

AIX MARSEILLE UNIVERSITE
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**Impact de l'innovation dans le commerce de détail:
facteurs influençant la fidélité des consommateurs
au commerce par mobile**

THESE POUR L'OBTENTION DU DOCTORAT EN SCIENCES DE GESTION
d'Aix-Marseille Université

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Zhuo ZHANG

Directeurs de recherche :

Monsieur Jean PHILIPPE

Professeur, Aix-Marseille Université

JURY :

Rapporteurs: Monsieur Camal GALLOUJ

Professeur, Université Paris 13

Monsieur Mbaye Fall DIALLO

Professeur, Université Lille

Suffragant: Monsieur Gilles PACHE

Professeur, Aix-Marseille Université

Madame Marie Christine MONNOYER

Professeur, Université Toulouse 1

Madame Anne Marianne SECK

Maître de conférences, Aix-Marseille Université

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A ma chère famille, avec toute mon affection.

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1. Introduction

Aujourd'hui, les technologies de l'information et la communication sont devenues une force qui donne une grande impulsion au développement de l'économie mondiale. Dans un même temps, elles provoquent énormément de changements dans les environnements internes et externes auxquels les entreprises sont confrontées. Après la révolution de l'information, les technologies jouent un rôle très important pour le commerce de détail : elles fournissent un soutien technique solide pour l'innovation et le développement du commerce de détail, et ont déclenché une révolution dans ce domaine.

Au 21^{ème} siècle, la vitesse de développement du commerce électronique s'est accélérée, en particulier le commerce mobile a connu une croissance explosive. Avec la couverture plus large des réseaux sans fil et des terminaux mobiles plus intelligents, la demande sur des services mobiles à valeur ajoutée a augmenté, ce qui a déclenché un développement du commerce mobile qui brise les limites de l'espace du commerce traditionnel, de sorte que les consommateurs peuvent compléter leurs activités commerciales à tout moment et n'importe où. En même temps, le prix d'accès aux réseaux sans fil et aux divers terminaux intelligents est de plus en plus acceptable par la plupart des gens. L'émergence du commerce mobile a provoqué un grand changement dans l'environnement des entreprises: il impacte profondément le secteur traditionnel du commerce de détail.

Cependant, en réalité, l'analyse et la discussion sur l'innovation du modèle d'affaires et du commerce mobile sont relativement limitées. Dans le cadre des technologies de l'information, l'analyse stratégique traditionnelle du commerce de détail n'est plus adaptée à ces changements. À la lumière de cela, il est important d'explorer activement l'innovation du modèle d'affaires du commerce mobile. Le commerce mobile est encore un nouveau sujet et les recherches sont relativement peu sur le comportement du

consommateur mobile. Il n'existe pas encore de définition du commerce mobile qui sont largement acceptée. Différents chercheurs ont adopté différentes méthodes de mesure dans leurs propres recherches. Il est plus facile pour les consommateurs du commerce mobile de comparer le prix et de changer de fournisseur plus rapidement. Les entreprises sont aussi confrontées à l'homogénéisation des produits et des services. La fidélisation des consommateurs est plus difficile à capturer par les entreprises. Les facteurs déterminants de la volonté de racheter dans le commerce mobile sont également difficiles à définir. Par conséquent, la recherche sur le commerce mobile est non seulement un sujet pratique très précieux, mais également un domaine à développer davantage.

Cette thèse considère les consommateurs du commerce mobile de vente de détail comme objet de recherche en prenant la valeur perçue du commerce mobile comme le point de départ. La question fondamentale de cette recherche : quelles sont les relations entre la valeur perçue et la satisfaction du commerce mobile sur la fidélité. Ce résumé de la thèse se concentre sur la présentation des résultats de la recherche. Donc, nous allons tout d'abord présenter le cadre théorique et comment il aboutit au cadre conceptuel que sera testé. La méthodologie utilisée sera ensuite précisée et les résultats obtenus seront enfin présentés et discutés.

1.1 Contexte de la recherche

Avec le développement rapide de la technologie du réseau mobile, le réseau 4G devient plus en plus mature et populaire. Le rythme de vie moderne devient trépidant, les utilisateurs font de plus en plus attention à l'utilisation du temps, tels que : le temps en transport en commun, le temps de repos au travail, le temps pour faire la queue, etc. Pendant ces temps fragmentés, les gens regardent des nouvelles, naviguent sur le site Web, font des achats, socialisent, etc. L'émergence du téléphone intelligent répond largement au besoin des consommateurs de mieux utiliser le temps fragmenté.

Selon Mark Weiser (1999)ⁱ de Xerox, les appareils mobiles seront partout et faciles à utiliser. Il a d'abord proposé le concept d'ubiquité en 1991. Aujourd'hui, le commerce

électronique basé sur Internet se développe et se déplace vers le M-commerce, qui est basé sur le réseau de communication mobile sans fil. De plus, avec le développement du secteur des TIC, le M-commerce est considéré comme une fenêtre importante sur l'avenir. Une autre raison pour que le M-commerce devienne un pionnier du mode de commerce émergent est la grande base de données des utilisateurs du commerce électronique et sa rétrocompatibilité.

Le nombre d'utilisateurs augmente donc progressivement. Selon le rapport le plus récent d'IAB (Interactive Advertising Bureau, 2016) : A global perspective of mobile commerce.ⁱⁱ Il montre qu'en moyenne, 75% d'utilisateurs du réseau mobile ont acheté des produits ou des services sur des appareils mobiles au cours des six derniers mois. Les consommateurs ayant acheté des produits sur des appareils mobiles déclarent qu'un tiers de leurs consommations sont réalisées sur des appareils mobiles. Le commerce mobile est devenu une habitude, près d'un quart des consommateurs dépensent via des appareils mobiles chaque semaine, en particulier dans la région Asie-Pacifique.

Sur la satisfaction des achats mobiles, 80% de consommateurs sont très satisfaits de l'expérience d'achat mobile, 62% des consommateurs prévoient d'acheter plus de biens et services sur les appareils mobiles dans les 6 mois suivants. La commodité (49%) et le gain du temps (46%) sont les deux motivations principales pour utiliser le commerce mobile. Face aux opportunités du développement du commerce mobile, diverses entreprises de distribution ont déployé des terminaux mobiles et se sont tournées vers le commerce mobile. Wal-Mart, Carrefour et les autres entreprises ont tous développé et lancé des applications pour des appareils mobiles. Contrairement aux achats en ligne traditionnels, le commerce mobile est un nouveau modèle d'achat combinant des terminaux mobiles et l'E-commerce. Les consommateurs peuvent rechercher, comparer, acheter et payer n'importe quand, n'importe où.

En tant qu'un nouveau modèle d'affaire émergent, le commerce mobile appartient à l'industrie des services. Le service est intangible et les utilisateurs ne peuvent pas le toucher et l'essence du service est de fournir de la valeur ajoutée aux utilisateurs. Par conséquent, l'amélioration de la valeur perçue des utilisateurs est très importante dans le secteur des services. Les clients comptent de plus en plus sur leurs propres

perceptions pour évaluer les entreprises. De ce point de vue, une bonne expérience d'achat peut créer de la valeur pour les utilisateurs et augmenter la valeur perçue par le client.

1.2 Problématique et objectifs de la recherche

Le développement vigoureux du marché de l'achat mobile a entraîné un développement rapide pour les entreprises, mais les défis sont immenses en même temps. Brynjolfsson et autres (2010)ⁱⁱⁱ ont souligné qu'avec le développement de la technologie du réseau mobile, les consommateurs ont de plus en plus de liberté dans le choix des sites d'achat en ligne et qu'ils ne manquent plus d'informations. Parce que les utilisateurs comprennent et maîtrisent parfaitement l'information sur les produits et les services, les prix des entreprises de commerce électronique deviennent de plus en plus transparents et la concurrence devient de plus en plus féroce. En même temps, avec l'augmentation de l'acquisition d'information par les utilisateurs, le pouvoir des consommateurs s'améliore continuellement. Reichheld et autres (2000)^{iv} ont souligné que les utilisateurs peuvent facilement basculer entre différents sites Web de consommations, et que seules les entreprises qui offrent aux utilisateurs les meilleures expériences d'achat peuvent attirer et acquérir des utilisateurs. Boyer, Hallowell & Roth (2002)^v ont constaté que le client en ligne est plus critique que le client hors ligne lorsque le service ne répond pas à ses attentes.

On peut dire aussi que la fidélité de l'utilisateur est plus difficile à maintenir. Les recherches existantes montrent que le coût d'acquisition de nouveaux utilisateurs et de rétention des anciens usagers représente respectivement 75% et 25% du budget total (Reichheld & Scheffer, 2000)^{vi}. Le coût de la rétention des anciens utilisateurs est beaucoup moins élevé. Dans le même temps, des études ont montré qu'attirer un nouveau client, le domaine dans les services traditionnels est environ 40% plus facile que le domaine des services électroniques (Luarn & Lin, 2005)^{vii}. En même temps, dans l'environnement du commerce mobile, l'utilisateur peut facilement utiliser le «bouche-à-oreille» pour partager son expérience d'achat avec d'autres personnes, ce qui affecte

la volonté et le comportement d'achat des autres.

En conséquent, comment cultiver et maintenir la fidélité des clients est crucial pour l'entreprise. Cependant, les recherches sur le comportement des consommateurs mobiles sont principalement basées sur l'adoption des utilisateurs. Bien que l'acceptation initiale ait été la première étape du succès, la survie à long terme et le succès final de l'entreprise dépendent de l'utilisation continue de l'utilisateur (Karahanna, 1999)^{viii}. Les taux de fidélisation et de rétention des clients constituent une mesure qualitative importante de la rentabilité des entreprises de service (Boyer, Hallowell & Roth 2002).

Théoriquement, le comportement de rachat des consommateurs relève de la loyauté comportementale. Selon Gremler & Brown (1996)^{ix}, de nombreux chercheurs définissent la fidélité par le nombre de fois que le consommateur continue d'acheter le produit ou le service. Tucker (1999)^x croit qu'après quatre et au-delà plusieurs fois, le comportement de rachat des consommateurs se réfèrent à la loyauté du consommateur. La recherche de Jacoby & Chestnut (1978)^{xi} montre que la fidélité du consommateur est de racheter fréquemment. Oliver (1999)^{xii} considère la fidélité du consommateur comme un achat répété du produit ou du service d'une marque particulière par les consommateurs et qu'ils ne changeront pas facilement pour d'autres fournisseurs de la marque. La fidélité du consommateur est l'engagement psychologique envers leurs fournisseurs préférés. Dans la définition de la fidélité du consommateur d'Oliver (1997)^{xiii}, le comportement de rachat fait partie de la troisième phase de la fidélisation des consommateurs.

Bien qu'il existe actuellement de nombreuses études sur l'utilisation continue des systèmes d'information, le commerce mobile est toujours particulier. L'application du commerce mobile est limitée par des conditions de ressources telles que la capacité de l'équipement terminal, la vitesse de réseau, etc. Le service de commerce mobile se rend n'importe quand et n'importe où, et les utilisateurs du commerce mobile sont à la fois des utilisateurs et des consommateurs. Par conséquent, il peut y avoir un grand écart sur l'utilisation continue entre des utilisateurs de commerce mobile et des utilisateurs des systèmes d'information généraux.

Bien que certains chercheurs aient mené des recherches sur l'utilisation continue par des consommateurs de système informatique, ils ne sont toujours pas convainçants sur l'utilisation continue du commerce mobile dans l'industrie de la vente au détail. Selon la théorie du comportement rationnel, l'intention comportementale de l'utilisateur est le prédicteur le plus efficace du comportement réel de l'utilisateur. De plus, la maximisation de la valeur est la base première de la prise de décision sur le comportement des clients, ce qui est l'hypothèse la plus fondamentale de la recherche sur le comportement des clients dans le domaine du marketing.

Faber, Ballon, Bouwman et al. (2003)^{xiv} propose que, pour concevoir des services et des produits de commerce mobile, une analyse systématique sur la valeur d'intention est nécessaire pour le fournisseur ; la valeur des attentes réelles des clients doit être effectuée. Parasuraman (1997)^{xv} a proposé que la valeur perçue par le client soit l'indicateur le plus important de l'intention de rachat des clients, et c'est aussi l'une des méthodes importantes pour mesurer l'avantage concurrentiel du service. Il est donc nécessaire d'étudier la signification et la composition de la valeur perçue du client, comment le client comprend, évalue et accepte la valeur fournie par l'entreprise. Ce qui permet aux entreprises de saisir les besoins psychologiques du client.

Compte tenu des problèmes indiqués ci-dessus et sur la base des résultats des études antérieures, nous discutons dans cette thèse des déterminants de la fidélité du consommateur au commerce mobile de la vente au détail. L'objectif principal de cette recherche est donc d'identifier et de comprendre les facteurs clés qui contribuent à fidéliser le consommateur au commerce mobile dans un contexte de la vente au détail.

Cet objectif général se décompose en quatre objectifs plus précis :

- Introduire le commerce mobile, son application aussi que son impact sur l'innovation du modèle des affaires du commerce de détail ;
- Introduire l'application théorique du 'Expectation Confirmation Model of Information System Continuance (ECM-ISC)' dans le commerce mobile et la modification que nous avons faite ;

- Explorer le mécanisme d'influence de la valeur perçue et de la satisfaction des consommateurs sur la fidélité des consommateurs du commerce mobile ;
- Proposer et tester empiriquement le modèle intégrateur des déterminants de la fidélité au commerce mobile ;
- Proposer des conseils pour le manager de la grande distribution afin d'améliorer leur qualité de service et finalement de capturer la fidélité des consommateurs.

Afin de compléter ces cinq objectifs de la recherche, nous devons clarifier ce qu'est le contenu spécifique de la fidélité des consommateurs de commerce mobile, et construire un modèle de recherche pour la fidélisation. Parce que la valeur perçue du commerce mobile reflète les caractéristiques du commerce mobile, les études ont montré que la valeur perçue a un impact important sur l'achat répété et la consommation continue de l'utilisateur, cette thèse mènera une recherche approfondie sur les trois questions suivantes:

1. Qu'est-ce qui constitue la valeur perçue des consommateurs du commerce mobile? Quel est le contenu spécifique de chaque dimension et comment ces déterminants influencent la fidélité au commerce mobile ?
2. Est-ce que la valeur perçue influence la fidélité du commerce mobile? Et quelle est la relation entre la valeur perçue, la satisfaction et la fidélité au commerce mobile?
3. Quel est l'impact des variables sociodémographiques sur le comportement du consommateur et la fidélité ?

2. Cadre Théorique et étude exploratoire

Cette thèse suit le plan de recherche suivant : la recherche de la littérature, la construction du modèle conceptuel et les tests empiriques, en combinant la recherche qualitative et la recherche empirique pour étudier les questions de recherche. Tout d'abord, nous allons présenter le concept du commerce mobile et son application au commerce de détail. Ensuite, il convient de préciser la relation entre la valeur perçue

des clients, la satisfaction et la fidélité du commerce mobile, et leurs facteurs influents. Enfin, à l'aide de données des entretiens approfondis et d'analyses qualitatives en utilisant des méthodes d'analyse de contenu, on obtient le modèle initial du mécanisme de fidélisation du commerce mobile et les hypothèses.

2.1 Commerce mobile dans l'innovation de commerce au détail

Depuis longtemps, le commerce de détail est considéré comme une industrie à forte intensité de main-d'œuvre qui nécessite très peu de technologie, et il investit rarement dans la R & D avec très peu de brevets (Hughes, 2007)^{xvi}. Jusqu'à présent, il y a encore un manque de recherche exhaustive sur l'innovation dans les industries de services, y compris la vente au détail (Reynolds et Hristov, 2015)^{xvii}. Même l'enquête CIS (Community Innovation Survey) et d'autres enquêtes ont montré que l'innovation du commerce de détail est faible et rare comparée aux autres secteurs (Gallouj, C., 2007)^{xviii}. L'innovation dans le secteur du commerce de détail comprend une approche holistique de la dimension de l'innovation en matière de vente au détail, ainsi que l'innovation en matière de format de détail, l'innovation technologique et l'innovation des modèles commerciaux. Dans cette thèse, nous analysons la théorie de Gallouj, C. (2007) car elle offre le point de vue le plus complet et le plus clair. Grâce à ces dimensions de l'innovation au commerce de détail, nous pouvons voir que l'innovation dans le commerce de détail est fondamentalement un processus pour créer ou modifier le modèle d'affaires.

Du point de vue de l'innovation technologique, le réseau de communication classique a principalement résolu les communications vocales entre humains, mais l'émergence du réseau de communication de données basé sur le protocole TCP / IP a rendu possible la communication entre l'humain et l'ordinateur. Informatique, et ainsi conduire à un concept de calcul universel (U-computing). Par conséquent, les activités commerciales intelligentes et le calcul universel deviennent des caractéristiques typiques de l'activité de magasinage en ligne.

Selon Gallouj, F. (1995)^{xi}, le développement des technologies d'information est très important pour la transformation de nombreuses activités de services. Les systèmes d'information pourraient créer de nouveaux types de services et développer de nouvelles façons pour fournir des services. Cela signifie que la relation entre l'entreprise et le client est modifiée, l'entreprise ne peut attirer les consommateurs qu'en leur fournissant une orientation distincte. Augmenter le lien entre l'entreprise et les consommateurs en créant de nouveaux groupes de clients, répondre à la demande de leurs multiples canaux d'achat. Cela exige que les entreprises de vente au détail innovent constamment les styles de produits, développent de nouveaux modèles de service, et puissent utiliser la technologie de l'information pour renforcer continuellement la communication avec les consommateurs et les guider à travers des propositions de valeur uniques.

Le commerce mobile basé sur le système d'information joue un grand rôle dans la transformation du modèle commercial des entreprises de détail en influençant cinq facteurs de l'innovation du modèle commercial : proposition de valeur, structure de la chaîne de valeur, réseau relationnel, structure organisationnelle et modèle de profit.

Depuis 2002, les chercheurs ont produit beaucoup de recherches sur le commerce mobile. Les principaux résultats sont dans la recherche théorique basique du commerce mobile, Shintaro Okazaki (2005)^{xx} a discuté de certaines directions futures du commerce mobile, telles que le commerce électronique et la comparaison d'affaires mobile et quelques recherches méthodologiques; la recherche sur les intergiciels mobiles, Kwon et al. (2003)^{xxi} a étudié l'application de la technologie multi-agent dans des conseils personnalisés dans la conscience de la situation: Lee & Benbasat (2003)^{xxii} a construit le cadre de l'interface de conception de commerce mobile pour la recherche de terminaux utilisateurs sans fil. L'analyse de la conception de l'interface doit prêter attention à sept aspects : contexte, contenu, communauté, personnalisation, communication, collection, commerce.

Ngai et al. (2007)^{xxiii} ont décrit l'identification par radiofréquence dans les applications mobiles et les études de cas des dernières années. Certains chercheurs ont étudié le modèle d'acceptation des technologies dans le commerce mobile. Wu & Wang

(2005)^{xxiv} ont étendu le modèle d'acceptation technique au commerce mobile. Ankar & D'Incau (2002)^{xxv} ont analysé la nature et la fonction des services mobiles du point de vue du client afin de fournir de la valeur aux utilisateurs d'Internet sans fil.

En résumé, la recherche actuelle sur le commerce mobile a montré une tendance au développement, le nombre de documents de recherche a augmenté. Il y a eu de nombreux aspects du commerce mobile dans les conférences et revues universitaires spécialisées, il y a aussi des monographies d'entreprises mobiles qui ont été publiées. La recherche sur le commerce mobile est relativement plus large et plus en profondeur, la théorie de base du commerce mobile, les méthodes techniques, les cas d'application ont commencé à faire des recherches approfondies. Avec le rythme accéléré d'application du commerce mobile, le réseau 4G dans le monde a été utilisé commercialement, donc la stratégie commerciale, le modèle d'affaires, le modèle d'application et la recherche comportementale du consommateur et d'autres recherches fondamentales dans le commerce mobile sont encore plus nécessaires.

2.2 Valeur perçue, satisfaction et fidélité au commerce mobile

Pour l'entreprise, la clé du succès est de comprendre ce dont les clients ont besoin, le client détermine la direction du développement de l'entreprise. Les entreprises ne peuvent concevoir une stratégie de marketing appropriée qu'après avoir parfaitement compris et maîtrisé le comportement d'achat des consommateurs, et progressivement établi et amélioré la satisfaction et la fidélité du consommateur. Étudier le comportement des consommateurs dans un environnement de commerce mobile est la base pour les entreprises de commerce mobile, formuler des stratégies efficaces et gagner la concurrence. À l'heure actuelle, les recherches de la communauté universitaire internationale sur le comportement du consommateur de commerce mobile sont encore à l'étape initiale : elles se préoccupent davantage du comportement d'utilisation initial et d'acceptation de l'utilisateur. La recherche sur le comportement d'utilisation continue du consommateur est encore très rare.

L'intention de rachat, aussi appelée la volonté de rachat, fait référence à la tendance des consommateurs à racheter des produits qu'ils ont déjà achetés auparavant, et c'est aussi le degré d'engagement psychologique du consommateur envers le service (Saleh et Ryan, 1991)^{xxvi}. C'est le degré de possibilité pour que les consommateurs essaient d'acheter à nouveau un produit ou un service (Dodds, Monroe et Grewal, 1991)^{xxvii}. Nous pouvons également dire qu'après que les consommateurs achètent et utilisent les produits, ils évaluent leur propre expérience d'achat et d'utilisation des produits afin d'évaluer s'il y a une intention d'acheter à nouveau (Kristensen, 2000)^{xxviii}. Selon Jones & Sasser (1995)^{xxix}, dans le scénario d'achat en ligne, l'intention de rachat des consommateurs signifie qu'après l'achat initial, l'intention du consommateur de visiter à nouveau le site Web de l'entreprise qui dépend de la satisfaction des transactions.

Théoriquement, le comportement de rachat des consommateurs appartient à la loyauté comportementale. Selon Gremler & Brown (1996)^{xxx}, de nombreux chercheurs définissent la fidélité par le nombre de fois que le consommateur continue d'acheter un produit ou un service, et les indicateurs de fidélité comprennent principalement : la proportion de consommation, l'ordre de consommation et la probabilité de comportements de consommation répétés. Tucker (1999)^{xxxi} croit qu'après le comportement de rachat des consommateurs se produit quatre fois ou plus, il se réfère à la fidélité des consommateurs. La recherche de Jacoby & Chestnut (1978)^{xxxii} a montré que la fidélité du consommateur est un comportement fréquent d'achat répété. Oliver (1999)^{xxxiii} considère la fidélité du consommateur comme un achat répété du produit ou du service d'une marque particulière par les consommateurs, ils ne changeront pas facilement à un autre fournisseur de marque, ainsi la fidélité du consommateur est l'engagement psychologique envers leurs fournisseurs préférés. Dans la définition de la fidélité du consommateur par Oliver (1997)^{xxxiv}, le comportement de rachat fait partie de la troisième phase de la fidélité du consommateur : Attitude / loyauté intentionnelle.

Dans les années 1980, le concept de la gestion de l'entreprise de la satisfaction du client est devenu le consensus. À ce moment-là, la recherche a considéré qu'une fois que les clients sont satisfaits, le comportement d'achat continu du client peut apparaître. Par

conséquent, la satisfaction de la clientèle a été considérée comme une mesure du succès commercial. Cependant, les études pratiques et théoriques montrent que le nombre de comportements d'achat continu était inférieur à 50% pour les clients satisfaits (He, 2007)^{xxxv}. Les chercheurs ont donc réalisé que la satisfaction des clients n'était pas le seul facteur de comportement d'achat continu.

En fait, un grand nombre de chercheurs ont constaté que la valeur perçue est un indicateur important de l'intention d'achat répétée (Woodruff, 1997^{xxxvi}; Petrick, 2002^{xxxvii}). Dans les recherches actuelles, certains chercheurs pensent que la valeur perçue par le client affecte directement le comportement d'achat continu du consommateur, tandis que certains chercheurs ont constaté que la valeur perçue par le client influence indirectement le comportement d'achat continu du consommateur par des facteurs tels que la satisfaction. Certains chercheurs pensent que la valeur perçue a des effets directs et indirects sur le comportement d'achat continu du consommateur.

Cependant, la recherche sur les facteurs influençant la valeur perçue du commerce de détail mobile est encore rare. La mesure de la valeur perçue avec une seule dimension manque de validité (Woodruff & Gardial, 1996)^{xxxviii}. Il est également difficile d'indiquer clairement comment améliorer la valeur perçue par les clients et améliorer la compétitivité des entreprises. Comparé aux achats en ligne traditionnels, le commerce mobile est à tout moment et n'importe ce qui permet au consommateur de comparer les prix et de changer de fournisseurs plus facilement, l'utilisation continue du commerce mobile sera plus difficile à établir.

Sur la base de ces recherches, nous avons constaté que la satisfaction du client influence directement la fidélité, tandis que la valeur perçue du client influence la fidélité par la satisfaction du client. Par conséquent, nous n'analysons pas seulement la satisfaction, mais aussi la valeur perçue par le client comme facteurs d'influence de la fidélité. Nous avons l'intention d'utiliser la méthode de recherche qualitative pour trouver et analyser les facteurs influençant la valeur perçue et la satisfaction du commerce mobile, et explorer efficacement l'impact de la valeur perçue et de la satisfaction sur la fidélité du commerce mobile.

2.3 Etude qualitative

Pour bien préciser comment les consommateurs perçoivent et évaluent le commerce mobile, nous avons effectué une étude qualitative exploratoire via des entretiens semi-directifs. Les interviews ont été réalisées en face à face avec 20 personnes et menés en France auprès d'utilisateurs français et chinois.

Les personnes interrogées ont été sélectionnées par différents critères tels que l'âge, le sexe, le travail, le rôle familial, etc. Les interviews ont été réalisés dans différentes situations: supermarché, fastfood store, gare routière, université, bureau, et à la maison pour distinguer les différents contextes d'utilisation du téléphone mobile. Les participants étaient âgés de 19 à 56 ans et étaient des professions commerciales, des étudiants, des enseignants, des restaurateurs, etc. Indépendamment du sexe de l'interviewé, la majorité des participants ont une bonne connaissance du commerce mobile et achètent fréquemment via leur téléphone mobile.

Ensuite, nous avons appliqué l'analyse de contenu comme méthode d'analyse. Dans cette recherche, nous avons d'abord utilisé Nvivo11 pour calculer la fréquence des mots. Nous nous sommes concentrés sur les 100 mots les plus utilisés après la suppression de la particule modale et des mots non pertinents. Nous avons trouvé les mots comme information, recherche, comparer, prix, temps, paiement, sécurité, pratique, facile, interaction, fonction, promotion, etc., qui sont les mots les plus utilisés par ces interviewés qui sont également apparus dans la littérature précédente comme montré dans le chapitre 2. Nous avons essayé de faire un codage ouvert du thème en fonction de ces mots en considérant les caractères de l'industrie du commerce de détail. Puis, nous avons utilisé Nvivo 11 pour explorer les extensions de ces mots afin de trouver les détails autour des facteurs clés après le codage. Cela nous a également aidé à mieux comprendre ces facteurs. Grâce à l'analyse qualitative, nous avons obtenu un premier schéma de recherche avec un certain nombre de variables pertinents. Dans la partie suivante, nous proposerons le modèle conceptuel, les variables et les hypothèses.

3. Modèle conceptuel et hypothèse de recherche

Dans cette partie, selon l'analyse de la littérature et le résultat de la recherche qualitative, nous avons combiné les caractéristiques des services du commerce mobile dans le secteur de détail pour extraire les principaux facteurs qui affectent le comportement d'achat continu des consommateurs selon les théories pertinentes et les conclusions de recherche.

Dans le deuxième chapitre, nous avons divisé les facteurs qui influencent le comportement du consommateur du commerce mobile en cinq types : caractéristiques du fournisseur de services de commerce mobile, caractéristiques du commerce mobile, caractéristiques propres des consommateurs, caractéristiques de l'environnement externe et caractéristiques du mobile perçues. En outre, les caractéristiques des fournisseurs de services de commerce mobile et les caractéristiques des activités de commerce mobile affectent principalement le risque perçu de la perception des consommateurs. Les caractéristiques des consommateurs se réfèrent principalement à l'innovation personnelle des consommateurs, et l'environnement externe se réfère principalement à l'impact social. Les caractéristiques de l'entreprise mobile comprennent l'utilité perçue, la facilité d'utilisation perçue, le coût perçu. Par conséquent, cette étude met en avant les principaux facteurs influençant de la volonté des consommateurs de poursuivre leurs achats dans le domaine de la vente au détail mobile, tels que la facilité perçue d'utilisation, l'utilité perçue, les bénéfices perçus, la sécurité perçue, la valeur psychosociale et la qualité du service.

3.1 Valeur perçue, satisfaction et fidélité

Fishbein et Ajzen (1975)^{xxxix} ont souligné que les intentions comportementales (dans cette recherche, le comportement du consommateur est la fidélité du consommateur au commerce mobile) est la volonté subjective des consommateurs de continuer à utiliser le commerce mobile. Plus l'intention du comportement d'une personne est grande, plus il est probable que l'on s'attende à quelque chose. Dans cette thèse, l'intention

comportementale est la variable performance. Blanca et al. (2017)^{xi} ont proposé dans leur étude que la valeur perçue contribue de manière significative à la satisfaction. La satisfaction a également un effet significatif sur la fidélité.

La valeur perçue de cette étude provient principalement de l'analyse du perspectif client, c'est-à-dire de l'étude du CPV (Customer Perceived Value). Ce concept était à l'origine lié à la perception de la valeur et de la satisfaction de Kolter & Levy (1969)^{xli}, et ils pensaient que la valeur perçue du client déterminait la satisfaction. Le chercheur axé sur la satisfaction de la clientèle croyait que la satisfaction était la cause directe de l'intention de comportement. Lapierre et al. (1999)^{xlii} ont divisé la valeur perçue en rendements perçus et en avantages perçus, où les rendements perçus sont constitués de la qualité perçue et des coûts temporels perçus, du prix réel, du prix perçu et du coût énergétique. L'étude a confirmé que la satisfaction a un effet direct sur l'intention comportementale et que la valeur perçue n'a pas d'effet significatif sur l'intention comportementale.

Il y a aussi beaucoup de chercheurs qui croient que la satisfaction du client et la valeur perçue ont un impact direct sur les intentions comportementales. La plupart des études empiriques ont confirmé que la cause directe de l'intention de comportement est la valeur perçue par le client et que la valeur perçue par le client affectera le comportement du client par la satisfaction. C'est-à-dire que le client a d'abord pensé que le magasinage est précieux et qu'il a ensuite l'impression que la consommation est satisfaisante, et qu'il y aura ensuite l'intention de continuer à consommer. Turel et al. (2006)^{xliii} Ont étudié la satisfaction et la fidélité des consommateurs en s'intéressant aux utilisateurs de services mobiles, que la qualité perçue et la valeur perçue est le principal facteur affectant la fidélité et la satisfaction du consommateur. Une plus grande satisfaction des consommateurs les fait se plaindre moins, ils vont répéter à l'achat et ils sont plus en mesure de supporter le prix élevé. Donc, nous proposons l'hypothèse ci-dessous:

H1: La valeur perçue du canal mobile influence positivement la fidélité aux canaux mobiles.

H2: La satisfaction des canaux mobiles influence positivement la fidélité aux canaux mobiles.

H3: La valeur perçue du canal mobile influence positivement la satisfaction aux canaux mobiles.

3.2 Facteurs déterminants de la valeur perçue du commerce mobile

Lin et al. (2016)^{xliv} propose un cadre de qualité du service, composé de deux dimensions (qualité du service électronique et qualité du service logistique), dans le contexte du commerce électronique. Les résultats indiquent que la qualité du service électronique et la qualité du service logistique sont étroitement liées à la satisfaction du client. Comme résultat de l'analyse qualitative de notre étude, ceux-ci sont également influents dans le commerce mobile,

H4: La qualité de service perçue sur les canaux mobiles influence positivement la satisfaction des canaux mobiles

Davis (1989)^{xlv} a défini la facilité d'utilisation perçue, ce qui suggère que la facilité d'utilisation perçue correspond à ce que les consommateurs perçoivent comme un degré de facilité d'utilisation des services de commerce mobile. C'est un autre facteur important dans le modèle d'acceptation de la technologie. En raison des limitations de l'appareil mobile en termes d'affichage, de vitesse et de fonctionnalité, cela augmente la complexité d'utilisation des services de commerce mobile. Cela rendra beaucoup d'utilisateurs réticents, même si l'utilité perçue des services d'affaires mobiles est positive. Mais ils abandonnent l'utilisation du service de commerce mobile parce qu'ils doivent faire plus d'efforts pour finalement.

H5: La facilité d'utilisation perçue influence positivement la valeur perçue du canal mobile.

Dans le modèle d'acceptation de la technologie, l'utilité perçue est un facteur très important qui affecte l'attitude d'adoption des utilisateurs. Dans le contexte du commerce mobile, le modèle d'acceptation de la technologie est largement utilisé, et la recherche empirique a prouvé que l'utilité perçue est un facteur important influençant l'adoption des consommateurs du commerce mobile. L'étude soutient que dans le secteur du commerce de détail, le commerce mobile, par rapport aux modèles commerciaux traditionnels ou aux E-commerce, peut donner aux utilisateurs l'efficacité et la commodité nécessaires pour prendre de meilleures décisions d'achat.

H6: L'utilité perçue influence positivement la valeur perçue du canal mobile.

La sécurité perçue fait référence à la possibilité que le service soit perçu par le consommateur en termes d'informations personnelles, de propriété du compte, etc. Les consommateurs vont essayer de trouver un moyen sûr d'éviter le risque. Au début de la promotion de la vente au détail mobile, les consommateurs ne sont pas conscients de ce nouveau type de modèle de service aux entreprises, et la sécurité perçue sera un facteur important influant sur leur attitude.

H7: La sécurité perçue influence positivement la valeur perçue du canal mobile.

Les avantages perçus en termes de coûts se rapportent au niveau de coût (coût de l'équipement, coût du service, etc.) que les consommateurs considèrent devra payer en raison de l'utilisation des services de commerce mobile. Dans la recherche passée, il n'y a pas d'avantages de coûts perçus sur les systèmes d'information plus matures. Dans ce contexte, les consommateurs pourraient devoir payer des frais pour l'utilisation des services de commerce mobile. Par conséquent, si ce coût aura une incidence sur l'attitude du consommateur vis-à-vis du commerce mobile, il devra être davantage exploré.

H8: Les avantages perçus en termes de coûts influencent positivement la valeur perçue des canaux mobiles.

La valeur sociale perçue fait référence à l'impact perçu des groupes environnants et de l'environnement. Compte tenu de la situation spécifique des services de vente au détail mobiles, combinée aux conclusions précédentes sur la recherche sur les paiements mobiles, cette étude a estimé que la valeur sociale perçue affecte la valeur perçue des consommateurs.

H9: La valeur psychosociale influence positivement la valeur perçue du canal mobile.

3.3 Variables modératrices: caractéristiques des consommateurs

Dans de nombreuses recherches sur le commerce électronique, les caractéristiques démographiques sociales des utilisateurs sont liées à leur comportement d'achat en ligne. Korgaonkar & Wolin (1999)^{xlvi}, Bhatnagar et al. (2000)^{xlvii} ont soutenu qu'accepter l'Internet comme un canal d'affaires et que les attitudes des utilisateurs envers ce

système sont liées au sexe et à l'âge. Morganosky et Cude (1999)^{xlvi} ont soutenu que l'éducation est pertinente et Dahlen (2000)^{xlix} l'a également considéré comme pertinent pour la profession. Dans ce contexte, certains chercheurs ont montré que les caractéristiques démographiques sociales du client affectent la motivation des achats en ligne individuels.

Selon Waarden, Benavent, Castéran (2013)¹, les disparités individuelles de loyauté sont probablement causés par l'hétérogénéité interpersonnelle, les clients ont des orientations d'achat différentes et devraient être intrinsèquement motivés par des récompenses variées incluant différents bénéfices perçus. Dans nos interviews, les répondants ont mentionné beaucoup de promotion, de marque, de prix, et aussi de plaisir du shopping mobile. Combiné avec les facteurs dans la littérature, nous proposons l'âge, l'innovation; hédonisme; fidélité à la marque; la sensibilité au prix et la sensibilité à la sécurité en tant que caractéristiques du consommateur.

3.4 Modèle de recherche

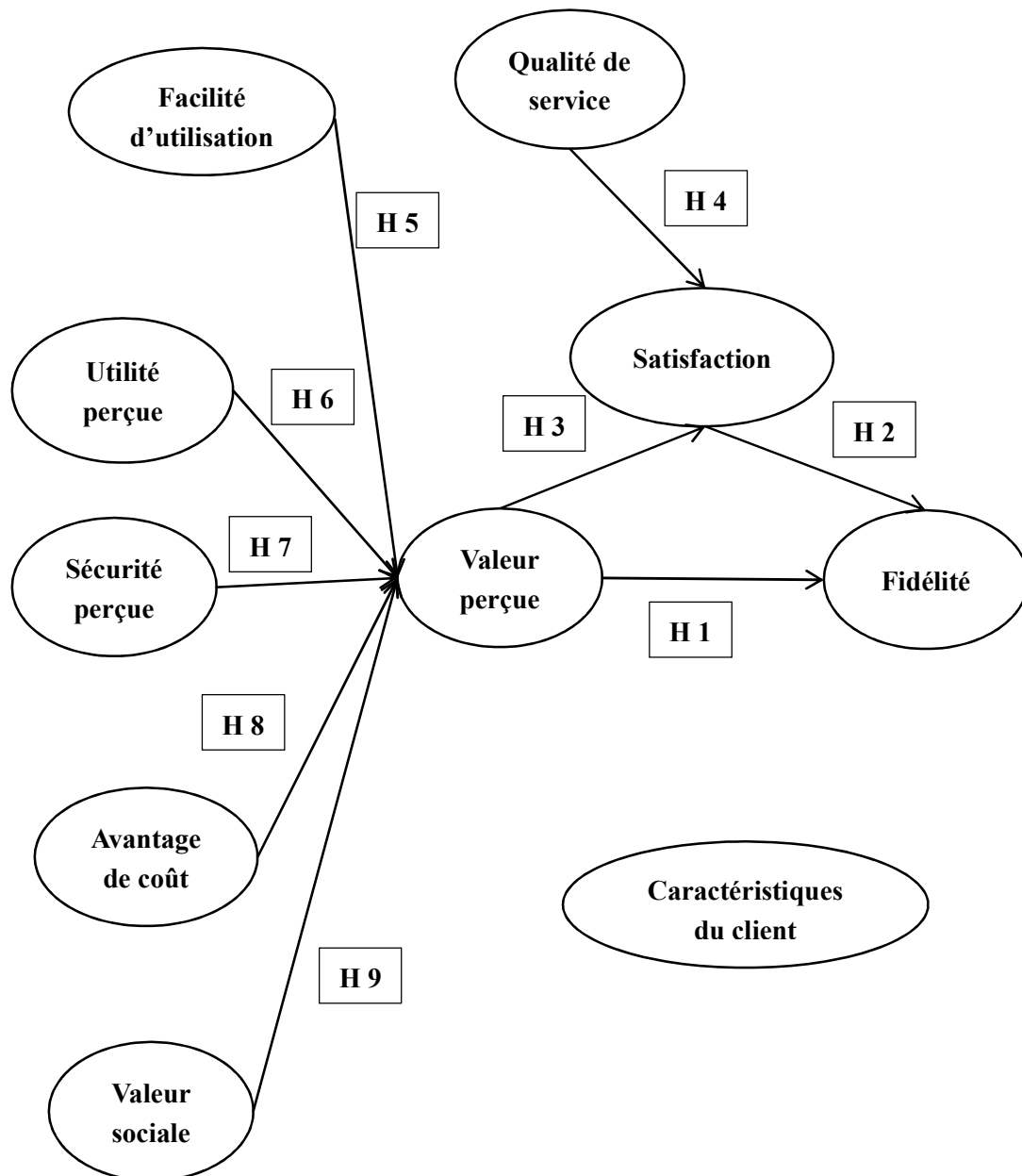
Le commerce mobile pourrait être appliquée à une variété de domaines, selon l'enquête de terrain application et l'analyse, cette recherche a l'intention de sélectionner le domaine de l'industrie du commerce de détail se réfère principalement à la vie quotidienne des consommateurs fréquents, tels que les centres commerciaux, supermarchés, dépanneurs, restaurants, etc. Cette étude appellera les entreprises mobiles dans le commerce de détail: la vente au détail mobile.

Sélectionnez le domaine de la recherche mobile au détail est principalement basée sur deux considérations. D'une part, le commerce de détail et la vie des gens sont étroitement liés, ce qui pourrait apporter beaucoup de commodité aux entreprises et aux consommateurs. Il a de vastes perspectives d'application. D'un autre côté, peu d'universitaires ont fait de la recherche dans ce domaine, il est nécessaire de mener une étude approfondie pour mieux guider l'application pratique du domaine.

Dans cette partie, selon la recherche existante et le résultat de la recherche qualitative, nous avons combiné les caractéristiques des services d'affaires mobiles dans le secteur

de détail pour extraire les principaux facteurs qui affectent le comportement d'achat continu des consommateurs selon les théories pertinentes et les conclusions de recherche. Basé sur la construction du modèle d'attente-confirmation de la continuité d'IS tel qu'illustré à la figure.

Figure R-1: Modèle de recherche.



4. Méthodologie de la recherche quantitative

Chiu et al. (2014)^{li} ont souligné que les répondants doivent avoir eu des activités d'achat en ligne au cours des six derniers mois, sinon cela affectera les véritables pensées du client et l'authenticité du questionnaire. Par conséquent, cette recherche a mis en place l'énoncé correspondant au début du questionnaire afin d'exclure ceux qui n'ont pas fait d'achats par téléphone mobile au cours des six derniers mois. Le questionnaire ne limite pas l'utilisateur à un nombre spécifique d'applications de magasinage de détail mobile pour répondre au questionnaire, principalement en tenant compte du grand nombre d'applications de magasinage au détail existantes. Les groupes d'utilisateurs sont également différents, et les différents utilisateurs du commerce mobile ont différents degrés de préférence de différentes applications et sites. L'individu doit être différent, si l'application d'achat mobile est limitée dans le questionnaire, le répondant s'ennuiera et cela aura un impact sur la réponse au questionnaire. Cette conception permet aux utilisateurs d'exprimer pleinement leurs sentiments à propos de l'application de magasinage qu'ils aiment, de sorte que les données de recherche sont plus représentatives.

4.1 Echantillon

Grâce à l'analyse des statistiques de base de la population des consommateurs interrogés, nous pouvons voir qu'il y a 178 femmes dans l'échantillon de l'étude, ce qui représente 52,8% du nombre total, légèrement plus que le sexe masculin (47,2%). Il est intéressant de noter que l'envoi initial par courriel comprenait un peu plus d'hommes (51,6%) que de femmes (48,4%) ; cette inversion des proportions respectives met en évidence que, probablement, les femmes s'intéressaient davantage au sujet traité par l'enquête. La proportion de jeunes de moins de 35 ans est élevée (63% de l'échantillon) ; cela peut être vu comme un résultat combiné du ciblage de la liste de diffusion et du comportement des personnes âgées qui sont probablement plus nombreuses à ne pas avoir d'expérience d'achat sur mobile et qui ne répondent donc pas au questionnaire

dans une plus grande proportion. 111 répondants ont entre 35 et 50 ans, soit 32,8% de l'échantillon. Seules 14 personnes ont plus de 50 ans, soit 6,9% du total. Ainsi, l'échantillon semble bien cadrer avec les recherches de Pedersen (2001^{lii}, 2003^{liii}). Du point de vue de la profession, seulement quelques-uns (2%) sont des personnes sans activité, une grande majorité des répondants (87%) étant impliqués dans diverses activités professionnelles. Les étudiants sont relativement peu nombreux (environ 11%) et cela semble confirmer que l'effet «boule de neige» était plutôt efficace, grâce à l'aide des personnes figurant sur la liste initiale des courriels. Parmi les répondants actifs, environ un tiers sont employés en tant que cadres. Ces compétences supérieures sont donc significativement plus nombreuses que d'habitude et cela provient probablement de la liste de diffusion originale basée sur des universitaires et des chercheurs. Ce profil d'emploi peut être évalué plus précisément en fonction du niveau de scolarité des répondants : plus de la moitié (57%) ont un diplôme baccalauréat et des autres (42%) ont un diplôme master. Cela pourrait être attendu de la cible de la liste initiale des emails. Cependant, seulement (1%) des répondants ne sont que de premier cycle ou de niveau inférieur et n'ont probablement pas été directement contactés par le courrier électronique initial, mais grâce à la redirection vers les proches concernés. Ce profil de l'enseignement supérieur est compatible avec la structure de la communauté des principaux utilisateurs de smartphones et de tablettes. La répartition du revenu mensuel est plus dispersée, il semble que l'utilisation du mobile pour faire du shopping peut être intéressante pour toutes les tailles de budget. Au contraire, le statut de la famille semble jouer un rôle de pilote dans ce comportement : la plupart (60%) des utilisateurs du commerce mobile sont mariés ou vivent en couple, les célibataires ne représentant que 37% de l'échantillon. Ceci est essentiellement cohérent avec ce que nous avons observé lors de la conduite des entretiens : les personnes mariées doivent acheter beaucoup pour la vie de famille. L'utilisation du shopping mobile permet de gagner du temps, d'optimiser l'organisation et améliore grandement la possibilité d'être au courant des meilleures affaires.

Tableau R-1: Description d'échantillon (partie 1)

Question	Type	Nombre	% de total
Sexe	Féminin	178	52.8
	Masculin	159	47.2
Age	16 to 20 ans	13	3.9
	21 to 25 ans	44	13.0
	26 to 30 ans	87	26.0
	31 to 35 ans	68	20.1
	36 to 40 ans	64	18.9
	41 to 45 ans	32	9.5
	46 to 50 ans	15	4.4
	51 to 55 ans	7	2.1
	56 to 60 ans	7	2.1
Profession	Exécutif	90	26.6
	Pigiste	9	2.7
	Employé ou travailleur	194	57.7
	Etudiant	37	10.9
	Inoccupé ou à la retraite	7	2.1
Education	Master ou supérieur	143	42.0
	Bachelier	191	57.0
	Enseignement secondaire ou moins	3	1.0
Revenu mensuel (€)	Plus de 3000	91	27.0
	2001 à 2500	83	24.6
	1501 à 2000	74	22.0
	1001 à 1500	53	15.7
	1000 ou moins	17	5.1
	<i>Réponses manquantes</i>	<i>19</i>	<i>5.6</i>
Situation familiale	Célibataire	126	37.4
	Marié	116	34.4
	En couple sans mariage	84	24.9
	Divorcé	2	0.6
	Veuf	4	1.2
	<i>Réponses manquantes</i>	<i>5</i>	<i>1.5</i>
Total		337	100

Deuxièmement, nous allons regarder à travers la distribution de l'expérience d'achat mobile et la fréquence d'utilisation de l'échantillon de l'enquête. 92 personnes (27%) utilisent quotidiennement le shopping mobile, 17.8% le font deux à trois fois par mois et 3% une fois par mois. Il est donc nécessaire d'étudier la volonté du consommateur d'utiliser le shopping mobile. Le montant moyen des dépenses est également assez

régulièrement réparti: 18% dépensent plus de 400 € par mois avec l'utilisation de leur téléphone mobile. Pour ces répondants, l'appareil mobile devient probablement une aide essentielle pour la plupart des tâches courantes. Les autres montants dépensés sont ensuite répartis de manière plus ou moins égale: 15% dépensent entre 301 et 400 €, 18% entre 201 et 300 €, 14% entre 151 et 200 €, 18% entre 101 et 150 € et 17% moins de 100 € mensuel. Ainsi, l'échantillon offre un panorama complet des niveaux d'implication des populations dans les achats mobiles. Ce niveau de dépenses plutôt élevé vient, au moins en partie, de la taille de la famille pour laquelle le magasinage est fait. Parmi nos répondants, les deux tiers n'achètent pas de biens uniquement pour eux-mêmes mais pour toute la famille de 2, 3 personnes ou plus. Ceci suggère que les besoins du shopping mobile sont particulièrement forts pour les ménages de grande taille.

Tableau R-2: Description d'échantillon (partie 2)

Question	Type	Nombre	% de total
Fréquence d'utilisation	Chaque jour	92	27.3
	3 ou 4 fois /semaine	89	26.4
	Chaque semaine	80	23.7
	2 ou 3 fois/ mois	60	17.8
	Chaque mois	10	3.0
	Moins régulièrement	6	1.8
Consommation moyenne (€)	Moins de 50	17	5.0
	50 à 100	39	11.5
	101à150	60	17.8
	151à 200	47	13.9
	201à 300	59	17.5
	301 à 400	51	15.1
	Plus de 400	60	18.0
	<i>Réponses manquantes</i>	4	1.2
Taille du foyer	Pour soi-même	123	36.5
	2 personnes	79	23.4
	3 personnes	60	17.8
	4 personnes ou plus	71	21.1
	<i>Réponses manquantes</i>	4	1.2
Total		337	100

4.2 Questionnaire

Le questionnaire comprend principalement 12 parties, la première partie est de comprendre les habitudes d'achat de l'utilisateur du commerce mobile, y compris le temps de magasinage, la catégorie de produit et le nombre d'applications mobiles. Les parties 2-7 consistent à tester 6 variables indépendantes, notamment: la facilité d'utilisation perçue (PEU); utilité perçue (PU); confiance perçue (CL); les avantages en termes de coûts perçus (PCB); valeur sociale perçue (PSV); la qualité de service perçue (PSQ). La section 8-9 est la variable du médiateur de test: valeur perçue (PV); Satisfaction (Satis). La partie 10 teste la variable de résultats: loyauté (Loy). La partie 11 est la mesure de la variable de contrôle: le degré d'acceptation de l'innovation personnelle; hédonisme; fidélité à la marque; sensibilité au prix ou à la sécurité. La dernière partie est l'information personnelle de base des consommateurs. Principalement en incluant le sexe, l'âge, l'éducation, la profession, le revenu mensuel, le nombre de temps d'achats mobile mensuel et le montant d'achat moyen par téléphone portable et ainsi de suite.

Nunnally (1978)^{liv} a proposé que les variables mesurées contiennent au moins 3 questions de mesure afin d'assurer leur validité. Churchill (1979)^{lv} a souligné que lorsque le résultat de plusieurs questions de mesure est cohérent avec les variables, il peut effectivement améliorer la fiabilité des variables. Danaher et Haddrell (1996)^{lvi} ont également suggéré que la mesure d'une variable avec plusieurs questions de mesure est plus fiable qu'une mesure unique. Par conséquent, cette étude pour chaque mesure de variable, assure qu'il y a au moins trois ou plus de trois questions de mesure pour mesurer les variables. On s'est assuré également que les répondants peuvent remplir le questionnaire dans environ 10 minutes, afin que les utilisateurs aient assez de patience pour répondre au questionnaire. Cependant, afin d'éviter à l'utilisateur de recevoir l'impact et d'éviter les questionnaires invalides, l'ordre des éléments de mesure est perturbé de façon aléatoire.

Pour que l'échelle de mesure ait un degré élevé de validité, de cohérence de contenu et de degré de reconnaissance des items de mesure, il existe généralement une échelle de

mesure Likert à 5 points ou 7 points. Dans cette étude, la mesure Likert à 7 points est utilisée pour la question, et le degré de reconnaissance de chaque élément de mesure est fixé de 1 à 7 niveaux différents. L'ampleur de la valeur est positivement corrélée avec le degré de reconnaissance. Plus la valeur est grande, plus le degré de reconnaissance de l'objet est élevé, par exemple si 1 est totalement en désaccord sur le contenu du titre, et 7 présente le contenu du titre entièrement accepté.

Afin d'assurer la représentation de l'échantillon autant que possible, sur la base d'une simple recherche de la plate-forme de recherche, nous avons choisi la plate-forme d'enquête de réseau de CreatSurey (<https://cs.creatsurvey.com>) en mai 2017 et Juin 2017, la publication officielle du questionnaire pour une période d'un mois. Enfin, un total de 350 questionnaires a été collecté. Après la collecte du questionnaire, 337 questionnaires valides ont été obtenus pour s'assurer de la validité des échantillons. La proportion de questionnaire retenue est donc de 96,5%. L'étude suivante sera validée sur les 337 questionnaires valides.

4.3 Méthode d'analyse

PLS estime le facteur de charge des chargements d'articles et des coefficients de cheminement par calcul itératif de plusieurs blocs. Il y a deux types de blocs, l'un est le mode formatif, et l'autre est le mode réflectif. La présentation en mode formatif est un élément qui se réfère à la construction, ce qui signifie que ces éléments construisent un concept abstrait. Mais ils ne sont pas interchangeables et ne partagent pas nécessairement un thème commun. Les éléments pourraient avoir n'importe quel modèle d'inter-corrélation mais devraient posséder le même genre de relations directionnelles. Le mode réflectif est la façon dont la construction se réfère à des éléments, ce qui signifie que le concept abstrait de construction existe réellement parce qu'il peut réellement être observé. Et le domaine conceptuel de la construction ne change pas en ajoutant ou en supprimant un élément. Tous les éléments du mode de réflexion sont inter corrélés (Diamantopoulos et Siguaw, 2006).

Dans PLS, il est courant d'appeler le modèle de mesure comme modèle externe et d'appeler la structure du modèle structurel comme modèle interne. Il y a deux étapes pour compléter le test du modèle d'équation structurelle. La première étape consiste à tester le modèle de mesure, y compris divers tests de fiabilité et de validité, tels que la validité convergente et la validité discriminante. En d'autres termes, il teste pour savoir si l'échelle que nous avons développée peut vraiment refléter la construction. La deuxième étape consiste à tester le modèle structurel, cette étape consiste à voir si l'hypothèse est supportée ou non, et à expliquer l'étendue de la construction. PLS est le processus d'estimation de la charge factorielle (la relation coefficient entre construction et éléments, généralement appelée chargement factoriel en mode réflectif et poids pondéré en mode formatif) et coefficients de cheminement (degré d'influence de la construction A à la construction B).

4.4 Mesure des variables

Les éléments de mesure de variables pertinents doivent être facilement compris par les utilisateurs et ne peuvent pas être ambigus, et faciles à remplir pour que les utilisateurs puissent comprendre pleinement la véritable signification du questionnaire afin d'obtenir des données d'enquête précises. Afin d'assurer l'exactitude et la validité des données mesurées, nous avons l'intention d'utiliser l'échelle de maturité utilisée dans les études précédentes et d'apporter les ajustements appropriés à la situation pertinente de l'expérience de magasinage mobile décrite dans les entretiens semi-structurés. Nous avons fait une pré-enquête pour tester le questionnaire. Après la pré-enquête, grâce à la rétroaction pour modifier les questions du questionnaire pour s'assurer que la requête est facile à comprendre, et qu'il n'y a pas d'ambiguïté. Le but du modèle est d'analyser la relation de satisfaction, la valeur perçue et la fidélité du commerce mobile dans le secteur de la vente au détail. C'est le point clé pour la qualité du modèle en mesurant correctement ces trois variables latentes. Leur mesure est présentée en premier, suivie des six variables prédictives identifiées qui devraient, plus ou moins, déterminer la variable cible. Le profil du client (âge, sexe, etc., mais aussi la préférence individuelle

pour l'innovation ou la sécurité) peut également exercer une influence mais de manière différente : Certaines relations dans le modèle peuvent être altérées dans un sens ou dans un autre par un profil spécifique: ces variables peuvent jouer un rôle modérateur.

4.4.1 Fidélité

Parasuraman et al. (2005)^{lvii} ont proposé une mesure de la volonté de rachat, qui comprend cinq aspects: continuer à faire des achats là-bas (ou de cette façon) à l'avenir; la priorité à ce site (ou façon de faire du shopping); partager des opinions sur les avantages qu'elle offre; recommander l'utilisation à des amis et à la famille, encourager les autres à acheter. Chiu et al. (2014) ont utilisé une échelle plus simple (3 items) pour mesurer la volonté de rachat des achats en ligne : continuer à choisir le site dans le futur; prévoir de continuer à acheter sur le site ; le site comme premier choix dans le futur. Les articles sont indiqués dans le tableau R-3. Loy 1 et Loy 3 proviennent de Parasuraman et al. (2005); Le Loy 2 provient de Chiu et al. (2014). Loy 4 est capturé à partir de notre propre étude qualitative.

Tableau R-3: Items pour mesurer la fidélité

Code	Item
Loy1	A l'avenir, je vais recommander chaudement à d'autres d'utiliser leur téléphone portable pour leurs achats
Loy2	A l'avenir, je continuerai sûrement à faire des achats avec mon téléphone portable
Loy3	A l'avenir, j'utiliserai certainement de plus en plus souvent mon téléphone portable pour faire mes achats
Loy4	A l'avenir, je vais certainement acheter des montants plus importants via mon téléphone portable

4.4.2 Satisfaction

La présente étude s'appuie sur les échelles matures trouvées dans la littérature et adaptées aux caractéristiques du commerce mobile en définissant quatre items de mesure, l'échelle de mesure initiale spécifique comme indiqué dans le tableau R-4. Sat 3 a été adapté d'Olivier (1980); Sat 4 est adapté de Bhattacharjee (2001); Sat 1 et Sat 2 sont adaptés du travail de Vijayasarathy (2004).

Tableau R-4: Items pour mesurer la satisfaction

Code	Item
Sat1	C'est pour moi un vrai plaisir d'utiliser mon téléphone portable pour faire des courses
Sat2	Quand j'utilise mon téléphone portable pour les courses, j'obtiens ce que je cherche
Sat3	J'ai été bien avisé quand j'ai décidé d'utiliser mon téléphone portable pour faire des achats
Sat4	Dans l'ensemble, faire ses achats avec son téléphone portable permet de mieux dépenser son argent

4.4.3 La valeur perçue

Cette recherche a défini la valeur perçue par le consommateur comme : les consommateurs utilisent des applications mobiles de magasinage au détail pour parcourir, et acheter les marchandises tout au long du processus d'une évaluation complète et des sentiments intérieurs. PVAL 1 est capturé à partir de notre recherche qualitative. PVal 2 est issu du travail de Sweeney, Soutar & Johnson (1997), ils ont étudié les antécédents de la valeur perçue par le client et l'influence de la valeur perçue par le consommateur sur l'intention d'achat du consommateur dans le domaine des appareils électroniques. Effet sur l'intention d'achat du consommateur. Le PVal 4 est adapté de Bourdeau et al. (2002) qui a proposé cinq dimensions selon l'environnement du réseau: la valeur utilitaire, la valeur d'apprentissage, la valeur d'achat, la valeur hédoniste et la valeur sociale. PVal 3 et PVal5 sont adaptés de Kim et al. (2013), ils ont construit un modèle d'acceptation de la technologie Internet mobile basé sur la valeur perçue par le client. Ils ont proposé que l'utilité perçue et l'intérêt perçu soient des avantages perçus de la valeur perçue par le client, tandis que la spécialisation du prix perçu est perçue comme le coût de la valeur perçue par le client.

Tableau R-5: Items pour mesurer la valeur perçue

Code	Item
PVal 1	Cela vaut le coup d'utiliser son téléphone portable pour faire ses achats
PVal 2	Cela vaut la peine de faire des achats avec son téléphone portable, même si cela coûte un petit peu plus
PVal 3	J'accepterais d'augmenter un peu mon forfait pour me sentir libre de faire, à tout moment, des achats avec mon téléphone portable
PVal 4	Cela vaut la peine de prendre le temps d'apprendre à se servir du téléphone portable pour faire ses achats
PVal 5	Acquérir un meilleur téléphone portable pour faire ses achats, cela vaut la peine, même si cela coûte un peu plus

4.4.4 Facilité d'utilisation perçue

L'expérience mobile d'achats interactifs se réfère à l'ensemble du processus d'achat mobile, l'interaction entre les utilisateurs et le service client et les autres membres du personnel, les utilisateurs et les utilisateurs et les sentiments psychologiques, mettant l'accent sur l'interaction, la rapidité et l'efficacité. Comp 1, Comp 2 et Inst 2 sont adaptés de Hsu et al. (2006). Inst 3 et Tspar 2 viennent de Hong, Thong & Tam (2006). Inst 1, Inter 1, Tspar 1 sont capturés à partir d'interviews.

Tableau R-6: Items pour mesurer la facilité d'utilisation perçue

Code	Item
Comp 1	Avec mon téléphone portable, c'est facile de comparer les prix des différents commerces
Comp 2	Avec mon téléphone portable, je suis toujours informé des meilleures offres de prix
Inst 1	Avec mon téléphone portable, je trouve plus facilement le magasin le plus proche
Inst 2	Avec mon téléphone portable, je trouve plus facilement toutes les informations dont j'ai besoin sur les produits ou services que je veux acheter
Inst 3	En faisant mes achats avec mon téléphone portable, j'obtiens la bonne information au bon moment
Inter 1	En cas d'interruption de la connexion, il sera facile de reprendre ma commande là où elle en était
Inter 2	Avec mon téléphone portable, j'ai un accès direct au service client du commerçant
Tspar 1	En faisant ses achats via le téléphone portable, on ne fait jamais la queue
Tspar 2	Utiliser son téléphone portable pour les achats, ça fait gagner beaucoup de temps

4.4.5 Utilité perçue

Dans cette étude, nous avons conçu les items du questionnaire pour en faciliter l'utilisation, basé sur Davis (1989), et son coefficient de fiabilité de facilité d'utilisation est de 0,94, ce qui est très cohérent et fiable. Et, cette recherche se réfère à l'amélioration de l'échelle par référence à Flex 3, Flex 4, sont adaptés de Hsu et al. (2006). Bien que la facilité d'utilisation appartient à la perception de la complexité de l'utilisation, cette étude est basée sur les prédécesseurs pour définir des sujets positifs, combinée avec la situation réelle de shopping sur téléphone mobile pour améliorer l'échelle. Conn 1,

Conn 2, Perso 1 et Func 1 sont adaptés de Kim, Chan & Gupta (2007). Flex 1, Perso 2 et Func 3 sont adaptés du travail de Parasuraman et al. (2005). Et Flex 2, Conn 3, Perso 3, Func 2 sont capturés à partir d'interviews.

Tableau R-7: Items pour mesurer l'utilité perçue

Code	Item
Flex 1	Avec mon téléphone portable, je peux aller sur les sites Internet ou utiliser les appli n'importe quand et n'importe où
Flex 2	Avec mon téléphone portable, je peux passer commande, même quand je me déplace
Flex 3	Les appli que j'ai sur mon téléphone portable sont très faciles à installer et à supprimer
Flex 4	Mon téléphone portable me donne accès à un très grand nombre de boutiques et de services
Conn 1	La connexion à Internet à partir de mon téléphone portable est rapide
Conn 2	Quand j'en ai besoin, je trouve toujours sans problème une bonne connexion Wi-Fi
Conn 3	S'il n'y a pas de connexion Wi-Fi, je trouve toujours d'autres réseaux abordables pour me connecter
Perso 1	Les appli ou les sites m'envoient directement sur le bon produit ou le bon service
Perso 2	Les appli ou les sites correspondent parfaitement à mes habitudes d'achat
Perso 3	Les appli ou les sites me donnent accès à des promotions ou des informations sélectionnées
Func 1	Les fonctions des appli sur mon téléphone portable sont très faciles à utiliser
Func 2	Mon téléphone portable offre beaucoup de fonctionnalités utiles pour faire des achats
Func 3	C'est très facile de payer avec mon téléphone portable

4.4.6 Qualité de service perçu

La qualité perçue de la livraison est souvent mentionnée dans nos entretiens, mais aucune autre étude ne porte attention à cette qualité. Apparemment, cette dimension est vraiment importante pour les consommateurs afin qu'ils puissent bénéficier d'une meilleure expérience d'achat mobile. Logist 1, Logist 2 sont adaptés de Chiu et al. (2014) et AfterS sont capturés à partir des interviews.

Tableau R-8: Items pour mesurer la sécurité perçue

Code	Item
Logist 1	Les produits ou services commandés avec mon téléphone portable me sont fournis dans les temps
Logist 2	Les produits commandés avec mon téléphone portable me sont remis en bon état
AfterS	La qualité du service après-vente me fait apprécier le fait d'acheter avec mon téléphone portable

4.4.7 Avantage de coût perçu

L'avantage de coût fait référence à la recherche de prix équitables ou de bonnes affaires par lesquelles de nombreux consommateurs sont motivés. Pour la mesure des prix monétaires et des coûts monétaires, la recherche existante comprend à la fois une mesure d'indicateurs individuels et une mesure de multiples questions de mesure (Hung, Ku & Chang, 2003). Selon Nunnally (1978), cette étude utilisera trois indicateurs ou plus pour mesurer la variable. Par conséquent, cette étude s'appuie sur la mesure du prix du service du produit, le prix 1 et le prix 2 proviennent du travail de Petrick (2002). Kim, Chan et Gupta (2007) ont présenté l'adoption de l'Internet mobile basée sur la valeur avec un test empirique, et DeviPr, MonBen et ConnPr s'en sont adaptés.

Tableau R-9: Items pour mesurer l'avantage de coût perçu

Code	Item
Price 1	Les prix des produits ou services que je peux acheter via mon téléphone portable sont attractifs
Price 2	En achetant avec mon téléphone portable, je peux bénéficier de meilleures promotions
DeviPr	Les téléphones portables ne sont pas si chers à l'achat, si on considère tous les services qu'ils rendent
ConnPr	Faire ses achats avec son téléphone portable permet de mieux tirer parti des coûts de connexion
MonBen	Dans l'ensemble, faire ses achats avec son téléphone portable permet de mieux dépenser son argent

4.4.8 Valeur sociale perçue

La valeur sociale perçue est principalement de considérer l'impact des groupes de consommateurs environnants sur son effet infini sur la mesure des effets interpersonnels. Image 1, Image 3 sont des travaux de Petrick (2002). Fash 1 et Fash 2 sont des questions de mesure de Pedersen (2003). Et Ident, Image 2 sont capturés à partir d'interviews.

Tableau R-10: Items pour mesurer la valeur sociale perçue

Code	Item
Image 1	Utiliser son téléphone portable pour faire ses courses, ça vous donne une bonne réputation
Image 2	On est considéré comme quelqu'un d'innovant, si on utilise son téléphone portable pour faire des achats
Image 3	Utiliser son téléphone portable pour faire ses courses, ça provoque de l'admiration
Ident	Faire des achats avec un téléphone portable montre bien la personne que vous êtes
Fash 1	Faire ses achats avec un téléphone portable, c'est être moderne
Fash 2	La plupart de mes amis utilisent leur téléphone portable pour leurs achats

4.4.9 Sécurité perçue

Conf 2 provient de Jarvenpaa & Todd (1996); Conf 3 et Conf 5 sont de Vijayasarathy et Jones (2000) ont conclu que le risque perçu est utilisé comme un indicateur de l'intention comportementale. Le risque perceptuel est utilisé comme un prédicteur du modèle dans l'ensemble du modèle, reflétant la perception du risque psychologique de l'individu sur l'adoption de l'attitude et de l'intention du magasinage en ligne du commerce mobile. Privac, Paym 1 et Paym 2 sont adaptés du travail de Parasuraman et al. (2005). Conf 1 et Conf 4 sont de Gefen et al. (2003) qui a souligné que la confiance de l'utilisateur dans le réseau comprend principalement les aspects suivants: l'activité réseau est honnête; elle se préoccupe de l'utilisateur ; elle fournit des services de qualité; l'achat et les attentes sont les mêmes; elle n'utilisera pas de comportement opportuniste. Repu et Resume proviennent d'entrevues de l'analyse qualitative.

Tableau R-11: Items pour mesurer la qualité de service perçu

Code	Item
Conf 1	Ma connexion à Internet avec mon téléphone portable est bien sécurisée
Conf 2	Les produits vendus en ligne sont strictement les mêmes qu'en magasin
Conf 3	Avec mon téléphone portable, je trouve plus facilement le magasin le plus proche
Conf 4	Les appli ou les sites que j'utilise pour mes achats avec mon téléphone sont vraiment fiables
Conf 5	Les appli ou les sites sont bien adaptés à l'utilisation avec un téléphone portable
Repu	Pour évaluer un site ou une appli, on peut se fier aux avis publiés par les utilisateurs
Privac	Quand j'achète avec mon téléphone portable, mes informations personnelles sont en sécurité
Paym 1	Les systèmes de paiement que j'utilise avec mon téléphone portable sont vraiment dignes de confiance
Paym 2	Quand j'achète avec mon téléphone portable, les informations liées à ma transaction ne seront pas transmises à d'autres personnes
Resume	En cas d'interruption de la connexion, il sera facile de reprendre ma commande là où elle en était

4.4.10 Caractéristiques du client

Waarden, Benavent et Casteran (2013) ont fait une recherche sur la façon dont les différentes orientations d'achat influencent les programmes de fidélisation perçus : ils ont proposé différents types de récompenses et leurs effets sur la fidélité perçue des clients. Ils ont défini différentes récompenses comme : économique, hédoniste, sociale-relationnelle, apathique et marque / loyale. Cette recherche nous rappelle d'établir les variables du modérateur et les items de mesure dans notre thèse. Selon la littérature et la recherche qualitative dans le chapitre précédent, nous proposons que le profil des clients mobile incluent : l'innovatrice; l'hédonisme; la sensibilité au prix et la sensibilité à la marque. L'innovation du consommateur est la mesure dans laquelle une personne utilise ou accepte un nouveau produit ou une nouvelle technologie par rapport à d'autres personnes dans son environnement social, et est en fait le degré d'acceptation de nouvelles choses par les consommateurs. Dans cette étude, en référence à la littérature existante et au modèle global, l'innovation du consommateur est une variable modératrice, la réaction des utilisateurs sur les nouveaux produits, les nouvelles technologies et la capacité personnelle à contrôler la fidélité du commerce mobile. Innova, Hedoni et La sensibilité au prix sont adaptée de Waarden, Benavent & Casteran (2013). La sensibilité à la marque est capturée à partir des interviews.

Tableau R-12: Items pour mesurer les caractéristiques du client

Code	Item
Innova	Quand je vois quelque chose de nouveau dans le commerce, je veux l'essayer dès que possible
Hedoni	C'est très important pour moi de prendre du plaisir à ce que je fais, même quand je fais des courses
Price sensitivity	Je me sens profondément déçu après un achat si je m'aperçois que j'aurais pu l'obtenir pour un meilleur prix
Brand sensitivity	En général, je préfère choisir une marque que j'aime plutôt qu'en essayer une nouvelle

5. Résultats de la recherche quantitative

Pour obtenir un meilleur modèle, une fois les données collectées, la première étape consiste à vérifier si les éléments sélectionnés sont appropriés pour mesurer les variables. Pour tester les éléments, nous avons effectué une analyse de fiabilité. L'objectif principal est de trouver la structure potentielle de l'échelle et de réduire le nombre d'items, afin que les variables puissent devenir plus pertinentes. La valeur de chargement de la variable observée sur la variable latente est la suivante, et il est nécessaire de supprimer les éléments inférieurs à 0,7 (les éléments à supprimer sont en gras). Après suppression de l'option avec une valeur de chargement faible, les valeurs AVE étaient toutes deux supérieures à 0,5, les valeurs de fiabilité composite étaient supérieures à 0,7 et les valeurs alpha de Cronbach étaient toutes deux supérieures à 0,7, indiquant une bonne validité du modèle.

Parce que nous avons supprimé certains éléments, nous avons également changé le nom de deux des variables afin de correspondre aux significations des éléments. La sécurité perçue a été renommée en tant que confiance perçue. Cette variable se réfère à la confiance des utilisateurs dans le commerce mobile, est le degré de confiance que les utilisateurs ont dans la responsabilité, l'intégrité et la bienveillance de l'opérateur de magasinage mobile. Comme la qualité des produits ou des services est la responsabilité fondamentale des opérateurs mobiles, l'intégrité et la bienveillance sont nécessaires pour traiter les opérateurs mobiles pour les utilisateurs, ne pas divulguer les informations sur l'utilisateur et s'assurer que les utilisateurs sont sûrs et sans soucis. La qualité de livraison perçue a été renommée comme perçue après la qualité du service. Cette variable fait référence à la qualité du service après-vente et du service logistique.

5.1 Evaluation du modèle de mesure

Habituellement, nous utilisons la fiabilité et la validité comme deux indicateurs pour mesurer si le résultat mesuré par l'échelle peut atteindre l'objectif du test, et s'il peut refléter correctement les faits objectifs. Par conséquent, une analyse complète de la

fiabilité et de la validité de l'échelle avant l'analyse formelle des données a été effectuée. Le modèle de mesure a été évalué à l'aide du logiciel SmartPLS 3.

Dans cette étude, les valeurs de α de toutes les variables de Cronbach sont toutes très satisfaisantes, allant de 0,77 à 0,90 comme le montre le tableau R-13. Toutes les valeurs sont supérieures à 0,7 et ce qui indique des mesures très crédibles. Par conséquent, la cohérence interne entre les questions de l'enquête est acceptable. De plus, les valeurs de fiabilité composite sont comprises entre 0,87 et 0,92. Ces résultats montrent que chaque facteur a une bonne fiabilité. Pour toutes les variables du modèle, les valeurs de variance moyenne extraites sont clairement au-dessus du seuil 0,5, allant de 0,63 à 0,73 comme indiqué dans le tableau R-13. La charge factorielle de chaque élément de mesure est supérieure à 0,6, ce qui montre que chaque facteur a une bonne convergence validité.

Tableau R-13: Fiabilité et validité de convergence

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Fidélité	0.873	0.913	0.723
Valeur perçue	0.802	0.871	0.629
Satisfaction	0.818	0.891	0.732
Coût avantage	0.866	0.903	0.651
Confidence	0.894	0.919	0.653
Qualité service	0.772	0.868	0.687
Facilité d'utilisation	0.896	0.920	0.658
Valeur sociale	0.825	0.884	0.656
Utilité	0.868	0.904	0.655

Dans cette étude, une méthode AVE rigoureuse est utilisée pour évaluer la validité discriminante. Selon Fornell et Larcker (1981), il est recommandé que pour chaque construction, l'AVE soit supérieur à la valeur maximale du coefficient de corrélation au carré (R^2) avec toutes les autres constructions mesurées. En d'autres termes, les relations statistiques entre les construits devraient être à un niveau inférieur à ceux entre les éléments, utilisés pour mesurer les constructions. Les résultats montrent que toutes les

variables utilisées dans cette étude sont conformes au critère de validité discriminant. Le tableau R-14 indique que les AVE de toutes les constructions sont supérieurs aux valeurs carrées de la matrice des coefficients de corrélation. Par conséquent, les 9 variables étudiées dans cet article présentent une validité discriminante acceptable.

Tableau R-14: Résultats de validité discriminante

	PCB	CL	PSQ	PEU	LOY	PV	Satis	PSV	PU
PCB	0.807								
CL	0.682	0.808							
PSQ	0.631	0.582	0.829						
PEU	0.597	0.589	0.423	0.811					
LOY	0.679	0.554	0.592	0.587	0.850				
PV	0.653	0.649	0.535	0.586	0.706	0.793			
Satis	0.654	0.587	0.608	0.531	0.735	0.724	0.856		
PSV	0.557	0.600	0.535	0.319	0.445	0.564	0.512	0.810	
PU	0.686	0.681	0.505	0.662	0.592	0.645	0.623	0.475	0.809

5.2 Modèle structurel

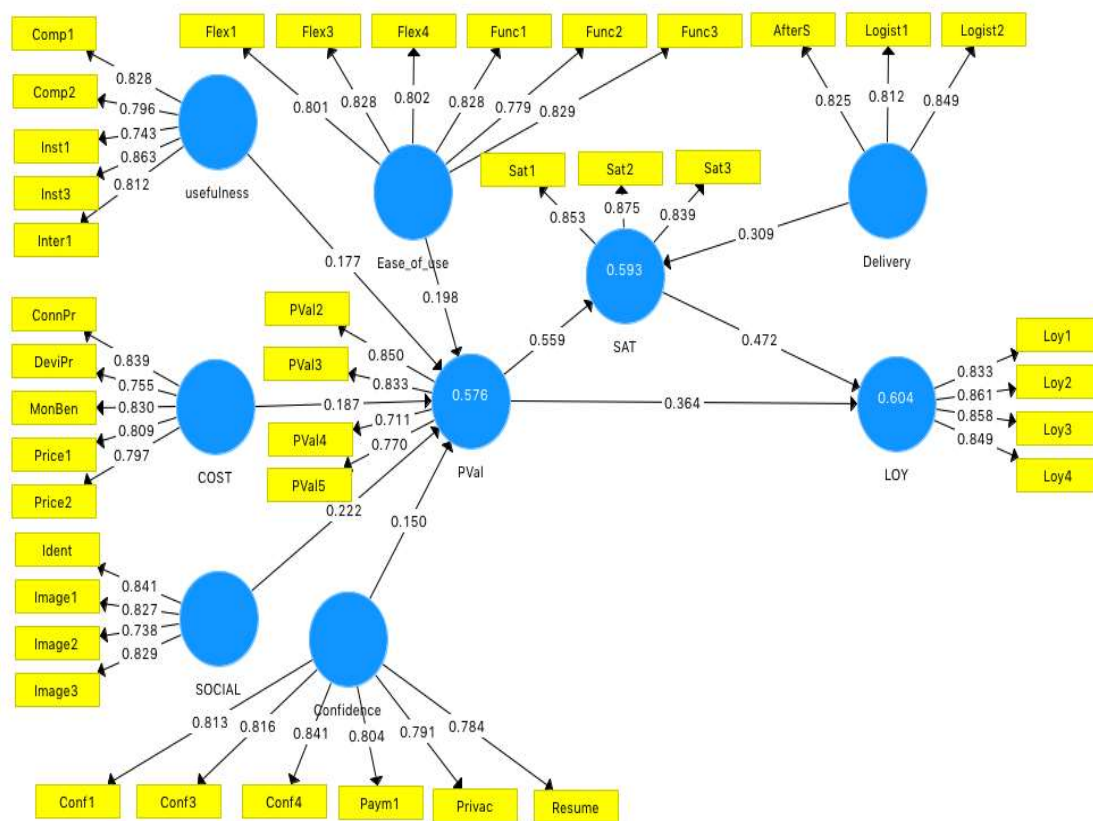
L'édition révisée du modèle structurel présentée à la figure R-1 a été évaluée à l'aide du logiciel SmartPLS 3. Le tableau R-15 indique que la variable cible, la fidélité de commerce mobile, est expliquée avec un R^2 de 0,604 par le modèle qui peut être considéré comme satisfaisant. Le modèle explique également assez bien deux autres variables, la valeur perçue du shopping mobile ($R^2 = 0,576$) et la satisfaction vis-à-vis du shopping mobile ($R^2 = 0,593$). SmartPLS calcule un indice de qualité d'ajustement qui évalue le degré de cohérence entre la matrice de covariance attendue estimée et la matrice de covariance de l'échantillon. Plus la qualité de l'ajustement est bonne, plus le modèle se rapproche de l'échantillon (Kline, 2015). Les résultats montrent que la valeur de Goodness of Fit est de 0,631, ce qui est largement supérieur au seuil de 0,36 recommandé par Wetzels et al. (2009)^{lviii}, cela signifie que le GoF est très satisfaisant.

Tableau R-15: Résultats de R²

	R Square	R Square Adjusted
LOY	0.604	0.602
PVal	0.576	0.569
SAT	0.593	0.590

Les variables latentes sont affichées par l'ellipse, les éléments sont affichés par le rectangle. La variance de variance (R²) expliquée par le modèle est écrite à l'intérieur de l'ellipse. Les variables latentes exogènes ne montrent pas de valeurs R². L'exactitude statistique des coefficients qui mesurent la relation entre les variables est calculée à partir des coefficients estimés.

Figure R-2: Coefficient de chemin de l'équation structurelle



Une évaluation de la précision des coefficients de trajets est calculée à l'aide de la méthode bootstrap, qui consiste à générer un très grand nombre d'échantillons alternatifs en supprimant de façon aléatoire certaines observations dans les données. 5000 sous-échantillons avec 337 observations ont été utilisés ici.

Le tableau R-16 montre que la valeur de beta est de 0,364 et la valeur de p est de 0,05. Par conséquent, la valeur perçue du canal mobile a un effet positif significatif sur la

fidélité des canaux mobiles, l'hypothèse 1 est supportée. De même, la satisfaction de la chaîne mobile a un effet positif significatif sur la fidélité des canaux mobiles (beta = 0.472, p = 0.000), l'hypothèse 2 est supportée. Les résultats indiquent également qu'il existe une corrélation positive significative entre la valeur perçue du canal mobile et la satisfaction du canal mobile (beta = 0,559, p = 0,000), donc l'hypothèse 3 ne peut pas être rejetée. La qualité de livraison perçue influence positivement la satisfaction des canaux mobiles (beta = 0,309, p = 0,000), ce qui soutient l'hypothèse 4. La facilité d'utilisation perçue est significativement liée à la valeur perçue du canal mobile (beta = 0,198, p = 0,002), hypothèse 5 est validé. L'utilité perçue a un effet positif significatif sur la valeur perçue du canal mobile (beta = 0,177, p = 0,025), l'hypothèse 6 est supportée. La perception de la sécurité a une influence positive sur la valeur perçue du canal mobile (beta = 0.150, p = 0.04), l'hypothèse 7 ne peut pas être rejetée. Le tableau 4 indique que l'avantage de coût perçu est influencé positivement par la valeur perçue du canal mobile (beta = 0,187, p = 0,007), donc l'hypothèse 8 est supportée. Les résultats montrent également que la valeur sociale perçue est significativement corrélée positivement avec la valeur perçue du canal mobile (beta = 0.222, p = 0.000), donc l'hypothèse 9 est supportée.

Tableau R-16: Résultats du coefficient de chemin

	Original Sample	Sample Mean (Bootstrap)	Standard Deviation (Bootstrap)	T Statistics (Bootstrap)	P Values (Bootstrap)
PVal -> LOY	0.364	0.363	0.066	5.490	0.000
PVal -> SAT	0.559	0.560	0.056	10.033	0.000
SAT -> LOY	0.472	0.475	0.062	7.577	0.000
Delivery -> SAT	0.309	0.309	0.060	5.166	0.000
Ease of use -> PVal	0.198	0.199	0.062	3.170	0.002
Usefulness -> PVal	0.177	0.174	0.079	2.239	0.025
Confidence -> PVal	0.150	0.150	0.073	2.050	0.040
COST -> PVal	0.187	0.191	0.069	2.713	0.007
SOCIAL -> PVal	0.222	0.220	0.049	4.522	0.000

Selon le tableau R-17, les résultats indiquent que la valeur de l'effet indirect des avantages perçus est avantageuse pour la fidélité, soit 0,117, valeur qui diffère significativement de 0 au seuil de confiance de 95%. En d'autres termes, cela signifie que les effets indirects retenus dans le modèle (par la valeur perçue et la satisfaction) sont significatifs, même comparés à la relation directe. De même, les valeurs de l'effet indirect des avantages perçus coûtent davantage à la satisfaction, confiance perçue à la loyauté, confiance perçue à la satisfaction, perception de la qualité du service à la loyauté, facilité d'utilisation à la satisfaction, et perception de la satisfaction 0,105, 0,094, 0,084, 0,146, 0,124, 0,111 et 0,264 ; pendant ce temps, leurs intervalles de confiance à 95% corrigés de Bias correspondent ne contiennent pas 0, ce qui indique l'existence de ces effets indirects.

Tableau R-17: Tableau des effets médiateurs

	Intermediate effect value	Bias-Corrected	
		95% CI	
		Lower	Upper
PVal -> LOY (Via SAT)	0.264	0.185	0.360
Service -> LOY (via SAT)	0.146	0.084	0.224
COST -> LOY (via PVal & SAT)	0.117	0.038	0.217
COST -> SAT (via PVal)	0.105	0.034	0.193
Confidence -> LOY (via PVal & SAT)	0.094	0.007	0.186
Confidence -> SAT (via PVal)	0.084	0.006	0.166
Ease of use -> LOY (via PVal & SAT)	0.124	0.045	0.201
Ease of use -> SAT (via PVal)	0.111	0.042	0.179
SOCIAL -> LOY (via PVal & SAT)	0.140	0.075	0.208
SOCIAL -> SAT (via PVal)	0.124	0.067	0.198
Usefulness -> LOY (via PVal & SAT)	0.111	0.012	0.210
Usefulness -> SAT (via PVal)	0.099	0.012	0.192

Selon les résultats, il n'y a que deux relations directes identifiées dans le modèle et confirmées comme significatives : la valeur perçue impacte directement la fidélité ; la satisfaction influence directement la fidélité. Aucune des autres relations directes n'a pu être introduite dans le modèle.

L'ensemble des variables collectées dans le modèle contribue à expliquer la fidélité au commerce mobile, mais elles n'ont pas le même poids. Selon le tableau R-18, la relation

la plus significative est directement entre satisfaction et fidélité. Cependant, la deuxième relation directe significative est entre la valeur perçue et la loyauté, et cette relation directe est renforcée pour devenir la plus significative par une relation indirecte à travers la satisfaction. L'effet total de la valeur perçue sur la fidélité est de 0,628, l'effet direct étant de 0,364 et l'effet indirect de 0,264, l'effet direct étant supérieur à l'effet indirect. Cela se réfère en effet que la valeur perçue par le consommateur dépend étroitement de la satisfaction. En d'autres termes, la valeur perçue affectera non seulement directement la fidélité, mais aura également un impact sur la fidélité par la satisfaction. Cela construit une relation triangulaire entre la satisfaction, la valeur perçue et la fidélité de cette étape exploratoire de la recherche, comme le montre le modèle structurel. .

Le tableau R-18 montre également qu'il existe deux autres déterminants puissants, à côté de la satisfaction et de la valeur perçue, qui influencent indirectement la fidélité du consommateur au commerce de détail mobile : perception de la qualité perçue du service et de la valeur sociale perçue. Premièrement, la qualité du service a une relation indirecte significative avec la fidélité par le biais de la satisfaction. Comme la valeur perçue dépend apparemment de la satisfaction, cela signifie que les chercheurs devraient accorder plus d'attention à l'influence de la qualité du service après-vente du commerce de détail mobile. Deuxièmement, la valeur sociale perçue a une influence significative sur la valeur perçue du commerce de détail mobile. Cela signifie que les consommateurs croient que le commerce mobile va augmenter leur valeur sociale, les détaillants devraient faire plus d'efforts sur ce point.

Trois variables viennent ensuite avec des poids similaires : le coût avantage perçu, la facilité d'utilisation perçue et l'utilité perçue. Les consommateurs penseront subjectivement que tous les avantages de l'utilisation du commerce mobile couvriront tous les coûts (matériels et immatériels compris), si l'avantage de coût global perçu est supérieur aux coûts, cela augmentera la probabilité d'utiliser le commerce mobile. Les consommateurs auront également une préférence pour le biais de comportement, ce qui augmentera la possibilité de fidélité du commerce de détail mobile.

L'utilité perçue et la facilité d'utilisation perçue sont deux facteurs importants qui influent sur l'expérience du consommateur en matière de fonctionnement. Par conséquent, l'amélioration de la conception des services dans ces deux domaines est une condition préalable importante pour améliorer la fidélité des consommateurs. Dans le domaine de la vente au détail mobile, d'une part, il est nécessaire de fournir des fonctions riches et pratiques aux utilisateurs et de les aider à gagner du temps, à accroître l'efficacité et à en ressentir la commodité à tout moment et n'importe où. D'autre part, pour fournir aux utilisateurs des modes de fonctionnement simples et faciles à utiliser, de sorte que les utilisateurs peuvent être clairs et qualifiés pour utiliser le commerce mobile.

Tableau R-18: Influences directes, indirectes et totales de différentes variables sur la fidélité du commerce mobile

Latent variables	Direct	<u>Types of influence</u>			Altogether
		Via Perceived value	Via Satisfaction	Via Perceived value & Via Satisfaction	
PVal: Perceived value	0.364	-	0.264	-	0.628
SAT: Satisfaction	0.472	-	-	-	0.472
Perceived after service quality	-	-	0.146	-	0.146
Perceived social value	-	0.081	-	0.059	0.140
Perceived ease of use	-	0.072	-	0.052	0.124
Perceived benefits cost advantage	-	0.068	-	0.050	0.118
Perceived usefulness	-	0.064	-	0.047	0.111
Perceived Confidence	-	0.055	-	0.040	0.095

Enfin, la confiance perçue est un déterminant moins important de la fidélité au commerce mobile de détail. C'était un obstacle majeur à l'acceptation du commerce électronique. Cependant, dans le commerce mobile, l'incertitude ou le risque perçu ont diminué par rapport à d'autres facteurs, l'effet semble être secondaire. Cela peut être dû

à deux raisons: Premièrement, la plate-forme ou l'application d'achat mobile existante est dérivée du commerce électronique. Dans le développement de l'expansion, la disposition globale et le système de processus de la plate-forme n'ont pas beaucoup changé. En raison également de l'impact de la marque, les consommateurs font confiance à une plateforme d'achat mobile. Deuxièmement, du point de vue de l'intimité, la majorité des acheteurs de téléphones mobiles existants sont très créatifs et réceptifs à de nouvelles choses et sont aventureux. Le résultat de l'aventure peut-être une meilleure performance, si l'expérience de magasinage mobile est meilleure. Donc, même lorsque le risque perçu est élevé, les consommateurs ont quand même choisi d'essayer le commerce mobile.

Certaines catégories de consommateurs doivent fonctionner différemment : selon le sexe, l'âge, le niveau d'éducation, le revenu, la situation familiale et le nombre de personnes dans le ménage. D'autres catégorisations peuvent également jouer : on peut s'attendre à ce que ceux qui ont une grande habitude d'acheter avec leur mobile se comportent différemment de ceux qui l'utilisent moins souvent. De même, certains consommateurs dépensent beaucoup sur leur mobile, tandis que d'autres dépensent beaucoup moins. L'analyse des différents groupes permet d'évaluer dans quelle mesure ces différences modifient les relations mesurées par le modèle général.

La grande majorité des relations entre modèles ne sont pas significativement modifiées lorsqu'on considère un groupe de consommateurs à un autre. Cependant, trois relations sont légèrement plus sensibles pour différents groupes: lorsque le consommateur a un niveau d'éducation inférieur ou lorsque son groupe familial a une taille modérée, la valeur sociale perçue contribue davantage à la valeur perçue du commerce mobile. En outre, l'impact direct de la valeur perçue de la fidélité au commerce mobile est plus prononcé pour les femmes que pour les hommes, ce qui peut résulter d'une rationalité économique plus développée. Enfin, l'influence de la valeur perçue sur la satisfaction est plus faible lorsque le consommateur appartient à un groupe familial plus important. La taille du groupe familial semble donc jouer un rôle récurrent, les personnes incluses dans un groupe plus large accordent moins d'importance aux avantages sociaux et associent moins de valeur et de satisfaction.

5.3 Comparaisons de groupe

Tout d'abord, nous avons constaté que les réponses pour les différents profils de consommateurs ne sont pas équilibrées pour établir des groupes. Pour le profil de l'innovation, il n'y a que 89 répondants qui ne sont pas d'accord de répondre qu'ils aiment essayer quelque chose de nouveau. En outre, il y a seulement 37 répondants qui déclarent qu'ils ne sont pas d'accord qu'ils aiment les achats mobiles. Il se peut que les consommateurs qui utilisent leurs appareils mobiles pour faire leurs achats soient guidés par la recherche de plaisir dans leurs activités quotidiennes. Ce peut être une tendance générale de la société. Pour la sensibilité au prix, il n'y a que 39 répondants qui ne se sentent pas déçus s'ils pouvaient avoir un meilleur prix. L'item a bien fonctionné et montre que les utilisateurs du commerce mobile sont sensibles au prix. C'est la même situation pour la sensibilité de la marque, seulement 36 répondants préfèrent la nouvelle marque à leur marque familière. Nous décidons donc de ne pas analyser les différents profils des consommateurs du commerce mobile et de nous concentrer uniquement sur les différents groupes démographiques. Certaines catégories de consommateurs doivent fonctionner différemment: selon le sexe, l'âge, le niveau d'éducation, le revenu, la situation familiale et le nombre de personnes dans le ménage. D'autres catégorisations peuvent également jouer: on peut s'attendre à ce que ceux qui ont une grande habitude d'acheter avec leur mobile se comportent différemment de ceux qui l'utilisent moins souvent. De même, certains consommateurs dépensent beaucoup sur leur mobile, tandis que d'autres dépensent beaucoup moins. L'analyse des différents groupes permet d'évaluer dans quelle mesure ces différences modifient les relations mesurées par le modèle général.

La grande majorité des relations entre modèles ne sont pas significativement modifiées lorsqu'on considère un groupe de consommateurs plutôt qu'un autre. Cependant, trois relations sont légèrement plus sensibles pour différents groupes : lorsque les consommateurs ont un niveau d'éducation inférieur ou lorsque leur ménage a une taille modérée, la valeur sociale perçue du magasinage mobile contribue davantage à la valeur perçue globale du commerce mobile. En outre, l'impact direct de la valeur perçue sur la

fidélité au commerce mobile est plus prononcé pour les femmes que pour les hommes, ce qui peut résulter d'un sens plus développé de la rationalité économique. Enfin, la valeur perçue influence davantage la satisfaction lorsque le consommateur appartient à un ménage plus petit. Ainsi, la taille du ménage semble jouer un rôle récurrent, les personnes incluses dans un groupe plus important accordent moins d'importance aux avantages sociaux et moins de valeur associée à la satisfaction.

6. Conclusions et discussions

Surtout, les dimensions structurelles de chaque variable ont été déterminées. Le modèle montre que la valeur perçue joue un rôle central qui est validé par le test empirique. Les analyses de la valeur perçue sont liées à de nombreux déterminants qui créent plus de variables. La satisfaction en tant que variable intermédiaire dans joue un rôle dans le modèle d'équation structurelle de loyauté d'achat mobile pour l'analyse de vérification. La valeur perçue, la satisfaction et la fidélité du commerce de détail mobile sont influencées par les différentes caractéristiques démographiques des utilisateurs mobiles. Par conséquent, les entreprises devraient mettre en œuvre une stratégie de marketing différente en fonction des différents attributs des utilisateurs.

- **Réponse à la première question de recherche: Qu'est-ce qui constitue la valeur perçue des consommateurs du commerce mobile? Et comment ces déterminants influencent-ils la loyauté du commerce mobile?**

La valeur perçue du commerce mobile repose sur cinq dimensions: la facilité d'utilisation perçue (PEU) ; l'utilité perçue (PU) ; la sécurité perçue (PS) ; avantages en termes de coûts perçus (PCA) ; la valeur sociale perçue (PSV). La valeur sociale perçue a un impact positif le plus significatif sur la fidélité au shopping mobile parmi les cinq composantes de la valeur perçue. L'avantage de coût perçu a un plus grand impact sur la fidélité au magasinage mobile que la facilité perçue d'utilisation et l'utilité perçue. Cependant, la confiance perçue dans la valeur perçue du magasinage mobile a l'impact le moins significatif sur la fidélité au magasinage mobile.

- **La valeur perçue influence-t-elle la fidélité du commerce mobile? Et quelle est la relation entre la valeur perçue, la satisfaction et la fidélité du commerce mobile?**

La perception de la valeur et de la satisfaction du consommateur a un effet positif significatif sur la fidélité du consommateur au commerce de détail mobile. Leurs poids d'impact sur la fidélité au commerce mobile sont différents, l'influence directe de la satisfaction sur la fidélité est supérieure à la valeur perçue, mais l'influence totale de la valeur perçue à la loyauté via la satisfaction est plus forte que la satisfaction. Il se réfère que la valeur perçue affectera non seulement directement la fidélité, mais aura également un impact sur la fidélité par le biais de la satisfaction. Cela construit une relation triangulaire entre la satisfaction, la valeur perçue et la fidélité dans cette étape exploratoire de la recherche. La satisfaction du commerce mobile est influencée par la perception de la qualité du service après-vente, qui est la troisième variable significative à influencer la fidélité du consommateur. Cela signifie que les consommateurs de commerce mobile accordent beaucoup d'attention à la qualité du service après-vente, comme la qualité logistique.

- **Quel est l'impact des variables sociodémographiques sur le comportement des consommateurs et la fidélité du commerce mobile?**

La grande majorité des relations entre modèles ne sont pas significativement modifiées lorsqu'on considère un groupe de consommateurs à un autre. Cependant, trois relations sont légèrement plus sensibles pour différents groupes : lorsque le consommateur a un niveau d'éducation inférieur ou lorsque son groupe familial a une taille modérée, la valeur sociale perçue contribue davantage à la valeur perçue du commerce mobile. En outre, l'impact direct de la valeur perçue de la fidélité au commerce mobile est plus prononcé pour les femmes que pour les hommes, ce qui peut résulter d'une rationalité économique plus développée. Enfin, l'influence de la valeur perçue sur la satisfaction est plus faible lorsque le consommateur appartient à un groupe familial plus important. La taille du groupe familial semble donc jouer un rôle récurrent, les personnes incluses dans un groupe plus large accordent moins d'importance aux avantages sociaux et

associent moins de valeur et de satisfaction.

Apport de la recherche

- Basée sur des recherches antérieures, cette thèse développe et corrige le modèle ECM-ISC du point de vue de la valeur perçue des utilisateurs du commerce mobile, et étudie empiriquement le modèle étendu à travers l'analyse empirique.
- Cette thèse étudie systématiquement la recherche sur les facteurs influençant la valeur perçue et le comportement des utilisateurs du commerce mobile. Sur cette base, la composition de la valeur perçue par l'utilisateur dans un environnement d'entreprise mobile est proposée.
- Cela construit une relation triangulaire entre la satisfaction, la valeur perçue et la fidélité de cette étape exploratoire de la recherche.

Apport managérial

Avec l'amélioration constante des appareils mobiles et le renouvellement constant des technologies des réseaux mobiles, la concurrence pour le commerce mobile deviendra de plus en plus féroce. De nombreuses entreprises utilisent diverses méthodes promotionnelles pour attirer de nouveaux utilisateurs. Cependant, ils ignorent la question de savoir comment conserver les anciens utilisateurs car conserver les anciens utilisateurs sur le site d'achat mobile est encore plus important pour les entreprises, mais également plus compliqué. L'utilisation de certains outils promotionnels peut les aider à attirer de nouveaux utilisateurs, mais cela a souvent un effet à court terme et peut être moins attrayant pour les anciens utilisateurs. Les anciens utilisateurs sont plus familiers avec les sites Web et les applications de commerce mobile pour les produits et services, leurs attentes de valeur sont plus élevées. Les efforts visant à améliorer la valeur perçue des anciens clients sont la clé pour les opérateurs de commerce mobile pour augmenter le nombre et la qualité des transactions. Par conséquent, dans l'environnement de commerce mobile, comment conserver les anciens clients est devenu un problème pour

tous les opérateurs. La recherche dans cette thèse a une signification pratique pour les entreprises de commerce mobile :

- Développer des fonctions d'interaction sociale ;
- Réduire raisonnablement le coût de l'utilisation du commerce mobile ;
- Simplifier les opérations d'achat et optimiser l'expérience du consommateur ;
- Améliorer et optimiser les fonctions de base pour augmenter l'utilité perçue ;
- Établir un environnement d'achat fiable et renforcer la confiance des consommateurs ;
- Proposer des services différenciés pour les attributs des utilisateurs du commerce mobile.

Limites et perspectives

En raison des nombreux facteurs discutés dans cette étude, la structure du questionnaire était légèrement longue. Bien que l'auteur ait fait de son mieux pour recueillir des données dans les délais, les données de l'échantillon sont encore relativement petites. Cela peut avoir une certaine influence sur les résultats de la recherche. Par conséquent, dans la sélection des échantillons de recherche, les futurs chercheurs devraient utiliser des méthodes d'échantillonnage scientifiques et adopter des méthodes de collecte de questionnaires multiples pour rendre les échantillons plus représentatifs.

L'auteur développe le modèle ECM-ISC et considère l'impact de la valeur perçue et de la satisfaction des utilisateurs. Cependant, les différentes dimensions de la valeur perçue sont également affectées par de nombreuses autres variables externes, telles que la qualité de l'information, la qualité du service, etc. L'auteur estime que l'étude de la relation entre ces variables externes et la valeur perçue aidera les entreprises à mieux créer la valeur dont elles ont besoin pour les utilisateurs et enrichir la recherche existante. Par conséquent, nous pouvons étudier plus avant les facteurs qui influencent les dimensions de la valeur perçue dans le futur.

Le commerce mobile dans cet article appartient à la catégorie du commerce de détail mobile, mais la portée est encore relativement grande. Cette recherche ne subdivise pas le type de magasinage mobile et ne fait pas de distinction entre les types de produits et les opérateurs de magasinage mobile. Cela affectera inévitablement l'applicabilité externe de cet article. Étant donné que le comportement de différents produits ou services dans différents types de commerce mobile est différent, la valeur obtenue par les utilisateurs du commerce mobile dans différents types d'achats mobiles sera également différente.

Cette recherche construit d'abord un modèle de recherche pour la fidélité du consommateur de commerce mobile. Selon les limites de recherche ci-dessus et la pensée du processus de recherche, les aspects suivants peuvent être étudiés plus à l'avenir:

- Élargir davantage la portée de la recherche et la taille de l'échantillon, et recueillir des données de recherche dans une combinaison d'enquêtes en ligne et hors ligne. Minimiser l'erreur créée par la sélection de l'échantillon et augmenter le caractère aléatoire de la sélection de l'échantillon, rendant la conclusion de la recherche plus représentative.
- Les études subséquentes devraient continuellement exploiter et étendre chaque facteur influant, et incorporer d'autres facteurs d'influence potentiels dans le modèle de recherche pour améliorer davantage le modèle dans cette étude.
- Dans la recherche future, les types de commerce mobile et les domaines subdivisés devraient être divisés de manière ciblée. Par exemple, B2C, C2C, produits orientés vers le consommateur, produits de type divertissement, etc. Cela peut être plus ciblé pour l'entreprise correspondante.

General Introduction

Today, information and communication technology has become a force with great impetus on the development of the global economy. At the same time, it has caused changes in the internal and external environments. After the information revolution, technology has played a very important role in retail. This technology has provided strong technical support for innovation and retail development, and has sparked a revolution in the field. In the 21st century, the speed of development of electronic commerce has accelerated, especially mobile commerce has experienced an explosive growth. With the wider coverage of wireless networks and smarter mobile devices, demand for mobile value-added services has increased, triggering the development of mobile commerce that breaks the boundaries of traditional commerce, so that consumers can complete their business activities at anytime and anywhere. At the same time, the prices of Wi-Fi and various mobile devices are becoming more acceptable to most people. The emergence of mobile commerce has caused a big change in the business environment: it will gradually phase out the traditional retail sector.

However, in reality, the analysis and discussion of innovation of the business model of mobile commerce are relatively weak. In the context of information technology, the traditional strategic analysis that exists in a company can no longer be adapted in front of changes. In light of this, it is important to actively explore the innovation of the mobile commerce business model. In addition, mobile commerce is still a new topic, research is relatively rare: there is still no clear definition of mobile commerce that is widely accepted. Different researchers have adopted different measurement methods in their own research. It's easier for mobile commerce consumers to compare prices and faster to change companies. Companies are confronted with the homogenization of products and services. Consumer loyalty is hard to capture by companies, and the determining factors of the willingness to repurchase in mobile commerce are also difficult to define. Therefore, mobile commerce research is not only a very valuable practical subject, but also an area for further development.

This thesis considers retail consumers of mobile commerce as a research subject, takes the perceived value of mobile commerce as the starting point. And we tries to conduct the research on this fundamental question: what are the determinants mechanism of the perceived value and satisfaction of mobile and their effects on loyalty. In order to introduce clearly the thesis, five parts will be presented as follow:

- The context of research on the loyalty of mobile commerce in the retail domain;
- The theoretical problem and the objectives;
- The research process;
- Theoretical and managerial contributions;
- The general architecture of the thesis.

1. Context of research

With the rapid development of mobile network technology, the 4G network is becoming more mature and popular. The pace of modern life has become hectic, users are paying more and more attention to the use of fragmented time, such as: time on public transport, rest time at work, time to queue, etc. During these fragmented time, people watch news, browse the website, shop, and socialize, etc. The emergence of smart phone largely meets the need of consumers to better use the fragmented time. According to Xerox's Mark Weiser (1999)^{lix}, mobile devices will be everywhere and easy to use. He first proposed the 'Ubiquitous' concept in 1991. Today, Internet-based E-commerce is developing and moving towards M-commerce, which is based on the wireless mobile communication network. In addition, with the development of the ICT sector, M-commerce is seen as an important window into the future. Another reason for M-commerce to become a pioneer of the emerging business mode is the large database of E-commerce users and its backward compatibility.

The number of users has therefore increased gradually. According to the most recent report from IAB (Interactive Advertising Bureau) in 2016: A global perspective of mobile commerce.^{lx} It shows that, on average, 75% of mobile users have purchased

products or services on mobile devices in the last six months. Consumers who purchased products on mobile devices are claiming that a third of their consumption is made on mobile devices. Mobile commerce has become a habit: nearly a quarter of consumers spend via mobile devices every week, especially in the Asia-Pacific region. On mobile shopping satisfaction, 80% of consumers are very satisfied with the mobile shopping experience, 62% of consumers plan to buy more products and services on mobile devices in the next 6 months. Convenience (49%) and time savings (46%) are the two main motivations for using mobile commerce.

Faced with opportunities in the development of mobile commerce, various distribution companies have deployed mobile devices one after the other and turned to mobile commerce: Wal-Mart, Carrefour and other entrepreneurs have all developed and launched applications for mobile devices. Unlike traditional online shopping, mobile commerce is a new purchasing model that combines mobile devices with E-commerce: consumers can search, compare, buy and pay at anytime and anywhere. As a new emerging business model, mobile commerce belongs to the service industry. The service is intangible that users can not touch it and the essence of the service is to provide added value to users. As a result, improving the perceived value of users is very important in the service sector. Customers rely more and more on their own perceptions to evaluate businesses. So a good shopping experience can create value for the users and improve the value perceived by the customer.

2. Objectives and questions of research

The vigorous development of the mobile shopping market has resulted in rapid development for businesses, but the challenge will be immense at the same time. Brynjolfsson et al. (2010)^{lxi} pointed out that with the development of mobile network technology, consumers are increasingly free to choose online shopping sites and lack no longer information. Because users understand and master information about products and services, the prices of E-commerce companies are becoming more transparent and competition is becoming fiercer. At the same time, with the increase in user information acquisition, the power of consumers is continually improved.

Reichheld and others (2000)^{lxii} pointed out that users can easily switch between different consumer websites, and that only companies which offer users the best experiences can attract and acquire users. Boyer, Hallowell & Roth (2002)^{lxiii} found that the online client was more critical than the offline client when the service did not meet the client's expectations.

We can say that the fidelity of the user is more difficult to maintain. Existing research shows that the cost of acquiring new users and retaining former users represents respectively 75% and 25% of the total budget (Reichheld & Scheffer, 2000).^{lxiv} The cost of retaining old users is much lower. At the same time, studies have shown that to attract a new customer, traditional services is about 40% easier than E-services (Luarn & Lin, 2005).^{lxv} At the same time, in the mobile commerce environment, the user can easily use "word-of-mouth" to share his buying experience with other people, which affects willingness and buying behavior of others.

Therefore, how to cultivate and maintain customer loyalty is crucial for the business. However, research on mobile consumer behavior is mainly based on user adoption. Although initial acceptance was the first step to success, but the long-term survival and ultimate success of the company depended on the continued use of the user (Karahanna, 1999).^{lxvi} Customer loyalty and retention rates are an important qualitative measure of the profitability of serving businesses (Boyer, Hallowell & Roth 2002).

Theoretically, consumer redemption behavior is behavioral loyalty. According to Gremler & Brown (1996)^{lxvii}, many researchers define loyalty by the number of times the consumer continues to buy the product or service. Tucker (1999)^{lxviii} believes that after four or more times, consumer repurchase behavior refers to consumer loyalty. Research of Jacoby & Chestnut (1978)^{lxix} shows that consumer loyalty is to repurchase frequently. Oliver (1999)^{lxx} considers consumer loyalty as a repeat purchase of the product or service of a particular brand by consumers, they will not easily change to other brand suppliers, so consumer loyalty is the psychological commitment towards their preferred suppliers. Oliver's definition of consumer loyalty (1997)^{lxxi}, repurchase behavior is part of the third phase of consumer loyalty.

Even though there are currently many studies on the continued use of information systems, mobile commerce is still unique: the application of mobile commerce is limited by resource conditions such as the capacity of terminal equipment, network speed, etc. The mobile commerce service is anytime and anywhere, mobile commerce users are both users and consumers. As a result, there may be a large gap in the continued use between mobile commerce users and users of general information systems.

Although some researchers have focused on the continued use of computer system users, they are still unconvincing about the continued use of mobile commerce in the retail industry. According to Rational Behavior Theory, the behavioral intent of the user is the most effective predictor of the actual behavior of the user. In addition, value maximization is the primary basis for customer behavior decision making, which is the most fundamental assumption of marketing behavior research.

Faber, Ballon, Bouwman et al. (2003)^{lxvii} proposes that, to design mobile commerce products and services, a systematic analysis of the intent and actual value of provider; the expectation and actual customer value is performed. Parasuraman (1997) proposed that the value perceived by the client is the most important indicator of the client's repurchase intent, and it is also one of the important methods to measure the service's competitive advantage. It is therefore necessary to study the meaning and composition of the perceived value of the customer, and how the customer understands, evaluates and accepts the value provided by the company. This allows companies to grasp the intrinsic psychological needs of the customer.

Given the above problems and based on the results of previous studies, we discuss in this thesis the determinants of consumer loyalty to the mobile retail trade. The main objective of this research is therefore to identify and understand the key factors that contribute to consumer loyalty to mobile commerce in a retail context. This overall goal is divided into four more specific objectives:

- Introduce mobile commerce and its application and impact on innovation of the retail business model;

- Introduce the Expectation Confirmation Model of Information System Continuance (ECM-ISC) application into mobile commerce and the modification we have made;
- Explore the mechanism of influence of perceived value and consumer satisfaction on the loyalty of mobile commerce consumers;
- Propose and test empirically the integrating model of determinants of mobile commerce loyalty.
- Offer advices for the supermarket manager to improve their quality of service and ultimately to capture consumer loyalty.

To complement these four research goals, we need to clarify what the specific content of mobile commerce consumer loyalty is, and build a research model for customer loyalty. Because the perceived value of mobile commerce reflects the characteristics of mobile commerce, many studies have shown that perceived value has a significant impact on repeat purchase and ongoing user consumption. This thesis will conduct a thorough research on the following three questions:

1. What constitutes the perceived value of mobile commerce consumers? What is the specific content of each dimension and how do these determinants influence the fidelity of mobile commerce?
2. Does the perceived value influence the fidelity of mobile commerce? And what is the relationship between the perceived value, satisfaction and loyalty of mobile commerce?
3. What is the impact of socio-demographic variables on consumer behavior and loyalty?

3. Research approach

This thesis follows the path of research: literature, model construction and empirical tests, combining exploratory research and empirical research to study research questions. First, the documentary search method is used in order to search, read and comb the relevant data from the literature, and determine the relevant concepts of this thesis. Then, using data from in-depth interviews and qualitative analyzes by using content analysis methods, we obtain the initial model of the mobile commerce loyalty mechanism. A conceptual model of the impact of the perceived value of mobile commerce on loyalty is constructed by theoretical logical deduction. The research hypotheses of the relationship between perceived value, satisfaction and fidelity have been proposed. Finally, an empirical adequacy test is conducted on the theoretical model and the research hypotheses.

Qualitative research is a research-based analysis of research objects, while quantitative research focuses on the analysis of quantitative proportions and changes, the two methods complement each other. If a qualitative or quantitative analysis is difficult to deeply reflect the complexity and the systematicity of research problems, the qualitative and quantitative research method can be used to describe and evaluate the behavior of consumers of mobile commerce. This thesis adopts a combination of exploratory qualitative research and quantitative research, qualitative analysis methods are used to sort out the concept, define variables and put forward relevant research hypotheses. Qualitative analysis methods are used to analyze the research results and the Nvivo 11 software was used. The research model and its assumptions were tested by a quantitative approach, with survey data from 337 mobile commerce users. The general model test and research hypotheses were conducted using the structural equations method, specifically the PLS-PM modeling (Partial least squares, path modeling) using the SmartPLS 3 software. This study analyzes variables such as perceived value, satisfaction and loyalty to mobile commerce, which belong to theories of management, marketing and psychology. While research objects are mobile users, this research requires the use of interdisciplinary and interdisciplinary knowledge.

4. Contributions of research

As the latest method of electronic commerce of information, mobile commerce is changing more and more the lifestyle of users, but the mechanism of loyalty is also a problem to be deepened. Based on the ECM-ISC model and the technology acceptance model, this thesis proposes factors such as: perceived ease of use, perceived utility, perceived quality of service, perceived trust, perceived benefit cost , perceived social value. Two types of contributions are expected from this research:

1. Theoretical contribution

- Although many researchers have recognized the importance of the continued use of information systems, research in this area is relatively weak compared to user adoption. Research on information system continued use were mainly based on the TAM model, then Bhattacharjee (2001) proposed ECM-ISC model based on the deficiencies of the TAM model. However, ECM-ISC model is a general model. Based on previous research, this thesis tries to develop the conceptual model based on the ECM-ISC model from the point of view of the perceived value of mobile commerce users, and empirically studies the extended model.
- In the mobile commerce environment, perceived value of the user has a very significant impact on behavior and behavioral intent. In the general field of consumer products, researchers have realized that perceived values in one dimension have limited enlightenment and guidance for managers. In mobile commerce, research on the dimensions of perceived value by the user is relatively small. This thesis tries to systematically study factors influencing the perceived value and behavior of mobile commerce users. On this basis, the composition of the value perceived by the user in a mobile business environment should be proposed.
- This thesis tries to establish a triangular relationship between the satisfaction, perceived value and loyalty of this exploratory stage of research.

2. Managerial contribution

With the constant improvement of mobile devices and the constant renewal of mobile network technologies, competition for mobile commerce will become fiercer. Many companies use various promotional methods to attract new users. However, they ignore the problem of how to keep old users. Retaining old users of the mobile shopping site is even more important for businesses, and this is also more complicated. The use of some promotional tools can really help them attract new users, but this often has a short-term effect and may be less appealing to former users. This is because former users are more familiar with mobile commerce websites or applications and their products and services, so their expectations of the value that the business can give are higher. Especially in the era of value perception, efforts to improve the perceived value of old customers are the key for mobile commerce operators to increase the number and quality of transactions. Therefore, in the mobile buying environment, how to retain old customers has become a problem for all mobile commerce operators. Research in this thesis tries to propose some useful suggestions for mobile commerce companies from these angles:

- Social interaction.

Do mobile commerce users have a greater demand for social interaction and are they easily influenced by their families, friends and social media?

- Cost of using mobile commerce

Customers who use mobile commerce have largely accepted E-commerce. If the perceived cost is too high when using mobile commerce, will they shift their interest back to E-commerce?

- Perceived usefulness

The nature of mobile commerce allows customers to purchase products or services anywhere, anytime, how to make mobile shopping more personal and convenient is an important question.

- Different consumers of mobile commerce

This research analyzes the socio-demographic differences of mobile commerce users to see if the loyalty of mobile commerce is different.

5. Research Architecture

With the main goal of determining the factors that explain consumer loyalty in the context of mobile commerce, our thesis is structured in 4 chapters, the architecture of this research work is summarized in Figure 1 below.

- The first chapter, Innovation in retail industry and mobile commerce

The main contents of this chapter include the review of the literature. We will first introduce the different dimensions of innovation in retail, and the concept of mobile commerce. Second, we introduce the concept of ICT and mobile commerce into the retail business model. Finally, we continue to discuss the influence of mobile commerce on the innovation of the business model. On this basis, we summarize the theoretical contributions of existing research to find the research perspective and innovation space of this thesis.

- Second chapter, Consumers behavior in mobile commerce

In this chapter, we first present the continuous usage behavior of mobile commerce and the expectation-confirmation-model-information system continuance (ECM-IS) model to determine the outcome variable, and try to sort the factors of influence used by other searches. Next, we analyze the mobile commerce technology acceptance model (TAM) in order to find the factors influencing mobile commerce consumer behavior, as well as the relationships between satisfaction, perceived value, and the fidelity of mobile commerce. Finally, we analyzed the perceived value of the consumer and the factors of influence.

- Third chapter, Exploratory study of qualitative research, conceptual model and hypotheses

A qualitative exploratory study is conducted with consumers in order to propose a conceptual model and to develop research hypotheses. The scope of our qualitative study is the retail sector. This study makes it possible to have a better understanding of the consumer in terms of evaluation in a context of mobile commerce.

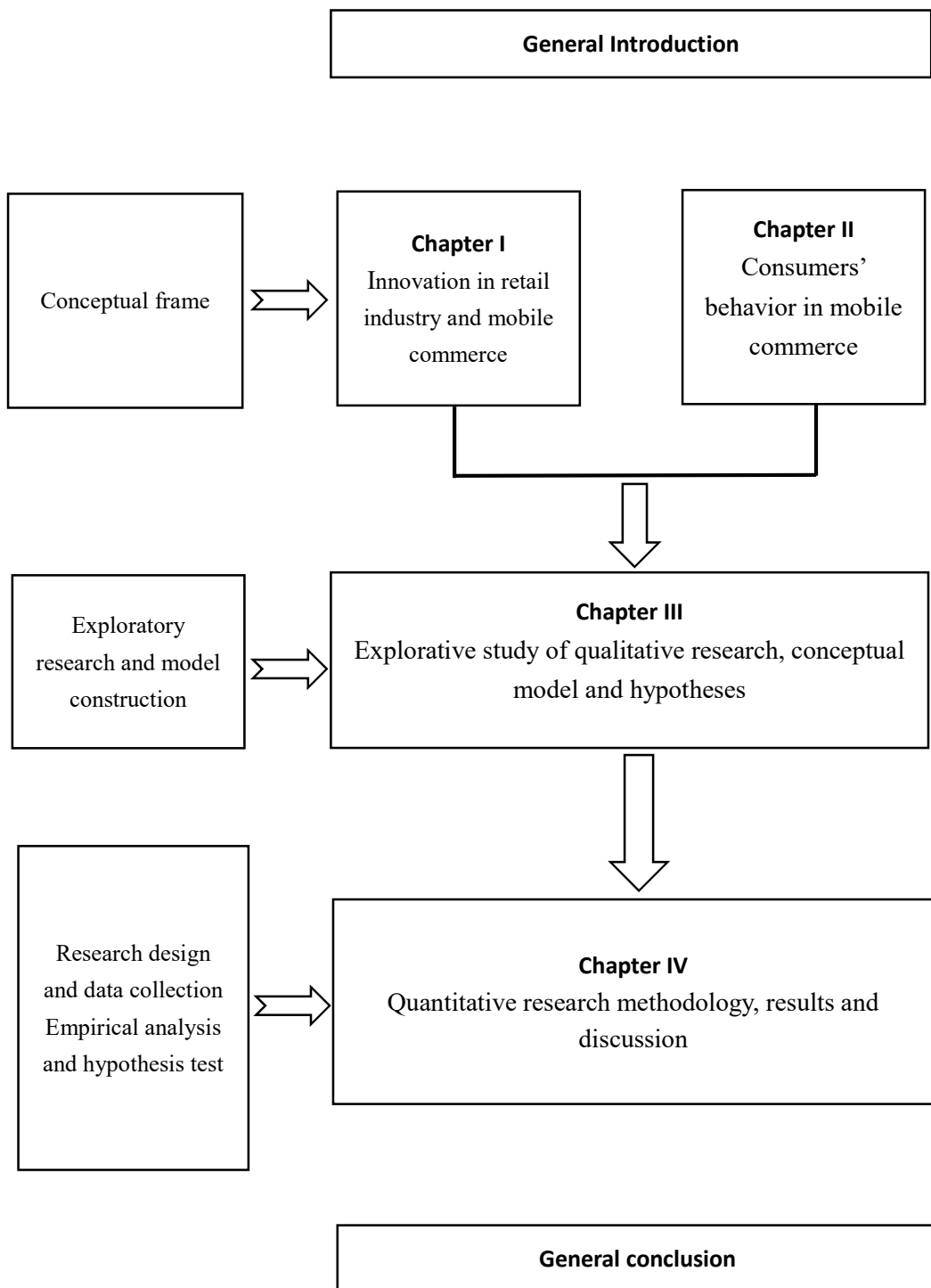
- Fourth chapter, Quantitative research methodology, results and discussion

This chapter attempts to empirically test the proposed model and research hypotheses through a quantitative study that we conducted.

- General conclusion

A synthesis on the theoretical contributions, the managerial implications of the research. It also outlines the limitations raised and the prospects for future research.

Figure 1: General structure of the thesis



Chapter 1

INNOVATION IN RETAIL INDUSTRY AND MOBILE COMMERCE

Introduction

The study of business model innovation in retail industry began in the 1950s, and the reason was due to the growing popularity of the supermarket as a representative of retail industry. Zimmerman M. M. (1941)^{lxxiii} pointed out that large surface and self-service are the core characteristics of supermarket, and he predicted that these features will likely become the direction of the traditional retail trade. Then, the central place theory of Christaller W. (1966)^{lxxiv} laid the theoretical basis of traditional retail industry trend analysis, he proposed that consumer will move farther for shopping while more products and services are provided. However, with the popularity of personal computer and networks, online shopping came into being. The definition of online shopping was originally given by Yeşil (1997)^{lxxv}: online shopping is consumer buying products or services through the shopping Web sites which sale products or services with catalogs and images in a multimedia way, presented in front of consumers through the global information network.

From the perspective of technological innovation, conventional communication network mainly solved the voice communications between human been, but the emergence of TCP / IP protocol-based data communication network made the communication between human and computer possible, and thus lead to universal calculation (U-computing) concept. Therefore, intelligent business activities and universal calculation are becoming typical characteristics of online shopping activity. According to Mark Weiser from Xerox (1999)^{lxxvi}, the future Internet computing devices will be everywhere and easy to use. He firstly proposed the concept of “Ubiquitous” in 1991. Today, Internet-based E-commerce is expanding and shifting to M-commerce, which is based on wireless mobile communication network. Moreover, with the development of the ICT (Information and Communication Technologies) sector in Japan and China and other leading countries, M-commerce is considered as an important window into the future. Another reason for M-commerce to become a pioneer of the emerging commerce mode is the large user data-base from E-commerce and its backward compatibility.

This new business mode will enable consumers to be freed from the constraints of time and space, which is different from traditional E-commerce activities. It refers that business model innovation is beginning to focus on the rapid growth of M-commerce, which is based on ICT and it leads the increase of Multi-channel, even Omni-channel operation.

In this chapter, we will firstly introduce the different dimensions of retail innovation and the concept of Mobile commerce in order to have a global understanding of which dimensions construct retail innovation, and whether mobile commerce meets the condition of retail innovation. Secondly, we introduce the concept of retail business model in order to better understand the elements and motor forces in mobile commerce as a new business model. Finally, we continue to discuss how ICT and mobile commerce influence and apply to retail business model innovation.

1. Innovation in retail

Since 1980s, the global retail industry has developed rapidly and created intense market competition. Retailers are continuously pursuing innovative activities in order to deal with this complicated situation. So that we have a preliminary understanding of retail innovation from different angles. However, compared with the rich and dynamic retail innovation practice activities, there are very limited theoretical achievements. Since longtime, retailing was considered as a labor intensive industry that needs very little technology, and it rarely invested in R&D with very few numbers of patent registrations (Hughes, 2007)^{lxxvii}. Until present, there is still a lack of comprehensive research on the innovation of service industries, including retailing (Reynolds & Hristov, 2015)^{lxxviii}. Even CIS (Community Innovation Survey) and other surveys showed that innovation of retail is weak and rare compared to other sectors (Gallouj, C., 2007)^{lxxix}. In consequence, it is very difficult to find literature on innovation in retail, and surveys that are specifically created for this domain. According to a synthesis of Gallouj, C. (2007)^{lxxx}, national results on innovation in retail are extremely heterogeneous. The results of retail innovation surveys vary widely for the same country according to the

different dates and periods of observation. In addition, methods and investigation techniques are often different as well as the coverage of trade and the sample size. This has probably given to retail a negative reputation on innovation. Investigators cannot make questions correctly if each retail company has their own definition on innovation.

1.1. Multiple dimensions of retail innovation

Retail innovation includes a holistic approach of retail innovation dimension, as well as retail format innovation, technology innovation and business model innovation. Because the dimensions of retail innovation are not quite clear. Innovation in retail includes sales methods, supply chain, internal management and so on. These dimensions together build the retail innovation. So we make a list of works which have been done by other researchers in table 1:

Table 1: The existing works on different types of innovation for commerce

Authors	Years	Contents
Abernathy & Clark ^{lxxxix}	1985	Architectural innovations, Niche Market Innovation, Regular innovation, Revolutionary innovation.
Badot & Cova ^{lxxxii}	1992	Radical innovation, Incremental innovation, Social innovation, Technical Innovation.
Dawson ^{lxxxiii}	2000	The format innovation, Technological innovation, Process Innovation, Product innovation.
Hertog & Brouwer ^{lxxxiv}	2000	A new concept, A new client interface, A new distribution system or servuction, A technological option.
Dupuis ^{lxxxv}	2002	Innovations of concept, Innovations of flow, Organizational innovation, Relational innovation, Architectural innovation.
Gallouj, C.	2007	New sales methods, New concepts or new store formats, New products and new services distributed by store, New products and new services, New process within a same format, New external process, Applications and uses of new technologies.

As we can observe, there is innovation on management of all activities of company. Researches on innovation considered not only the sales of products, but also the shopping experience and entertainment of customers. We analyze the theory of Gallouj, C. (2007) because it offers the most complete and clear point of view.

- **New sales methods**

Method of sales is a basic factor for retail trade and it's the first thing to attract customers to make their shopping decision. The traditional method of sales is the reaction between vendors and customers, but with the accelerated pace of life, consumers need more effective purchase methods such as: auto sales machine; Tele-sales; Drive, online shopping, etc.

- **New concepts or new store formats**

Retail innovation has often been associated with store format, a retail format is the physical embodiment of a retail business model (Reynolds et al., 2007)^{lxxxvi}. This dimension of innovation in retail is a set or a result of different forms of innovation in the process, the product or even the organization. For example, supermarket is a format which has changed the organization of the store completely.

- **New products and new services distributed by store**

Here, the new products are developed by the distributors at their initiative. The most famous example is the PL (Private Label), there are three forms of PL on the market:

- Independent brands that work with a store ('Bout'chou' for Monoprix, 'Reflets de France' for Carrefour, etc.)
- Flags marks or generic brands that are invented by Carrefour in the 70's. These are unbranded products which often carry a logo, but they are less successful now.
- Store brands that are the most popular in recent years. For example, Carrefour Bio.

- **New products and new services**

The retail trade is a perfect field to test a new product especially the supermarket. There are all the brands, all the product ranges on the shelves of stores. So, it is a very important test element for the distribution of new product or services such as financial services, insurance services or travel agencies, etc.

- **New process within a same format**

It's difficult to distinguish this innovation dimension comparing to others. There are some examples: category management; cash desk; 48 hours delivery.

- **New external process**

The greater part of innovation on this dimension is on the changing relationship between retailers and suppliers, as we mentioned, the retailer is becoming the center of the procurement cycle.

- **Applications and uses of new technology**

According to different goals of technology, we divided technology into three types: firstly, the technology that affects the product itself, such as the production of goods, processing, packaging technology. Secondly, technology that affects the operation and management of retail enterprises such as warehousing, logistics, sales, commodity standard coding technology, inventory management technology, computer network technology, data transmission and processing technology. And finally, technology that affects consumers, such as bar code technology, capital settlement, transfer, payment and other technologies.

Through these dimensions of retail innovation, we can see that innovation in retail is basically a process to create or modify the business model. The business model analyzes retail innovation holistically, and Timmers (1998)^{lxxxvii} suggested that business model is a complete system of product, service and information flows that includes all the participants and their roles, which could create benefits to the participants. Tapscott & Ticoll (2000)^{lxxxviii} also pointed out that business model is an unique networked system of communication and trading instruments for supplier; provider of business services; equipment suppliers and Customers. At each crucial revolution of retail, there are new business models emerging in the market. Of course, the new business model does not come alone because it's led by the change of technology, organization, products, etc. The business model is just the final result which is showed in front of customers, but retailers have made or adapted many other innovations such as information and communication technology. ICT helped retailers to create mobile commerce which is a

new business model and it is developing rapidly, so we will introduce M-commerce in retail which is based on ICT.

1.2 Mobile commerce in retail.

Over all, with the development of ICT, M-commerce is becoming a massive industry in retail market. Retailers could establish their own M-commerce to increase sales, enhance customer satisfaction and continuously enhance the value proposition. Retail companies can rely on M-commerce to expand their own customer base, to reduce the distance with them. The timely marketing strategy will lead the value orientation of consumers. Due to the increasing development of Internet information technology, the time for obtaining products and services information is greatly shortened, which not only benefits the marketing activities of retail enterprises, but also facilitates the consumers to obtain better services. So we firstly present mobile commerce in retail trade, in order to have a more comprehensive view.

1.2.1 Mobile commerce in retail.

With the rapid development of mobile Internet technology and the popularity of mobile devices such as smart phones and hand-held computers, mobile commerce has developed rapidly as a new business model. In recent years, more and more researchers have devoted a lot of energy to its analysis. The concept of mobile commerce has also been fully enriched and developed. The broad definition of mobile commerce encompasses that all the transaction behavior and entertainment achieved through mobile devices are within the scope of mobile commerce, by using advanced electronic methods to engage in business activities. Its purpose is to complete the transaction process of business affairs through electronic data Information, as well as to link up the enterprises, consumers and other related agencies through the electronic exchange of goods and services information. A narrow definition of mobile commerce refers that mobile commerce achieve the need for data transmission in a variety of entertainment

and trading activities by using mobile devices: the form of data transmission can be short messages, MMS, mobile Internet shopping.

However, by reading the relevant literature, we found that the understanding and definition of mobile commerce has not yet reached a consensus by academic community. There are still big differences in the definition of mobile commerce concept. Researchers have defined it from their respective perspectives. After a lot of literature reading, the definition of mobile commerce can be summarized as trading perspective; E-business extension perspective, system perspective.

- **Transaction perspective**

In the market economy activities, mobile commerce is regarded as a convenience, real-time, personalized transaction activity by using mobile devices to make variety of business information interaction, relying on the mobile communication network. Tsalgaidou & Veijalainen (2000)^{lxxxix} defined the mobile commerce as "any economically valuable transaction through mobile terminal devices and based on mobile communication networks". Similarly, Singaporean scholar Kenneth C.C. Yang (2005)^{xc} also argues that "mobile commerce is a direct or indirect transaction that is directed and conducted through a wireless communications network." Barnes (2002)^{xcii} points out that "mobile commerce refers to any direct or indirect transaction with monetary value that is conducted through a wireless communication network". Pitoura (2001)^{xciii} and others believe that "all the transactions with economic value that is conducted by at least one mobile terminal device through the mobile communication network is part of the mobile commerce."

In summary, under the trading perspective, researchers mostly define the concept of mobile commerce around the market trading activities. They took mobile commerce as the methods and channel of market transactions, the literature is mostly concentrated in the consumer behavior research.

- **E-business extension perspective**

Mobile commerce under the traditional E-commerce extension perspective was mainly regarded as a succession and deepening of traditional E-commerce, a cooperation

between mobile hardware devices (mobile phones, PDA, etc.) and the Internet. Muller (1999)^{xciii} pointed out that "mobile commerce is a subset of E-commerce, it is the currency value related transactions through the mobile communication network. It not only increased the trading volume of the electronic trading market, but also expanded E-commerce throughout the trading market." Keen & Mackintosh (2001)^{xciv} also proposed that "mobile commerce is an extension of E-commerce based on the Internet, any E-commerce transaction through wireless devices at anytime and anywhere can be seen as mobile commerce." Mobile commerce broke the limitation of the traditional E-commerce which is can only be completed by fixed network or fixed equipment. They also believe that "mobile commerce is an extension of the E-commerce model based on the development of the Internet, any electronic trading activity completed by wireless terminal equipment based on wireless network can be seen as mobile commerce." Guo (2003)^{xcv} also proposed that "mobile commerce is an extension of E-commerce from wired communications to wireless communications, from business form of fixed locations to anytime, anywhere. In this perspective, the study of mobile commerce is mainly based on the E-commerce: research concept definition, research perspective and research methods are influenced by the Internet research field.

- **System perspective**

From a system perspective, mobile commerce is seen as an interactive ecosystem between customer and company; this ecosystem is based on a certain social-economic background and different technical basis. Mobile commerce can be understood as a business platform or system for goods, services, information, and knowledge exchange through wireless mobile devices and wireless communications technology. This platform combines the mobile communication network and the Internet, to make the exchange and interaction of enterprise internal and external information more convenient and quick through the mobile terminal, so as to improve the operation of enterprises operating system. In short, mobile commerce is a system between mobile devices and other mobile communication terminals, or between mobile devices and other network information terminals under the support of mobile communication

technology and network information technology. In addition, in the system perspective, mobile commerce researches focus mostly on the platform development, system integration/development and system applications.

Table 2: List of definition of mobile commerce from different perspectives

Perspective	Researcher	Definition
Trading perspective	Clarke (2001) ^{xcvi}	Mobile commerce is all of business activities that has money value through mobile communication networks.
	Tsalgaidou & Veijalainen (2000) ^{xcvii}	Mobile commerce is any transaction that utilizes mobile terminals to achieve economic value through mobile communication networks.
	Barnes S.J. (2002) ^{xcviii}	Mobile commerce refers to any direct or indirect transaction behavior with monetary value through a wireless communication network.
	Siau et al. (2004) ^{xcix}	Mobile commerce is a new form of electronic trading, it is a business model combined wired E-commerce technology and wireless communication network which is through the mobile communication equipment.
	Ngai (2007)	Mobile commerce is any transaction activity that has money value through a wireless communication network.
E-business extension perspective	Muller (1999)	Mobile commerce is any transaction activity through mobile communication network, which is a special form of E-commerce.
	Coursaris, C. (2002) ^c	Mobile commerce is a subset of E-commerce.
	Kalakota & Robinson (2002) ^{ci}	Mobile commerce refers to the real business transactions in the process of moving, is to rely on mobile devices to maintain business relationships and storage, sales, services, product information required by the application platform, as a new E-commerce reasonable extend to meet customer channels and meet the comprehensive challenges.
System perspective	Mylonopoulos & Doukidis (2003) ^{cii}	From a systematic perspective, Mobile commerce is an interactive ecosystem of individuals and enterprises, this ecosystem is based on a certain social-economic background and different technical basis

Through table 2, we can contrast that the essence of mobile commerce includes three elements: mobile terminal equipment, wireless communication technology, business activities. Therefore, mobile commerce is the business activity based on wireless communication technology, through mobile terminal equipment, it is the organic unity with wireless communication technology and electronic commerce technology.

1.2.2 Characteristics of mobile commerce

Compared with other information technology based business activities, mobile commerce is not a simple expansion of E-commerce, but also as a business model derived from the usage of mobile communication technology (Lehner & Watson, 2001)^{ciii}, it has unique characteristics. M-commerce has the characteristics that traditional E-commerce does not have, such as mobile commerce does not have the constraints of time and space; customers can access the mobile network at any time and any location with mobile network conditions; mobile devices are more personalized; it can create more value and benefits for users (Siau et al., 2004).^{civ} Researchers have carried out extensive and in-depth exploration on the characteristics of mobile commerce, as shown in the table 3:

Table 3: List of different characteristics of mobile commerce

Researcher	Years	Characteristics
Tsalgatidou & Veijalainen	2000	Ubiquity, personalized, positional sensitivity, adaptability, broadcast
Clarke II	2001	Ubiquity, location, personalized, convenient
Anckar & Incau ^{cv}	2002	Flexibility, convenient, ubiquity
Lee & Tan ^{cv}	2003	No constraints of time and location
Venkatesh et al. ^{cvii}	2003	Anytime and anywhere
Turban et al. ^{cviii}	2004	Mobility, convenient, ubiquity, positioning
Looney et al. ^{cix}	2004	Ubiquity, customization
Ngai & Gunasekaran ^{cx}	2007	Mobility, wide range of accessibility
Durlacher Research Institute ^{cx}	2011	Personalized, location, all-time service

Through the combination of the literature, we can see that the characteristics of mobile business are different from each researchers although the descriptions, but the characteristics of the mobile commerce are well identified and can be summarized as: anytime and anywhere, convenient, location-related, personalized service, which are consistent with the four major values of Clarke II (2001)^{cxii}.

1.2.3 Functions of mobile Commerce

Mobile commerce has a wide range of functions and services. Based on the above literature, we summarized several applications of mobile commerce as below:

- **Mobile search**

Consumers can use mobile devices to search their favorite information at anytime and anywhere. For example, they can get news information, weather conditions, traffic information, life services, product prices, picture or music, video games and so on. At the same time, mobile search service providers can also provide users with more targeted information or services based on the geographic location of users' terminal devices.

- **Mobile payment**

Consumers can bind their mobile devices to bank cards, credit cards or third-party payment platforms (such as PayPal, Apple pay, etc.) to instantly pay for the purchased products or services at anytime and anywhere. They can also manage their personal bank account bills, funds, information, financial investment which greatly saves the consumer time and improve work efficiency.

- **Mobile entertainment**

Consumers use mobile devices to watch videos; listen to music; download eBooks; play games; share photos or videos and so on.

- **Mobile app store**

Mobile App Store is a platform service that consumers can browse and download applications from their mobile devices. At the same time, it provide development tools and product release channels for the application software developers.

- **Mobile shopping**

Consumers use the mobile terminal device to connect to the wireless network, search and browse the information of the goods or services of interest, and directly place orders and make payment to realize the sale of virtual or physical goods.

However, we cannot expand all of these functions. This study explores the influential factors of mobile commerce usage behavior from the value perspective of consumers. Mobile shopping is also very good integration of other features of mobile commerce applications, it is very representative. Therefore, combined with the above literature review, this study uses the concept of mobile commerce transaction perspective, that is, from the perspective of mobile shopping to analyze consumer behavior.

1.2.4 Concept of mobile shopping

With the increasingly development of mobile network and the popularity of mobile devices as smart phones, mobile shopping market has flourished. Su & Lu (2009)^{cxiii} pointed out that mobile shopping refers to the online shopping activities of consumers through mobile phone, due to the portability of mobile phones, consumers can use mobile phones to complete the online shopping anywhere. Yang & Kim (2012)^{cxiv} pointed out in their study that mobile shopping free the consumers from time and space constraints, so consumers can enjoy shopping activities from mobile shopping. Ozok A. A. & Wei J. (2010)^{cxv} also pointed out that mobile shopping is about consumer use smart phones and other mobile devices for online shopping activities through the mobile network. Through these existing researches, we try to define the mobile shopping as: mobile shopping refers to the use of smart phone, tablet PC and other mobile devices to participate transactions of products and services through the mobile communication network. Mobile shopping is closely related to traditional online shopping, but mobile shopping has some different characteristics from the traditional online shopping as showed in table 4.

Table 4: Different characteristics between mobile device and PC

PC	Mobile device
Large screen, good experience, high efficiency	Small screen, keyboard input is relatively difficult, difficult to enter complex work
Cannot be used at anytime and anywhere	Anytime and anywhere, perceptible location,
PC is mainly used for work scenes, use time is complete, abundant, coherent	The mobile phone is mainly used on the way to get off work or at home in a relatively relaxed situation, fragmented features obvious, easily interrupted
Clear demand and active search-based, supplemented by wandering leisure needs	Leisurely needs, while derived out of immediate demand, including limited time and quantity, snapping and other impulses consumer demands

Firstly, PC and notebook computers are the most important terminal equipment for traditional online shopping, while mobile terminal devices are mainly smart phone and tablet PC. Different terminal equipment make the user experience very different in the shopping process.

Secondly, communication network. With the development of wireless network technology, the realization of the fourth generation of communication technology and the full coverage of urban WIFI hot spot not only make mobile shopping benefiting from a wider network access, but also make mobile Internet speed greatly improved. Mobile shopping users could complete their shopping process with the smooth and fast mobile Internet, and greatly receive positive shopping experience.

Due to the differences between the terminal devices and the communication networks, mobile shopping is no more limited by time and space as traditional online shopping. Mobile users can purchase their favorite products and services at anytime and anywhere when they need. Mobile shopping is a specific business application of mobile commerce, it subordinates to mobile commerce, inherits and presents mobile business features. Through the combination and summary of the mobile commerce and mobile shopping literature, and combined with the characteristics of mobile shopping transaction itself, we propose that mobile shopping has the following characteristics.

- **Mobility**

The emergence of mobile commerce means that when users perform E-commerce, such as E-banking, online shopping, download songs, play games and other activities, they no longer need to sit in front of the computer, they only need some mobile hand held devices to help them to finish the activities. As a transformative technology, mobile computing allows customers to access information whenever and wherever they are, without any physical connection. People want to buy a commodity, but for some reason, such as no time or no chance they can go to the store to buy or see a certain commodity, but they want to know more about the information; then they can use mobile commerce to achieve it. Mobile commerce is a "ubiquitous" technology which expands the physical space through data and resources.

- **Immediacy**

Consumers can not only make shopping and other activities when they are in the state of moving; meetings; travelling; social activities and so on, but can also access to audio-visual information, graphic information, customized information and related services in the mobile state to meet their timely demand.

- **Connectivity**

Users with the same location or interest can easily connect together via text messaging and mobile chat applications, where advertisers can promote merchandise and make special offers in order to expect subscribers to answer and accept the information.

- **Portability**

Most portable hand held devices can be carried personally. When you are in a meeting, you do not have to be limited to a meeting room, you can use a mobile device that can connect to a network. You are no longer subject to time and space constraints, and you may omit some troubles of life, such as browse the web page, and deal with some business through the business application when waiting for the phone, during the traffic jams. The users can save the merchandise's appearance, company address, hotel information, bank details, payment and credit card details and safety information

through the photographic functions of the mobile terminal, etc., at the time they need to shop or sign a contract.

- **Position relevance**

Companies can provide services based on the user's location. Mobile communication technology can easily locate the users. Location-based services (LBS) are the core applications of mobile business, such as emergency medical services, car driving navigation services, travel guide services, etc. Location-based services make mobile commerce taking full advantage of its strengths, not just repackaging old applications.

- **Identifiable**

The mobile phone has an embedded number to support security transactions, while the number is anonymous. Mobile devices are typically used by a single individual by accurately identifying a user. In the E-commerce environment, users can access the fixed network to access to various types of information resources, it is difficult to confirm the user's true identity. Since the terminal devices used by the mobile communication user is usually owned by the users, this personal configuration can be built into the mobile device, and each terminal has a unique identity, so the user's identity is not only easy to distinguish, and easy to collect and deal with.

- **Personalized**

Mobile devices are generally used by their owners, so they can be personalized. Mobile phones have stronger penetration ability, so producers can produce more segmented lifestyle tools. Mobile business phone number in the mobile business has a correspondence with the users. Moreover, this correspondence has the characteristics of portable, so that each mobile phone number represents a certain mobile business subject. The number of the mobile communication terminal has in fact become a commercial symbol of the mobile commerce subject, which is a closer correspondence than any previous communication ways.

- **Better foundation**

Because of their different origins, E-commerce and M-commerce have completely different user base. Most of the early Internet users were highly educated computer users, and later the Internet has been slowly spreading to the general public. In contrast, there are data that indicate, in addition to commercial mobile users, most of the cellular phone users are young, less educated users. People who use mobile phones are not only senior white-collar workers, but there are also many low-educated people. The success of mobile commerce is largely based on the large number of potential consumers.

Although many scholars and businessmen are optimistic about mobile commerce, but it is still in infancy, and there are still many problems which need to be faced and solved.

- **Trust and privacy**

Users are sensitive to privacy issues, and they refuse to use the system because they do not trust it. Some companies require their customers to provide some personal information, including demographic information, consumption patterns, or product requirements. Unfortunately, most of time, consumers do not know how their personal information will be treated. There are two solutions to this problem, either to make consumers aware of the benefits of voluntarily providing such information or to give some material stimulus to attract consumers.

- **Security**

For mobile commerce, security is a critical issue. Mobile commerce security issues have three layers: network connectivity layer, management layer and business layer. There are different security risks in the three layers. Passing information in the air hides potential security risks.

- **Management and realization**

Technology cannot solve all the problems, neither create revenue, but it could connect all the people which are involved in the business system. Consumers always hate to receive too many messages. Obtaining user trust and licensing are important challenges for marketers. Consumers are more likely to trust the SMS sent by their service

providers, so service providers should provide filtering, protection and active management for their users.

- **Hardware**

Mobile devices typically have limited capacity, and service providers have to think carefully about which one is their goal. Mobile devices are easy to be stolen or destroyed. Hand held device's screen is small, the software application is rough, no cookie and process control function, if the current connection is broken, mobile devices can only be restarted. So the design of hand held devices must be simple, emphasizing the relevance of information and transactions. Hand held devices typically have limited power and low bandwidth connection rates.

- **Cost structure**

E-commerce access cost is low, so a lot of companies have the opportunity to participate. While mobile business practitioners need to buy industry access license, but also spend a lot for business input and cannot provide free services on the limited broadband resources in front of intense competition. Although some mobile commerce applications seem to be good, for example, using location-based services to help customers reach stores selling products, but is it worth spending much money in investment and questionably making a reasonable return on investment. The failure example tells us that mobile commerce enterprises just focus on how to bring new feelings to the customer is not enough to get real benefits.

In this part, we firstly introduced the different domains of retail innovation by using the theory of Gallouj, C. (2007), which includes new sales methods; new concepts or new store formats; new products and new services distributed by store; new products and new services; new process within a same format; new external process; applications and uses of new technologies. That means retail innovation is basically the innovation of the whole business model, and retailers have made or adapted many other innovations such as information and communication technology. So we introduced mobile commerce which is a new business model. We also summarized the characteristics of mobile commerce and mobile shopping activates. In order to fully

understand this new business model and how it changed the retail business, we need to analyze the retail business model in the next part.

2. Retail business model

From the mid-90s of last century, the Internet is the representative innovation of the increasing popularity of information technology, it led the continuous creation of E-commerce platform which created a new business model of enterprise. Business model received the continuing attention from the companies and academia, which became a popular term in the world. But different scholars hold different views and the research conclusions varied widely on the definition, constituent elements, division, establishment and innovation and other content of business model. Which caused a certain number of scholars starting to use statistical analysis methods to find common features, in order to form a consensus in many different research results.

In this part we mainly combine and summarize the meaning of business model; the constituent elements of business model; the latest innovation theory and so on, by doing review of important concepts and theoretical perspectives. Business model is an ecosystem which is composed by many interrelated factors. It includes a holistic structure of the product and the service, including the narration of the positioning of the different markets and the distribution of interests of the different market. This is the guiding ideology and core theory of this part. Therefore, in this part, the concept of business model and its structural elements are systematically sorted out.

2.1 Concept of business model

Business model was first born in 1939, Schumpeter^{cxvi} once said: "price and output competition is not important, which is important is the competition from the new business, new technology, new supply and new business model". The business model became a specialized term for the management community until the 1970s. Konczal (1975)^{cxvii} and Dottore (1977)^{cxviii} first used the term "Business Model" when

discussing the data and the model of process. In the ensuing period, the research of information system has also begun to use the concept of business model, specifically to describe the enterprise information system. In the 1980s, the concept of business model was extended to the IT field. After entering the mid-90s, the birth of the Internet, which was created in the third technological revolution, greatly promoted the rapid development of E-commerce. Business model became popular in the industry and also gained attention from theoretical and the academic community. At present, the concept of business model could be summarized into the four following categories:

- **Business model is a method to create value**

This theory highlights the core of the business model: the process of value creation and realization. Linder & Cantrell (2001)^{cxix} proposed that the business model refers to a process of the organization or business system creates its own value. In general, it consists in three parts: the structural framework, the organizational transformation model and the operational management form. Often the form of operational management is the core element of the organization's value creation. And the organizational transformation model is generally an important element to enhance the organization's ability to maintain the organizational changes to meet competitions.

Chesbrough & Rosenblomm (2002)^{cxx} defined business model as "a process of consultation and transformation between technology research and value creation." A business model is a professional architecture that is used to truly reflect the value creation, supply and sharing of a company. Magretta (2002)^{cxxi} defined business model as a series of solutions to create value for the customer and all the participants who maintain the normal operation of the business. Company uses its own resources as logistic flow, information flow and capital flow in the business process, in order to deliver the final products and services to customers, and to recover the investment, and finally to obtain a profit solution. According to the above analysis, the theory holds that the nature of the business model is a process of thinking that how the organization creates value.

- **Business model is a system**

This theory is a good answer to "how business model create value", it is a new perspective by using system as a starting point to explore the business model, and it discussed the logical relationship between the internal elements of business model. Timmers (1998) proposed that business model can answer and describe the business management procedures and operational mechanisms, can identify very correctly the interests of different business models to make a specific account of the source of income. So the basic elements of business model usually include the quality, type, market players, value, income and other business content, which formed a complete business model system.

Tapscott & Ticoll (2000) pointed out that business model is a unique system which use the network as the primary means of communication and trading for suppliers, channels, providers of business services, equipment suppliers, and customers. Similar to the theory of Timmers, Weill and Vitale (2001)^{cxxii} suggested that business model should be a whole process to share goods, information, wealth and benefits between business customer, partner and supplier. Amit & Zott (2001)^{cxxiii} first proposed that business model is generally used to describe an internal element structure of one organization, the so-called organizational structure, but it proved that the network operations form is built by both the suppliers, companies and customers.

Mahadevan (2002)^{cxxiv} summed up by reproduction the theory that business model is usually referred to a system which combine the flow of interest, value and logistics between enterprise and its partners, suppliers, who plays important role. Warren, Thelwan et al. (2010)^{cxxv} suggested that business model is a value creation system which is built by value proposition, value creation, value maintenance and realization. Business model in each domain has its own value system and operating method.

- **Business model is a profitable model**

The core idea of this theory is that business model is simply a pattern of organizational profitability, generally speaking is how the business creates a profit model. It describes the most primitive concept of business model that profit is the first element of

company's survival. Stewart (2000)^{cxxvi} has conducted the analysis of this theory. Hawkins (2001)^{cxxvii} proposed that business model is the internal logic between the products or services it provides, the form profitable by producing and to avoid bankruptcy.

Rappa (2003)^{cxxviii} thought that business model is the way for company to maintain its own business by creating revenue, which sets the position of the company in the value chain and guides it to make money. From the financial point of view, the definition of business model was described as the economic model of one enterprise, its essence is the logic of corporate profits, and related variables include revenue sources, pricing strategy, and cost structure. Based on the above analysis, this research thinks that the simple profit model cannot be equal to business model, it can only be counted as a constituent of business model.

- **Business model is a business logic**

This theory suggested that business model has been transformed into a business logic that is often used to illustrate all the processes of how company create and realize value. Osterwalder et al. (2004)^{cxxix}, as a typical representative of the theory, described the business model as a conceptual tool that covers the various components and their interrelationships, in order to explain a fixed entity's business logic. Based on the above definitions, business model can be used to reflect all the customer value provided by the enterprise, the enterprise's internal structure, the company's partner and all the resources. Richardson & Allen (2006)^{cxxx} concluded that business model should be divided into three levels, the first level is the development of strategy; the second level is the daily operation; the third level refers to the economic development the three levels constitute the entire content of business model.

After analyzing the scholars' opinions, this paper proposed that business model is a business logic of profitability, which enterprises use their own resources to integrate and improve the relationship between customers, partners and suppliers, in order to create more value for customers.

2.2 Elements of business model

At present, due to the concept of business model did not have a unified understanding, and then led to the deviation of understanding in various elements of business model. Mainly the business model level and number are relatively different.

Because researchers have different definitions on business model, there are some differences between elements of business model. Alt R. (2001)^{cxxxix} pointed out that the elements of a business model are built of mission, structure, processes, revenues, legal affairs, and technology. Hamel (2000)^{cxxxii} suggested that business model is built of customer interfaces, core strategies, value networks, and strategic resources, which is a recognized component in recent years.

In summary, some of the main research results, perspectives and emphases of business model components are different. Multi-angle researches make the results comprehensive and holistic, but it also brings logical confusion. Despite the diversity of perspectives, almost all of the researchers' works included basic elements as market structure, values, business processes, core competencies, pricing strategies, sources of revenue, and strategic technology. In this part, we summarized the composition of business model elements as five aspects: value proposition, relationship network, organizational design, profit model, value chain structure. We can see that the value creation is very important for business model, and we will analyze how ICT influence these five aspects in next part.

2.3. Motor force of business model innovation

Mitchell et al. (2003)^{cxxxiii} proposed that if only one single component of business model changed, it is only a business model improvement which is not a business model innovation. There must be more than four constituent elements changed compared to competitor, to call this change innovation of business model.

Tucker (2001)^{cxxxiv} defined that business model innovation from a customer's perspective which is the process of maximizing customer value by using its own

resources. Gordijn et al. (2005)^{cxxxv} analyzed the value chain and the constituent elements from two perspectives, pointing out that business model innovation can be achieved by upgrading the value chain, value network and changing the components of business model to achieve business model innovation. Business model is a simple description of the basic logic of enterprise value creation, so business model innovation is to create a basic logic change to adapt to the changing environment, in order to make a more effective way to carry out business activities and corporate values.

In general, business model innovation is to carry out a series of innovative ways under a certain driving forces, identified by most of the relevant researchers as market opportunity pull power, new technology market boost, external environment and other aspects of environmental pressure.

- **Business environment pressure**

As the business environment is extremely unstable, so the business model must continue to carry out innovative activities in order to adapt to the changing business environment. Malhotra (2000)^{cxxxvi} has shown that business model of traditional firms is driven by plans and goals that have been developed in advance, to ensure that business model is based on the original plan and objectives. As the existence of business environment is not sustainable and consistent, companies must make business model innovation.

Sosna al. (2010)^{cxxxvii} also carried out a profound argument on the relevant issues. The continuity of the business model is very unclear under certain circumstances, there is a possibility of mutation. When new changes appear in the current market (new participants, new information technology) existing business model cannot adapt to the fierce market competition. Therefore, in the future of socioeconomic, business model innovation has become one of the necessary skills for sustainable development of enterprises. At present, many scholars believe that enterprises carry out business model innovation based on the pressure of business environment, but how the business environment effectively affect the business model innovation did not get a good answer.

- **Customer value creation**

The core function of business model is the value creation, usually refers to value creation of enterprise in a certain internal and external environment. Amit (2001)^{cxviii} pointed out that a business model usually refers to a transaction activity that an enterprise created, in order to exploit value creation when it opens up the market.

Kambil (2007)^{cxix} described value propositions as a unique value driver for products or services or value-added services that meet customer needs. Value propositions is defined as what the supplier is using to meet customer needs, and in particular how products and services meet customer needs and improve performance by its uniqueness. According to these researches, we can see that customer value creation has become the driving force of business model innovation.

- **New technology market**

If companies want to transform the new technology into real productivity, it must be established into business model which adapt its own development characters. Therefore, the marketization of new technology has become a driving force for business model innovation. Timmers (1998)^{cxl}, Amit & Zott (2001) found out the Internet is representative of the development and application of advanced technology as the main driving force for business model innovation.

Faber (2003)^{cxli} and other scholars found that the development of industrial finance and other technologies to promote business model innovation through the field of ICT research. Amit et al. (2001) pointed that researches of innovation have two main areas respectively as, business model innovation and new technology innovation.

So, it is concluded that technology innovation has become the earliest and most mature research trend in the field of business model innovation. As we consider innovation of retail business model as our research goal, we estimate that the development of retail business innovation is greatly influenced by the information and communication technology.

2.4. Retail business model innovation

Many scholars have studied the business model theory of retail industry. Yu & Lu (2010)^{cxlii} analyzed business model through the reform of format and business. This article adopt the strategic point of view, looking for the long-term strategy development of enterprises. It adapted well for the development of local small and medium-sized retail enterprises, but it still has some limitations for large retail chain enterprises. Li (2006)^{cxliii} also held the same similar point of view, proposed that target customer selection, market competitors flaws and market precise positioning are seriously restricting the retail business model innovation. The content and conclusion of these relevant researches have some practical significance to the innovation of retail industry, but their scope of study still have some limitations, and it is not grasped from the whole situation.

Wu (2008)^{cxliv} proposed an empirical analysis of Wal-Mart's business model elements based on the study of Gary Hamel^{cxlv}. They pointed out that business model consists of four parts: customer interface, core strategy, strategic resource and value network, which includes three aspects: enterprise, customer and value network, analyzing the Wal-Mart's business model elements and Wal-Mart's success. However, unlike the above scholars, Gary Hamel's business model is based on the individual business model, so the actual study must be different from retail business model; the study is not very detailed and thoughtful and lack of measures for general retail specialized innovation,. Hristov (2015)^{cxlvi} redefined retail innovation as a new (significantly enhanced) retail elements (commodities, categories, services, business environment, etc.) and programs which have been carried out with the companies and technologies that hold the elements. In order to make retail companies master new market knowledge and technology, Hristov also suggested that retail innovation can use the pyramid image to illustrate the different levels of its existence: the highest level is generally strategic innovation; the second level is customer innovation; the third lever is usually operational support and organizational structure innovation, the second and third level belong to business activities of the enterprise.

Through the above researches, we can see that different scholars have undergone different researches on the innovation of retail business model. From which we can distinguished some of the scholars focus on external environment innovation, and some other researchers focus on business model elements. As a new perspective of theoretic analysis on the retail business model innovation, some scholars focus on the internet information technology in the innovation of retail business model.

However, there is no consensus on the innovation of retail business model innovation, and the scopes of the research are different. Business model in the theoretical research and specific practice activities do not have a good unified content with centralized formation. It's relatively not easy to make quantitative evaluation of retail business model innovation in real life and many analysis only use the case study which lack empirical evidence. So in order to pursue the basic law of retail business model innovation, we must tap the elements of retail business model and how ICT affects these elements. First, we introduce ICT and mobile commerce in retail.

3. Influence of ICT and mobile commerce on Business Models

ICT is the most influential technology of human society of 20th century, especially since 1990s, and they mainly provide new technologies commercially. During this period, not only the development, manufacturing and services of ICT have been rapidly increased, but the application of ICT has also grew more widely. Over all, with the development of ICT, M-commerce is becoming a massive industry in the market. ICT refers to a combination of information, communication and technology (It is abbreviated as ICT). It is a new concept and new technology integrated by information and communications technologies. We can say that ICT is an extended subject of IT (Information Technology) which combined with the modern communication technology. The existence of information is the premise of IT, and the information is not just a simple list of data, but a useful data which is processed carefully: it could be text, numbers may also be an image or sound, etc. As an important resource, information is not only available and valuable, but also shareable; historical

cumulatively; timeliness and multiple renewable. It's these characteristics make information an important resource for enterprise development. In other words, information and communication technology is the usage of computer for information processing, the usage of modern communication technologies for information collection; storage; processing and using. Also as we have seen that ICT has become the most innovative field for years, and they mainly provide new technologies commercially. ICT has a great competitive advantage compared to other technologies, it has a significant impact on elements of business model. It also has a certain direct effect on the development of business model, to promote companies carrying out innovative activities. This part combines the constituent elements of retail business model and mobile commerce, in order to introduce five factors that influence retail business model innovation. That is: value proposition, value chain structure, relationship network, organizational structure and profit model to explore the retail business model innovation.

3.1. Impact on value proposition

Value proposition usually refers to the products or services provided by the enterprise leading to consumer value growth. In traditional retail business model, customers get the value by buying products. This simple activity is the customer's value proposition of traditional retail industry. But through ICT, retail enterprises could establish their own M-commerce to increase the sales volume of the enterprise, to enhance the customer's satisfaction, and to constantly enhance the value proposition. Retail enterprises can rely on M-commerce innovation, expand their customers ease, narrow the distance with the consumers, timely marketing and launching new products. It will lead the consumer's value orientation. As the Internet information technology is increasingly developed, it greatly shorten the access to products and services information time; it's not only conducive to the retail business marketing activities, but also to facilitate the consumer to get better service.

Consumers can also use M-commerce online communication tools to share shopping experiences, merchandise and service evaluation, this is strengthening the daily communication between retailer and consumer, facilitating retailer to grasp the value of the preferences of customers. The above information is difficult to get through the traditional retail business model, ICT could solve the above problems and efficiently deliver the value of consumer products and services advocates to retailers.

3.2 Impact on value chain structure

The emergence of ICT has a significant impact on the key value chain structure and other aspects of retail enterprises. Summarized as the following areas:

- **Reduce the operating costs of retail enterprises**

ICT has reduced the cost of daily business activities of retail enterprises and enhanced the comprehensive competitiveness of enterprises. Through the usage of Internet technology, a large number of retail enterprises could search for more product supplier groups than before, which expanded the scope of screening, greatly improving the retail business negotiations skill, and ultimately reducing the cost of supply.

Retail enterprises could attract companies with the same desire of products to improve their collective purchasing negotiation ability through the full establishment of ICT; this is conducive to reduce purchasing expenses. Retail enterprises can also use the Internet information technology to share business shopping information procurement to accelerate the timely supply and reduce inventory costs. It improved the efficiency of the usage of funds to speed up product sales activities, to master the preferences for consumption of customers through the marketing data. Retail enterprises can fully use the advantages of the logistics platform, centralized distribution of goods.

- **Improve the retail sales and service level**

ICT has greatly improved the retail business comprehensive marketing force, it can provide customers with higher value. Retail enterprises could establish a sales relationship platform based on ICT to improve the utilization of information technology.

The usage of ICT allowed retailers to collect the information of consumers and partners and then reasonable allocate the resources, change the marketing strategy for different situations. At the same time retailers can analyze the customer's consumer preferences to provide differentiated services, targeted to carry out marketing activities to customers. Retail enterprises can merge the offline stores or online sales platform to sell products to consumers, effectively increase the number of sales and improve the product market popularity. All consumers can use online E-commerce or M-commerce platform to communicate with the enterprise, to make recommendations, to improve services.

- **Improve the efficiency of retail business management**

The existence of ICT has greatly enhanced the efficiency of the daily operation and management of retail enterprises, which is conducive to improving the operation efficiency of retail enterprises. ICT can focus on control of all online and offline stores, the stores share the market information to enhance the level of information utilization. Through the popularization of Internet information technology in retail enterprises, and continuous improvement of the original management model, are very conducive to make reasonable decisions to increase the comprehensive profitability of retail enterprises. After the establishment of efficient office operating system, retailers could promote greatly the management efficiency and reduce the human and material investment. After the above analysis, it can be seen that the establishment of E-commerce or M-commerce platform can greatly promote the management level of retail enterprises, reduce expenses, increase economic efficiency and improve the operational efficiency of enterprises.

3.3 Impact on network structure

In traditional retail network structure, the relationship between suppliers and retailers and between retailers and customers are simply the division of labor and cooperation, the information between them is not shared. In the context of ICT, network structure has changed, and the influence on the relationship network structure is basically reflected in the influence on the customer relationship. Improve the level of information

sharing and promote information exchange and delivery will ultimately enhance consumer loyalty to retail enterprises, comprehensively enhance the management level. CRM management system is the necessary tool of retail business in the era of ICT.

3.4 Impact on organizational structure

As the business environment is unstable, the change of corporate strategic will inevitably affect its internal structure, seriously restricting the development of organizational structure. The usage of ICT is improving scientifically by collecting a large number of timely information. Compared with traditional retail organization structure, the organizational structure under the influence of ICT added integrated office, network department and customer service department.

3.5 Impact on profit model

The birth of ICT has played a great role in the management of modern retail enterprises, especially it deeply changed the business process structure of enterprises, enhanced the marketing and service quality, effectively reduced the operating costs, it also had a great impact on enterprise's revenue sources and product pricing. The revenue channel is the most important part of the business model research. It is the core of the business model. The stable Revenue channel becomes the founding material of the sustainable development of the enterprise. The emergence of ICT make business revenue channels more diversified, such as many retail companies take the form of network marketing platform. This will greatly change the retail business revenue sources.

To sum up, ICT has played a great role in transforming the business model of retail enterprises. The macro environment is becoming more and more unstable and inconsistent. The demand of consumers is becoming more and more complicated. To a certain extent, ICT has an impact on all the elements of retail business model, completely changed the value orientation of consumers, and profoundly changed the retail enterprise value chain and internal organizational structure.

3.6 Application of mobile commerce in retail

GS1 Mobile Com White Paper (2008)^{cxlvii} stated that retail mobile commerce services include product information services, goods scanning, store locator, product navigation, mobile payment, membership points, advertising promotions and so on. According to the development of the practice of mobile commerce, we summarized four categories of retail mobile commerce services as shown in table 5.

Table 5: Mobile commerce services for retailers

Trading process	Application category	Typical application
Pre-sale	Provide Personalized information	Retailers could provide discounts and coupons and other information of goods / services to potential customers (users in getting Premise licenses) through SMS, Email or Apps; enhance brand appeal; offer business location depending on needs
Sales	Provide products information	Provide information of placement of goods to customers enabling them to find what they need; provide customers the commodity prices, production date, origin and quality information, so that customers feel comfortable
	Provide mobile payment function	Provide mobile payment function
After-sales	Improve product and service quality	Offer purchasing plan according to customers' habit; offer better products and services with feedback

The huge potential in delivering M-commerce through mobile devices created by the combination of rapidly developing technology and high uptake rates of mobile devices has been recognized for more than a decade (Bitner et al., 2000)^{cxlviii}. M-commerce is understood here as mechanisms through which food retailers can enable their strategic shift toward serving their customers (Saarijärvi, 2012)^{cxlix}. As the application of new technology, M-commerce and its innovative services have a lot of features. The research of key factors for high-quality mobile services with excellent perceived value for customer, technology platform for mobile services, service model, service delivery methods, as well as the changes of consumers' behavior, make us understand better the value of mobile commerce.

Varley & Rafiq proposed in (2003)^{cl} that retail services is customer service, including a variety of additional value-added services through interaction offered by sales staff, the implementation of commercial policy and the facilities provided by retailers. The initial service innovation, mainly were the introduction of advanced technology and equipment, such as fast cash system and convenient bag storage systems, but consumers' demand changes to a spiritual level, and began to consider the innovation of diversification for the various departments.

Thus, this research tries to analyze the services offered by the retailers via mobile phones. Mobile commerce includes not only products but also good quality services offered by the retailers, such as precise information, products' scanning function, reservation ubiquity, after-sell service and social share experience, etc. In some cases, mobile services are even more useful to attract and keep consumers than products.

Consequently, M-commerce becomes more and more important for retailers by providing the personalized shopping experiences to their consumers with the persist information (Nysveen et al., 2005)^{cli}. Current research specific to the retailing industry, shows that consumers who own a smart phone perceive the social media and other applications provided by the retailer as valuable in the in-store environment. In retail, there are two kinds of mobile apps for the use context. One of them is developed by independent application developers like 'Shop kick', which was designed by an independent company who offer the service for the retailers like Best Buy, Macys, American eagle, etc. They use the LBS (Location Based System), the coupon which could get from applications, scanning function to make consumers purchase easier and funnier. Amazon has the same application which focuses more on price comparison function.

Another kind of apps was developed by retailers themselves. Like Walmart developed his own apps and which could switch to 'in store mode' automatically when customers enter into one Walmart store: they will receive the information on new products or promotions, they could reserve the products if they are sold out. In France, retailers developed also their own apps because they caught the tendency of retail's future. We made a list of these apps with their functions as in table 6.

Table 6: List of mobile service in retailers' apps

Functions		Retailers							
		Auchan	Casino	Carrefour	DIA	Monoprix	Leclerc	Lidl	Walmart
Information service	Catalogue	○	○	○	○	○	○	○	○
	Promotion	○	○	○	○	○	○	○	○
	Scanning	○	○	○		○			○
LBS	My store	○	○	○	○	○		○	○
	Accurate search in store			○		○			○
Personal Assistant	List of shopping	○		○		○			○
	Member card management	○	○	○		○			○
	Contact with seller	○		○		○	○		○
Payment		○	○	○		○			○
Social media		○		○				○	○

We can observe through the list that information service is the most basic function for retailers and nearly all the retailers add it in their apps. Consumers can receive the catalogue and promotion information via their smart phones. They can also scan the product for price and further information. In the function of LBS, 'my store' is used by most retailers to help their customers to find the nearest store easily. Accurate search in store allow consumers to find their target products quickly. For personal assistant function, management of member card and list of shopping help consumers to shop more comfortably, they don't need to carry the papers and lot of member cards with them. Some retailers also add the function of contact with seller in their apps, this is obviously very important for them to make interaction with consumers in the online environment. In this point, social media has the same function of contact with seller.

Conclusion

As conclusion, retail innovation is basically the innovation of retail business model, which includes all the dimensions of retail innovation. According to Gallouj, F. (1995)^{clii}, the development of information technologies is very important for the transformation of many service activities. Information systems could create new types of services and developing new ways to provide services. That means the relation between company and customer is changed, enterprise can attract consumers only by providing distinctive value orientation. Increase the connection between the enterprise and consumers by making new customer groups, meet their multiple shopping channels demand. This requires retail companies to constantly innovate product styles, develop new service models, and be able to use information technology to continuously strengthen communication with consumers and guide them through unique value propositions. Mobile commerce based on information system plays a great role in transforming the business model of retail enterprises by influencing five factors of retail business model innovation: value proposition, value chain structure, relationship network, organizational structure and profit model.

Ngai & Gunasekaran (2007)^{cliii} summarized the previous mobile commerce researches, they summed up that the mobile commerce academic researches mainly follow five directions:

- The first direction is the basic theory research on mobile commerce. Mainly related to the overview of mobile business research, mobile commerce and application of the future direction of development research, and consumer behavior-related research, mobile commerce economics, mobile commerce business strategy and business model research, related laws and moral studies.
- The second direction is the study of wireless network infrastructure, mainly related to the study of wireless and mobile networks, the study of network requirements.
- The third direction is the study of mobile middle ware. It mainly includes the research of Agent technology, the research of database management technology,

the research of security technology, the research of wireless / mobile communication components, the research on wireless and mobile protocols.

- The fourth direction is the main research on wireless terminal user which focus on two aspects, namely hardware and software. The hardware aspect is mainly mobile hand held devices, mainly focused on mobile terminal research, such as smart phones and personal business assistants (PDA). The software is mainly for mobile user interface, and refers to the mobile device terminal mobile business applications used when system and interface are operating.
- The fifth direction is mobile business applications and case studies. At present, mainly including mobile finance, mobile advertising, mobile inventory management, commodity search and purchase, Proactive Service Management, mobile auction and reverse auction, mobile entertainment services, online games, mobile office, mobile distance education and Wireless data centers and other fields.

Since 2002, scholars have produced a lot of researches of mobile business. The main results are: in the basic theoretical research of mobile commerce, Shintaro Okazaki (2005)^{cliv} discussed some future researches directions of mobile commerce, such as E-commerce and mobile business comparison and some methodology researches; mobile middleware research, Kwon et al. (2003)^{clv} studied the application of multi-agent technology in personalized hints in situation awareness: Lee & Benbasat (2003)^{clvi} has constructed the framework of design mobile commerce application interface for the research of wireless user terminals. The seven factors as 7C: Context, Content, Community, Customization, Communication, Collection, Commerce, and analysis of the interface design should pay attention to seven aspects;

Ngai et al. (2007) described radio frequency identification in mobile applications and the case studies from recent years, some scholars have studied the technology acceptance model in mobile commerce, and Wu & Wang (2005)^{clvii} has extended the technical acceptance model and apply it to mobile commerce. Anekar & D'Incau (2002)^{clviii} analyzed the nature and function of mobile services from a customer perspective to provide value to wireless Internet users.

In summary, the current research for mobile commerce has shown an increasingly hot trend, the number of research papers increased year by year. There have been many mobile commerce aspects of specialized academic conferences and journals, dozens of mobile business monographs have been published. Research on mobile commerce is relatively wider, more in-depth, the basic theory of mobile commerce, technical methods, application cases have begun extensive researched. With the accelerated pace of application of mobile commerce, 4G network in the world have been used commercially, so business strategy, business model, application model and consumer behavior research and other basic research in the mobile commerce is even more necessary. We will introduce the research on consumer behavior in mobile commerce environment in next chapter.

Chapter 2

CONSUMERS BEHAVIOR IN MOBILE COMMERCE

Introduction

For enterprise, the key of success is to understand what customers need, the customer determines the direction of business development. Enterprises could only design a suitable marketing strategy after thoroughly understand and master the purchase behavior of consumers, and gradually establish and enhance consumer's satisfaction and loyalty. Study the behavior of consumers in mobile commerce environment is the basis for enterprises to carry out mobile commerce, formulate effective strategies and win the competition. At present, the international academic community's research for the mobile commerce consumer behavior is still in the initial stage: it has been more concerned about the user's initial use and acceptance behavior. Research on consumer continuous use behavior is still very rare. In view of this, this chapter combines the current situation of research on consumer continuous use behavior of mobile commerce in retail and provides the theoretical reference to establish the theoretical model.

In this chapter, we firstly introduce consumer continuous use behavior of mobile commerce and expectation-confirmation-model-information system continuance (ECM-IS) model, in order to determine the performance variable and try to sort out the influencing factors which are used by other researches. Then we analyze the technology acceptance (TAM) model of mobile commerce in order to find external influencing factors of mobile commerce consumer behavior. Also, the relationships between satisfaction, perceived value and loyalty of mobile commerce are discussed. At last, we analyze consumer perceived value and the influencing factors.

1. Consumer continuous use behavior of mobile commerce

As the mobile commerce users, consumer is the driving force for the development of mobile commerce, exploration of their use intention and behavior is particularly necessary for the development of retail mobile commerce. At present, international academic community for the research on mobile commerce in the field of consumer behavior is still in its infancy, research has been more concerned about initial use and acceptance of consumer, research of consumer continuous use is still underdeveloped. In view of this situation, this part combs the current researches on continuous use behavior of mobile commerce in order to provide the references for this research. We will firstly introduce the relationship between repurchase intention and loyalty, in order to understand the research goals.

1.1 Repurchase intention and loyalty

Repurchase Intention (RI), also known as willingness to repurchase, refers to the tendency of consumers to purchase again from companies they have already bought before, and it is also the degree of consumer psychological commitment to service (Saleh & Ryan, 1991)^{clix}. It is the extent of possibility that consumers try to buy a product or service again. We can also say that, after consumers purchase and use the products, they evaluate their own purchase and usage experience of products to assess whether there is an intention to purchase again (Kristensen, 2000)^{clx}. According to Jones & Sasser (1995)^{clxi}, in online shopping scenario, consumer repurchase intention means that after the initial purchase, consumer's intention to visit company website again will depends on transaction satisfaction.

Theoretically, consumer repurchase behavior belongs to behavior loyalty. Many researchers defined loyalty through the number of times that consumer is continuing to purchase product or service, and indicators to measure loyalty mainly include: proportion of consumption, order of consumption and probability of repeated consumption behaviors. Tucker^{clxii} believes that after consumer repurchase behavior

occurs four or more times, it refers to consumer loyalty. Research of Jacoby & Chestnut (1978)^{clxiii} showed that consumer loyalty is a frequent repeat purchase behavior. Oliver (1999)^{clxiv} considers consumer loyalty as a repeated purchase of one particular brand's product or service by consumers, they will not change to another brand suppliers easily, so consumer loyalty is the psychological commitment to their preferred brand suppliers. In the definition of consumer loyalty by Oliver (1997)^{clxv}, repurchase behavior is part of the third phase of consumers loyalty: Attitude / intentional loyalty.

It is not hard to see that in theory, consumer repurchase intention belongs to the category of consumer loyalty. However, consumers repurchase intention and behavior is just one of measure factors of consumer loyalty, and there are obviously differences in theoretical basis and influencing factors. Repurchase intention is within the scope of behavioral intention, and the willingness to repurchase and continuous use are the relations between consciousness and behavior. A person's willingness to behave often heralds his possible action tendency or behavior in the future. It is the process of decision that all behavior must go through. The probability that a person conducts a certain behavior is positively related to the intensity of his willingness to do the action. Fishbein et al. (1992) point out that the most direct way to predict whether consumers will take a specific action in the future is to understand their intention to take such action^{clxvi}. Therefore, the intention to repurchase has become a more stable and reliable indicator of consumers repurchasing behavior. By researching consumers repurchase intention, enterprises can predict whether the consumer can become loyal or not.

Based on the above researches, we choose to use consumer continuous purchase behavior as an indicator to measure their loyalty of retail mobile commerce in our research. Taking mobile commerce users who have had mobile shopping behaviors recently as research object, in order to study repurchase intention and behavior which refer to loyalty, through the website or APP after the first purchase of these mobile users. Loyalty will be the result variable of our research model. According to previous chapter, the emergence of ICT is an essential part of mobile commerce. Therefore, in order to study consumer loyalty of retail mobile commerce, we need to study the theory of consumer continuous use behavior of information system.

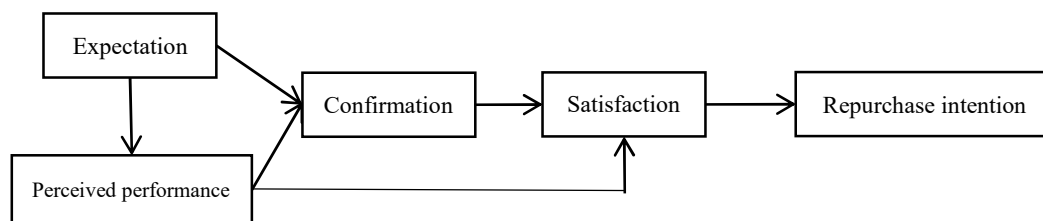
1.2 Consumer continuous use behavior of information system

Since 1970s, the issue of adoption and continuous use of ICT has been paid more and more attention. Many scholars have tried to study it from different perspectives and technical characteristics, and they have produced a lot of theories to explain and predict consumer behavior and model. Bhattacharjee (1998)^{clxvii} pointed out that the cost to attract new consumers is five times than maintaining old customers for information and communication system, which means that consumer continuous use is much more important than initial adoption. In the existing IS continuous use researches, there are two kinds of theory, one is about how to adjust adoption model of information system (such as rational behavior theory, technology acceptance model, etc.) to adapt continuous use model. Another one is about new theory and model for continuous use, represented by Bhattacharjee's expectation-confirmation model.

1.1.1 Expectation confirmation theory (ECT)

In the early 1980s, Olivier proposed the Expectation-Confirmation Theory (ECT) for the study of consumer satisfaction and post-purchase behavior (repeated purchase intention). The theory proposed that consumer satisfaction determine their repurchase intention, expectation and confirmation all impact satisfaction, the theoretical model shown in figure 2:

Figure 2: Expectation-Confirmation Theory^{clxviii}



As we can observe, consumers build an expectation of one product or service before they purchase it. Then based on the performance of this product or service, consumers will build gradually perception in the subsequent use process of product or service.

After this, consumers will compare their expectations before consumption and perception after use, in order to build confirmation or no confirmation. Confirmation refers that perceived performance is exactly the same as expected. The state of non-confirmation is divided into two categories: when perceived performance is greater than expected, is positively not confirmed, and the opposite is negatively not confirmed. The degree of confirmation will directly affect consumer satisfaction: with confirmation and positively non-confirmation, the degree of consumer satisfaction will increase, and negatively non-confirmation will reduce consumer satisfaction. Consumers ultimately decision of repurchase is according to the degree of satisfaction, a high degree of satisfaction will produce repurchase intention and behavior of products.

It can be seen that the expectation before usage affects perceived performance and the degree of confirmation after usage, and perceived performance also affects the degree of confirmation and satisfaction. The degree of confirmation positively affects the satisfaction degree. The satisfaction degree will affect directly consumer repurchase intention. Which expectation belongs to Pre-behavior factors, the other three are post behavior factors.

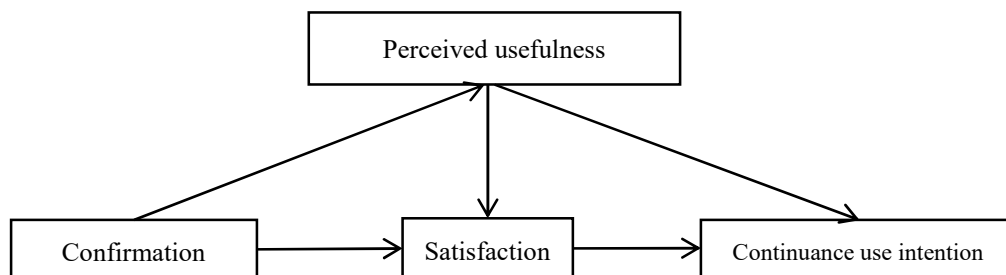
1.1.2 Expectation confirmation model of information system continuance (ECM-ISC)

Bhattacharjee (2001)^{clxix} first introduced ECT theory into the field of information system by breaking traditional IS research theory framework. He mentioned that whether a user continues to use an information system is similar to whether a consumer has repeatedly purchased a product or service, both of them are affected by initial use experience after the initial decision. According to the similarities between these two behaviors, Bhattacharjee, based on the theory of expectation-confirmation, draws on the theory of technology acceptance and constructs the Expectation-Confirmation Model of IS Continuance (ECM-ISC).

According to ECM-ISC model, the factors that affect consumer continuous use intention include: the degree of confirmation of consumer expectation, the degree of

satisfaction with information system and perceived usefulness (which is used to measure use expectation in the model). Among them, satisfaction has the greatest impact on consumers continuous use intention, followed by perceived usefulness. Customer satisfaction is mainly determined by the degree of confirmation of previous experience, followed by perceived usefulness. Degree of confirmation also has a direct impact on perceived usefulness. Model shown as in figure 3:

Figure 3: Expectation-Confirmation Model of IS Continuance^{clxx}



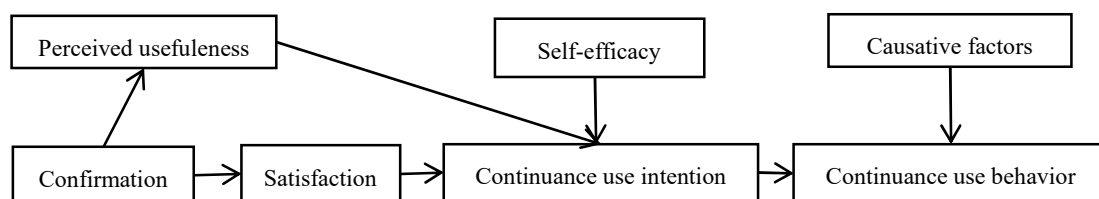
Compared with ECT theory, ECM-ISC is more concerned about the changes of expectation after consumers use information system, and these changes will affect consumer continuous use intention. Bhattacharjee compared consumer post adoption expectations and pre-adoption expectations and proposed that consumers' expectations will be potentially changed after the adoption. So he added perceived usefulness as variable, and perceived usefulness has an impact on satisfaction no matter before or after the adoption of information system, and then it affects consumers continuous use intention. At the same time, ECM-ISC model takes consumer subjective feeling and attitude as the focus of research, which greatly increased the reliability and validity of the model to study the behavior of information system users.

Since Bhattacharjee proposed ECM-ISC, scholars widely applied it to their studies on consumer continuous use intention and behavior, such as E-learning system (Hayashi, 2004)^{clxxi}; portal website (Lin, 2005)^{clxxii}; mobile internet (Hong, 2006)^{clxxiii}; online learning (Lee, 2010)^{clxxiv}; online virtual community (Jung, 2011)^{clxxv}; data mining tools (Huang, 2013)^{clxxvi} and so on. All these results fully confirmed the applicability and validity of the model.

1.1.3 Extended model of ECM-ISC

However, ECM-ISC model also has some shortcomings, it only focused on consumers continuous use intention and ignored consumer actual use behavior (Limayem & Hirt, 2007)^{clxxvii}, which behavior is not necessarily directly generated by intention, the habit may also lead to the actual behavior (Thorngate, 1976)^{clxxviii}. Limayem & Hirt (2007) used continuance behavior as a dependent variable in their user behavior study of World Wide Web, which made up for this shortcoming of previous studies on consumer continuous use intention, and they used habit as moderate variable. Later, Bhattacharjee (2008)^{clxxix} studied on the literature of information system management, he revised and expanded his original model by introducing the theory of perceptual behavior control which is represented by two variables: self-efficacy and causative factors; he added continuous use behavior to the original model. The extended model is shown in figure 4. The results showed that continuous use intention significantly affects continuous use behavior. And self-efficacy has a significant positive effect on continuous use intention, causative factors has a significant positive effect on continuous use behavior. The extended ECM-ISC model can better explain consumers continuous use intention and behavior.

Figure 4: Extended model of Expectation-Confirmation Model of IS Continuance^{clxxx}



However, as we observed, ECM-ISC model does not focus on the impact of other external factors on the various variables in the model, and only use satisfaction and perceived usefulness to test continuance use behavior is not very convincing.

1.2 Influencing factors in ECM-ISC Model

Scholars believe that the influencing factors of ECM-ISC model are not just as those shown in the model, there are many other factors that play important roles. ECM-ISC model does not involve much research on external factors, partly because the starting point of ECM-ISC model is to establish a general analysis model, not for a particular system application, and the external variables are closely related to the actual research background. So, on one hand, it has a strong tolerance and expansibility, suitable for a variety of information systems research. On the other hand, the model needs to be combined with the specific research background to its improvement and specificity. Many scholars have introduced other research factors into the ECM-ISC, we summarized the external factors as shown in table 7:

Table 7: External influencing factors based on ECM-ISC

Researchers / Years	External influencing factors
Hayashi, 2004; Bhattacharjee, 2008	Self-efficacy
Hayashi, 2004; Jung, 2011	Social sense of existence
Hong, Thong and Tam, 2006	Perceived ease of use
Limayem, 2007; Huang, 2013; Shiau, 2013 ^{clxxxii}	Habits
Bhattacharjee, 2008	Causative factors
Jung, 2011	Perceived autonomy
Lin TC, 2012	Perceived benefits and cost
Sun, 2013	Perceived cost
Huang, 2013	Task technology fit
Shiau Wen-lung, 2013	User participation
Shiau, 2013	Perceived entertainment

Studies have confirmed that these factors affect indirectly or directly consumers continuous use behavior. These researches opened up new ideas for continuous use research and provided the basic model for us to study continuous use behavior of mobile commerce system users, which also provided some references to develop influencing factors.

1.3 Research of mobile commerce based on ECM-ISC

As we said, ECM-ISC model is not for a particular system application, and the external variables are closely related to the actual research background. And, in the research of mobile commerce continuous use, most scholars combined it with mobile commerce specific application scenarios to explore consumer continuous use behavior, by modifying the existing research model, or adding new research variables based on existing information system continue use theory. We summarized some current research results as table 8.

Through the table 8 we can observe that first of all, existing researches mainly generalized mobile commerce as the research object, the specific application of mobile commerce model research is not too much, and different application patterns have different characteristics, it should be combined with specific application scenarios for related research, which provides a certain space and significance for our study of retail mobile commerce consumer continuous use.

Secondly, the theoretical basis of the research on continuous use of mobile commerce is based on the continuous use of information system of expectation confirmation theory. Most scholars are based on the original model to add other variables on their researches, among these factors that impact mobile commerce consumer continuous use model, the most important factor is satisfaction, other factors include perceived usefulness, perceived ease of use, perceived entertainment, perceived cost, information quality, service quality, immersive experience, technical complexity, conversion costs, perceived image enhancement, personal innovation and so on.

Table 8: Research of continuous use of mobile commerce

Researcher	Object	Theory basis	Conclusion
Hong, Thong & Tam (2006)	Mobile commerce	ECM-ISC	Using the theory of technology acceptance theoretical research results, added perceived ease of use and usefulness in ECM-ISC, and used perceived usefulness and perceived usability to collect the expectation of the user's adoption. They studied the networking and their willingness influences to continued use. The study is based on the mobile Internet as an empirical test, all the assumptions are supported.
Huang (2007)	Mobile commerce	ECM-ISC	Personal innovation has a significant impact on satisfaction and willingness to use, and innovation has a greater impact on people's use of mobile commerce compared to perceived usefulness and expected recognition.
Byoungsoo (2010) ^{elxxxii}	Mobile data service	ECM	User satisfaction, perceived usefulness, perceived entertainment and perceived costs are important factors for the continuous use willing in mobile data service users.
Chong, Alain & Yee-Loong (2013) ^{elxxxiii}	Mobile commerce	ECM-ISC	Perceived usefulness, trust and perceived entertainment significantly affect the willingness of consumers continue use, in which trust has the greatest effect; perceived cost and perceived ease of use have no significant impact on consumer satisfaction, but directly affect the consumer's continued use willing.
Zhou Tao (2013) ^{elxxxiv}	Mobile payment	ECM-ISC	Trust, immersion experience and satisfaction affect consumers continue use of mobile payment. The quality of service will significantly affect the confidence of consumers in mobile payment, the quality of the system significantly affect the satisfaction, information quality and quality of service positively affect the consumer immersion experience.

Based on the above research, we also summarized that some influencing factors in ECM-ISC are kept and used in ECM-ISC of mobile commerce, as shown in table 9:

Table 9: Influencing factors in ECM-ISC and ECM-ISC of mobile commerce

Influencing factors in ECM-ISC	Influencing factors in ECM-ISC of M-commerce
Task technology fit	Satisfaction
Causative factors	Perceived usefulness
Perceived ease of use	Perceived ease of use
Perceived entertainment	Perceived entertainment
Perceived cost	Perceived cost
Perceived benefits and cost	Conversion cost
User participation	Immersive experience
Self-efficacy	Personal innovation
Perceived autonomy	Technical complexity
Habits	Perceived image enhancement
Social sense of existence	Service quality
	Information quality

In this part, we firstly made a basic understanding of the researches on consumer repurchase behavior intention, and we use consumer continuous use behavior as an indicator to measure their loyalty of retail mobile commerce. Loyalty will be the result variable of our research. Then, through the theoretical study of ECM-ISC model, we sorted out the external factors that affect indirectly or directly consumers continuous use behavior. These researches opened up new ideas for continuous use research and provided the basic model for us to study continuous use behavior of mobile commerce system users, which also provided some references to develop influencing factors. But these factors did not focus on mobile commerce, so we sorted out the influencing factors through the research of ECM-ISC of mobile commerce, and there are many factors kept by researchers as: Perceived usefulness, Perceived ease of use, Perceived entertainment, Perceived cost, Conversion cost, Immersive experience, etc. However, they are not enough to support our research model, because the continuous use behavior occurs after consumer acceptance behavior, and it will be affected by the expectation of users in the period of accepting. Therefore, in next part we firstly systematically review the research of mobile commerce consumers in order to find useful external factors to improve the research of mobile commerce continuous use behavior. Secondly, we will study the relationship between the continuous use of mobile business, consumer satisfaction and loyalty.

2. External influencing factors of mobile commerce consumer behavior

Understanding consumer behavior is critical to the management and development of mobile commerce. At present, most of mobile commerce user behavior researches are about consumer acceptance and the external factors. They provide some useful references for our research on external factors that affect continuous use behavior of mobile commerce users. So, we firstly introduce the researches of external influencing factors based on TAM theory. Then we introduce the relationships between mobile commerce customer satisfaction, loyalty and continuous use.

2.1 Research based on technology acceptance model (TAM)

TAM theory was proposed by the professor Fred D. Davis of Arkansas State University in 1989^{clxxxv}, mainly used to analyze and explain the individual's acceptance behavior of information technology. Ngai & Gunasekaran (2007) reviewed the literature on mobile commerce before 2003, classifying previous studies into five categories: mobile commerce application research, wireless network infrastructure research, mobile middleware research, wireless user terminals and the basic theory of mobile commerce research. Since then, there are some researches of mobile commerce, mainly about adoption of consumer behavior after 2003.

Pagani (2004)^{clxxxvi} studied 3G multimedia user acceptance in Italy and discussed the relationship between perceived usefulness, perceived ease of use, price, perceived entertainment, perceived innovation, knowledge and user acceptance. These study found that perceived usefulness, perceived ease of use, price and connection speed are the key factors to allow users acceptance of mobile commerce.

Cheong & Park (2005)^{clxxxvii} constructed a model based on the technology acceptance model, and conducted an empirical research with South Korean users. The results showed that perceived usefulness, perceived entertainment and perceived price level are three important factors that influence consumer attitude and behavior toward mobile

commerce. Perceived ease of use has an indirect impact on use intention through attitude. Perceived system quality, perceived content quality and network experience are three basic factors that affect indirectly attitude and behavior intention through perceived usefulness, perceived ease of use and perceived entertainment.

Lee & Jun (2005)^{clxxxviii} introduced the contextual perceived usefulness on perceived playfulness and consumer's intention to construct the model and validated the model basis of TAM model. The main research conclusion is each factor on the adoption of consumers has a more significant impact, on the expansion of TAM model can better explain the consumer's willingness to adopt the mobile business. In the 2007 study, it was proved that customer satisfaction would affect consumer continuous purchase intention, and perceived usefulness, perceived ease of use and situational perceived usefulness would affect customer satisfaction.

Kenneth C.C. Yang (2005)^{clxxxix} explored the impact factors of mobile consumer adoption in Singapore by TAM model. The study demonstrated the applicability of TAM in mobile commerce adoption in Singapore and explains the relationship between perceived usefulness, perceived ease of use, attitudes, demographic variables, and adoption. Result showed that perceived usefulness and perceived ease of use affect user attitude. Innovativeness, past adoption behaviors, knowledge, technology cluster, individual characteristics (such as age, gender, and occupation) affect use attitude through perceived usefulness and perceived ease of use, and there is a correlation between perceived usefulness and perceived ease of use.

Hsin-Hui Lin (2005)^{cx} constructed the consumer adoption model from the five aspects as perceived usefulness, perceived ease of use, reliability, and self-efficacy and cost, it proved that the model is superior to TAM model of explanation the consumer adoption of mobile commerce. Manojehri et al. (2006)^{cxci} conducted a study of consumers' intention to adopt mobile commerce in Oman, and found that consumers in Oman had a strong willingness to use mobile commerce and 66% said they would use mobile business, users are concerned about the security and cost of the transaction process. Enrique Bigné et al. (2007)^{cxcii} studied the factors that influenced the adoption of mobile commerce by Spanish users, and found that age, attitudes, Internet shopping

experience, relationships with mobile phones (frequency of use, time of use, and intimacy of mobile phones) are the main predictors of adoption of mobile commerce, among which age, mobile phone use time, and mobile phone intimacy, attitudes and mobile business experience are the most relevant influencing factors.

Bhatti (2007)^{cxci} built consumer adoption model in an empirical research based on TAM model and innovation diffusion theory, the results showed that subjective norms, perceived usefulness, perceived ease of use and behavior control have a very important impact on the adoption of mobile commerce, subjective norms and behavioral controls also affect perceived ease of use. Toh Tsu Wei et al. (2008)^{cxci} examined the effects of perceived usefulness, perceived ease of use, trust, perceived costs and environment on the use of mobile commerce by Malaysian users. It is found that perceived usefulness, trust, perceived cost and environment impact are positively correlated with consumer adoption intention, and perceived ease of use and trust have no significant effect on the adoption of mobile commerce. Lu & Su (2009)^{cxci} illustrated the influential factors of mobile adoption as technique and the anxiety of mobile device usage, recreation, usefulness, ease of access, and compatibility. Using the structural equation model analysis showed that recreation is the most significant factor affecting consumers' willingness to mobile shopping, and its effect is stronger than the external incentive factors and compatibility; anxiety will negatively affect consumers' willingness to use mobile device; The skills of consumers operating mobile devices can have a significant impact on anxiety, entertainment and usefulness; the difficulty of accessing the network has no significant impact on the willingness to use.

Eunju et al. (2009)^{cxci} proposed that perceived usefulness, ease of use, instant connectivity, entertainment and perceived value are factors that influence Korean consumers to use mobile device to buy real-time fashion products. The empirical results showed that perceived usefulness, ease of use and recreation significantly affect the perceived value, and perceived value indirectly affects the consumer's willingness to use; perceived value as a mediator variable significantly positively affects the mobile shopping intention; instantaneous connection to perceived value and willingness to use of the will is not significant. Akinori et al. (2012)^{cxci} compared consumers who

experience physical stores with consumers who browse online stores in order to study the motivations of consumers using mobile devices to navigate online stores. Using the structural equation model to analyze the two groups, the results showed that idea motivation is the most important motive for consumers to browse online and offline stores. Motivation to use the mobile device to navigate online stores also includes adventure motivation and value motivation; Satisfaction motivation is a motivating factor for consumers to experience physical stores.

Alastair et al. (2014)^{excviii} analyzed the behavior of UK consumer use mobile shopping by issuing questionnaires, explored the attitudes of consumers to cell phone shopping, and how to use mobile phones at different stages of the consumer decision-making process. The study confirmed that product categories and product involvement affect whether consumers use mobile shopping, and the number of people who use mobile phones increased as the number of purchased products increased. The use of mobile phone number is more to purchase of highly involved products (televisions, cell phones, etc.) than the purchase of low degree of involvement in products (such as daily necessities); convenience, easy access have a significant positive impact on consumer mobile shopping use intention, and the consideration of the trust factors hinders the consumer choose the phone shopping; consumers usually use mobile phones in search information and evaluation options, query product information, coupons and promotional information, etc., and less in the order release and trading stages. Brian & Daniel (2014)^{excix} qualitatively examined the experience of consumers who used mobile Internet devices in shopping activities. The results showed that consumers use mobile devices as a shopping management and social management of the auxiliary tools for consumers to provide an entertainment shopping experience and emotional benefits. The study presented a model that describes the external incentives (product information, trust, economic conditions) and intrinsic incentives (security and authorization) of mobile devices using consumer devices. As summary, we made a list of influencing factors of mobile commerce behavior based on technology acceptance model, as shown in table 10.

Table 10: Influencing factors of mobile commerce behavior based on TAM

Researchers	Years	Influencing factors	Mediator variables	Dependent variables
Pagani	2004	Perceived usefulness Perceived ease of use Price connection speed	-	User's acceptance of mobile commerce.
Cheong & Park	2005	Perceived usefulness Perceived entertainment Perceived price level	-	Consumer attitude and behavior toward mobile commerce
		Perceived ease of use	Attitude	Use intention
		Perceived system quality Perceived content quality Network experience	perceived usefulness Perceived ease of use Perceived entertainment	Attitude and behavior intention
Lee & Jun	2005	Perceived usefulness Perceived ease of use	-	Customer satisfaction
		Customer satisfaction	-	Continuous purchase intention
Yang	2005	Innovativeness Past adoption behaviors Knowledge Technology cluster Individual characteristics	Perceived usefulness Perceived ease of use	User attitude
		Perceived usefulness Perceived ease of use	-	User attitude
Lin	2005	Perceived usefulness Perceived ease of use Reliability Self-efficacy Cost	-	User's acceptance of mobile commerce.
Manochehri et al.	2006	Security Cost of transaction	-	Users acceptance of mobile commerce
Bigné et al.	2007	Age Mobile phone use time Mobile phone intimacy Attitude Experience	-	Users adoption of mobile commerce
Bhatti	2007	Subjective norms Perceived usefulness Perceived ease of use Behavior control	-	Users adoption of mobile commerce
		Subjective norms Behavior control	-	Perceived ease of use
Wei et al.	2008	Perceived usefulness Perceived cost Trust Environment	-	Users adoption of mobile commerce
Lu & Su	2009	Reaction	-	Users adoption of mobile commerce
Ko et al.	2009	Perceived usefulness Perceived ease of use Reaction	Perceived value	Use intention of mobile commerce
Holmes et al.	2014	Convenience Easy access Trust	-	Use intention of mobile commerce
Brian & Daniel	2014	Product information Trust Economic condition Security Authorization	-	Use intention of mobile commerce

As we observed, researchers used TAM theory to analyze the external influencing factors of consumer acceptance of mobile commerce. Two most important influencing factors are perceived usefulness and perceived ease of use which is from the aspects of individual perception. Perceived usefulness means: users will increase the expected subjective probability of their working performance or learning performance for a particular application. When the user perceives the usefulness of the system is higher, the more positive the attitude he has for the system. Perceived ease of use means: users perceive the ease with which the system is learned. As the user perceives the easier way to learn, the more positive the system is. In terms of a system design, whether the system is easy to learn, will affect the user's motivation to accept the system, thus affect the use of behavior. Perceived usefulness is the primary factor in the use of new technology by individuals, and perceived ease of use is a secondary factor in the use of new technologies by individuals.

Perceived usefulness of individual, in addition to influencing their attitudes, can have a direct impact on behavioral intentions. For example, due to the needs of the work, even if the attitude is negative or difficult to operate, but the system is useful for the work, so users still have high behavioral intentions. Perceived ease of use will affect the individual's perceived usefulness of new technology, when the perceived ease of use with the higher degree, the individual's perceived usefulness of new technology is higher.

2.2 Mobile commerce customer satisfaction, loyalty and continuous use

Lin & Wang (2006)^{cc} studied loyalty of 255 mobile commerce users in Taiwan and found that perceived value, trust, user satisfaction and habits of users have an impact on loyalty of users. Perceived value and user trust have a strong intermediary role. Cyr, Head & Ivanov (2006)^{cci} studied loyalty of mobile commerce users from the perspective of design aesthetics, and found that perceived usefulness and perceived entertainment have a direct impact on loyalty of mobile commerce users. Perceived

ease of use impacts perceived usefulness and perceived entertainment. Level of aesthetic design affects loyalty of mobile business users through perceived usefulness, perceived entertainment and perceived ease of use.

Thong, Hong & Tam (2006)^{ccii} discussed the effect of perceived usefulness, perceived ease of use, perceived entertainment, users experience difference, customer satisfaction which could influence consumer continuing use with a sample of mobile Internet users. An empirical study confirms that perceived usefulness, perceived ease of use, perceived entertainment all have a direct impact to the continuing use: customer satisfaction also plays an intermediary role to the continuing use. The experience difference also influences the continuing use through the perceived usefulness, perceived ease of use, perceived entertainment and user satisfaction.

Turel & Serenko (2006)^{cciii} conducted an empirical study on satisfaction of 210 young mobile service users in Canada. The results showed that perceived quality and perceived value of users will affect user satisfaction. Perceived value of users has an impact on perceived quality of users, and the relationship between customer satisfactions plays an intermediary role.

Wang & Liao (2007)^{cciv} studied the measurement of mobile commerce users' satisfaction and found that content quality, appearance, service quality and ease of use affect satisfaction of mobile commerce users. Gao, Xu & Wang (2012)^{ccv} studied customer satisfaction of mobile commerce and found that mobile commerce expectation service quality, perceived mobile commerce quality and perceived value of mobile commerce users affect customer satisfaction of mobile commerce. Among them, expectation of mobile commerce service quality and perceived mobile commerce quality have an indirect impact on satisfaction through perceived value of users.

Through the above literature review, we can see that most studies are based on the theory of mobile commerce and the characteristics of the service by adding new factors. In order to provide a more complete and systematic understanding to the existing research and provide theoretical material for our research, we summarized the influencing factors of mobile commerce user behavioral intentions. The results are showed in table 11. Most empirical studies confirmed that the direct antecedent factor

of loyalty and continuous use behavior is customer satisfaction, while perceived value of customer influences loyalty and continuous use behavior through customer satisfaction. That refers that consumer think the consumption is valuable and then satisfied, and then there will have intention to continuous use. Therefore, we do not only analyze satisfaction, but also customer perceived value as the influencing factors of customer continuous use behavior (loyalty).

Table 11: Influencing factors of mobile commerce consumer behavior

Researchers	Years	Influencing factors	Mediator variables	Dependent variables
Lin & Wang	2006	Perceived value Consumer trust Habit	Consumer satisfaction	Consumer loyalty
Cyr, Head & Ivanov	2006	Level of design aesthetics	Perceived usefulness Perceived entertainment Perceived ease of use	Consumer loyalty
Turel & Serenko	2006	Perceived quality	Perceived value	Consumer satisfaction
Thong, Hong & Tam	2006	Perceived usefulness Perceived ease of use Perceived entertainment	Satisfaction	Continuous use
		Experience difference	Perceived usefulness Perceived ease of use Perceived entertainment	Continuous use
Wang & Liao	2007	Content quality Service quality Perceived ease of use	-	Consumer satisfaction
Gao, Xu & Wang	2008	Perceived quality Expectation of service quality	Perceived value	Consumer satisfaction

In this part, we firstly analyzed mobile commerce consumer behavior researches based on technology acceptance model. Then we summarized the influencing factors of mobile commerce user acceptance and behavioral intention, and combined the influencing factors in ECM-ISC and ECM-ISC of mobile commerce which are summarized in first part. We found that main influencing factors are: satisfaction, perceived usefulness, perceived ease of use, perceived entertainment, perceived cost, security, characteristics of consumer. Secondly, according to the researches on relationships of customer satisfaction, loyalty and continuous use, we found that customer satisfaction influences directly loyalty, while perceived value of customer influences loyalty through customer satisfaction. Therefore, we do not only analyze satisfaction, but also customer perceived value as the influencing factors of loyalty.

3. Consumer value perception theory

Perceived value of our research is mainly analyzed from the customer perspective, which focus on the analysis of perceived value during or after the usage of mobile commerce. The concept of customer perceived value was firstly proposed by Kolter & Levy (1969)^{ccvi} in order to combine perceived value and satisfaction, and they considered that customer perceived value could determine satisfaction.

3.1 Consumer perceived value and loyalty

In 1980s, the concept of business management of customer's satisfaction became the consensus. At that time, research considered that once customers were satisfied, customer continuous purchase behavior might appear. Therefore, customer satisfaction was taken as a measure of business success. However, both subsequent practice and theoretical studies show that the number of continuous purchase behavior was less than 50% for satisfied customers (He, 2007)^{ccvii}, so researchers began to realize that customer satisfaction is not the only factor to create consumer continuous purchase behavior.

In fact, a large number of scholars have found that perceived value is an important indicator of repeat purchase intention (Woodruff, 1997^{ccviii}; Petrick, 2002^{ccix}). In current researches, some scholars think that customer perceived value affects directly consumer continuous purchase behavior, while some scholars found that customer perceived value influences indirectly consumer continuous purchase behavior through factors such as satisfaction. Some scholars think that perceived value has both direct and indirect effects on consumer continuous purchase behavior.

3.1.1 Direct impact of customer perceived value on loyalty

Zeithaml (1988)^{ccx} found that customer perceived value has an intermediary role in the relationship between quality and customer behavior, which means that customer perceived value affect directly customer purchasing behavior. Sweeney, Soutar &

Johnson (1997)^{ccxi} studied the antecedents of customer perceived value and the influence of customer perceived value on consumer purchase intention in the field of electronic devices, and found that customer perceived value has significant effect on consumer purchase intention.

Sirohi, McLaughlin & Wittink (1998)^{ccxii} argued that monetary or non-monetary costs of consumer and perceived service quality determine perceived value then affect consumer continuous purchase behavior. The research of Boyer, Hallowell & Roth (2002)^{ccxiii} also pointed out that perceived value is an important factor for consumer continuous purchase and continuous use. Kim, Chan & Gupta (2007)^{ccxiv} studied the relationship between customer perceived value and their acceptance behavior. The results showed that customer perceived value has a significant impact on consumer acceptance intention.

3.1.2 Indirect impact of customer perceived value on loyalty

Patterson & Spreng (1997)^{ccxv} demonstrated that perceived value has a significant impact on customer satisfaction through the empirical research of commercial professional services, and then has an impact on consumer continuous purchase behavior through satisfaction. Barnes (2001)^{ccxvi} mentioned that perceived value creates customer satisfaction and continuing satisfaction create loyal. Hellier et al. (2003)^{ccxvii} used consumer continuous purchase propensity model to indicate that customer perceived value does not directly affect consumer continuous purchase intention, but influences indirectly consumer continuous purchase intention through customer satisfaction and brand reference.

This shows that perceived value has an important impact on consumer loyalty. Service quality and perceived value influence customer satisfaction and future behavior, and service quality and perceived value have significant positive impact on customer satisfaction.

3.2 Composition of customer perceived value

With the development of perceived value, many scholars began to consider the research on dimension and classification of perceived value. Through the review of existing literature, we believe that these scholars can basically be classified as two following categories:

3.2.1 Balance between benefit and loss perspective

Scholars who based on this perspective take customer perceived value as the result of a balance of perceived benefits and cost. From the perspective of perceived benefits and cost, Zeithaml (1988) classified customer perceived value into four categories through focus group interview: value is about low price (focusing on cost); value refers to what customer needs in product or service (focusing on benefit); value is the quality gained from the price paid (focusing on benefit and cost of a given dimension); value is a balance of all perceived benefits and cost (focusing on all relevant factors).

In many researches of perceived value, they regard product quality as a "revenue" factor and regard price as "cost" factor. However, with the deepening research on customer perceived value, researchers have continuously expanded and supplemented the connotation of perceived benefits and cost. Babin, Darden & Griffin (1994)^{ccxviii} considered customer perceived value includes two benefits: utility interest and hedonic Benefit. Parasuraman & Grewal (2000)^{ccxix} found that components of customer perceived value are mainly product quality, service quality, and price and brand equity. Among these components, product quality, service quality and brand equity belong to perceived benefit. Lapierre (2000)^{ccxx} proposed that perceived benefit and perceived cost relate to products, services, and relationships.

Previous researches also explored the composition of perceived cost. Monroe (1991) considered perceived price as customer perceived cost, believing that perceived price is the total cost of what customer purchased, which includes purchase price, acquisition, transportation, installation, order processing, repair costs and under-performing risks.

However, his definition includes only monetary costs and risk as non-monetary costs, without considering other non-monetary cost elements. These non-monetary costs are precisely what many other scholars are more interested in (Zeithaml, 1988).

3.2.2 Multidimensional division perspective

Although Zeithaml (1988) proposed that perceived value includes perceived benefits and perceived costs, which is accepted by many scholars, many studies on the specific dimension of perceived value have jumped out the two-dimensional method of perceived benefits and perceived costs. Based on the research of Zeithaml (1988), Carothers (1991)^{ccxxi} extended perceived quality in perceived benefit dimension, believing that perceived quality is not only perceived product quality, but also perceived quality of service. Parasuraman (1997)^{ccxxii} proposed that perceived product quality and perceived service build perceived benefit; perceived price build perceived cost. Parasuraman & Grewal (2000)^{ccxxiii} is also based on two-dimensional theory, proposed the acquisition of value, use value, transaction value and redemption.

Babin et al. (1994)^{ccxxiv} divided customer perceived value into utilitarian and hedonistic benefits. His definition of utilitarian benefits is that consumers are motivated by their real needs, and hedonistic benefits refer to that consumers purchased for fun. Chandon et al. (2000)^{ccxxv} argued that utilitarian benefits pay more attention on maximizing their own benefits, focusing on saved money, time, and product quality and convenience. And hedonism is mainly for their own psychological pursuit, including pursuit personal value, entertainment, etc.

Sheth, Newman & Cross (1991)^{ccxxvi} found that social value, functional value, cognitive value, emotional value and situational value are the major constituent dimensions of customer perceived value. Jillian & Geoffrey (2001)^{ccxxvii} proposed PERVAL model, which divided functional value into price value and quality value, thus constitutes emotional value, social value and functional value (quality and price).

3.3 Research on customer perceived value in network environment

According to review of perceived value, we can see that customer perceived value is affected by the attributes of product and the shopping experience. Internet has not only created new product and service for consumer, but also provided new experience for consumer to acquire product and service. In network environment, consumers make purchasing decisions more easily based on more comprehensive information than traditional environment, while computer and mobile device also bring uncertainty and risk to consumers to make decision.

Therefore, many researchers think that when customers buy product and service in network environment, composition of perceived value will be different. Our research studies mobile commerce which is based on wireless network environment, so through network environment, research on customer perceived value in network environment could provide more useful ideas for us.

Bourdeau et al. (2002)^{ccxxviii} proposed five dimensions according to network environment: utilitarian value, learning value, purchasing value, hedonistic value and social value. By researching e-mail users and network users, results showed that e-mail users pay more attention to social values, and network users pay more attention to hedonistic and learning value. Lee (2004)^{ccxxix} pointed out that shopping practical value and experience value of online shopping users both have positive impacts on customer satisfaction, which has a significant positive impact on customer loyalty.

Kim et al. (2013)^{ccxxx} built a mobile Internet technology acceptance model based on customer perceived value. He proposed that perceived usefulness and perceived interest are perceived benefit of customer perceived value, while specialization perceived price are perceived cost of customer perceived value. They argued that function, entertainment, and social aspects of the App have a positive effect on perceived value, satisfaction. Wu et al. (2014)^{ccxxxi} conducted a research based on the perspective of relational transactions and found that perceived value, moral hazard cost and information search cost significantly positively influenced repurchase intention of online shoppers.

In addition, many scholars studied perceived value from the perspective of influencing factors under the network environment. Jarvenpaa & Todd (1996)^{ccxxxii} proposed that customer perceived value formation in the network environment is influenced by product perception (price, quality and diversity choice), purchase experience (effort, compatibility and entertainment), service (responsibility, insurance, Empathy), perceived risk (economic risk, social risk, performance risk, personal risk, privacy risk). Eighmey (1997)^{ccxxxiii} studied commercial web sites and proposed marketing perceptions, entertainment value, informational value, ease of use, credibility and interactivity will affect customer perceived value. Kalakota & Robinson (2002)^{ccxxxiv} proposed that in mobile Internet environment, new business activities require mobile commerce companies to re-understand the changes in customer perceived value and classify them as basic innovation, device innovation and customer preference. Chen & Dubinsky (2003)^{ccxxxv} explained that experience value, perceived product quality, product price and perceived risk are the key factors to affect customer perceived value in B2C E-commerce environment. Kim et al. (2007)^{ccxxxvi} established a mobile Internet technology acceptance model based on customer perceived value. They proposed that perceived usefulness and perceived interest are the perceived benefit of customer perceived value, while perceived price is the perceived cost of customer perceived value. This model gave us main reference for our study.

However, the research on influencing factors of perceived value of retail mobile commerce is still rare. Measuring perceived value with a single dimension lacks a degree of validity (Woodruff & Gardial, 1996)^{ccxxxvii}. It is also difficult to provide a clear direction for how to improve customer perceived value and improve the competitiveness of enterprises. Compared to traditional online shopping, mobile commerce is anytime and anywhere which allowed consumer to compare price and conversion suppliers easier, mobile commerce continuous use will be more difficult to establish.

Conclusion

Through the review of literature, it is not difficult to find that the research on mobile commerce user behavior gradually improved. But for the emerging field of retail mobile commerce, there are still many places need to be developed. In the meantime, we gave great affirmation to previous studies and also found the following points to be supplemented:

In this chapter, we firstly introduced that consumer repurchase behavior intention is an indicator to measure consumer loyalty of retail mobile commerce. That means loyalty will be the performance variable of our research. Then, according to theoretical studies of ECM-ISC model, we sorted out the factors that affect indirectly or directly consumers continuous use behavior. These researches provided the basic model (ECM-ISC) for us to study continuous use behavior of retail mobile commerce system users, which also provided some references to develop influencing factors.

Secondly, because these factors did not focus on mobile commerce, so we sorted out the influencing factors through the researches of ECM-ISC of mobile commerce, and there are many factors used and tested by researchers as: perceived usefulness, perceived ease of use, perceived entertainment, perceived cost, conversion cost, immersive experience, etc.

However, they are not enough to support our research model, because continuous use behavior occurs after consumer acceptance behavior, and it will be affected by the expectation of users in the period of accepting. Therefore, we analyzed mobile commerce consumer behavior researches based on technology acceptance model. Then we summarized the influencing factors of mobile commerce user acceptance and behavioral intention and combined the influencing factors in ECM-ISC and ECM-ISC of mobile commerce. We found that main influencing factors are: satisfaction, perceived usefulness, perceived ease of use, perceived entertainment, perceived cost, security, characteristics of consumer.

At last, according to the researches on relationships of customer satisfaction, loyalty and continuous use, we found that customer satisfaction influences directly loyalty,

while perceived value of customer influences loyalty through customer satisfaction. Therefore, we do not only analyze satisfaction, but also customer perceived value as the influencing factors of loyalty.

So, in next chapter, we intend to use qualitative research method to find and analyze the influencing factors of mobile commerce perceived value and satisfaction, and effectively explore the impact of perceived value and satisfaction on retail mobile commerce loyalty. We will then try to construct the theoretical model and put forward relevant hypotheses and test it with an empirical study. At last, we put forward corresponding policy suggestions according to the research of this article.

Chapter 3

EXPLORATIVE STUDY OF QUALITATIVE
RESEARCH, CONCEPTUAL MODEL AND
HYPOTHESES

Introduction

Through the analysis of the second chapter, we can see that the research on users' intention of traditional retail shopping is rich, and the research on users continued use intention of E-commerce has also been paid attention by many scholars. But the existing literature on M-commerce consumer's use behavior is far from enough, we have not yet found too many relevant literature of retail mobile consumer continued use to study. Continued use of consumer behavior impact mechanism in retail mobile shopping environment has not yet been validated. Compared to traditional online shopping, mobile shopping's characteristics as anytime, anywhere make the price comparison and suppliers conversion easier, then mobile shopping and continued use model is more difficult to build. According to the literature of second chapter, we found that customer satisfaction influences directly loyalty, while perceived value of customer influences loyalty through customer satisfaction.

So, in mobile Internet environment, how is the relationship between mobile shopping consumers perceived value, satisfaction on intention of continued use? This question requires the analysis of the real consumer experience evaluation information from mobile user in mobile shopping situation. This section will be used as a research entry point for the continued use of mobile shoppers, combining existing literature theory and exploratory research to explore the key factors that affect the intention of consumers to repurchase via mobile commerce, and also help the author to build retail mobile consumers continued use theoretical hypotheses and model.

We will present firstly the qualitative study and data coding we conducted, then the operational insight from the qualitative study with Nvivo 11 and finally the conceptual model and research hypotheses.

1. Qualitative study and data coding

Qualitative research method has been the most important research tradition in the field of sociological research, but there is no mainstream paradigm. For example, Creswell divided qualitative research into: tradition life history, phenomenology, grounded theory, ethnography, and case studies (Creswell, 1998)^{ccxxxviii}. In this complex research history, we generally understand the qualitative study as that researcher get into a specific context, with a series practice of observation and interpretation to show the specific world. These practices transform the everyday world into a series empirical representations, such as field notes, conversations, photographs, recordings, notes, etc., which exist in various empirical materials such as case material, personal experience, introspection, life history, interviews, artifacts, cultural texts and their products, observing texts, historical texts, interactive texts and visual texts, etc. (Denzin & Lincoln, 2000)^{ccxxxix}. The exploratory qualitative study is useful in two contexts (Evrard et al., 2003)^{ccxli}. One is in the exploration of a vague problem in order to determine a certain number of propositions more precisely and hypotheses specificity. Another one is the comprehension of a phenomenon and its in-depth analysis, with all its subtleties, which a more formal study would not necessarily be followed in future.

1.1. Data collection

Qualitative interview is one of the most widely used methods of collecting data in social science research. It focuses on the personal feelings, statements of life and experience of the respondents. Through the dialogue with the respondents, the researchers can obtain, understand and explain the respondents' personal knowledge of social facts. A qualitative interview is a conversation for a particular purpose, researcher and interviewee focus primarily on the statement of perception of self, life and experience. Researcher is able to acquire, understand and explain the individual's knowledge of social reality through dialogue. (Minichiello et al., 1995)^{ccxli}.

1.1.1 Interviews

According to interviewing types and a variety of different interpretations, the general definition is as follows: a face to face verbal interchange in persons, the interview, and attempts to elicit information or expressions of opinion or belief from another person or persons (Maccoby, E.E. & Maccoby, N. 1954)^{ccxlii}.

In short, interviews as a way to get information are mainly direct face-to-face interviews, where researchers can understand what the respondents are doing, or what they are thinking, and why they are going to do so. There are many different types of interviews, which are distinguished by research processes: they are mainly divided into structured interviews, focused or semi-structured interviews or unstructured interviews and group interview. (Minichiello et al., 1995).

Semi-structured interviews can be quantitative or qualitative orientated models, primarily based on the use of broader research questions as an interview to conduct interviews. Interview guide or interview table is usually designed before the start of interview as the framework, but its words and the order of the problem is not too limited, the most important content must be consistent with the research questions, the type of problem or discussion approach are more flexible. So it can provide a more realistic look of respondents' cognitive experience. After comparison, this research selected semi-structured interviews to carry out the collection of information.

1.1.2 Sampling

Interviews are often used as a data collection method in qualitative research, but it often uses theoretical sampling and purpose sampling methods to select respondents. Theoretical sampling is based on the concept development and theory development to select the sample. Unlike stochastic sampling in quantitative research, the theoretical sampling and purpose sampling used in qualitative research must select samples that allow the study to obtain the maximum amount of information. In order to explore a

more research problem, the sample size is usually less, emphasizing the acquisition of the original data development theory by interacting with respondents in the natural context (Chen, 2000)^{ccxliii}. Thus, the extracted samples must have a typical representation that can reflect the important characteristics of a particular class of phenomena, rather than a statistically significant representation.

According to the above principles, people who have experienced events related to research issues, with good expression of their own, with more outgoing personality, with a certain degree of observation and reflection ability, such respondents are undoubtedly the most appropriate (Chen, 2000). The number of respondents with purpose of sampling better achieve theoretical saturation as a criterion; from the experience, the number of respondents between 20-30 people is appropriate.

This study chose respondents who have had already mobile shopping experience, in order to conduct semi-structured interview to study the factors that affect the sustainable use of mobile shopping. Interviews were carried by face-to-face interviews with 20 people and conducted in France with French and Chinese users. The reason to choose the different nationalities is to find out the influence from different culture backgrounds. In Asia, with the highly speed growth of possession of mobile devices and the improvement of the website quality, the mobile consumption already take 50% of on line purchasing in 2015 in China according to Alibaba data. The percent conversion is ten times larger than United States.

The respondents were selected by different backgrounds such as age, sex, work, family role, etc., as showed in table 12. The interviews were carried on in varying situations i.e. in front of supermarket, fast food store, train or bus station, university, office, and at home to distinct the different contexts of using mobile phone. Participants were ranging from 19 to 56 years old and were business professions, students, academicians, restaurants. Irrespective of the interviewee's gender, majority of the participants had a good knowledge of the mobile commerce and are buying frequently via their mobile phones.

Table 12: Background of respondents

Number	Country	Gender	Age	Occupation
1	France	Male	23	Waiter
2	France	Male	29	Waiter
3	China	Female	27	Air hostess
4	China	Female	27	PhD Student
5	China	Male	30	Graduate Student
6	China	Female	29	Business Professional
7	China	Male	26	Business Professional
8	China	Female	28	Entrepreneur
9	France	Male	56	Business Professional
10	China	Female	33	PhD Student
11	China	Male	32	Graduate Student
12	France	Female	23	Bachelor Student
13	China	Female	26	Business Professional
14	France	Female	35	Bachelor Student
15	France	Male	40	Business Professional
16	France	Male	22	Bachelor Student
17	France	Female	20	Bachelor Student
18	France	Female	21	Bachelor Student
19	France	Female	40	Business Professional
20	France	Female	33	Business Professional

1.2. Content analysis

Qualitative methods type has undergone a qualitative leap for the last 20 years. In more traditional and linguistic methods, such as content analysis, discourse analysis, rhetorical analysis, semantic analysis, semiotics (Vannini, 2007)^{ccxliv}, argumentation analysis, narrative analysis, cultural analysis (Bal & Gonzales, 1999)^{ccxlv}, domain analysis (Hjørland, & Albrechtsen, 1995)^{ccxlv} and other methods. Sociologists also

created their own unique qualitative analysis methods, such as grounded theory (Glaser & Strauss, 1967^{ccxlvii}; Strauss & Corbin, 1998^{ccxlviii}), qualitative comparative analysis (Ragin, 2010)^{ccxlix}, sequence analysis using optimal matching techniques (Abbott & Forrest, 1990)^{cccl}, corpus construction (Bauer & Gaskell et al., 2000)^{cccli}, thematic network (Stirling, 2001)^{ccclii}. A common feature of all these studies is the advancement of qualitative research methods towards a more systematic, more precise, more rigorous, more formal direction (Kiser, 1997)^{cccliii}.

There are some qualitative research orientation in the text itself, generally this kind of analysis is called content analysis. Content analysis is a research method, where researchers examine a single text or a certain number of text of the subject, the key words and their frequency, the association between keywords (Fielding & Lee, 1998)^{cccliv}. Thus we could use the information, the author, the recipient and the text represented characters, culture and the times in the text to infer. The text can be a book, a separate chapter of the book, essays, interviews, newspaper titles and articles, historical documents, diaries, presentations, scripts, advertisements, etc. In fact, any verbal communication works can be the object of text analysis (Neuendorf, 2002^{ccclv}; Stemler, 2001^{ccclvi}). According to Bardin (1977)^{ccclvii}, content analysis has two functions:

- The first is a heuristic function that enriches an exploratory discovery approach: it is content analysis to see or understand.
- The second is a function of empirical proof or the inference based on working hypotheses that we seek to validate.

So content analysis method has the following three key features:

- Systematic, refers to the choice of content or category should be based on consistent standards, in order to avoid that the information which support the hypothesis of researchers was included in the study of the situation.
- Objectivity, means that analysis must be based on well-defined rules to ensure that different people can derive the same result from the same literature.

- Quantitative, refers to the usage of statistical methods in the study of categories and analysis of frequency of unit to measure, express the results of content analysis with a digital or graphical way.

Therefore, it is obviously very appropriate to use the content analysis method to establish the sustainable use effect of mobile shopping as the research paradigm. The combination of qualitative analysis method and quantitative analysis method to study these textual information allow us to explore more effectively mobile consumers continue use impact factors. Content analysis method extract the concept and construct the theory from users real mobile shopping experience, thus the results could be more objective and true. Therefore, this chapter use the content analysis method to explore the impact of mobile shopping consumption experience and its continuous use of users, and provide a clear orientation and basis for the next empirical research.

1.2.1. Content analysis techniques

According to Braun & Clarke (2006)^{cclviii}, content analysis emphasizes pinpointing, examining, and recording patterns (or "themes") within data. It's an analysis that use systematic steps to observe the context, culture or interactive relationship between the message, and also an analysis method through observation to sort out sense. Content analysis has three types of techniques as shown in the table 13 (Evrard et al., 2003):

Table 13: three types of Content analysis technique

Type of Content analysis technique	Examples of indicator
Syntactic analysis	Structure of speech Ex: Time and mode of verbs
Lexical analysis	Nature and richness of the vocabulary Ex: Frequency of occurrence of words
Thematic analysis	Cutting by theme and frequency of appearance

Subject represents the elements that often appear in the text, including the meaning of claims, idioms or contextual contexts. Subject analysis is the process of reproducing them. From the interview text, the recurrence and commonality is the common theme we are looking for. In order to facilitate our subsequent coding work.

1.2.2. Word frequency

In this research, we first used Nvivo11 to calculate the word frequency. We focus on the 100 words the most used after deleting the modal particle and irrelevant words. For the reason of paragraph, we chose 20 words the most important as shown in table 14, and the full words list is in annex. We make open coding according to these words.

Table 14: 20 words the most used by respondents

Words	Frequency	Percentage (%)
information	135	1.88
time	119	1.66
convenient	57	0.79
price	42	0.58
search	35	0.49
payment	28	0.39
interaction	27	0.38
security	26	0.36
easy	23	0.32
discount	22	0.31
quality	21	0.29
functions	20	0.28
compare	18	0.25
save	15	0.21
fragmented	12	0.17
communication	9	0.13
delivery	9	0.13
evaluation	9	0.13
promotion	9	0.13
anywhere	8	0.11

We could see the words as information, search, compare, price, time, payment, security, convenient, easy, interaction, function, promotion, etc. are the most used by these interviewees which are also appeared in the previous literature as shown in chapter 2. We will try to make open coding of the theme according to these words by considering the retail industry characters.

1.2.3. Data coding

Data coding should begin with identifying research topics and selecting text samples. Researcher divides the text into small, operable units such as words, phrases, sentences or themes to encode the text manually or with the help of software. Since the 80s, digitization and computerized of qualitative analysis is an irreversible trend (Dohan & Sánchezjankowski, 1998)^{cclix}. Compared with the manually coding, computer coding takes more time. The more flexible is the initial encoding frame, the stronger is the induction of research, the sooner researcher use computer coding, the more likely they waste time and effort (Ezzy, 2002)^{cclx}. In order to avoid this situation, Ezzy suggested to read repeatedly the transcripts or other documents and making some side notes at the same time, highlight and study the relevant paragraphs until there is a clear theme and the initial coding box, and then encoding on a computer. On the issue of data analysis, coding analysis is the key link between data collection and theory formation from these data. There are three levels to encode which are: open coding, axial coding and selective coding (Strauss & Corbin, 1990)^{cclxi}. Researcher could establish the theory from the complex data after three-level data analysis process.

Therefore, this research will use Nvivo software to help the author to finish the three-level data coding. First, the author calculate the frequency of key words in Nvivo after importing the original files, and then encode each paragraph associated with the research questions by reading the original data segmentally. With the progress of this research, the same paragraph may also appear different coding through the different angles of problem and the new ideas.

1.2.3.1. Open coding

Open coding is the first stage of data coding which is based on the data collected in the early stage, in order to define the concept's character and category found in the data analysis. Open coding should not only maintain consistency in the same category,

but also focus on discovering new category and new character, pay attention to balance between coherence and new categories (Strauss & Corbin, 1990).

In this study, manual method of open coding is used to analyze the collected text data step by step, and accurate and valuable concept is extracted and further classified into categories in the process of developing concepts. In the actual coding process, we extracted 88 nodes and 31 categories by carefully comparative analysis. The full process of open coding is attached in annex, and we show some examples of open coding as shown in the table 15.

Table 15: Process of open coding

Open coding raw data examples	Nodes
<p>“...We were in this small town and we don’t know where we could find the store, so Nicolas used his phone to find a Casino which is 10 minutes from us. We were so happy because otherwise we will have nothing to eat for that night.”</p> <p>“It’s useful to use the store model because I could find what I want quickly. And I can use my phone to scan the product for more information when I find it. Like a bottle of wine, I can’t find the price and I scan it with my phone, the price came up.”</p> <p>“Payment is easier than before, I don’t have to bring my wallet every time I go to shopping. I could pay with my smart phone. ”</p> <p>“It’s very useful to keep the member card in my phone. I hate when I have to take three or four members card with me, they take a lot of place. Now I can just scan it in my phone.”</p>	<p>a1. technology of LBS a2. in-store mode a3. Payment with phone a4. member-card collection</p>
<p>“Well, it’s different to connect to Internet at the train from the toilet. I usually take a book when I take the train or a plane because I can’t get the Wi-Fi, if I have it everywhere, I will never finish one book in my life.”</p> <p>“They have Wi-Fi in Carrefour and the speed is not bad, so I really enjoy the shopping with my wife there.”</p> <p>“I think it’s very important for me if I can connect to Internet or not, sometime there is no connection and I don’t know what to do.”</p> <p>“This is a really problem if Wi-Fi is bad and I feel panic when it happened.”</p> <p>“Yes, I think it’s really important because we all need to use Internet every day. I want to search some information with my mobile.”</p> <p>“Convenience, I can consume as long as the network works at anytime, anywhere. Mobile phone is relatively lighter compared to the computer, easy to carry, and do not limited to cable Internet, nor by the access point restrictions”</p>	<p>a5. Wi-Fi connection a6. Wi-Fi in store a7. Internet connection is very important a8. panic without connection a9. need Internet everyday a10. no limitation of cable access</p>

The categorization of the sample data is shown in the following table 16.

Table 16: Categorization of the sample data

No.	Categories	Nodes
1	A1 function	a1. Technology of LBS, a2. In-store mode, a3. Payment with phone, a4. Member-card collection
2	A2 Wireless access	a5. Wi-Fi connection, a6. Wi-Fi in store, a7. Internet connection is very important, a8. Panic without connection, a9. Need Internet every day, a10. No limitation of cable access
3	A3 Personalization	a11. Personalized information, a12. More personal advice
4	A4 Flexibility	a13. Use the fragmented time, a14. No need to go out, a15. Anytime, a16. No limit of time and location, a17. Shopping at home, a18. Anytime and any where
5	A5 Price comparison	a19. Compare around, a20. Learn about price information, a21. A lot of price information to compare
6	A6 Instant information	A22. Watch all sort of information of products, a23. Instant search information, a24. Promotion message in store
7	A7 Interaction	a25. Communicate with professional staff, a26. Communication channels, a27. Online customer service, a28. Communicate with friends
8	A8 Spared time	a29. No need to choose the store, a30. More efficient, a31. don't waste time
9	A9 Confidence	a32. Don't trust, a33. No security problem, a34. Worry about security issues
10	A10 Reputation	a35. Worry from something heard
11	A11 Personal Privacy	a36. Worry about the privacy, a37. Personal information
12	A12 Payment system	a38. Payment is safe, a39. Just as safe as a bank card
13	A13 Hardware condition	a40. Screen is too small, a41. Screen is also an inconvenient point
14	A14 Transaction cost	a42. Promotion caused my purchase interest, a43. Price is important
15	A15 Device cost	a44. Mobile phone is expensive
16	A16 Connection cost	a45. Cost more without Wi-Fi, a46. Data cost is expensive
17	A17 Fashion and trend	a47. Share with friends, a48. Influence by friends
18	A18 Sense of identity	a49. Afraid to be mocked
19	A19 Public image	A50. people around me all use it
20	A20 Logistic quality	a51. Need more patient to wait for delivery, a52. Can't have the product after payment
21	A21 After sales quality	a53. After-sales service is not convenient, a54. After-sale service is meticulous and humanized
22	A22 Perceived value	a55. Reserve the products, a56. Good innovation, a57. Convenient, a58. More choices, a59. Rhythm faster
23	A23 Satisfaction	a60. Excited to be satisfied, a61. Products I like, a62. Very happy, a63. Most comfortable, a64. Good service, a65. Very attractive, a66. Very intimate

24	A24 Loyalty	a67. Often purchase, a68. Accumulate points, a69. Exchange for a discount, a70. Repeat to search, a71. Share experience
25	A25 Family status	a72. Family status, a73. Have a baby
26	A26 Innovativeness	a74. Open mind, a75. Less passion with new things
27	A27 Hedonism	a76. Bring happiness, a77. It is a joy
28	A28 Brand loyalty	a78. Favorite brand, a79. Focus on a brand, a80. Don't care about the brand
29	A29 Price sensitiveness	a81. Discount to attract me to buy, a82. Do not want to waste money, a83. Purchased faster when it's cheaper, a84. Use mobile phone to purchase because of discount, a85. Save money
30	A30 Safety sensitiveness	a86. Don't use because of security, a87. Safety is more important than convenience

1.2.3.2. Axial coding

Axial coding is the second stage of data coding. It allowed the author to extract more abstract categories by discovering and establishing the potential relationship between different concepts. The purpose is to develop main categories. After repeating analysis of 88 nodes and 31 categories of open coding, 16 main categories were obtained. The specific results of the categorization analysis are shown in the table 17.

Table 17: Axial coding

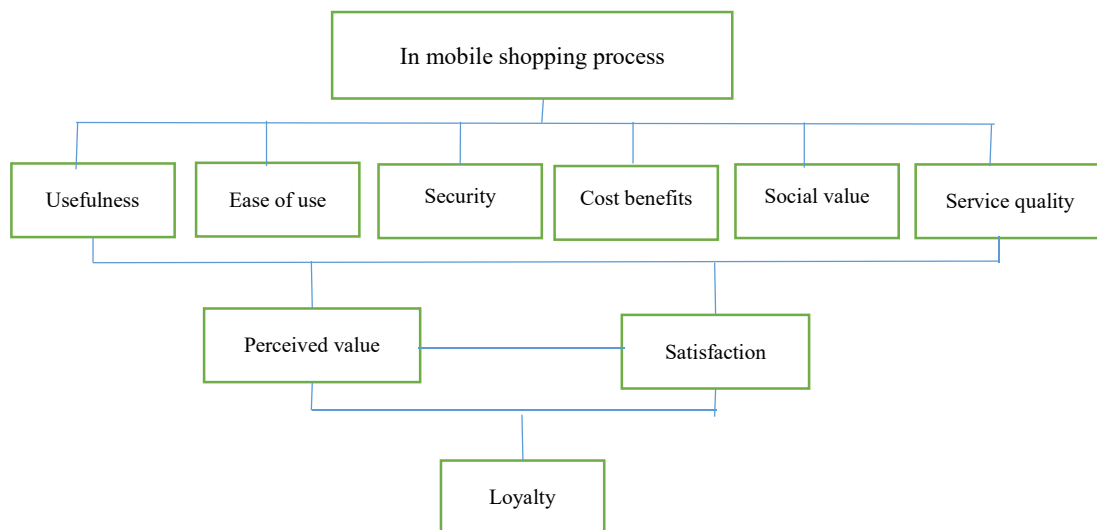
Categories from Open coding	Main Categories
A1 Function; A2 Wireless access; A3 Personalization; A4 Flexibility	B1 Hardware capacity B2 Internet condition B3 Ease of use
A5 Price comparison; A6 Instant information; A7 Interaction; A8 Spared time	B4 Searching B5 Usefulness
A9 Confidence; A10 Reputation A11 Personal Privacy; A12 Payment system	B6 Perceived safety B7 Perceived security
A14 Transaction cost; A15 Device cost A16 Connection cost	B8 Perceived cos benefits
A17 Fashion and trend; A18 Sense of identity; A19 Public image	B9 Social impact B10 Psycho social value
A20 Logistic quality; A21 After sales quality	B11 Customer service quality B12 Delivery perceived quality
A22 Perceived value	B13 Mobile channel perceived value
A23 Satisfaction	B14 Mobile Channel Satisfaction
A24 Loyalty	B15 Mobile channel loyalty
A25 Family status; A26 Innovativeness A27 Hedonism; A28 Brand loyalty A29 Price sensitiveness; A30 Safety sensitiveness	B16 Customer Characteristics

1.2.3.3. Selective coding

Selective coding is the final stage of data coding, and its main goal is to identify the "core category" from the main category and develop the "story line". The main tasks of this process include: through the in-depth analysis of the original data, concepts, categories and main categories, to dig out the "core categories" that can lead all other categories; by analyzing and exploring the core categories, main categories and other categories. To development of a new theoretical framework; continue to develop the scope to make it more subtle, and more complete.

After deep analysis and discussion, the core category is defined as "retail mobile shopping consumers continued use (loyalty) impact factors", the core category can be the category and theme which are linked into an organic association as a whole system. The story line around main category is: in mobile shopping process, consumers will have Perceived usefulness, Perceived ease of use, Perceived security, Perceived cost benefits, Perceived social value and Delivery perceived quality, these factors affect the user's satisfaction degree and perceived value, then affect the user's continued use intention, which is loyalty. As shown in figure 5.

Figure 5: Story line around main category



1.2.3.4. Theoretical saturation test

This study also used the mobile shopping depth interview data for theoretical saturation test. The theoretical saturation test is based on the fact that no additional data is added as a criterion for stopping sampling. The theoretical saturation test of this paper is carried out with a reserved 1/3 of the interview data. In the process of coding analysis of the data, the concepts, categories and core categories are repeated, and no new categories and relationships appeared. The core areas still meet the "retail mobile consumers continued use (loyalty) impact factors". Therefore, theoretical saturation test shows that the theoretical model from qualitative analysis achieved theoretical saturation. In order to better understand these categories, we will introduce Nvivo11 software to analysis the content of each category.

2. Operational insights from the qualitative study

For different qualitative research and analysis types, the computer's auxiliary function is different. In general, the benefits of computerization for qualitative study are not as obvious as for quantitative research for qualitative research. For the linguistic-based qualitative research methods such as content analysis and symbol analysis, the evaluation of the computer's auxiliary role is generally high (Mehmetoglu & Dann, 2003)^{cclxii}.

When the qualitative analysis strategy is based on the framework of coding-retrieval, the benefits of qualitative analysis with software are obvious. The efficiency and system of the researchers' management data are greatly improved, and the consistency of the treatment for different qualitative data are also increased obviously. However, for discourse analysis, case studies, and narrative analysis, the role of qualitative analysis assisting software is limited (Alexa & Züll, 1999^{cclxiii}; Ezzy, 2002^{cclxiv}). So, we use Nvivo11 to complete content analysis in this part.

2.1. Perceived ease of use

It refers to the potential users, that the ease of use of a particular system. Consumers do not require special personal effort in order to achieve the desired effect. In retail industry, with the technology of LBS and Wi-Fi connection, retailers could send the accurate information or highly related information to their customers. Or they can also send the store location to them for the convenience.

Through the rectangular tree structure of all contents related with ease of use, we could see that time, information, payment, anywhere any time, etc. are very highly mentioned by these interviewees. People carry their smart phones or mobile devices (as iPad, etc.) to anywhere they go at any time. They could search for information, enjoy the entertainment applications, communicate with others, and purchase or reserve the products/services without any limit. All of these new concepts or technologies are becoming a very important part of our daily routine, which means the new context of commerce activities are also coming into our life. The context, especially with regard to mobile applications, is seen as an important variable, and due to the possibility of developing context-aware or location-based services in the mobile domain, the concept of context has received more and more attention (Bouwman & Van, 2002)^{cclxv}.

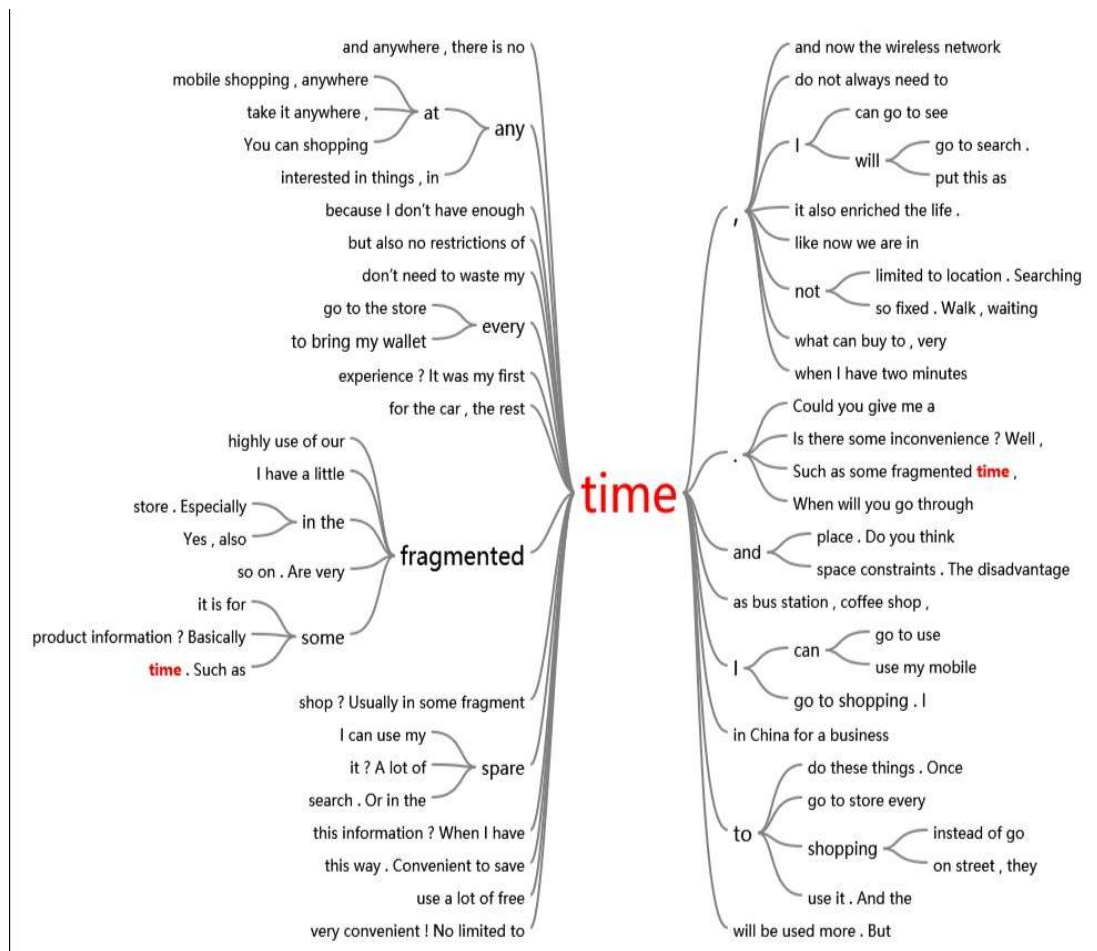
Then, if mobile services are to come up with real added value to the users' experience, developers have to understand both the concept of mobility, as well as the context of the use of mobile applications (Bouwman, Bejar & Nikou, 2012)^{cclxvi}. First of all, we have to understand which factors compose the context. To better understand the impact of context on consumers' behavior, particularly in terms of technology-based services, researchers have called for more research on contextual factors (Dabholkar & Bagozzi, 2002)^{cclxvii}. Following the previous research, context can be divided to Computing context, user context, physical context (Schilit, Adams & Want, 1994)^{cclxviii} and time context (Chen & Kotz, 2000)^{cclxix}. Computing context refers to the basic technologies of mobile commerce such as the Wi-Fi access, the communication costs and so on.

User context means normally the social situation of consumers. Physical context refers to the environment condition including the temperature, the traffic condition. Time context refers to e.g. day, week, or month (Chen & Kotz, 2000). Some services clearly fit some context while other services do not. It is therefore important to categorize services quite carefully, and to relate them to contextual aspects (Bouwman, Bejar & Nikou, 2012).

2.1.1. Time schedule

For the word ‘time’, it was considered as the key to open the door of M-commerce, because it allowed consumers to better benefit their fragmented time. As shown in figure 6.

Figure 6: Extension of word ‘Time’



“I’m so glad to use my smart phone when I have a little time between work and other activities. For example, I could watch the products and promotion information when I go to the toilet or when I take a little rest between my work times. This is really useful for me to notice and capture the new products because I don’t have enough time to go to store every day. I used to be bored when I go to the toilet, but now I feel I could stay there for the whole afternoon.”

“I just finished my study life at the university and I have a part time job in a restaurant, so I have a lot of time now. As I don’t have a vehicle to go shopping, so I spend a lot of time on mobile apps. I can spend whole day to compare the price and put it in my purchase list, it’s kind of fun.”

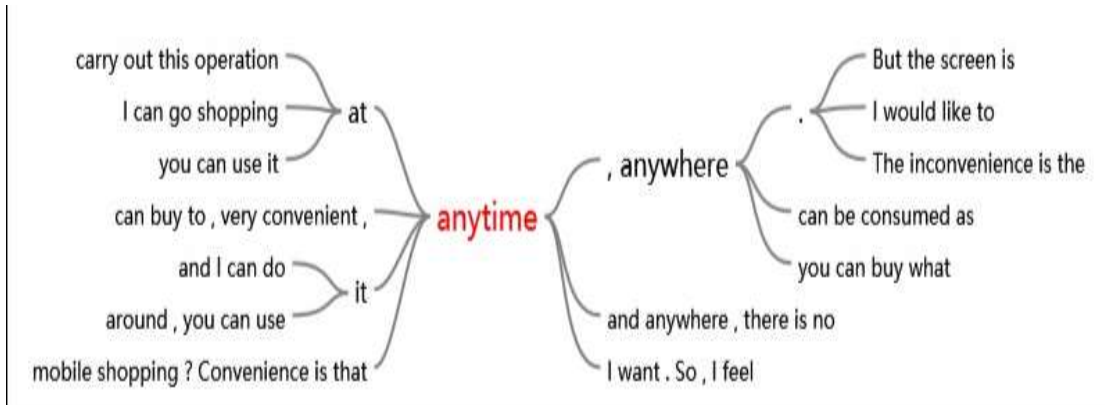
“I just like to reserve my tickets or hotels via my iPhone, it’s very easy to use and I can do it anytime I want. So, I feel a lot of liberation with it. I even order my pizza with my phone; I don’t want to go to store with too many other customers on the waiting line.”

So, we could see there are three kinds of time like fragmented time, abundant time and intended time. Consumers all have different rhythm of life, but they all choose to spend their time with M-commerce to make it easier.

2.1.2. Anytime and anywhere

The second word ease of use was ‘anytime & anywhere’, as we mentioned before, consumers could use M-commerce at anytime and anywhere. It makes these two factors inseparable, for example, consumers could use LBS to get the quick information when they are in an unfamiliar location.

Figure 7: Extension of word ‘anytime’



“I take the shuttle to go to work every time I have to fly. When I wait the shuttle at the station and wait my plane at the airport, I prefer to search the local information where I will fly to.”

Figure 8: Extension of word ‘anywhere’



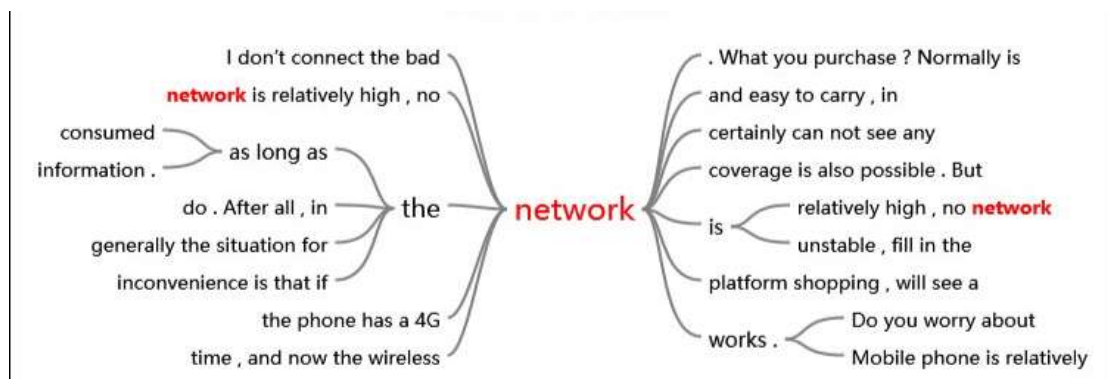
“It was my first time in China for a business conference, I was in airport and I have to go to the meeting room in three hours. But I lost my laser pen which is very important for my presentation, so I used my phone to find a store not too far from the building where I should go, that is really helpful.”

As a result, we considered the location has two aspects: location convenient and location not convenient.

2.1.3. Network access

Internet of mobile access and fixed device access are very different. The mobile Internet access is slower, the signal is weak at some location. This factor truly influenced the consumers' purchasing intention.

Figure 9: Extension of word 'network'



“Well, it’s different to connect to Internet at the train from the toilet. I usually take a book when I take the train or a plane because I can’t get the Wi-Fi, if I have it everywhere, I will never finish one book in my life.”

“I think it’s very important for me if I can connect to Internet or not, sometime there is no connection and I don’t know what to do.”

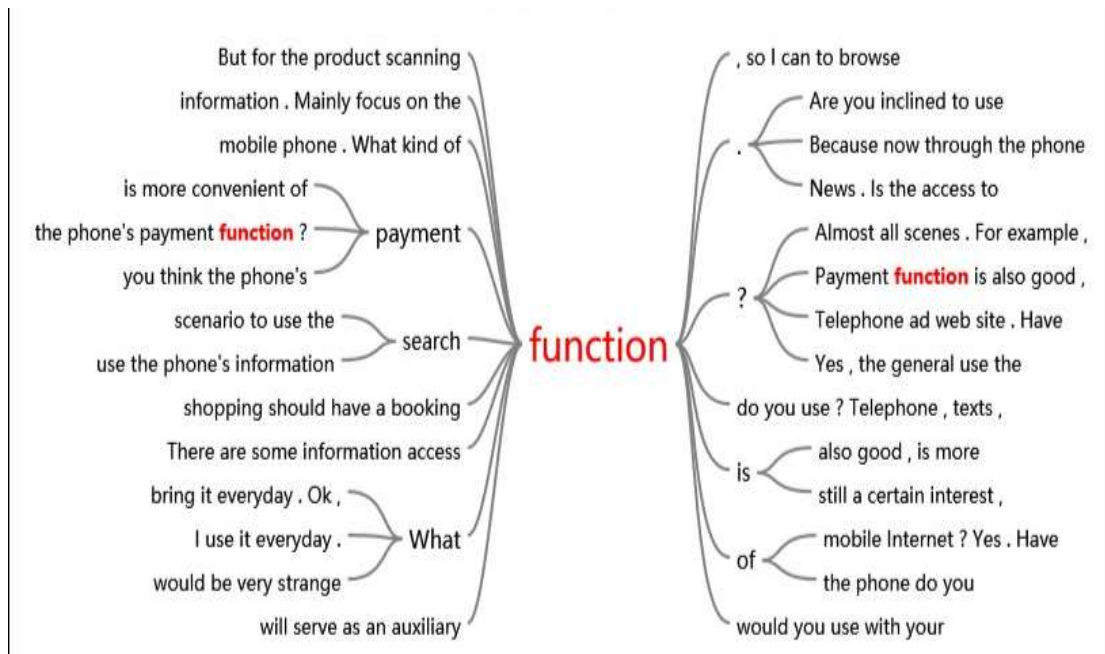
“This is a real problem if Wi-Fi is bad and I feel panic when it happened.”

“Yes, I think it’s really important because we all need to use Internet every day. I want to search some information with my mobile.”

2.1.4. Functions

The word function is also mentioned a lot of times, it mostly appeared with payment, search in-store mode and scanning. These functions make consumers purchase activities easier than before.

Figure 10: Extension of word ‘function’



“...We were in this small town and we don’t know where we could find the store, so Nicolas used his phone to find a Casino which is 10 minutes from us. We were so happy because otherwise we will have nothing to eat for that night.”

“Payment is easier than before, I don’t have to bring my wallet every time I go shopping. I could pay with my smart phone. But I worried about the security problem at the same time, if they steal my phone, I can do nothing then.”

The in-store function of Walmart is very interesting as an M-commerce, it switches automatically when consumers enter into the store, and they could locate the consumer’s position and told them where to go for the right product.

“It’s useful to use the store model because I could find what I want quickly. And I can use my phone to scan the product for more information when I find it. Like a bottle of wine, I can’t find the price and I scan it with my phone, the price came up.”

So, the personal assistant in store will help consumers to make their decision easier, and they could interact with the retailers for more information.

“It’s very useful to keep the member card in my phone. I hate when I have to take three or four members card with me, they take a lot of place. Now I can just scan it in my phone.”

Through the interviews with participants, the role of context appears to be a critical part of their purchasing experience. They described the time, the location and the Internet condition are very important for them to use the M-commerce instead of other channels.

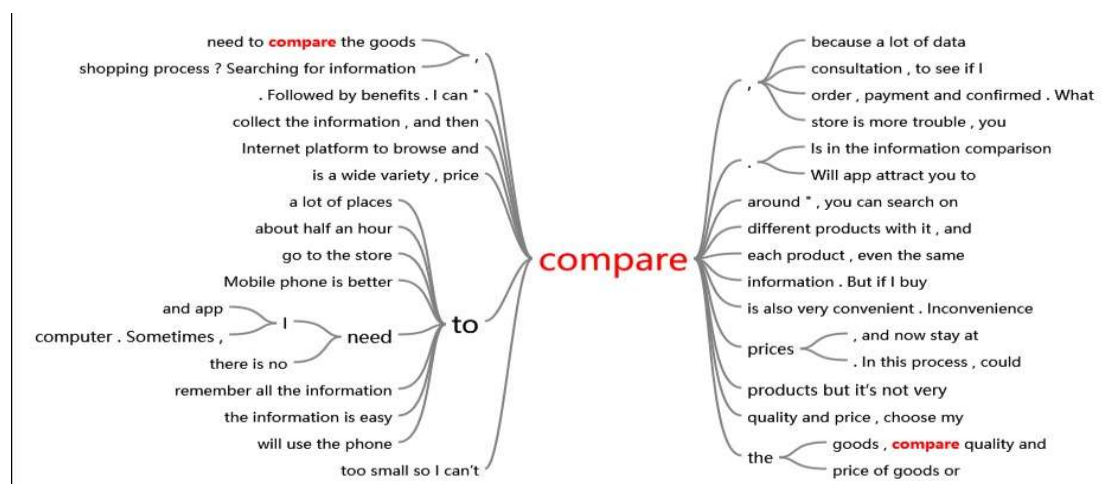
2.2. Perceived usefulness

Usefulness is factor that helps consumers to estimate or evaluate the value of certain apps. If consumers consider M-commerce is useful to save time or money and adapt their life habit, then they will feel satisfied. According to interviewees, compare and search for information, interaction and save are mostly mentioned as useful in retail M-commerce.

2.2.1. Price comparison

Consumers use mobile devices to compare quality, price and other information of products. This is very useful for them to choose a better product or service. Many interviewees mentioned this topic during the interview.

Figure 11: Extension of word ‘compare’



“Because it is convenient, fast, and it is easy to find the Internet platform to browse and compare each product, even the same product can have different prices and quality. Choose more, the platform is broader.”

“I bought a computer on Taobao, that computer costs 2500 Yuan. I started to search for information, I search for a cost-effective computer, and it came out a lot of information, I compared them one by one. Including price, evaluation, credit and other information. And finally came to my own conclusions on the purchase. The consumers’ comments are important.”

“I can compare around, you can search on different shopping sites and app I need to compare the goods, compare quality and price, choose my most satisfied.”

“I first searched a lot of information of watch through forum of watch fans, but also to the major web sites to find the price information, discount information, and then I found a page is playing 60% discount. This price is too attractive.”

2.2.2. Instant information

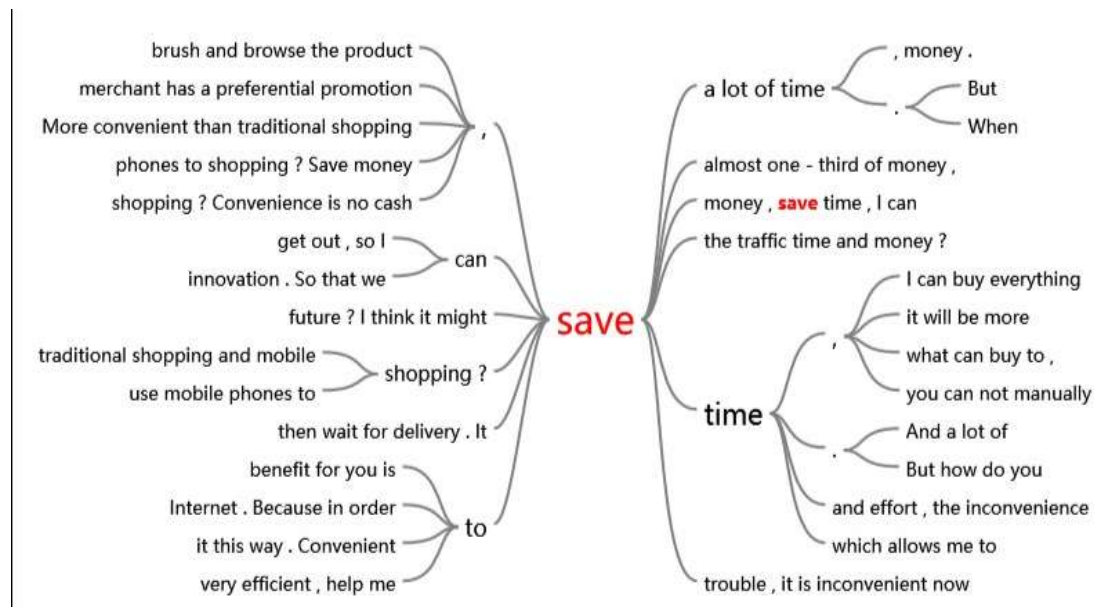
Consumers search and analyze the information they found or promoted from the retailers. Before they go to the store, they usually search the product index and price at their spare time. Retailers must pay attention at this stage to keep them loyal by analyzing consumers’ habit. Consumers search and analyze the information they found or promoted from the retailers. Before they go to the store, they usually search the product index and price at their spare time. Retailers must pay attention at this stage to keep them loyal by analyzing consumers’ habit.

“And I can use my phone to scan the product for more information when I find it. Like a bottle of wine, I can't find the price and I scan it with my phone, the price came up. Mobile shopping do not need to go home to buy what I need, inconvenience is I can't see the details of the items.”

2.2.3. Spared time

Another useful point is time saving. Consumers don't need to waste time on the road to go to store, they don't need to wait in line in store. They could just purchase or reserve the products at home at any so time they think is convenient.

Figure 13: Extension of word 'save'



“First because I do not want to spend too much time on the road, do not want to go to the store and so many guests crowded together, I think the use of mobile phone shopping more convenient and more efficient.”

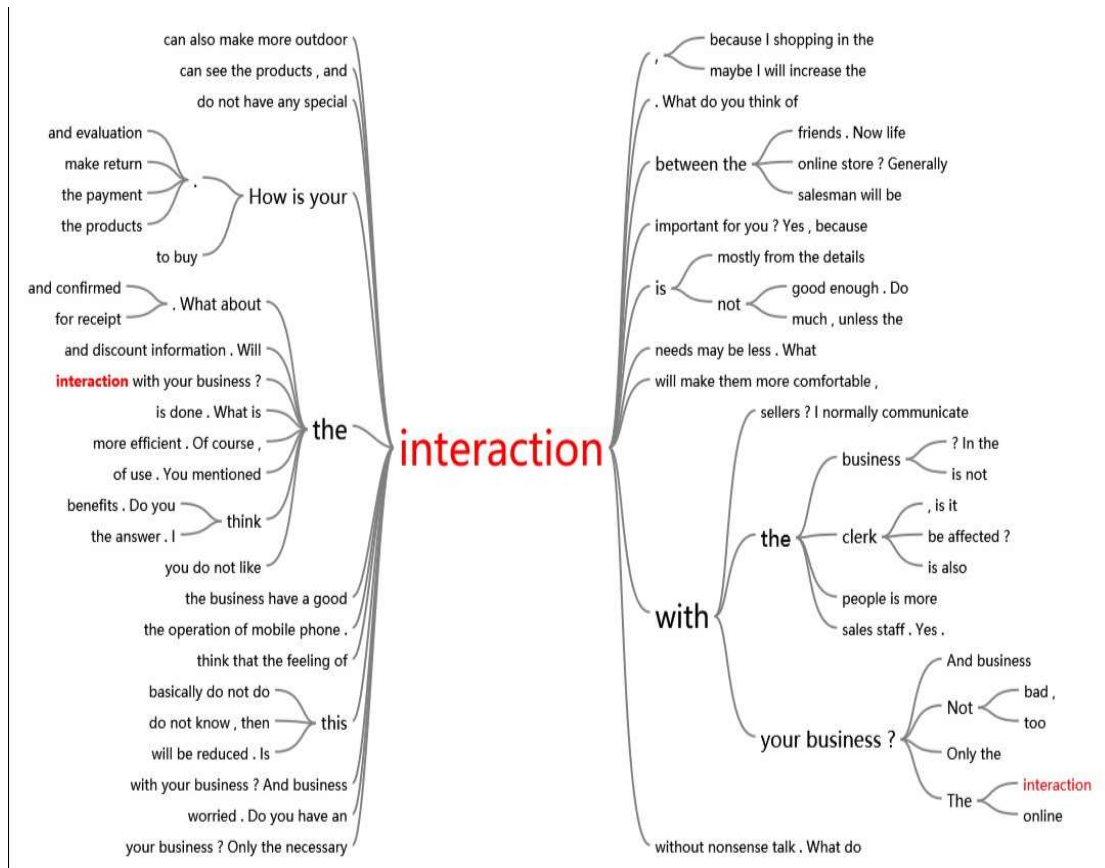
“Save time, you cannot manually find and quickly retrieve the goods. You can start shopping without having to go out by yourself. You do not need to carry a large bag of heavy objects, you can easily receive at home. And supermarket app, I think the promote information will be faster received.”

2.2.4. Interaction

Because of the intangible and uncertainty characteristics of services, many scholars doubt the reality of service innovation, they think the service is an adjunct of tangible product and service innovation itself does not exist. In addition, the relations between service innovation and technological innovation were discussed: do they have the same process, nature, mechanisms and effects? Currently, in the debate over whether the presence of innovative services people generally agree: innovation in services exist, but the form is very different with technical and organization innovation. It exists almost no services without tangible elements, at the same time, there is little tangible goods which don't include some kind of services (Lovelock, 2001)^{cclxx}.

Retailers need to make real the service innovation activity and strategy; they must first clear the basic driving forces of innovation in services. Sundbo & Gallouj (1998)^{cclxxi} analyzed the services with a number of European countries and they proposed a model of the driving forces. We can see that customers are one part of actors, following Gummerus & Pihlström, 2011)^{cclxxii}, M-commerce can be defined as 'content and transaction services that are accessed and/or delivered via a mobile handheld device (PDA, mobile, cellular or phone, GPS, etc.) based on the interaction/transaction between an organization and a customer'. So, in M-commerce environment, customers participate in the production of service more frequently than before, research on customer participation and their influence to the production and delivery process of service gradually increased (Bendapudi and Leone, 2003^{cclxxiii}; Ennew and Binks, 1999^{cclxxiv}; Hsieh and Yen 2005^{cclxxv}). Consequently, M-commerce become more and more important for retailers to provide a personalized shopping experience to their consumers (Nysveen et al., 2005)^{cclxxvi}.

Figure 14: Extension of word ‘interaction’



Retailers could interact with them by offering more information.

“I need to prepare a dinner for my friends and I had no idea in my mind, so I went to Carrefour with no list at all. I planned to buy the first thing I saw in the food region. But, when I picked up one box of chicken and scan it, there is a recipe of curry chicken which came out. And they even marked the position of every ingredients I need, so I made my shopping quickly and went back home to prepare the dinner.”

“I’d like to take the pictures of what I bought and share it with my friends. I can put it on Facebook, twitter and Instagram.”

“Every time I see my friends share some nice food, I want to go buy it immediately. Maybe I’m so greedy.”

Service production process and manufacturing process are very similar. Therefore, the principle of the management of manufacturing operations with some management experience can be used to manage service processes. However, due to the characteristics of the service, management and operations of services have a different process.

Customers could get satisfied by the quality of the relationship with service person, and to determine the quality of service. Through M-commerce the company can create the interactions with its customers, engage with their value-creating processes and deliver additional resources for their use (Grönroos, 2008^{cclxxvii}; Grönroos and Ravald, 2011^{cclxxviii}).

The purpose of M-commerce is to find customers current and future needs, then design the programs to meet the customer's needs, including mobile services, service delivery methods and experts support. Then try to provide the faster, more comprehensive services to customers with an unprecedented shopping experience. The company is able to interact with customers via a variety of M-commerce that assist customers in their everyday processes beyond the traditional boundaries of food stores (Klabjan and Pei, 2011)^{cclxxix}.

2.3. Perceived Security

Consumers can not perceive its results for any purchase and they all have fear of uncertainty. Therefore, the consumer decision-making implies a dose of uncertainty. Consumer in M-commerce environment will consider economic risks, functional risks, and personal privacy risk. In M-commerce market, consumer's perceived security is the basis for the dissemination and repurchase activities, not only for the trust of both parties to the transaction, but also for the privacy of trading system and security. Privacy protection is one of the conditions that consumers choose M-commerce. At the same time, improving the security of mobile commerce systems is beneficial to consumers and suppliers. Privacy policy will have an impact on the consumer's willingness to act.

Figure 15: Extension of word 'security'



“I don't trust mobile commerce because I have to put all my personal information in it, if they use it in other purpose...”

“I'm a little bit worried about my privacy in this context, I don't know if my personal information is well secured or not. But everything has risk, like visa card. We have to pay attention to protect it by ourselves.”

“Mobile screen is too small so I can't compare different products with it, and I don't want to take my Ipad every day because I live in Marseille, it's very risky to do that.”

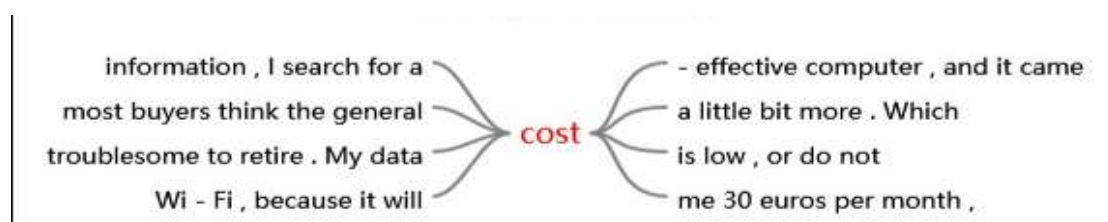
“Mobile screen is also an inconvenient point for me, can't use it as a computer. Sometimes, I need to compare products but it's not very easy to do it with my mobile.For security problem, I think it is ok because iPhone is much better than android system. I'm not worried.”

This research think that the behavior of mobile shoppers depends on their confidence degree in privacy protection and the security of electronic trading systems. And perceived security could influence consumer uncertainty and complexity in electronic market transactions and relationships. Therefore, perceived is defined here as a predictive variable of mobile shopping consumer behavior.

2.4. Perceived cost benefits

Cost includes all costs when consumers are purchasing, such as price, acquisition costs, transportation, Internet fee, installation, ordering, and maintenance or repair costs. In new technology acceptance study, a large number of scholars consider the cost as an important factor that affects consumer's attitude. The study considers that cost must be taken into account when consumers choose M-commerce.

Figure 16: Extension of word 'cast'



“I may not use too much when I don't have Wi-Fi, because it will cost a little bit more.”

“My data cost me 30 euros per month, I think it's expensive”

Figure 17: Extension of word 'price'



“The promotion they sent me is very interesting because they seem to know what I'm looking for. For example, I need to buy a print machine two weeks ago which I searched it a lot for the best price. And then the Carrefour sent me a list of printers with promotion, I was so happy and surprised that I found it this way.”

“The price is maybe the most important for me to use M-commerce. I found one pair of shoes which I really like and very expensive in store, so I decided to search it with my mobile, I found the same thing with a very attractive price and I made the order very quickly.”

“I don't have a car to go for shopping, it's not very convenient to take bus to Carrefour every time. So, I prefer to search and reserve products with my mobile and go get it. That saves me a lot of time.”

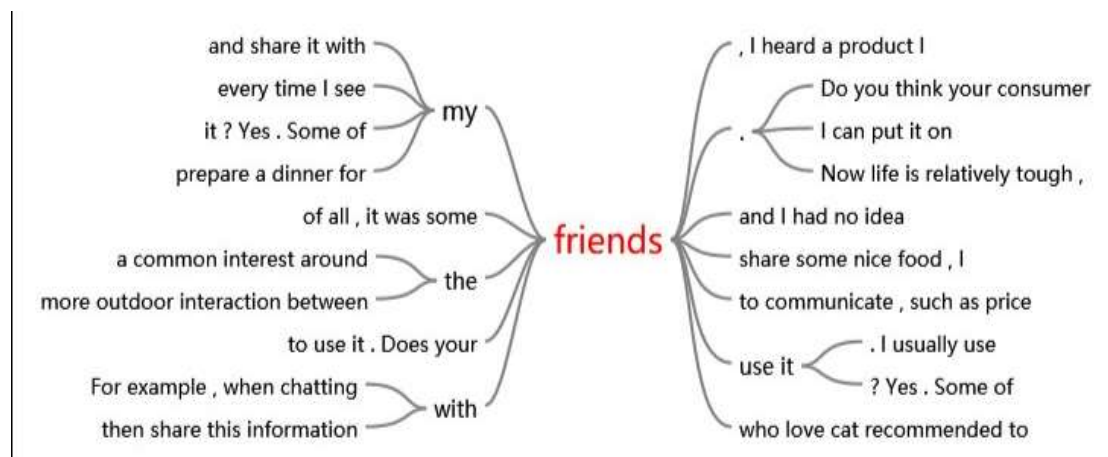
“Of course, price is very important but I don't like to receive too many information every day, it makes me uncomfortable.”

Kim, Chan and Gupta (2007) found that monetary sacrifice negatively affects perceived value and thus, consumer intentions of mobile Internet adoption. Perceived cost benefit of accessing mobile and wireless service has traditionally been higher than that of accessing wire-based Internet (Wang, Lin and Luarn, 2006)^{clxxx}, this suggested that financial considerations, including the cost of Wi-Fi connection, and device price will influence consumer intentions to continue to use M-commerce.

2.5. Psycho social value

Social value refers to the perceived impact of the surrounding groups and the environment. Consumers in the use of mobile commerce are influenced by the impact and pressure from people around (Pedersen, 2001)^{cclxxxix}. In this study, the factor of social influence mainly followed the definition of "subjective norm" in rational theory of behavior, and whether people who think it is important to do it want to engage in this behavior. Our interviewees are mostly impacted by their friends or popularity.

Figure 18: Extension of word ‘friends’



“I’d like to share things with other people, and every time I see my friends share some nice food, I want to go buy it immediately. Maybe I’m so greedy. So I don’t want to make fake evaluation.”

“I’d like to take the pictures of what I bought and share it with my friends. I can put it on Facebook, twitter and Instagram.”

Figure 19: Extension of word ‘popular’



“The frequency is very high. Almost everyone now does not leave their mobile phones. Mobile phones are convenient for our lives, in China no matter what age or social class, we all use it. Children for learning, the use of adults is even more enriched.”

“Of cause, now young people should be keener on mobile consumption. If someone does not it would be very strange”

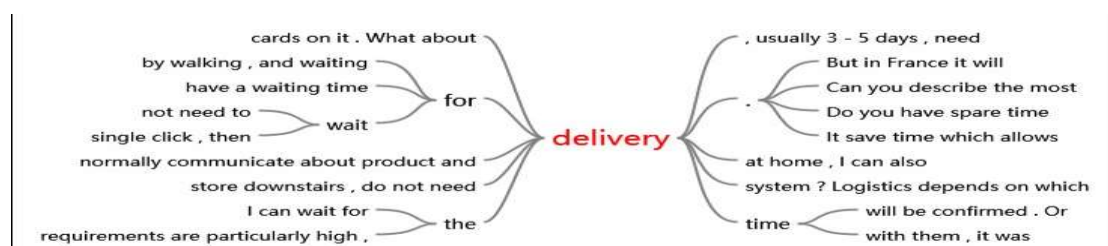
“This is a good question. Very much. Daily use. And the people around me also use it frequently, smart phones in the current Chinese market are quite popular and important.”

For mobile retail, this study suggests that the "psycho social value" should focus on the consumer's herd mentality and the network externalities.

2.6. Perceived service quality

Variety of services is one of the most important predictors in adoption of M-commerce (Yadav, Sharma & Tarhini, 2016).^{cclxxxii} Jun & Palacios (2016)^{cclxxxiii} proposed that diverse mobile application service features is one of the main sources of customer satisfaction for mobile banking business. Although these two factors are not discussed in mobile commerce environment by scholars, but delivery quality and after sales service are two kind of service which are highly mentioned in the interviews. The interviewees were normally satisfied if the delivery was quick and the after sales service was good.

Figure 20: Extension of word ‘delivery’



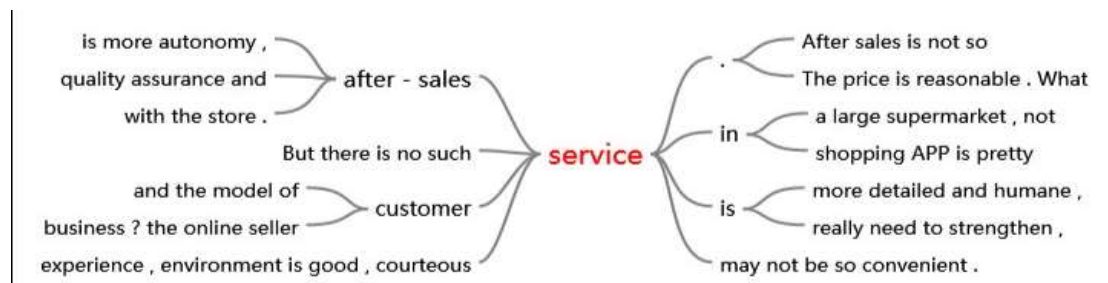
“And after the purchase will have a waiting time for delivery, usually 3-5 days, need more patience compared to the traditional shopping.”

“I cannot immediately get products after the payment, need to wait 2-3 days or more time. And if they broke the products, it will be really complicated to return and change for another one.”

“Like the shoes I just said, from Italy to France took only a week, very fast.”

We could see that if logistic is not efficient, customers are less satisfied. They prefer to get the products just after they paid for them.

Figure 21: Extension of word ‘service’



“Customer services are more patient, but I do not like the machine and the model of customer service. After sales is not so good to do a good job. So, I do not buy large products on the mobile phone platform, after-sales and quality assurance ca not really make consumers satisfied.”

“Yes, I think this may be a mobile inconvenient point. We cannot have face to face communication with the store. After-sales service may not be so convenient. For example, once, I bought a watch with bracelet problem. I called but they said the warranty does not contain the bracelet, but these are not very clear on the app to understand. If I was in the store, I will ask very clearly. I have no way to do that on the app.”

“Mobile phone shopping more flexible, targeted search is more autonomy with a clear purpose, after-sales service is more detailed and humane.”

According to Ahmad, Rahman & Khan (2017)^{cclxxxiv}, customer service is one of the major factors which help in the formation of loyalty.

2.7. Consumers characteristics

Firstly, Consumers characteristic describes the factors influenced customers’ intention of using M-commerce, including age; family situation; salary; culture; mobility and consumer Innovativeness. According to Waarden, Benavent, Castéran (2013)^{cclxxxv}, individual disparities in loyalty likely result from interpersonal heterogeneity, customers have different purchase orientations and should be differently intrinsically

motivated by various rewards that include different perceived benefits. In this part of interview, they mentioned a lot of discount, brand, price, and also enjoyment of mobile shopping. Combined with the factors in literature, we propose age, innovativeness; hedonism; brand loyalty; price sensitiveness and safety sensitiveness as the consumer's characteristics.

2.7.1. M-shopping profile (Age sex, family, Income, etc.)

There are six interviewees above 30 years old, we consider this age as a boundary for age. Five of them use their smart phones to purchase and three of them use retailers' apps. Normally, the older persons use less M-commerce but other variables play also important role. Like family situation: single person has less intention to use M-commerce:

"I don't use regularly apps of supermarkets because I don't need to buy a lot of products. Normally, I buy something I need after work. But I think I will use it after I have a family."

"It's very useful for me because I have a baby and I need to buy a lot of things for him, diaper; food; clothe and so on. That's why I started to search the price with my mobile."

Culture back ground is also very important, there are nine Asians and eleven Europeans, and Asians use more M-commerce than Europeans because they have habit to use smart phones when they were in Asia.

"I think Chinese people are more open for new stuff and the local government encourages the M-commerce from years, but I really think the French people don't like to try something new, it's the spirit of Europe."

2.7.2. Innovativeness

This characteristic appeared also in the interviews: it refers to the degree of acceptance of new things or new ideas by consumers. The adopters are divided into innovators, early adopters, early followers, late followers and laggards (Rogers, 1983)^{ccclxxxvi}. In

mobile business services, innovative consumers are more willing to adopt mobile commerce. Martin & Catalán (2013)^{cclxxxvii} proposed that innovativeness were found to have a positive impact on mobile shopper satisfaction. The study of Lu (2014)^{cclxxxviii} found that among well-educated M-commerce users, user personal innovativeness as measured by perceived usefulness, the determinants of initial adoption, remain as strong determinants of user continuance intention.

“I’m open for new technology and concept, nothing is better than this.

“No, I am not interested every time they said a new business mode, I prefer the traditional way. I can go to store and talk to sellers.”

2.7.3. Hedonism

Li, Dong & Chen (2012)^{cclxxxix} thought that hedonism factors had a positive effect on the consumption experience. Gan & Wang (2017)^{ccxc} also found that hedonism has significant and positive impacts on satisfaction.

“Of course. I am a shopaholic. Often use mobile phone to make consumption, the frequency is extremely high. I’d like to enjoy the shopping time.”

“Of course. Mobile phones can not only shopping, you can also pay telephone fee, electricity, water, etc., very convenient. Mobile phone shopping is definitely my first choice. It makes me feel very happy, I prefer to enjoy this feeling.”

2.7.4. Brand loyalty

Brand has also been mentioned a lot by interviewees: they will pay less attention to the price for their favorite brands. They will use mobile service because of the brand loyalty.

Figure 22: Extension of word ‘brand’



“I am not very sensitive to the price. If I like a brand I will not be affected by the price. I am more inclined to my favorite brand. If the supermarket app can send my favorite brands and products information, I will choose to use this app.”

“Are generally my favorite brands, shopping malls. Chanel, lv and so on. And the shopping platform, Taobao, 58 city and so on.”

“How to say that, I think when I use APP to buy things that I pay more attention to brand. If I immediately need something, for example, I need a pair of slippers, I do not care about brand, I will go to Taobao. But like Carrefour, first, it is not my favorite, nor the most concerned about. In addition, these are also within reach. I do not deliberately use APP”

“Then one day my girlfriend found this brand is discounting on Vente privée APP, she told me to look at it. I found it is really cheap, and it is playing half discount. Then I bought two pieces of clothes through the mobile app.”

2.7.5. Price sensitiveness and safety sensitiveness

“Because the computer is more expensive, so I will spend a lot of time to understand the information, I do not want to waste money, about half an hour to compare information. But if I buy clothes, I will be faster to complete.”

“I will, for example, some products of Taobao will have a price discount by mobile shopping. This will let me abandon the use of computers.”

“Mobile shopping do not need to go out, so save a lot of time. When we do not have much time to go shopping, no time to try, this will be much faster. The price will be cheaper.”

“I do not like to buy things through the phone, I prefer to go to the store for shopping. Because of security problems.”

“In addition to security issues I feel better, last week my phone was invaded. Although I feel it's very easy to use, but I still worry.”

According to the description, some consumers are interested in price or cost of purchasing activities, and some of them pay more attention on security problem. This

will lead to two different kinds of consumer behavior.

With the help of Nvivo, we can find out the details around the key factors after coding. It also helped us to better understand these factors and the story line. In the next part, we will propose the conceptual model, variables and hypothesis.

3. Conceptual model and hypothesis

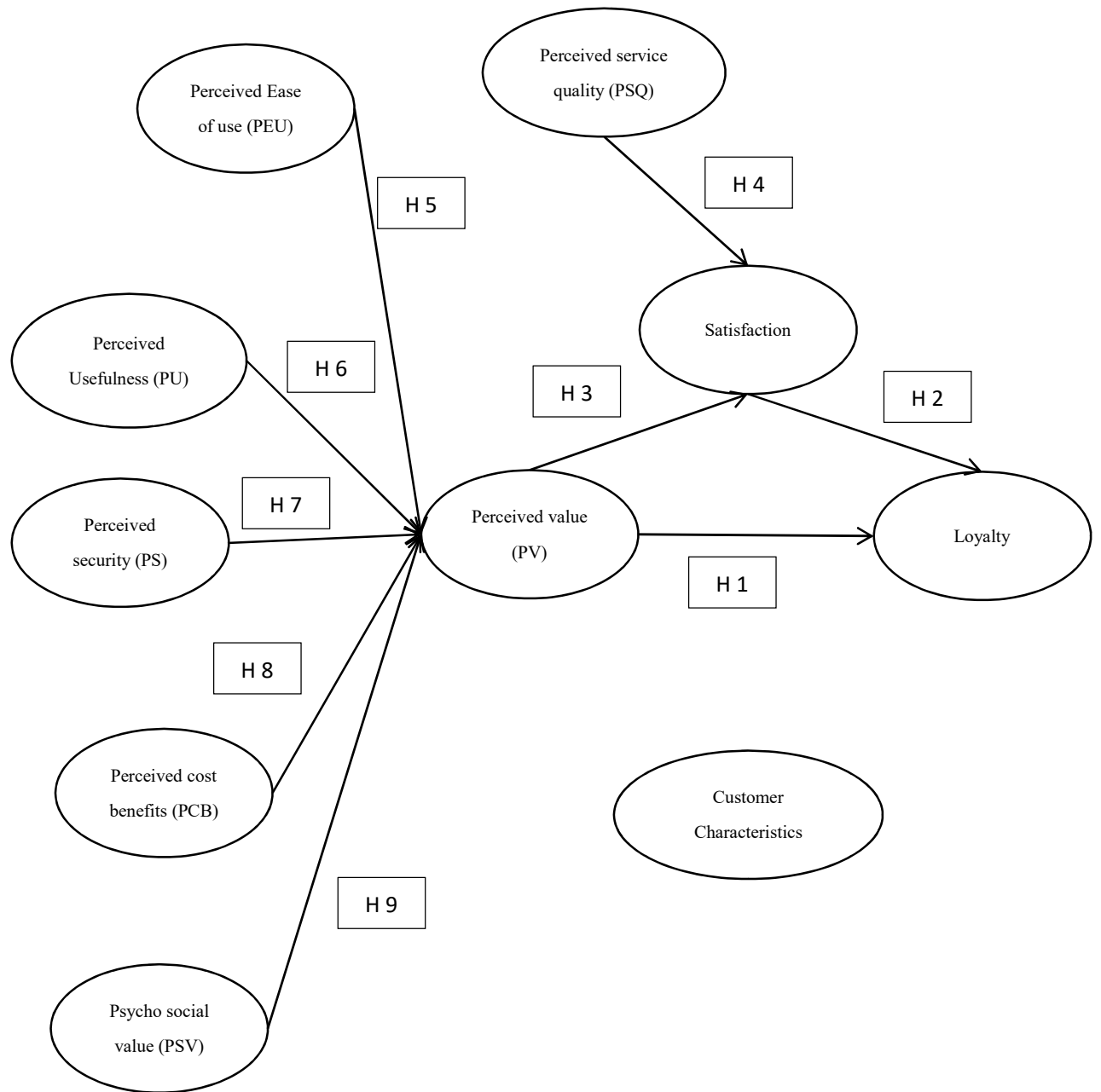
Mobile commerce could be applied to a variety of areas, according to the application field investigation and analysis, this research intends to select the field of retail industry mainly refers to the daily life of consumers frequent shopping, such as shopping malls, supermarkets, convenience stores, restaurants, etc., this study will call mobile business in retail industry: the mobile retail. Select the field of mobile retail research is mainly based on two considerations. On the one hand, the retail field and people's lives are closely related which could bring a lot of convenience to business and consumers. It has a broad application prospects. On the other hand, not so much scholars made research in this field, it is necessary to carry out in-depth study to better guide the practical application of the field. For the mobile retail industry, this chapter will divide business activities into pre-sale - sale - after-sale as three links, in order to consider each link in the mobile business can provide typical services, such as shown in this table 18. On this basis we build research model and hypothesis.

Table 18: Three links of business activities

pre-sale	Advertising and information services
sale	Scanning and payment services
after-sale	Member services

In this part, according to existing research and the result of qualitative research, we combined the characteristics of mobile business services in the retail sector to extract the main factors that affect the consumers continued purchase behavior according to the relevant theories and research conclusions. Based on the construction of Expectation-Confirmation Model of IS Continuance as shown in the figure 23.

Figure 23: Conceptual research model



3.1 Variables definition and research hypothesis

In the second chapter, we divided the influencing factors of mobile commerce consumer's behavior into five types as mobile commerce service provider characteristics, mobile commerce business characteristics, consumers' own characteristics, external environment characteristics and perceived mobile business characteristics. In addition, the characteristics of mobile commerce service providers and the characteristics of mobile commerce business mainly affect the perceived risk of consumer perception. The characteristics of consumers mainly refer to the personal innovativeness of consumers, and the external environment mainly refers to the social impact. Mobile business characteristics include perceived usefulness, perceived ease of use, perceived cost. Therefore, this study puts forward the main factors influencing consumers' willingness to continue purchase in the field of mobile retailing, such as perceived ease of use, perceived usefulness, perceived cost benefits, perceived security, psycho social value, perceived service quality and customer characteristics.

3.1.1 Performance variable: Loyalty

Fishbein & Ajzen (1975)^{ccxc i} pointed out that behavioral intentions (in this research, the behavior of the consumer is the consumer's loyalty to mobile commerce) is the subjective willingness of consumers to continue to use mobile commerce online shopping. The greater the intention of a person's behavior, the greater the odds that he is expected to try something. In this study, the behavioral intention is the result variable as the whole model. The measurement indicators that Blanca et al. (2017)^{ccxc ii} proposed in their study that perceived value contributes significantly to satisfaction. Satisfaction also has a significant effect on loyalty. So, we propose the hypothesis as below:

H1: Mobile channel perceived value positively influences mobile channel loyalty.

H2: Mobile channel satisfaction positively influences mobile channel loyalty.

H3: Mobile channel perceived value positively influences mobile channel satisfaction.

3.1.2 Mediation variable

3.1.2.1 Perceived value

The perceived value of this study is mainly from the customer perspective analysis, that is, the study of CPV (Customer Perceived Value). This concept was originally linked to Kolter & Levy (1969)^{ccxciii} perceived value and satisfaction, and they thought that customer's perceived value determines satisfaction. There are many scholars who put forward their own views on customer perceived value, the most authoritative is that Porter's "competitive advantage": customer perceived value is the customer perceived benefits less customer perceived costs. Later scholars studied from different perspectives on customer perceived value.

In the study of customer perceived value, more than half of scholars used the concept of comparison between perceived gains and perceived losses, and most scholars believed that customer perceived value is a subjective feeling. That is to say, even for the same product service, in the eyes of different people, the perceived benefits and cost are more likely to be different. Therefore, this study defines the customer perceived value: the user comparison between perceived gains and perceived lost.

The perceive value oriented researchers believed that perceived value has a direct influence on behavioral intention. Chen & Dunbinsky (2003)^{ccxciv} analyzing also network environment, put forward the product quality, product price, experience value, perceived risk as four dimensions of customer perceived value, in order to study consumer network purchase intention. Kim et al. (2007)^{ccxcv} set up an Internet technology acceptance model based on customer perceived value on mobile Internet. They suggested that perceived usefulness and perceived interest are the perceived gains of customer perceived value. Lee & Jun (2007)^{ccxcvi} revealed that integrating CPV (contextual perceived value) with CS (customer satisfaction) and TAM in a single model can better explain and predict mobile commerce consumers repurchase intention. Contextual perceived value has a significant effect on consumers repurchase intention and customer satisfaction. Liu et al. (2015)^{ccxcvii} also indicate in their study that

perceived value, personal innovativeness, and coupon proneness positively affect consumers' acceptance of M-coupon applications.

According to literature, no matter from which dimension to study consumer perceived value, their contents are similar. This study also used the two dimensions of perceived gains and perceived loss as the starting point of the study of customer perceived value, and combined the technical Expectation-Confirmation model and the actual situation of mobile shopping to modify the dimension. Perceived usefulness, perceived ease of use as a perceived gain dimension; perceived security, perceived cost benefits as perceived loss.

3.1.2.2 Satisfaction

Consumer satisfaction and loyalty as the focus of consumer research areas, has been studied by scholars and mobile commerce companies. Dong (2003) through the study of intention of behavior to find out: the intention of the customer perceived value and customer satisfaction are two variables which have a greater impact of intention. For the variable which is the direct cause of intention, scholars have an heated discussion, there are two factions, one consider customer satisfaction as the leading, another one consider customer perceived value as the leading.

The customer satisfaction oriented researcher believed that satisfaction is the direct cause of behavior intention. Lapiere et al. (1999)^{ccxcviii} divided perceived value into perceived returns and perceived benefits, where perceived returns are made up of perceived quality, and perceived time costs, real price, perceived price and energy cost. The study confirmed that satisfaction has a direct effect on behavioral intention, and the perceived value has no significant effect on behavioral intention.

There is also a lot of researchers believing that customer satisfaction and perceived value both have a direct impact on behavioral intentions. Most of the empirical studies confirmed that the direct cause of behavior intention is customer perceived value, and customer perceived value will affect customer behavior through satisfaction. That is, the customer first thought shopping is valuable and then feel that the consumption is

satisfactory, and then there will be the intention to continue to consume. Turel et al. studied consumer satisfaction and loyalty by investigating the users of mobile services, that perceived quality and perceived value is the main factor affecting consumer loyalty and satisfaction. Higher satisfaction of consumers make them complain less, they will repeat to purchase and they are more able to bear the high price.

Jimenez, San-Martin & Azuela (2016)^{ccxcix} offered evidence on how trust and satisfaction can increase loyalty and motivate purchases via mobile devices.

3.1.3 Predictive variables

3.1.3.1 Perceived service quality

Lin et al. (2016)^{ccc} proposed service quality framework, consisting of two dimensions (electronic service quality and logistics service quality), in the E-commerce context. The results indicated that E-service quality and logistics service quality are strongly linked to customer satisfaction. As the result of qualitative analysis in our study, these are also influential in mobile commerce.

H4: Mobile channel perceived service quality positively influences mobile channel satisfaction

3.1.3.2 Perceived ease of use

Davis (1989) defined perceived ease of use, which suggested that perceived ease of use refers to which consumers perceive degree of ease of use of mobile commerce services. This is another important factor in the technology acceptance model. Due to the limitations of the mobile device in terms of display, speed and functionality, it increases the complexity to use mobile commerce services. This will make a lot of users prohibitive, even if the perceived usefulness of mobile business services is positive. But they give up to use mobile commerce service because they need to pay more efforts to eventually.

Perceived ease of use has the strongest impact on the user's attitude towards online consumer behavior (Moon & Kim, 2001). Perceived ease of use is also proved in other studies of TAM model (Venkatesh, 2000^{ccci}). According to experience, ease of use of new technology is considered more intuitive and more attractive (Vander Heijden, 2003^{ccci}). In mobile commerce, Luarn & Lin (2005)^{ccci}; also pointed out that perceived ease of use has a certain impact on the use attitude. Thakur & Srivastava (2012)^{ccci} mentioned that ease of use influence positively the usage intention for mobile payment services. The results of Muslim, Sajad & Maryam (2014)^{ccci} show that there is a positive relationship between perceived ease of use mobile users' satisfaction. As familiar, Lee, Tsao & Chang (2015)^{ccci} also proved that perceived ease of use positively affected customer satisfaction. The study of Parijat & Saeed (2016)^{ccci} found that factors like perceived usefulness, perceived ease of use have significant impact on the usage intention of mobile money services. Perceived ease of use had a significant effect on M-commerce adoption (Roy & Moorthi, 2017)^{ccci}. In convenience stores, supermarkets or restaurants, consumers are pursuing simple and convenient mobile business services, the simpler and easier to use the service, the higher the consumer's intention to accept mobile commerce. This study proposed that in the mobile retail sector, the ease of operation of the service will positively affect the perceived usefulness of consumers and their attitudes.

H5: Perceived ease of use positively influences mobile channel perceived value.

3.1.3.3 Perceived usefulness

According to Davis (1989)^{ccci} & Bhattacharjee (2001)^{ccci} definition of the perceived usefulness, we suggest that perceived usefulness is the extent to which consumers perceive the use of mobile commerce services. The Perceived usefulness is the interaction between human and system which brought external benefits that is improvement of job performance (Heijden, 2004)^{ccci}. Moon & Kim (2001)^{ccci} and other research found that if the use of new technology could make users engaged in certain acts to obtain high performance, the use of new technology is more likely.

According to Thakur & Srivastava (2013)^{cccxi}, perceived usefulness is found to be significant dimensions of technology adoption readiness to use mobile commerce. Perceived usefulness is positively related to trust and mobile users' satisfaction (Amin, Rezaei, & Abolghasemi, 2014)^{cccxiv}. Lee, Tsao & Chang (2015)^{cccxv} also proved that perceived usefulness positively affected customer satisfaction. The SEM results of Rajan, Sharma & Tarhini (2016)^{cccxvi} showed that perceived usefulness has significant influence on consumer's intention to adopt M-commerce.

In the technology acceptance model, perceived usefulness is a very important factor that affects the adoption attitude of users. In the context of mobile commerce, the technology acceptance model is widely used, and empirical research proved that perceived usefulness is an important factor influencing the adoption of mobile commerce consumers. The study argues that in the retail sector, mobile commerce, relative to traditional business models or E-business models, can give users the efficiency and convenience of making better shopping decisions that will positively affect consumer's attitude.

H6: Perceived usefulness positively influences mobile channel perceived value.

3.1.3.4 Security

Perceived security refers to the possibility that the service is perceived by the consumer in terms of personal information, account property, and so on. Bauer (1960)^{cccvii} extended psychology, first introduced the concept of risk, that any consumer behavior is likely to produce unpredictable Results, and some of these results may be the cause of consumer's dissatisfaction. Lim (2003)^{cccviii} thought that in E-commerce environment, consumers will consider the risk of technology, vendor and product. Rakhi & Mala, (2014)^{cccix} tested the relationship between perceived risk and usage intention for mobile payments in India that perceived risk negatively affects usage intention. Yang et al. (2015)^{cccxx} defined perceived risk as perceived performance risk, perceived financial risk, and perceived privacy risk which were tested that have strong negative effects on perceived value and acceptance intention. Gan & Wang (2017)^{cccxi}

also proved that perceived risk significantly and negatively affects satisfaction. So, this is an unpredictable Risk. Consumers will try to find a safe way to avoid the risk. In the early stage of mobile retail promotion, consumers are not aware of this new type of business service model, and perceived security will be an important factor affecting their attitude.

H7: Perceived security positively influences mobile channel perceived value.

3.1.3.5 Perceived cost benefits

Perceived cost benefits refer to the level of cost (equipment cost, service cost, etc.) that consumers consider to pay because of the use of mobile commerce services. In the past, there is no perceived cost benefits in more mature information system research. Which is different from the consumer's purchase behavior, for employees are not required to pay. In the context consumers may need to pay a fee for the use of mobile commerce services. Therefore, whether this cost will affect the consumer's attitude to the mobile commerce will need to be further explored. Wu J.H. & Wang S.C. (2005)^{cccxix} argued that perceived costs can have an impact on consumer adoption. The study proposed that higher perceived costs can affect the attitudes and willingness of consumers in the retail sector to use mobile business services. The SEM results of Yadav, Sharma & Tarhini (2016)^{cccxiii} showed that perceived cost has a significant influence on consumer's intention to adopt M-commerce.

H8: Perceived cost benefits positively influence mobile channel perceived value.

3.1.3.6 Perceived social value

Perceived social value refers to the perceived impact of the surrounding groups and the environment. In the current study, the social impact factor is mainly influenced by "subjective norms" definition in Fishbein & Ajzen (1975) rational behavior theory, it refers to people think whether someone important want them to engage in this behavior. The study of Toh et al. (2009)^{cccxiv} revealed that social influence are positively

associated with consumer intention to use of M-commerce in Malaysia. Lu (2014)^{ccccxxv} pointed out that social influence has changed the pattern of influence on continuance intention. Gan & Wang (2017) found that social values has significant and positive impacts on satisfaction and purchase intention.

In view of the specific situation of mobile retail services, combined with previous conclusions on mobile payment research, this study thought that perceived social value affect the perceived value of consumers.

H9: Psycho social value positively influences mobile channel perceived value.

3.1.3.7 Moderator variable: customer characteristics

In many E-commerce framework research, the social demographic characteristics of users are related to their online shopping behavior. Korgaonkar & Wolin (1999)^{ccccxxvi}, Bhatnagar et al. (2000)^{ccccxxvii} argued that accepting the Internet as a business channel and user attitudes towards this system are related to sex and age. And Morganosky & Cude (1999)^{ccccxxviii} argued that education is relevant and Dahlen (2000)^{ccccxxix} also considered it relevant to the profession. In this context, some researchers have shown that the customer's social demographic characteristics affect the motivation of individual online shopping.

3.2 Table of Hypothesis

As result, we propose 9 hypothesis as shown in table 19:

Table 19: Table of hypothesis

H1:	Perceived value positively influences mobile channel loyalty.
H2:	Satisfaction positively influences mobile channel loyalty.
H3:	Perceived value positively influences mobile channel satisfaction.
H4:	Perceived service quality positively influences mobile channel satisfaction.
H5:	Perceived ease of use positively influences mobile channel perceived value.
H6:	Perceived usefulness positively influences mobile channel perceived value.
H7:	Perceived security positively influences mobile channel perceived value.
H8:	Perceived cost benefits positively influence mobile channel perceived value.
H9:	Psycho social value positively influences mobile channel perceived value.

CONCLUSION

This chapter focuses on consumer perceived value of mobile shopping affect the continued use intention, a qualitative research was conducted through the content analysis method which is based on the data of mobile shopping consumer interviews. We try to identify the mechanism and model of how perceived value of mobile commerce effect continued use intention, and obtained the key elements of perceived value, satisfaction and repurchase intention. The first part introduced the three stages of original data coding method and produced Perceived usefulness, Perceived ease of use, Perceived security, Perceived cost benefits, Perceived social value and Delivery perceived quality as main factors, and the main story line of these factors. The second part, we used Nvivo11 software to analyze the content these factors. In the last part, we proposed variables, conceptual model and hypothesis. There is a systematic association between these factors, and a system - related impact mechanism model is formed. The factors in the model can be divided as:

Consumer perceived value contents perceived usefulness, perceived ease of use, perceived security, perceived cost benefits, perceived social value. Consumer satisfaction contents perceived service quality. Consumer perceived value influences consumer satisfaction and continued use intention (loyalty). Consumer satisfaction influences continued use intention (loyalty).

Based on content analysis research methods, this chapter found that the influence of perceived value of mobile shopping on consumer repurchase, consumer satisfaction plays a mediating role in this impact relationship. Previous studies have found that perceived value has an impact on repurchase intention, but how the internal impact mechanism is not clear. Then what is the role between satisfaction; perceived value and repurchase intention, which needs further empirical test and we will introduce in the next chapter.

Chapter 4

QUANTITATIVE RESEARCH METHODOLOGY, RESULTS AND DISCUSSION

Introduction

The purpose of the present chapter is to specify how the conceptual model has been empirically tested. All the methodological aspects have therefore to be explained in detail, before analyzing and discussing the results obtained by this quantitative approach. In order to test the theoretical model and the hypotheses which are introduced in last chapter, we implement a quantitative study in this chapter that includes four parts. Firstly, the methodological aspects of the quantitative analysis is introduced which includes measurement of variables, statistical analysis methodology and questionnaire design. The initial measurement scale is designed based on the previous studies and the semi-directive interviews to design operability of each variable. Then, we present the results of the analysis. Which includes the scale purification, the measurement model and the structural model. After these, the group comparisons are implemented. All of the empirical processes in this chapter are done with Smart SPL 3 software.

1. Methodological aspects of the quantitative analysis

In order to test the theoretical model defined in the previous chapter, some empirical research methodologies have been used that are presented here. We first describe how were measured the variables interacting in the model: all are latent variables that cannot be measured by a single question. We then present the quantitative methods used for the analysis and why they were chosen. In a third step we introduce the way the questionnaire is designed and submitted to consumers in the aim of collecting a sufficient number of answers. The characteristics of the sample constituted by the persons having answered the questionnaire are then described, closing the methodological part of this chapter.

1.1 Variable measurement

The questionnaire must measure and set variables which are relevant with the research questions and are taken into account by the conceptual model. The factors that affect consumer loyalty to mobile commerce have therefore to be included in the measured items. Churchill (1979)^{ccccxx} proposed four main principles for scale development:

- Scale development needs to be based on the correct concept;
- Representative questions should be selected from the literature;
- Multiple observation variables should be used to measure a latent variable;
- Items used for measures must be accepted by reliability and validity tests.

The questions used for variable measurement (items) must be easily understood by the interviewees. This not only means that they cannot be ambiguous, but also that they must not mix separate concepts. Furthermore, in order to get accurate survey data, respondents should be in condition to fully express their true meanings: this implies to make sure that the questionnaire is easy to fill and doesn't require a too long time to be answered. In order to ensure the accuracy and validity of the measured data, every time it was possible, we used scales that had been proven as satisfactory by previous studies. However we made limited adjustments in order to better fit with to the specific context

of retail mobile shopping experience according to the information gained from the semi-structured interviews. A pre-test was conducted to ensure that the queries are easy to understand without ambiguity, and allow a smooth investigation.

The variables to be measured are numerous and encompass: perceived ease of use (PEU), perceived usefulness (PU), confidence (CONF), perceived cost advantage (PCA), perceived social value (PSV), Perceived service quality (PDQ), perceived value (PV), Satisfaction (SAT), loyalty (LOY) and some others enabling an approach of the customer's characteristics. All these variables don't play the same role in the conceptual model we want to test here: The performance variable (customer loyalty to mobile channel for shopping duties) is used as the target variable that seeks to explain, as best as possible. Two other variables (satisfaction and perceived value) are kind of syntheses the consumers are supposed to build in their mind. These clear synthetic abbreviated assessments play a mediating role between numerous predictive variables and the future intent to use mobile channel again. It's a key point for the quality of the model that these three latent variables are measured in a satisfactory way. Their measurement is presented first, followed by the six predictive variables identified that should, more or less, determine the target variable. The customer's profile (age, gender etc., but also individual preference for innovation or for security) may also exert some influence but in a different way: Some relations in the model may be altered in a sense or in another by a specific profile: these variables can play a moderating role.

1.1.1 The target variable: loyalty toward mobile channel for shopping duties

Fishbein & Ajzen (1975)^{ccxxxi} pointed out that behavioral intentions are the subjective willingness of consumers to continue to use a specific service, product or trademark. In the context of our research, behavioral intentions can be named as the consumers' loyalty to mobile commerce, in other words, their intent to continue to use mobile devices and online services for and when shopping. Use continuance of mobile commerce (Loyalty) refers to the willingness to judge the future usage after an initial

transaction in a mobile shopping environment. The measure of re-purchase intention also produces a well representative measure of loyalty. Parasuraman *et al.* (2005)^{cccxixii} proposed a measure of the willingness to repurchase, which includes five aspects: will continue to shop there (or that way) in future; will give priority to this site (or way for shopping); will share opinions on the advantages it offers; will recommend the use to friends and family, will encourage others to buy. Chiu *et al.* (2014)^{cccxixiii} used a more simple (3 items) scale to measure online shopping repurchasing willingness: continue to choose the site in the future; plans to continue to buy on the site; the site as the first choice in the future. The items are shown as in table 20. Loy 1 and Loy 3 are from Parasuraman *et al.* (2005); Loy 2 is from Chiu *et al.* (2014). Our own qualitative interviews provide a qualitative analysis of the mobile commerce consumer interview information. When the user feels that the shopping site is trustworthy, it will often produce a repeated purchase intention, with sentences such as "good product, logistics fast, and a pleasant shopping experience. Buy!" Users feel that the product is good, will increase their amount for shopping, such as "I will use more my mobile phone for shopping, I will purchase more in future." Loy 4 is captured from our own qualitative study.

Table 20: Items measuring the loyalty toward mobile channel for shopping duties

Code	Item
Loy1	In future, I will warmly recommend other people to use their mobile for shopping
Loy2	In future, I will surely continue to purchase via my mobile
Loy3	In future, I will certainly use more and more my mobile for shopping
Loy4	In future, I will certainly increase the amount spent <i>via</i> mobile shopping

1.1.2 Mediation variables

The conceptual model proposed in chapter 3 displays two variables that play a mediating role between the target performance variable (consumer's loyalty) and the predictive variables. These two mediators are supposed to be considered by the consumer after any buying experience and she/he uses this assessment when taking new

purchase decisions. Consumer's satisfaction with a purchase experience and the perceived value of a specific purchase are commonly referred in marketing research as playing an important part in the consumers' further behavior.

1.1.2.1 Mobile channel Satisfaction

Satisfaction is an emotional response that users produce after a purchase experience. The whole process of purchase is considered and assessed, combining the subjectively perceived emotional states (including positive and negative emotional experiences), and taking into account the output of the process. In mobile shopping process, when the merchandise's products or services met or exceed the user's expectations, the shopping will give users a sense of satisfaction, bring users happy and generate a positive satisfaction. On the opposite when the user encountered unresolved issues during a shopping process, it will produce unpleasant negative emotional experience.

The measurement of after purchase satisfaction is a very classical question in marketing studies and the relevant researches are very numerous. Olivier (1980)^{cccxixiv}, Bhattacharjee (2001)^{cccxv} and Vijayarathy (2004)^{cccxvi} are among the most representative studies published on the question. They stress the multiple dimensions to be taken into account when measuring a consumer's satisfaction: Satisfaction can be directly measured by asking the respondent to quote his/her level of satisfaction. Another indirect approach consists in asking an assessment of the decision which conducted to the purchase: was it a wise choice?

At last, the emotional aspect can be measured by evaluating the pleasure associated with the purchase. The present study draws on the mature scales found in the literature and adapted to the characteristics of mobile commerce defining four measurement items, the specific initial measurement scale as shown in the table 21. Sat 3 was adapted from Olivier (1980); Sat 4 is adapted from Bhattacharjee (2001); Sat 1 and Sat 2 are adapted from the work of Vijayarathy (2004).

Table 21: Items measuring the satisfaction toward mobile channel loyalty

Code	Item
Sat1	I truly find pleasure in using my mobile for shopping
Sat2	When I use my mobile for shopping, I obtain what I'm looking for
Sat3	I made a wise choice when I decided to use my mobile for shopping
Sat4	On the whole, how satisfied do you feel with purchasing <i>via</i> your mobile devices?

1.1.2.2 Mobile channel Perceived value

This research defined the consumer perceived value as: consumers use mobile retail shopping Apps to browse, and purchase the goods throughout the process of a comprehensive evaluation and inner feelings. PVAL 1 is captured from our qualitative research. PVal 2 is from the work of Sweeney, Soutar & Johnson (1997)^{cccxvii}, they studied the antecedents of customer perceived value and the influence of customer perceived value on consumer purchase intention in the field of electronic devices, and found that customer perceived value has significant effect on consumer purchase intention. PVal 4 is adapted from Bourdeau et al. (2002)^{cccxviii} who proposed five dimensions according to network environment: utilitarian value, learning value, purchasing value, hedonistic value and social value. PVal 3 and PVal5 are adapted from Kim et al. (2013)^{cccxix}, they built a mobile Internet technology acceptance model based on customer perceived value. He proposed that perceived usefulness and perceived interest are perceived benefit of customer perceived value, while specialization perceived price are perceived cost of customer perceived value.

Table 22: Items measuring the perceived value toward mobile channel loyalty

Code	Item
PVal 1	It is valuable to use mobile device for shopping
PVal 2	Purchasing <i>via</i> mobile is worth it, even if it costs a bit more
PVal 3	I would accept to pay a little more on internet fee, so I can freely shop with my mobile
PVal 4	It is worth to spend some time learning how to use a mobile for shopping duties
PVal 5	Buying a better mobile device for shopping is worth it, even if it is costs some more

1.1.3 Predictive variables

Numerous variables have been identified as playing an important role in the adoption of an innovation by consumers. Different fields are concerned by these predictive variables. When adopting an innovation the consumer assesses first its usefulness but the new offer has also to be easy to use: complicated systems will dissuade most consumers. Following the same idea, quality of delivery is another point taken into account. A specific facet of usefulness can also be found in the cost advantages an innovation may generate. At last, many consumers give a huge importance to the way they are perceived by others and the social value of using an innovative service can be another driver for adoption. However, all these attractive factors will entail no adoption if the consumer feels unsecure. The perceived risk variable can be measured through the degree at which the consumer is confident to the mobile system and its applications. These six dimensions have been retained as six latent variables measuring how the consumer perceives the mobile use for shopping, taking each point of view: Perceived usefulness, perceived ease of use, Perceived service quality, perceived cost advantages, perceived social value and perceived security of the process.

1.1.3.1 Perceived usefulness (PU)

In mobile commerce, users can not personally experience the product, this purchase feature will enable users to have more questions, when the user has a problem will be resolved through customer service, user evaluation offered the reference for the other consumers to buy, but also allowed users to present a real view of products and services. Mobile shopping interactive experience refers that in the whole mobile shopping process, the interaction between users and customer service and other service personnel, users and users and the psychological feelings, emphasizing the convenience of interaction, timeliness and efficiency. Comp 1, Comp 2 and Inst 2 are adapted from Hsu et al. (2006)^{cccxi}. Inst 3 and Tspar 2 are from Hong, Thong & Tam (2006)^{cccxi}. Inst 1, Inter 1, Tspar 1 are captured from interviews.

Table 23: Items measuring the perceived usefulness

Code	Item
Comp 1	With my mobile phone, it's easier to compare the prices of different shops
Comp 2	With my mobile phone, I'm always informed of the best price offers
Inst 1	With my mobile phone, I find it easier to find the nearest store
Inst 2	With my mobile phone, I find more easily all the information I need about the products or services I want to buy
Inst 3	When shopping with my mobile phone, I get the right information at the right time
Inter 1	Technical problems can be rapidly solved by the customer service via my mobile device
Inter 2	With my mobile, I have a direct access to the retailer's customer service
Tspar 1	With mobile shopping you never have to queue
Tspar 2	Using a mobile for shopping spares much of your time

1.1.3.2 Perceived ease of use (PEU)

In this study, we designed the questionnaire items for ease of use, which is based on Davis (1989)^{cccxliii}, and its reliability coefficient of perceived ease of use is 0.94, which is highly consistent and reliable. And, this research refers to the improvement of the scale by reference to Flex 3, Flex 4, are adapted from Hsu et al. (2006). Although the ease of use belongs to the perception of the use complexity, but this study is based on predecessors to set positive topics, combined with the actual situation of mobile phone shopping to improve the scale. Conn 1, Conn 2, Perso 1 and Func 1 are adapted from Kim, Chan & Gupta (2007). Flex 1, Perso 2, and Func 3 are adapted from the work of Parasuraman *et al.* (2005). And Flex 2, Conn 3, Perso 3, Func 2 are captured from interviews.

Table 24: Items measuring the perceived ease of use

Code	Item
Flex 1	With my mobile device I can visit the websites or use the apps at anytime and anywhere
Flex 2	With my mobile device I can order or purchase even when I'm travelling
Flex 3	The apps I have in my mobile are very easy to download and unload
Flex 4	My mobile device gives access to a very large range of shops and services
Conn 1	The connection from my mobile to Internet is quick
Conn 2	Anytime I need it, I always find a good Wi-Fi connection for my mobile
Conn 3	In case of no Wi-Fi connection, I can always be connected through other affordable networks
Perso 1	The web sites or apps introduce me directly to the right product or service
Perso 2	The web sites or apps narrowly fit with my personal shopping habits
Perso 3	The web sites or apps provide me with special offers or information selected for me
Func 1	The functions of apps I have in my mobile are very easy to use
Func 2	My mobile device offers many function that are useful for shopping
Func 3	It is very easy to pay with my mobile device

1.1.3.3 Perceived service quality (PSQ)

Perceived service quality is mentioned a lot in our interviews, but there is no attention paid by other researches. Seemingly this dimension is really important for consumers to receive a better mobile shopping experience. Logist 1, Logist 2 are adapted from Chiu et al. (2014) and AfterS are captured from the interviews.

Table 25: Items measuring the Perceived service quality

Code	Item
Logist 1	The products or services I order via my mobile are delivered without delay
Logist 2	The products I order via my mobile are in good condition when delivered
AfterS	After sales quality makes me feel satisfied of mobile shopping

1.1.3.4 Perceived cost advantage (PCA)

Cost advantage refers to the research for fair prices or good bargains by which many consumers are driven. For the measurement of money prices and money costs, existing research has both a measurement of individual indicators and a measurement of multiple measurement questions (Hung, Ku & Chang, 2003)^{cccxliv}. According to Nunnally (1978)^{cccxlv}, this study will use three or more indicators to measure the variable. Therefore, this study draws on the measurement of product service price, Price 1 and Price 2 are from the work of Petrick (2002)^{cccxlv}. Kim, Chan & Gupta (2007)^{cccxlv} presented value-based adoption of mobile internet with an empirical test, and DeviPr, MonBen and ConnPr are adapted from it.

Table 26: Items measuring the perceived cost advantage

Code	Item
Price 1	The prices of products or services I can buy via my mobile are attractive
Price 2	When using my mobile for shopping, I can benefit better bargain offers
DeviPr	Mobile devices are not so expensive to buy, considering all the services they provide
ConnPr	Mobile shopping allows to make better use of connection costs
MonBen	On the whole, purchasing with your mobile allows to better spend your money

1.1.3.5 Perceived social value (PSV)

Perceived social value is mainly to consider the impact of the surrounding groups of consumers on its infinite effect on the measurement of interpersonal effects. Image 1, Image 3 are adapted from the work of Petrick (2002). Fash 1 and Fash 2 are from Pedersen (2003)^{cccxlvi} measurement questions. And Ident, Image 2 are captured from interviews.

Table 27: Items measuring the perceived social value

Code	Item
Image 1	Using a mobile for shopping gives a good reputation
Image 2	You will be considered as innovative if you use a mobile for shopping
Image 3	Using your mobile for shopping brings you some admiration
Ident	Shopping with a mobile says what person you are
Fash 1	Using mobile devices for shopping is a modern behavior
Fash 2	Most of my friends do use their mobile for shopping duties

1.1.3.6 Confidence (CONF)

Perceived security (PS) was thus renamed as Perceived “Confidence”. This variable refers to the confidence of the users in mobile commerce, is the degree of trust that users have responsibility, integrity and benevolence of the mobile shopping operator. To ensure the quality of products or services is the basic responsibility of mobile shopping operators, integrity and benevolence are required to deal with mobile operators to treat users, do not disclose the user's information to ensure that users in the site shopping is safe and doesn't cause any worry. Murray & Schlacter (1990)^{cccxlvi} pointed out that perceived risk is a subjective expectation and judgment of consumers on the various risks that may arise in the use of mobile commerce.

Conf 2 is from Jarvenpaa & Todd (1996)^{cccxlvi}; Conf 3 and Conf 5 are from Vijayasathy & Jones (2000)^{ccccl} concluded that perceived risk is used as an indicator of behavioral intention. Perceptual risk is used as a predictor of the model in the whole

model, reflecting the individual's psychological risk perception impact the adoption of mobile commerce online shopping attitude and intention. Privac, Paym 1 and Paym 2 are adapted from the work of Parasuraman *et al.* (2005). Conf 1 and Conf 4 are from Gefen *et al.* (2003)^{cccli} which pointed out that the user's trust in the network mainly includes the following aspects: the network business is honest; concerned about the user; will provide quality services; purchase and expectations are the same; will not use opportunistic behavior. Repu and Resume are from interviews.

Table 28: Items measuring the confidence

Code	Item
Conf 1	My mobile connection to Internet is well secured
Conf 2	The products sold via mobile apps are strictly the same as in the store
Conf 3	With my mobile I get exact information about what service will be delivered
Conf 4	The websites or apps I use for shopping from my mobile are really reliable
Conf 5	The web site or apps are well adapted for mobile devices
Repu	In order to assess the websites or apps, one can rely on users evaluations
Privac	When I use my mobile for shopping, my personal information is safe
Paym 1	The payment systems I use with my mobile are really trustworthy
Paym 2	When I use my mobile for shopping, my transaction information will not be spread to other people
Resume	In case of connection disruption, it will be easy to resume my shopping process later on

1.1.4 Moderator variables: customer characteristics

Waarden, Benavent & Casteran (2013)^{ccclii} made a research on how different purchase orientations influence the perceived loyalty programs, they proposed different type of rewards and their effects on customers' perceived loyalty. They defined different rewards as: economical, hedonist, social-relational, apathetic and brand/loyal. This research reminds us to establish the moderator variables and the items of measurement in our thesis. According to the literature and qualitative research in previous chapter, we propose that M-shopping customers' profile include: Innovativeness; Hedonism; Price sensitivity and Brand sensitivity. Consumer innovation is the extent to which an

individual is using or accepting a new product or new technology relative to other people in his or her social environment, and is actually the degree of acceptance of new things by consumers. In this study, with reference to the existing literature and in the overall model, consumer innovation is a moderator variable, the reaction of users on new products, new technology and personal ability to control mobile commerce loyalty. Innova, Hedoni and Price sensitivity are adapted from Waarden, Benavent & Casteran (2013). Brand sensitivity is captured from interviews.

Table 29: Items measuring the perceived customer characteristics

Code	Item
Innova	When I see something new in my shopping environment, I want to try it as soon as possible
Hedoni	Enjoying what I am doing is very important to me, even when shopping
Price sensitivity	I would feel deeply disappointed after a purchase, if I discover I could have got it at a better price
Brand sensitivity	I generally prefer choosing a brand I like than trying a new one

1.2 Statistical analysis methodology

This research uses Partial Least Squares (PLS) path modeling for Structural Equation Model (SEM) to test the hypotheses. This is an analytical technique to detect or construct predictive models. According to Pirouz (2010)^{cccliii}, the PLS-SEM method offers numerous advantages:

- It can handle multiple dependent variables and multiple independent variables;
- It can overcome the problem of multivariate co-linearity;
- It robustly handle interference data and lost values;
- It optimizes the predictive ability of input observed variables for latent variables;
- It can handle both reflective and formative indicators;
- It may apply to small samples;
- Results are not affected by limitations due to non-normal data distribution.

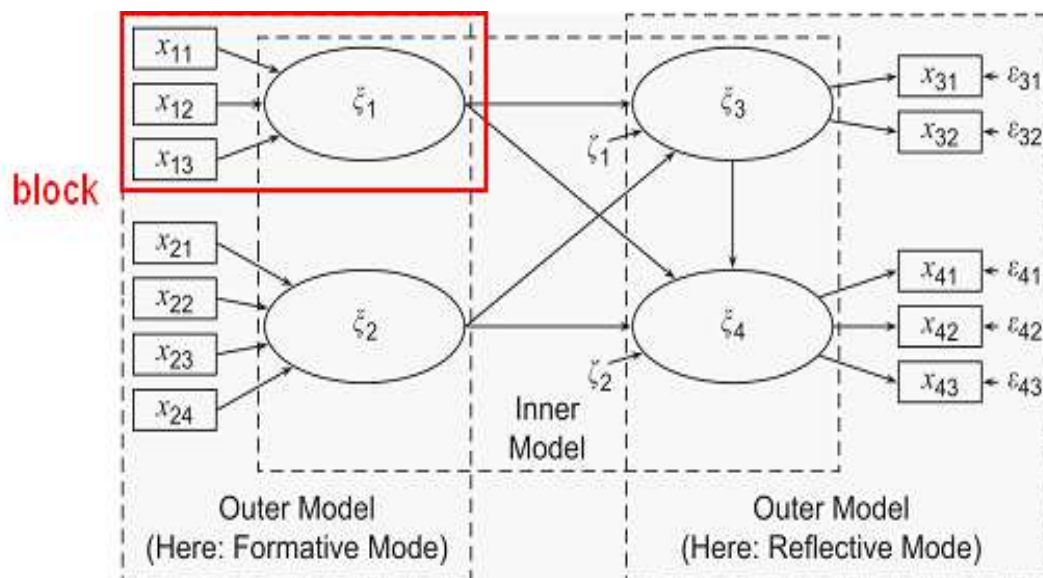
Since there are not many samples in this study, PLS has good ability of prediction and interpretation. For the present research, the PLS analysis was performed using the Smart-PLS3 software developed by Ringle, C. M., Wende, S., and Becker, J.-M. (2015)^{cccliv}.

1.2.1 The PLS approach for path modeling

PLS calculation method is based on the delimitation of "Blocks" into the structural model: Each "Block" consists in one latent variable and the observed items enabling it to be measured as shown in figure 24. The PLS method calculates one block after another.

In the diagram, a construct (figured by an ellipse) and the observed items that reflect its abstract concept (figured by rectangles) build a block. PLS estimates the load factor of item loadings and path coefficients through an iterative calculation of multiple blocks. Two types of block are figured, one according to the formative mode, and the other to the reflective mode. In formative blocks one can say that the items refer to the construct, when in reflective blocks it is the construct that refers to the items. (Diamantopoulos & Sigauw, 2006)^{ccclv}

Figure 24: Path modeling using reflective and formative measures for latent variables



Formative mode is suitable when each item is contributing to the construct, which means that these items, put together, build an abstract concept. But they are not interchangeable and don't necessarily share a common theme. The items could have any pattern of inter-correlation but should possess the same sort of directional relationships.

With the reflective mode, the items are direct observable consequences of the construct. These consequences can be easily directly measured, which is not the case of the construct. The conceptual domain of the construct does not change by adding or deleting an item. All the items in the reflective mode should be highly inter-correlated as they share a same driver. In the present research, all the items used were conceived as consequences of the latent variables. Therefore, we will not give more detail on how the coefficients are calculated in a formative mode.

The PLS method separates the outer model (called the measurement model) from the inner model (called the structural model). The estimated coefficients do not play the same role nor have the same meanings in the two models: the measurement model consists in the block analysis which determines how the latent variables are measured by the observed items PLS calculates the factor loading (or weight in a formative context) for each item. The structural model estimates the path coefficients between the latent variables, determining so the degree of influence from a construct to another. It enables so the corresponding hypotheses to be tested. To complete the structural equation model analysis requires to be operated in two successive steps. The first step is to verify the acceptability of the measurement model, block by block and then all together. During the second step, the structural model is tested; in other words, it will be verified if the hypotheses are supported or not by the data. This step should not be conducted if the measurement model is not fully accepted, because invalid measures could entail erroneous interpretations.

1.2.2 The quality tests for the measurement model

The items are questions answered by the respondents. They were chosen in order to measure the different variables retained in the conceptual model. However, it is of paramount importance to verify if they effectively present good psychometric properties. Various tests exist that allow assessing reliability and validity of their use as measuring scales. These tests are conducted block by block. Furthermore, even if all these tests prove to be satisfactory, the risk exists that some items, used into a block in order to measure a specific variable, would have also been suitable for measuring another one. Therefore the discriminant validity of the whole model has to be evaluated in order to be sure that the different constructs are measured as effectively different variables.

Reliability refers to the consistency and the stability of the scale. The internal consistency is usually by indexes such as the Cronbach's alpha or the rho, composite reliability index. The PLS-SEM software used computes both of them. The higher the value of the index, the more consistent and reliable can be considered the scale. In general, when the Cronbach's alpha coefficient is greater than 0.7, the scale is judged as highly reliable, while a 0.9 (or more) value characterizes the best reliability levels for a scale. If Rho value is greater than 0.7 the scale is well reliable and consistent.

Validity refers to the degree to which a measurement tool can accurately measure what needs to be measured. It reflects the following question: is a scale appropriate to measure what it is intended to? Validity is generally divided into three types: content validity, Criterion-related Validity and Construct Validity. The content validity is considered to be satisfactory when the measurement variables come from the existing literature and have been empirically tested many times. The criterion related validity refers to the degree to which an item is related to the construct it is aimed to measure. A good idea can be obtained by looking at the variance extracted when estimating a construct. It is commonly stated that, in average, it should be greater than 0.5. Actually, a lower value of the AVE (average variance extracted) indicates a construct that excludes more than the half of the total variance of the items used for its measure: in

such a case, convergence of the items with the construct is too low to be accepted.

The construct validity assesses the extent to which a construct effectively measures the concept it is aimed to. When latent variables are measured, it is quite difficult to build statistical indicators estimating if the measured construct accurately follows the latent concept. However, it is useful to verify that the blocks are the most effective to measure separate concepts or, at least, that the different constructs are well discriminated by the items used. This rejoins the discriminant validity measure.

Discriminant validity is assessed by comparing the amount of information extracted from the individual items inside a block with all other correlations that can be observed between the blocks. The purpose is to detect items which could well have been used for measuring another construct than the one they were intended to. The cross-loadings table can be used therefore, but a more synthetic analyze can be sufficient: for each construct, the level of its squared correlations with other constructs should be lower than the average variance extracted from the items when measuring it. In other words, the consistency of its items must be stronger than the relationships with other constructs. If not, cross-loadings analyzes will reveal that some items should be deleted, because their belonging to only one block could be questioned.

1.2.3 Methods for assessing the structural model quality

Once a model and all its coefficients have been estimated using specific optimization criteria, the question arises of its quality or explaining power. For structural equations models, the classic approach divides randomly the sample into two parts, one for estimating the measurement model and the other for confirming the structural relationships. Due to this double sample approach, numerous “goodness of fit” indexes can be calculated, observing the predictive power of the model estimated with one sample when applied to the other one. The PLS method accepts smaller samples, but most classical global quality indexes cannot be calculated. Nevertheless goodness of fit (GoF) indexes are available that are specific to the PLS method. Each coefficient is estimated the same way, but the analyst needs to have an idea of how precise it is. PLS-

SEM approaches offer a specific method in order to assess the precision of the estimated coefficients: the bootstrap technique. At last, another field of assessment can be found in the test of the indirect effects: most structural models display mediator variables (as it is the case here) and it is worth to verify if these variables effectively play such a role.

1.2.3.1 Overall quality indexes

Tenenhaus et al. (2004)^{ccclvi} suggested that the GoF can be considered as a means to validate an overall PLS path model. The PLS approach does not aim to optimize a global scalar function, so there is no overall index of model validation (Tenenhaus et al., 2005)^{ccclvii}. However the decisive factor R^2 (also known as the coefficient of determination) can be used. This supposes that the whole model converge in explaining a target variable. The R^2 is commonly analysed as the share of the variance of the target variable that is explained by the model. It ranges from 0 to 1 (100 percent). The closer the value of R^2 is to 1, the better the model explains the target variable. Inversely, the smaller the value of R^2 , the poorer the fit of the regression lines to the explained variable.

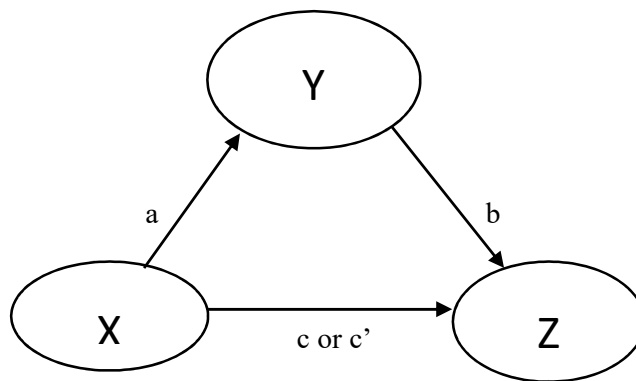
1.2.3.2 Bootstrap technique for estimating coefficients precision

When the sample size is not large enough, or when other samples are not available, the accuracy of the estimated coefficients can be evaluated by using the bootstrap technique. This method is integrated in most PLS-SEM software. It generates a large number (5,000 in the present research) of alternative samples by deleting and adding randomly respondents from the original data collected. The stability of the estimates can therefore be calculated, giving a mean value and a standard deviation for each one. If an estimate presents a 95% confidence interval which includes de zero value, one can conclude that the value which was directly estimated from the original sample cannot be considered as significantly differing from zero and the null hypothesis cannot be rejected. This occurs if the data contains too many respondents obeying to opposite logics concerning the relationship that is estimated.

1.2.3.3 Tests of indirect effects

In this research, the conceptual model contains direct and indirect relationships between the explanatory variables and variables to explain. According to Baron and Kenny (1986)^{ccclviii}, a variable can act as a mediator to the degree that it reflects the relationship between an independent variable and a dependent variable. Depending on the complexity of the model mediation can be simple (one step) or multiple (chain). Preacher & Hayes (2008)^{ccclix} propose a computing tool which calculates the coefficients enabling to state if mediation exists and then how important it is for the targeted variable. Figure 25: Coefficient c of the direct relation between X and Z without the control of the mediator Y

Figure 25: Analyzing the mediation effect



In order to test the existence of a mediation relationship, researchers need to compare the coefficient c of the direct relation between X and Z without the control of the mediator Y and c' which is the same coefficient under control of the mediator Y . If the two coefficients c and c' are the same, (that is $c - c' = 0$), the mediating effect of Y doesn't exist. On the opposite, mediation of Y is said to be total when the direct effect disappears under the control of the mediator ($c' = 0$, with $c \neq 0$). In this research we verify the intermediary role of mediators by using the tool proposed by Smart-PLS 3.0 path analysis. Bootstrap method allows checking if the coefficient c differs in a significant manner from c' . Calculation is made for each mediation chain in the model.

1.3 Questionnaire design, survey process and data preparation

After the introduction of variable measurement and statistic method of our research, we will introduce the method of questionnaire design and release based on two parts. First, the scale and the content of questionnaire is introduced, and a pre-test is developed immediately. Second, we explained how the data is collected and prepared.

1.3.1 Questionnaire design and pre-test

The initial measurement scale was designed based on the previous studies and on the semi-directive interviews conducted to verify the operability of each variable. Each item found in the literature had to be adapted the more precisely possible to the specific context of the mobile shopping. Consequently, the initial design of the mobile commerce questionnaire was submitted to a small sample of twelve consumers in order to verify if all questions and items could be easily understood and answered. The purpose of this pre-testing of the questionnaire was also to detect if some items had to be changed or deleted. The specific method is to ask the respondents to judge and determine the reliability and accuracy of each item. Furthermore, well balanced items should also produce widely spread answers, from “Strongly disagree” to “Strongly agree”: items presenting answers only on one side of the agreement scale should be eliminated from the questionnaire, or revised in order to give more balanced measures. Chiu et al. (2013) pointed out that the respondents must have had online shopping activities in the past six months, otherwise it will affect the customer's real thoughts, affecting the authenticity of the questionnaire. Therefore, this research set up a corresponding statement at the very beginning of questionnaire, inviting people not to answer if they have made no mobile phone shopping during the past six months.

Nowadays, a lot of different retail mobile shopping applications (apps) and sites exists. Each one is used and preferred by different users or user groups according to their specific needs and preferences. Our conceptual frame discusses the attitudes and behaviors of consumers using mobile devices for shopping duties. Therefore the

questionnaire aims at capturing opinions of users of mobile shopping in general and not concerning a specific retail mobile shopping application. This, of course, increases heterogeneity of answers, but it also allows users to fully express their feelings about the retail shopping app they like. The collected data will so give a comprehensive sight on this new behavior.

The data collected by the questionnaire can be divided into 12 parts: the first part is designed to describe the user's shopping habits with her/his mobile device (shopping time, product category and number of mobile apps). Parts 2 to 7 are devoted to measure 6 independent variables, including: perceived usefulness (PU); perceived ease of use (PEU); Perceived service quality (PDQ); perceived cost advantages (PCA); perceived social value (PSV) and confidence level (CL) in mobile shopping. Parts 8 and 9 are dedicated to the measure of two mediator variables: Satisfaction (Satis) and perceived value (PV) of the mobile shopping. The result variable (loyalty to the mobile shopping = LOY) constitutes the part 10. Part 11 and 12 measure control variables which characterize each respondent: part 11 tries to better know her/his profile as a consumer (degree of personal innovation acceptance; hedonism; brand loyalty; price or security sensitiveness). At last, part 12 collects the basic personal information of respondents (gender, age, education, family size, occupation, monthly income, frequency of mobile shopping use and average amount expended).

The latent character of a variable implies that it cannot be directly measured in a satisfactory way. Nunnally (1978) pointed out that at least 3 measurement questions are necessary in order to assess the validity of the measure of a latent variable. The different questions used should concern easily measured aspects which can be considered as direct consequences of the latent variable to be measured. These questions should not be fully redundant but should express slightly different consequences. The existence of the latent variable and its measurability will result from the observed convergence and shared communality of the directly measured questions. Danaher & Haddrell (1996)^{ccclx} consider that measuring a variable with multiple measurement questions is more reliable than to depend on a single question. Moreover, Churchill (1997) pointed out that the measure with multiple measurement questions can effectively enhance the

reliability of the measured latent variables if these separate measures prove to be consistent enough together.

Therefore, the questionnaire counts at least three measurement questions (items) for each variable to be measured. On the whole, it comprises 69 items and 14 other questions. Such a size renders it essential that the items could be quickly understood and rated by respondents. A Likert type scale was used for most questions: respondents are asked to indicate to which degree they agree to a proposed sentence (item). It is generally acknowledged that 5 to 7 points scales are well adapted to effectively capture the thoughts of respondents. Such measurement scales are offering a high degree of validity and a good consistency of content. They allow to respondents progressing faster when filling out the questionnaire: answers become more rapid once the respondent has well recognized the standard answers proposed, which is easier when they are always the same. A debate exists (add references) on the utility of the central (neutral) quote in impair scales: it actually allows respondents to avoid giving an opinion on a sentence they don't understand. However, it is often used as a numeric value in the scale. Moreover, after the first answers it may become attractive for respondents wishing to complete their answers rapidly. Therefore we preferred a 6 points scale which offers the same details of agreement as the 7 points does, but forces doubtful respondents to choose between "Rather agree" or "Rather disagree". The scale ranges from "Strongly agree" (6), "Agree" (5), "Rather agree" (4), "Rather disagree" (3), "Disagree" (2) down to "Strongly disagree". We verified that the respondents could complete the questionnaire in about 10 minutes. Furthermore numerous items were set to appear in a random way in order to avoid, if possible, proximity bias. This was done very carefully so as not to disturb the understanding of questions by the respondents.

1.3.2 Questionnaire release

To obtain answers to the research questions necessitates a specific survey to be handled out. Once the questionnaire built and tested, a specific issue arises due to the difficulty to identify potential relevant respondents. They must be mobile commerce users and

should have already acquired a certain degree of understanding or experience of mobile commerce. Answers from other people will be less relevant or less consistent in content. In general, the majority of consumers who use mobile commerce have the experience of using E-commerce.

To better fit with the habits of this population we adopted the method of an online survey. The survey was placed on the survey platform "CreatSurey" (<https://cs.createsurvey.com>). This gave some interesting advantages in comparison with a classical paper postal survey: answers are instantaneously transferred into the data files and without typewriting errors. Moreover missing answers due to inattention can be eliminated by requesting again an answer when omitted. This produces complete questionnaires, with very few missing answers, located only in questions with no requested answer: sensible questions (i.e. about income) or questions depending on another one.

However a large mailing list is necessary to ask people to answer and/or to transfer the questionnaire to concerned relatives. Who will answer or not falls totally out of the surveyor's control, making it difficult to master the representativeness of the sample.

The survey started with about 1000 email addresses of university researchers, professors and advanced students, most located in European countries: 31% in Germany, 16% in Scandinavia, 14% in southern Europe, another 14% in western Europe and 13% in central Europe; the remaining 12% being located all around the world. Their help was solicited, asking them to transfer the questionnaire access to anybody among their relatives who could have a mobile shopping experience. Access to the questionnaire was open from May to June 2017, during a period of one month. At the end of the survey a total of 350 questionnaires were collected, but 13 were not validated and were deleted because the answer time was really too short to be credible (120 seconds or less) or because most questions had been answered by selecting the same rating. The apparent 35% answer rate is of course over evaluated due to the "snowball" effect which cannot be precisely estimated. However the 337 valid answers represent 96.5% of what was collected and were used for testing our hypotheses.

1.3.3 The sample

We have to acknowledge that the sample constituted for this research is an opportunity sampling: answers were collected through a “snowball” scheme from academics files and their relatives. 337 valid answers were collected, but as respondents were kept anonymous, it is not possible to exactly count how many are direct answers and how many were redirected by the desired “snowball” effect. A description of the sample is necessary at this very first step of data analysis. The descriptive analysis describes the overall characteristics of the respondents in the questionnaire, including several demographic variables such as gender, age, education, income, etc., as shown in table 30.

Through the analysis of the basic population statistics of the surveyed consumers, we can see that there are 178 women in the study sample, accounting for 52.8% of the total number, slightly more than the male (47.2%). It is of interest to note that the initial emailing sent comprised a little more men (51,6%) than women (48,4%); this inversion of the respective proportions highlights that, probably, women had greater interest in the subject treated by the survey. The proportion of women shopping would have been higher than the male, the proportion of female consumers will naturally be slightly higher. The proportion of young people under 35 years of age is high (63% of the sample); this can be seen as a combined result of the targeting of the mailing list and of the behavior of older people who are probably more numerous not to have a mobile shopping experience and are therefore not answering the questionnaire in a greater proportion. 111 respondents are between 35 and 50 years old, accounting for 32.8% of the sample. Only 14 people are older than 50 years, accounting for 6.9% of the total. Thus the sample seems well in line with Pedersen (2001, 2003) research. From the profession’s point of view, only a few (2%) are unoccupied people, a vast majority of respondents (87%) being involved in various professional activities. Students are relatively few (about 11%) and this seems to confirm that the “snowball” effect was rather well efficient, thanks to the help of the people in the initial email list. Among the active respondents, about a third are employed as executives. These higher skills are

thus significantly more numerous than usual and this comes probably from the original mailing list based on academics and researchers.

Table 30: Description of the sample

Question	Type	Number	% of total
Gender	Female	178	52.8
	Male	159	47.2
Age	16 to 20 years old	13	3.9
	21 to 25 years old	44	13.0
	26 to 30 years old	87	26.0
	31 to 35 years old	68	20.1
	36 to 40 years old	64	18.9
	41 to 45 years old	32	9.5
	46 to 50 years old	15	4.4
	51 to 55 years old	7	2.1
	56 to 60 years old	7	2.1
	Over 60 years old	13	3.9
Profession	Executive	90	26.6
	Freelance	9	2.7
	Employee or Worker	194	57.7
	Student	37	10.9
	Unoccupied or retired	7	2.1
Education	Post graduate (master or higher)	143	42.0
	Bachelor or graduate	191	57.0
	Secondary education or less	3	1.0
Monthly income (€)	More than 3000	91	27.0
	2001 to 2500	83	24.6
	1501 to 2000	74	22.0
	1001 to 1500	53	15.7
	1000 or less	17	5.1
	<i>Missing answers</i>	19	5.6
Family status	Single	126	37.4
	Married	116	34.4
	In couple, but not married	84	24.9
	Divorced	2	0.6
	Widowed	4	1.2
	<i>Missing answers</i>	5	1.5
Total		337	100

This job profile can be more precisely assessed by looking at the educational levels of respondents: More than half (57%) have a bachelor's degree and another (42%) have a master's degree. This could be expected from the target of the initial list of emails. This could be expected from the target of the initial emails list. Only 1% of respondents are only undergraduate or less level and were probably not directly contacted by the initial emailing but thanks to the redirection to concerned relatives. Monthly income distribution is more spread, it seems that using the mobile for shopping can be interesting for every budget sizes.

On the contrary, the family status seems to play a driver role toward this behavior: most (60%) mobile commerce users are married or live in couple, single persons being only 37% in the sample. This is basically consistent with what we had observed when conducting the interviews: married people need to buy a lot for current family life and other supplies. The use of mobile shopping helps to save time, to optimize organization and greatly improves the possibility of being aware of best bargains.

Table 31 describes the respondents' habits with the mobile shopping. The sample gathers people with quite different habits as to use their mobile for shopping. 27% use it every day, 26% use 3 or 4 times a week, 24% once every week, 21% 2 or 3 times each month or every month. Only 2% use it less regularly.

The average amount of spending is also rather regularly spread: 18% spend more than 400 € monthly with the use of their mobile phone. For these respondents, the mobile device is probably becoming an essential help for most current tasks. Other amounts spent are then more or less equally distributed: 15% spend between 301 and 400 €, 18% between 201 and 300 €, 14% between 151 and 200 €, 18% between 101 and 150 € and 17% less than 100€ monthly. Thus the sample offers a complete panorama of peoples' levels of involvement in mobile purchases. This rather high level of spending comes, at least partly, from the family size for which shopping is made. Among our respondents, the two third are not purchasing goods only for themselves but for the whole family of 2, 3 or more persons. This suggests that the needs of mobile shopping are particularly strong for large households.

Table 31: Description of the respondents' habits in the sample

Question	Type	Number	% of total
Frequency of usage	Every day	92	27.3
	3 or 4 times a week	89	26.4
	Every week	80	23.7
	2 or 3 times a month	60	17.8
	Every month	10	3.0
	Less regularly	6	1.8
Average consumption amount (€)	Less than 50	17	5.0
	50 to 100	39	11.5
	101 to 150	60	17.8
	151 to 200	47	13.9
	201 to 300	59	17.5
	301 to 400	51	15.1
	More than 400	60	18.0
	<i>Missing answers</i>	4	1.2
Household size (Purchases made...)	Only for yourself	123	36.5
	For your household (2 persons)	79	23.4
	For your household (3 persons)	60	17.8
	For your household (4 persons or more)	71	21.1
	<i>Missing answers</i>	4	1.2
	Total		337

2. Results and discussion

This paragraph includes four parts: we first purify the scales measuring the latent variables by suppressing the less convergent items. Secondly, we verify the reliability and validity of the measurement model. Thirdly, we test our hypotheses through the structural model by looking if all the relationship between the factors influencing consumers' loyalty to mobile commerce are significantly differing from zero. Finally, we use groups' comparison to test the influence of the moderating variables on the different relations measured by the general model.

2.1 Scale purification

In order to get a better model, after the data was collected, the first step is to check whether the selected items are appropriate to measure the variables. To test the items, we conducted a reliability analysis. The main purpose is to find out the potential structure of the scale and to reduce the number of items, so that the latent variables could be better measured. Therefore we used the loading value of the observed items on the latent variable. Items with loading lower than 0.7 can be deleted without great loss of information in the construct. Table 32 presents the deleted items and table 25 describes the items kept in the purified scale of each latent variable.

We can observe through table 32 that these items all have a loading value lower than 0.7, they should be deleted in order to ensure the reliability of model measurement. After we delete these items, we still have at least 3 or more items for each latent variable.

Table 32: Deleted items due to weak loading values on the latent variable

Loading	Item	Intended latent variable
0.690	<i>On the whole, how satisfied do you feel with purchasing via your mobile devices? (SAT-4)</i>	Satisfaction
0.681	<i>It is valuable to use mobile device for shopping (PV-1)</i>	Perceived value
0.617	<i>With my mobile phone, I find more easily all the information I need about the products or services I want to buy (Inst-2)</i>	
0.582	<i>With mobile shopping you never have to queue (Tspar-1)</i>	Perceived usefulness
0.531	<i>Using a mobile for shopping spares much of your time (Tspar-2)</i>	
0.520	<i>With my mobile, I have a direct access to the retailer's customer service (Inter-2)</i>	
0.672	<i>With my mobile device I can order or purchase even when I'm travelling (Flex-2)</i>	
0.621	<i>The web sites or apps narrowly fit with my personal shopping habits (Perso-2)</i>	
0.620	<i>The web sites or apps provide me with special offers or information selected for me (Perso-3)</i>	
0.571	<i>The web sites or apps introduce me directly to the right product or service (Perso-1)</i>	Perceived ease of use
0.569	<i>The connection from my mobile to Internet is quick (Conn-1)</i>	
0.366	<i>In case of no Wi-Fi connection, I can always be connected through other affordable networks (Conn-3)</i>	
0.310	<i>Anytime I need it, I always find a good Wi-Fi connection for my mobile (Conn-2)</i>	
0.694	<i>Using mobile devices for shopping is a modern behavior (Fash-1)</i>	Perceived social value
0.532	<i>Most of my friends do use their mobile for shopping duties (Fash-2)</i>	
0.680	<i>The web site or apps are well adapted for mobile devices (Conf-5)</i>	
0.627	<i>In order to assess the websites or apps, one can rely on users evaluations (Repu)</i>	
0.598	<i>When I use my mobile for shopping, my transaction information will not be spread to other people (Paym-2)</i>	Confidence
0.513	<i>The products sold via mobile apps are strictly the same as in the store (Conf-2)</i>	

Table 33: Items kept for measuring target and mediator variables

Loading	Item	Latent variable
0.863	In future, I will surely continue to purchase via my mobile (LOY-2)	Loyalty (4 items)
0.862	In future, I will certainly use more and more my mobile for shopping (LOY-3)	
0.849	In future, I will certainly increase the amount spent <i>via</i> mobile shopping (LOY-4)	
0.828	In future, I will warmly recommend other people to use their mobile for shopping (LOY-1)	
0.848	When I use my mobile for shopping, I obtain what I'm looking for (SAT-2)	Satisfaction (3 items)
0.836	I truly find pleasure in using my mobile for shopping (SAT-1)	
0.812	I made a wise choice when I decided to use my mobile for shopping (SAT-3)	
0.837	Purchasing <i>via</i> mobile is worth it, even if it costs a bit more (PV-2)	Perceived value (4 items)
0.803	I would accept to pay a little more on internet fee, so I can freely shop with my mobile (PV-3)	
0.734	Buying a better mobile device for shopping is worth it, even if it is costs some more (PV-5)	
0.706	It is worth to spend some time learning how to use a mobile for shopping duties (PV-4)	

We can see that the loading values are from 0.706 to 0.863, the lowest value is from the 4th item of perceived value: *It is worth to spend some time learning how to use a mobile for shopping duties (PV-4)*. Which probably means consumers do not like to use too much time to learn the functions of mobile commerce. Also, the loading value of the 5th item of perceived value is 0.734: *Buying a better mobile device for shopping is worth it, even if it is costs some more (PV-5)*. Which can remind us that consumer is sensible on the cost. Through table 4.15, we can see that the loading values are from 0.709 to 0.851, the lowest value is from the item of perceived usefulness: *With my mobile phone, I find it easier to find the nearest store (Inst-1)*. Is it means that in the real life, consumers could find the nearest store because they go to there often? The mobile phone could only help you in a new place and when you don't know the location of the store. Otherwise, all other items have a loading value higher than 0.8 which is quite good for our research.

Table 34: Items kept for measuring predictive variables (part 1/II)

Loading	Item	Latent variable
0.827	When shopping with my mobile phone, I get the right information at the right time (Inst-3)	Perceived usefulness (5 items)
0.774	With my mobile phone, I'm always informed of the best price offers (Comp-2)	
0.772	With my mobile phone, it's easier to compare the prices of different shops (Comp-1)	
0.771	Technical problems can be rapidly solved by the customer service via my mobile device (Inter-1)	
0.709	With my mobile phone, I find it easier to find the nearest store (Inst-1)	
0.795	The apps I have in my mobile are very easy to download and unload (Flex-3)	Perceived ease of use (6 items)
0.795	The functions of apps I have in my mobile are very easy to use (Func-1)	
0.765	With my mobile device I can visit the websites or use the apps at anytime and anywhere (Flex-1)	
0.763	My mobile device gives access to a very large range of shops and services (Flex-4)	
0.754	My mobile device offers many function that are useful for shopping (Func-2)	
0.744	It is very easy to pay with my mobile device (Func-3)	
0.851	The products I order via my mobile are in good condition when delivered (Logist-2)	Perceived service quality (3 items)
0.822	After sales quality makes me appreciate mobile shopping (AfterS)	
0.814	The products or services I order via my mobile are delivered without delay (Logist-1)	
0.837	Mobile shopping allows to make better use of connection costs (ConnPr)	Perceived cost advantages (5 items)
0.829	On the whole, purchasing with your mobile allows to better spend your money (MonBen)	
0.812	The prices of products or services I can buy via my mobile are attractive (Price-1)	
0.797	When using my mobile for shopping, I can benefit better bargain offers (Price-2)	
0.756	Mobile devices are not so expensive to buy, considering all the services they provide (DeviPr)	

Table 35: Items kept for measuring predictive variables (part 2/II)

0.795	Shopping with a mobile says what person you are (Ident)	Perceived social value (4 items)
0.785	Using a mobile for shopping gives a good reputation (Image-1)	
0.734	Using your mobile for shopping brings you some admiration (Image-3)	
0.711	You will be considered as innovative if you use a mobile for shopping (Image-2)	
0.828	The websites or apps I use for shopping from my mobile are really reliable (Conf-4)	Confidence (6 items)
0.817	With my mobile I get exact information about what service will be delivered (Conf-3)	
0.799	My mobile connection to Internet is well secured (Conf-1)	
0.775	The payment systems I use with my mobile are really trustworthy (Paym-1)	
0.775	When I use my mobile for shopping, my personal information is safe (Privac)	
0.760	In case of connection disruption, it will be easy to resume my shopping process later on (Resume)	

Through table 4.16, we can see that the loading values are from 0.76 to 0.828, there are four items for perceived social value and six items for confidence. The loading values for each variable are quite average. After deleting the items with low loading value, the AVE values are all greater than 0.5, the composite reliability values and the Cronbach's alpha values are all greater than 0.7, indicating good validity of the measurement model.

2.2 The measurement model

Usually, we use reliability and validity as two indicators to measure whether the result measured by the scale can achieve the purpose of the test, and whether it can correctly reflect the objective facts. Therefore, a comprehensive analysis of the reliability and validity of the scale before the formal data analysis was conducted. The measurement model was evaluated using the Smart-PLS 3 software program.

2.2.1 Reliability and convergence validity

Reliability is used to measure the accuracy of a scale, representing the degree of consistency of the measurement. Higher the reliability coefficient is, more consistent and reliable the test result will be. Reliability of the measurement model can be well measured by Cronbach's α and composite reliability obtained through PLS analysis. Reliability is not the guarantee of validity, but high reliability should be the basic precondition for further analysis (Nunnally and Bernstein, 1994)^{ccclxi}.

In this research, I use Cronbach's α as a reliability test of the internal consistency between the questions aimed at measuring latent variables. Cronbach (1951)^{ccclxii} puts forward the criterion of judging reliability. That is, if Cronbach's α is less than or equal to 0.35, it is low reliability. $0.35 < \text{Cronbach's } \alpha \leq 0.7$ indicates middle reliability; Cronbach's $\alpha > 0.7$ which presents high reliability (Nunnally, 1978)^{ccclxiii}. Fornell and Larcker (1981)^{ccclxiv} put forward the concept of composite reliability (denoted by CR or ρ_r). High composite reliability indicates high internal consistency of the indicators. In practice, the value of ρ_r should be better higher than 0.7, and 0.6 is the lowest acceptable value (Fornell and Larcker, 1981; Bagozzi and Yi, 1988)^{ccclxv}.

In this study, the values of Cronbach's α of all variables are all very satisfying ranging from 0.77 to 0.90 as can be seen in table 28. All are greater than 0.7, indicating highly credible measures. Hence, internal consistency between the survey questions is acceptable. Moreover, the values of composite reliability are comprised between 0.87 and 0.92. These results show that each factor has good reliability.

Table 36: Reliability and convergence validity

	Cronbach's Alpha	Composite Reliability (Rho)	Average Variance Extracted
Loyalty	0.873	0.913	0.723
Perceived value	0.802	0.871	0.629
Satisfaction	0.818	0.891	0.732
Usefulness	0.868	0.904	0.655
Ease of use	0.896	0.920	0.658
Cost advantage	0.866	0.903	0.651
Service quality	0.772	0.868	0.687
Social value	0.825	0.884	0.656
Confidence	0.894	0.919	0.653
<i>Threshold</i>	<i>>0.7</i>	<i>>0.7</i>	<i>>0.5</i>

Convergent validity refers to the degree of correlation between different items measuring the same concept. To check convergent validity, the Average Variance Extracted (AVE) of each latent variable is calculated. (Wong et al., 2013)^{ccclxvi} For all variables in my model the values of Average Variance Extracted are clearly over the 0.5 threshold, ranging from 0.63 to 0.73 as shown in table 4.16. The factor load of each measurement item is higher than 0.6, which shows that each factor has good convergent validity.

2.2.2 Discriminant validity

Discriminant validity consists in assessing whether two different latent variables differ significantly the one from the other (Byrne, 2010)^{ccclxvii}. Discriminant validity means that different observed values should be distinguished when different constructs are measured by different methods (Byrne, 2010). The most common statistical method used to test of discriminant validity is the multi-traits multi-methods (MTMM). Evidence obtained by MTMM method is highly convincing, but its design is complex and difficult to operate. In contrast, SEM method is direct, has low requirements for the sample, and is especially suitable to examine the discriminant validity of variables measured in study models.

Table 37: Results of discriminant validity

	PCB	CL	PSQ	PEU	LOY	PV	Satis	PSV	PU
PCB	0.807								
CL	0.682	0.808							
PSQ	0.631	0.582	0.829						
PEU	0.597	0.589	0.423	0.811					
LOY	0.679	0.554	0.592	0.587	0.850				
PV	0.653	0.649	0.535	0.586	0.706	0.793			
Satis	0.654	0.587	0.608	0.531	0.735	0.724	0.856		
PSV	0.557	0.600	0.535	0.319	0.445	0.564	0.512	0.810	
PU	0.686	0.681	0.505	0.662	0.592	0.645	0.623	0.475	0.809

NB: AVE is given in bold in the diagonal; other data are the squared correlations between the measured variables

In this study, rigorous AVE method is used to evaluate the discriminant validity. According to Fornell and Larcker (1981), it is recommended that for each construct, AVE should be greater than the maximum value of the squared correlation coefficient (R^2) with all other measured constructs. In other words, the statistical relationships between the constructs should be at a lower level than those between items, used to measure the constructs. The results show that all the variables used by this study comply with the discriminant validity criterion. Table 28 reports that the AVE of all constructs are greater than the squares values of the correlation coefficient matrix. Therefore, the 9 variables studied in this paper present acceptable discriminant validity.

2.3 The structural model

In this part, we will firstly make an overall view of structural model by introducing the Goodness of Fit and the path coefficients of structural equations model. Secondly, the results of path coefficients is introduced. Then we test the mediating effect in the model in order to verify if there exists some mediation. And finally, we make a hierarchy of determinants of loyalty to introduce the different effect of each variable.

2.3.1 Overall view

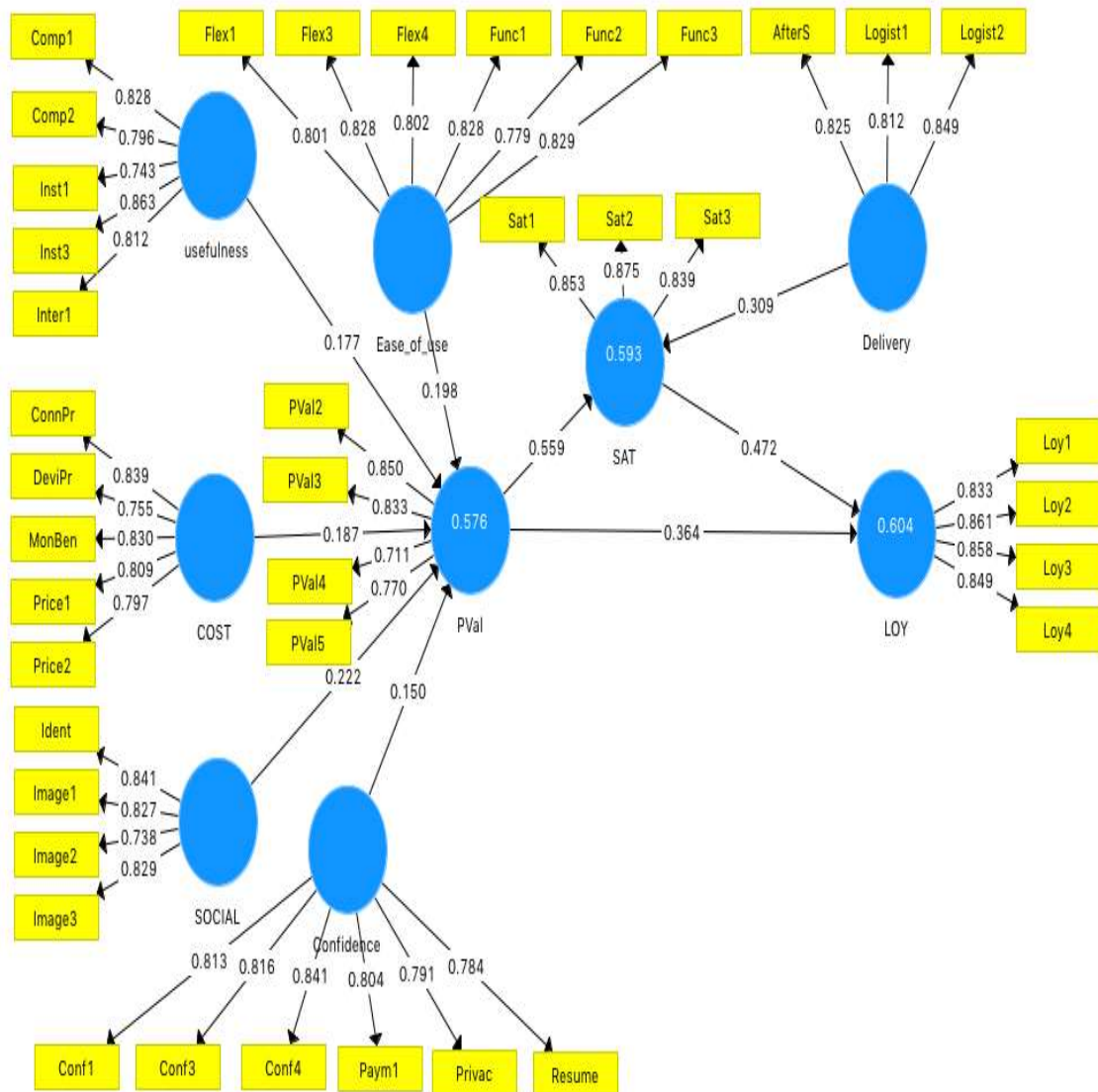
The structural model as shown in Figure 4.3 was evaluated using the Smart-PLS 3 software program. Table 30 reports that the target variable, Loyalty to Mobile shopping, is explained with an R^2 of 0.604 by the model which can be considered as satisfactory. The model also explains rather well two other variables, the mobile shopping perceived value ($R^2=0.576$) and the satisfaction with mobile shopping ($R^2=0.593$). Smart-PLS calculates a Goodness of fit index which assesses the consistency degree between estimated expected covariance matrix and sample covariance matrix. The better the goodness of fit, the closer the model fits to the sample (Kline, 2015)^{ccclxviii}. Results show that the value of Goodness of Fit is 0.631, which is largely higher than the 0.36 threshold recommended by Wetzel et al. (2009)^{ccclxix}. This means that Goodness of Fit is very satisfactory.

Table 38: Results of R^2

	R^2	Adjusted R^2
Loyalty	0.604	0.602
Satisfaction	0.593	0.590
Perceived Value	0.576	0.569

Figure 26 presents the structural model as it was evaluated by the PLS analysis. The latent variables are figured by ellipses, the items by rectangles. When it is the case, the share of variance explained by the model (R^2) is written inside the ellipses figuring the variables. Exogenous latent variables (predictive variables) do not show R^2 values. The statistical accuracy of the coefficients measuring the relationship between the variables is calculated from the estimated coefficients obtained by bootstrap. The bootstrap process is established here with 5000 subsamples of 337 answers randomly extracted from the original data.

Figure 26: Path coefficients of Structural Equations Model



2.3.2 Path coefficients

An assessment of the precision of the paths coefficients is calculated using the bootstrap method, which consists in generating a huge number of alternative samples by randomly deleting some observations in the data. 5000 sub samples with 337 observations were used here.

Table 4.18 shows that the value of beta is 0.364 and p value is 0.05. Hence, mobile channel perceived value has a significant direct positive effect on mobile channel loyalty, the hypothesis 1 is supported. Similarly, mobile channel Satisfaction has a significant positive effect on mobile channel loyalty (beta = 0.472, p = 0.000), hypothesis 2 is supported. The results also indicate that significant positive correlation exists between mobile channel perceived value and mobile channel satisfaction (beta = 0.559, p = 0.000), so hypothesis 3 cannot be rejected. Perceived service quality has a positive influence on mobile channel satisfaction (beta = 0.309, p = 0.000), which supports the hypothesis 4. Perceived ease of use is significantly related to Mobile channel perceived value (beta = 0.198, p = 0.002), hypothesis 5 is supported. Perceived usefulness has a significant positive effect on mobile channel perceived value (beta = 0.177, p = 0.025), hypothesis 6 is supported. Confidence in mobile systems security positively influences mobile channel perceived value (beta = 0.150, p = 0.04), the hypothesis 7 cannot be rejected. Table 4 reports also that perceived cost advantage exerts a positive influence on mobile channel perceived value (beta = 0.187, p = 0.007), so the hypothesis 8 is supported. The results also show that Perceived social value plays a significantly positive role in mobile channel perceived value (beta = 0.222, p = 0.000), so hypothesis 9 is supported. The structural model shows that all 9 hypotheses are supported by the data collected: none has to be rejected. Table 39 shows that the bootstrap analysis confirms what is directly observed on the original data: mean coefficients are very close to the one estimated on the original sample and most coefficients present high T-test values.

Table 39: Results of path coefficient

	Original Sample	Sample Mean (Bootstrap)	Standard Deviation (Bootstrap)	T Statistics (Bootstrap)	P Values (Bootstrap)
PVal -> LOY	0.364	0.363	0.066	5.490	0.000
PVal -> SAT	0.559	0.560	0.056	10.033	0.000
SAT -> LOY	0.472	0.475	0.062	7.577	0.000
Service -> SAT	0.309	0.309	0.060	5.166	0.000
Ease of use -> PVal	0.198	0.199	0.062	3.170	0.002
Usefulness -> PVal	0.177	0.174	0.079	2.239	0.025
Confidence -> PVal	0.150	0.150	0.073	2.050	0.040
COST -> PVal	0.187	0.191	0.069	2.713	0.007
SOCIAL -> PVal	0.222	0.220	0.049	4.522	0.000

2.3.3 Mediation Test

The researcher uses the Smart-PLS 3.0 to verify the mediating effect. Scholars report that indirect effect exists if the confidence interval of the indirect effect value calculated by the Bootstrap does not contain 0, so 12 mediated relationship in the model are all significant. Bootstrap method used here, has run 5000 times, using 5000 alternative samples of 337 observations.

The results indicate that indirect effect value of perceived benefits cost advantage to loyalty is 0.117, a value which significantly differs from zero at the 95% confidence threshold. In other words, this means that indirect effects retained in the model (through perceived value and satisfaction) are significant, even when compared with the direct relationship. Similarly, the values of indirect effect of perceived benefits cost advantage to satisfaction, perceived confidence to loyalty, perceived confidence to satisfaction, perceived after service quality to loyalty, ease of use to loyalty, ease of use to satisfaction, and perceived value to satisfaction are 0.105, 0.094, 0.084, 0.146, 0.124, 0.111, and 0.264; meanwhile, their corresponding Bias-corrected 95% confidence

intervals do not contain 0, indicating the existence of these indirect effects.

Table 40: Study of mediating effects in the structural model

	Intermediate effect value	Bias-Corrected	
		95% CI	
		Lower	Upper
PVal -> LOY (Via SAT)	0.264	0.185	0.360
Service -> LOY (via SAT)	0.146	0.084	0.224
COST -> LOY (via PVal & SAT)	0.117	0.038	0.217
COST -> SAT (via PVal)	0.105	0.034	0.193
Confidence -> LOY(via PVal & SAT)	0.094	0.007	0.186
Confidence -> SAT(via PVal)	0.084	0.006	0.166
Ease of use -> LOY(via PVal & SAT)	0.124	0.045	0.201
Ease of use -> SAT(via PVal)	0.111	0.042	0.179
SOCIAL -> LOY(via PVal & SAT)	0.140	0.075	0.208
SOCIAL -> SAT(via PVal)	0.124	0.067	0.198
Usefulness -> LOY(via PVal & SAT)	0.111	0.012	0.210
Usefulness -> SAT(via PVal)	0.099	0.012	0.192

Only two direct relationships explaining loyalty were identified in the model and are confirmed as significant: perceived value impacts directly loyalty; satisfaction influences directly loyalty. None of the other direct relationships could be introduced into the model.

2.3.4 Hierarchy of Determinants of Loyalty

The set of variables collected in the model contributes to explain loyalty to the mobile commerce, however they do not have the same weight. According to table below, the most significant relationship is directly between satisfaction and loyalty. However, the second significant direct relationship is between perceived value and loyalty, and this direct relationship is reinforced to become the most significant by an indirect

relationship through the satisfaction. The total effect of perceived value on loyalty is 0.628, which the direct effect is 0.364 and the indirect effect is 0.264, the direct effect is greater than the indirect effect. This refers indeed that consumer perceived value narrowly depends on the satisfaction. In other words, the perceived value will not only directly affect the loyalty, but also impact the loyalty via satisfaction. This build a triangle relationship between satisfaction, perceived value and loyalty of this exploratory stage of the research, as shown in the structural model.

Table 33 also shows that, beside satisfaction and perceived value, there are two other powerful determinants, influencing indirectly the consumers' loyalty of retail mobile commerce: Perceived service quality and perceived social value. Perceived service quality has a significant indirect relationship with loyalty via satisfaction. Researchers should pay more attention on the influence of delivery quality of retail mobile commerce because it is one of the determinants of the buyers' satisfaction. Perceived social value plays the first role in creating perceived value of retail mobile commerce. This means consumers believe that mobile commerce will increase their social value, the retailers have to take this into account: considering mobile users as an "elite" among other clients will draw more clients to use their mobile for shopping.

Table 41: Direct, indirect and total influences of the different variables on the consumer's loyalty toward mobile commerce

	Direct	Types of influence			Overall
		via perceived value	Indirect: via satisfaction	via perceived value & satisfaction	
<u>Latent variables:</u>					
Perceived value	0.364	-	0.264	-	0.628
Satisfaction	0.472	-	-	-	0.472
Perceived service quality	-	-	0.146	-	0.146
Perceived social value	-	0.081	-	0.059	0.140
Perceived ease of use	-	0.072	-	0.052	0.124
Perceived benefits cost advantage	-	0.068	-	0.050	0.118
Perceived usefulness	-	0.064	-	0.047	0.111
Confidence	-	0.055	-	0.040	0.095

Three variables come next with similar weights: the perceived benefits in terms of cost advantage, the perceived ease of use and the perceived usefulness. Consumers will subjectively believe that all the benefits of using mobile commerce will cover all the costs it entails (including device cost, connection cost and others). Perceived value of mobile shopping depends also on the opinion that benefits are exceeding the costs.

Perceived usefulness and perceived ease of use are two important factors affecting consumers' perceived value of mobile shopping. Both are tightly related to the effective experience of the consumer with this new mode of shopping. On operation. Therefore, enhancing service design in these two directions is an important prerequisite for improving consumers' loyalty and repeated use. In the field of mobile retail, on the one hand, it is necessary to provide rich and practical functions to users and help them to save time, to increase efficiency and to feel the convenience at anytime and anywhere. On the other hand, to provide users with simple and easy-to-use operating modes, so that users can instinctually understand how to do and feel skilled enough to use mobile commerce.

At last, confidence appears as a less important determinant to retail mobile commerce loyalty. It was a major obstacle to the acceptance of E-commerce. However, in mobile commerce, the uncertainty or perceived risk has diminished in comparison with other factors and it now plays a second rank role. This may be due to two reasons: First, the existing mobile shopping platforms or apps are derived from the pre-existing E-commerce. In the expansion development, the overall layout and the process system of the platforms didn't changed much. Also due to the impact of the brand, consumers trust more mobile shopping platform. Second, confidence appears to be a basic condition of use more than an effective driver: if confidence is low, perceived value and loyalty are weak. Differently, if confidence exists, the use is acknowledged as practicable, but a higher level of confidence will not boost the use. Moreover, most mobile phone shoppers are highly creative, receptive to innovations and more adventurous than average.

2.4 Group comparisons

First of all, we found that the answers for different profiles of consumers are not balance to establish groups. For the profile of innovativeness, there are only 89 respondents which are not agree that they like to try something new. Also, there are only 37 respondents are not agree that they enjoy the mobile shopping. It may refers that consumers who use their mobile devices to shopping are very much guided by a search for pleasure in their daily activities. It may be a general trend of society. For the price sensibility, there are only 39 respondents don't feel disappointed if they could have a better price. The item has worked well and shows that mobile commerce users are sensitive to price. It's the same situation for the brand sensibility, only 36 respondents prefer new brand than their familiar one. So, we decide not to analyses the different profiles of mobile commerce consumers, and just focus on different demographic groups. Some categories of consumers must operate differently: by gender, age, level of education, income, family status and number of people in the household. Other categorizations can also play: one can expect that those who have a great habit of buying with their mobile behave differently from those who use it less often. Similarly, some consumers spend a lot on their mobile, while others spend a lot less. The analysis of the different groups makes it possible to evaluate to what extent these differences modify the relations measured by the general model.

2.4.1 Effect of gender

Taking the gender into account divides the sample into two groups: 159 male and 178 female respondents. Table 42 analyzes the effect of gender on the 9 structural relationships in the model. Only one difference among the coefficients is significant at the 95% probability threshold. It concerns the impact of perceived value on loyalty: female users present a tighter relationship, their loyalty being closely depending on perceived value. This suggests that women have more consistent behaviors than men do. For other paths coefficients, gender is not significantly affective.

Table 42: Differences between coefficients according to gender

	Female (N=178)		Male (N=159)		Difference between coefficients means	
	Original	STDEV	Original	STDEV	diff	p-Value of null hypothesis
PVal -> LOY	0.481	0.085	0.263	0.096	0.217	0.044
SAT -> LOY	0.378	0.085	0.552	0.084	0.174	0.927
COST ->PVal	0.138	0.086	0.231	0.108	0.094	0.754
Confidence ->PVal	0.105	0.090	0.253	0.123	0.147	0.833
Ease of use ->PVal	0.234	0.074	0.173	0.102	0.061	0.313
usefulness ->PVal	0.273	0.103	0.019	0.122	0.254	0.055
SOCIAL ->PVal	0.232	0.068	0.206	0.068	0.027	0.389
PVal -> SAT	0.600	0.075	0.542	0.070	0.058	0.286
Delivery -> SAT	0.244	0.079	0.377	0.079	0.133	0.882

2.4.2 Effect of age

According to age, the sample was divided into two groups: 212 “younger” people aged 35 or less, and 125 “older” people aged over 35. Table 43 shows that no significant difference could be observed according to these two age groups.

Table 43: Differences between coefficients according to age

	>35 years old (N=125)		≤35 years old (N=212)		Difference between coefficients	
	Original	STDEV	Original	STDEV	diff	p-Value
COST ->PVal	0.141	0.087	0.281	0.107	0.139	0.154
Confidence ->PVal	0.135	0.125	0.141	0.088	0.006	0.476
Delivery -> SAT	0.382	0.093	0.245	0.069	0.136	0.879
Ease of use ->PVal	0.127	0.087	0.234	0.081	0.107	0.183
PVal -> LOY	0.277	0.111	0.432	0.077	0.154	0.126
PVal -> SAT	0.524	0.087	0.606	0.062	0.082	0.224
SAT -> LOY	0.519	0.102	0.431	0.073	0.088	0.756
SOCIAL ->PVal	0.226	0.070	0.199	0.055	0.027	0.624
usefulness ->PVal	0.347	0.112	0.053	0.096	0.294	0.970

2.4.3 Educational level

The education level as a subgroup variable was divided the sample into two groups: 194 Bachelor and below and 143 master and above, the implementation of the analysis obtained the following table. The following table can be obtained, the impact of perceived social value on the perceived value of different education level, undergraduate and below influence coefficient is higher than master and above influence coefficient with significant differences. In other paths coefficient, different gender influence coefficient does not have significant differences, as shown in the following table.

Table 44: Differences between coefficients according to educational level

	Bachelor or less (N=194)		Master or higher (N=143)		Difference between coefficients	
	Original	STDEV	Original	STDEV	diff	p-Value
COST ->PVal	0.187	0.099	0.183	0.090	0.004	0.485
Confidence ->PVal	0.098	0.091	0.249	0.115	0.150	0.846
Delivery -> SAT	0.265	0.071	0.364	0.093	0.099	0.802
Ease of use ->PVal	0.219	0.078	0.170	0.098	0.049	0.338
PVal -> LOY	0.456	0.080	0.260	0.106	0.196	0.069
PVal -> SAT	0.614	0.065	0.491	0.088	0.123	0.132
SAT -> LOY	0.381	0.081	0.568	0.091	0.186	0.937
SOCIAL ->PVal	0.285	0.065	0.126	0.068	0.159	0.046
usefulness ->PVal	0.178	0.090	0.159	0.122	0.019	0.448

2.4.4 Income level

Taking income as a group variable was divided the sample into two groups: 163 people belonged to households earning 2000 € or less per month, 174 people earning more than 2000 € per month. The analysis of the following table shows that there is no significant difference among all the income groups. See as below table.

Table 45: Differences between coefficients according to income level

	>2000 €/month (N=174)		≅ 2000 €/month (N=163)		Difference between coefficients	
	Coeff.	STDEV	Coeff.	STDEV	diff	p-Value
COST ->PVal	0.099	0.094	0.274	0.097	0.175	0.093
Confidence ->PVal	0.242	0.094	0.063	0.107	0.179	0.895
Delivery -> SAT	0.265	0.086	0.365	0.075	0.100	0.193
Ease of use ->PVal	0.130	0.080	0.308	0.091	0.179	0.072
PVal -> LOY	0.325	0.090	0.390	0.101	0.065	0.317
PVal -> SAT	0.589	0.084	0.521	0.065	0.067	0.740
SAT -> LOY	0.479	0.084	0.477	0.094	0.003	0.505
SOCIAL ->PVal	0.267	0.075	0.179	0.058	0.088	0.823
usefulness ->PVal	0.190	0.102	0.121	0.116	0.069	0.672

2.4.5 Family status

Taking family status as a group variable was divided the sample into two groups: 221 people are unmarried, 116 people are married. The analysis of the following table shows that there is no significant difference among all the family status groups. See as below table.

Table 46: Differences between coefficients according to family status

	Married (N=116)		Not married (N=221)		Difference between coefficients	
	Original	STDEV	Original	STDEV	diff	p-Value
COST ->PVal	0.497	0.132	0.076	0.094	0.420	0.993
Confidence ->PVal	-0.078	0.126	0.114	0.140	0.192	0.154
Delivery -> SAT	0.194	0.091	0.374	0.107	0.180	0.103
Ease of use ->PVal	0.118	0.097	0.186	0.113	0.068	0.323
PVal -> LOY	0.395	0.107	0.334	0.119	0.060	0.647
PVal -> SAT	0.666	0.076	0.476	0.105	0.190	0.927
SAT -> LOY	0.432	0.093	0.431	0.109	0.001	0.503
SOCIAL ->PVal	0.244	0.091	0.163	0.087	0.081	0.741
usefulness ->PVal	0.060	0.141	0.342	0.138	0.282	0.079

2.4.6 Household size

The Household size as a subgroup variable was divided the sample into two groups: 123 for themselves and 214 for 2 and above, the implementation of the analysis obtained the following table. The following table can be obtained, the impact of perceived value on the perceived satisfaction and social perceived value on the perceived value of different family amount, 2 and below group influence coefficient is higher than for themselves group influence coefficient with significant differences. In other paths coefficient, different gender influence coefficient does not have significant differences, as shown in the following table.

Table 47: Differences between coefficients according to household size

	2 persons or more (N=214)		for themselves (N=123)		Difference between coefficients	
	Original	STDEV	Original	STDEV	diff	p-Value
COST ->PVal	0.220	0.088	0.064	0.092	0.156	0.893
Confidence ->PVal	0.124	0.098	0.217	0.107	0.093	0.258
Delivery -> SAT	0.418	0.067	0.129	0.096	0.289	0.993
Ease of use ->PVal	0.155	0.073	0.299	0.108	0.144	0.134
PVal -> LOY	0.360	0.079	0.381	0.125	0.021	0.450
PVal -> SAT	0.478	0.066	0.675	0.081	0.197	0.032
SAT -> LOY	0.494	0.075	0.418	0.115	0.076	0.701
SOCIAL ->PVal	0.166	0.065	0.340	0.075	0.174	0.037
usefulness ->PVal	0.228	0.102	0.114	0.123	0.114	0.764

2.4.7 Frequent users

Taking use frequency as a group variable was divided the sample into two groups: 261 people use once or above every week, 76 people are other. The analysis of the following table shows that there is no significant difference among all the use frequency groups.

See as below table.

Table 48: Differences between coefficients according to the frequency of use

	Sporadic users (N=76)		Frequent users (N=261)		Difference between coefficients	
	Original	STDEV	Original	STDEV	diff	p-Value
COST ->PVal	0.184	0.143	0.190	0.076	0.006	0.493
Confidence ->PVal	-0.017	0.142	0.177	0.084	0.194	0.118
Delivery -> SAT	0.251	0.095	0.327	0.068	0.075	0.259
Ease of use ->PVal	0.400	0.135	0.145	0.070	0.255	0.950
PVal -> LOY	0.392	0.131	0.367	0.076	0.026	0.560
PVal -> SAT	0.657	0.089	0.531	0.064	0.125	0.871
SAT -> LOY	0.406	0.138	0.485	0.069	0.079	0.310
SOCIAL ->PVal	0.240	0.115	0.213	0.055	0.027	0.582
usefulness ->PVal	0.167	0.144	0.197	0.092	0.030	0.428

2.4.8 Amount of mobile consumption

Taking amount of consumption as a group variable was divided the sample into two groups: 163 people 200 and below, 174 people are 200 and above. The analysis of the following table shows that there is no significant difference among all the amount of consumption groups. See as below table.

Table 49: Differences between coefficients according to amount of monthly expenses via mobile

	More the 200 € (N=209)		200 € or less (N=174)		Difference between coefficients	
	Original	STDEV	Original	STDEV	diff	p-Value
COST ->PVal	0.198	0.082	0.133	0.114	0.065	0.690
Confidence ->PVal	0.140	0.088	0.190	0.127	0.050	0.372
Delivery -> SAT	0.349	0.076	0.266	0.093	0.083	0.751
Ease of use ->PVal	0.206	0.076	0.199	0.096	0.006	0.522
PVal -> LOY	0.432	0.070	0.199	0.122	0.233	0.948
PVal -> SAT	0.517	0.075	0.619	0.072	0.102	0.165
SAT -> LOY	0.443	0.068	0.561	0.109	0.118	0.181
SOCIAL ->PVal	0.234	0.057	0.191	0.087	0.043	0.659
usefulness ->PVal	0.195	0.089	0.160	0.147	0.035	0.583

2.4.9 Conclusive remarks drawn from group analysis

The vast majority of model relationships are not significantly altered when considering one group of consumers to another. However, three relationships are slightly more sensitive for different groups: when consumers have a lower level of education or when their household have a moderate size, the perceived social value of mobile shopping contributes more to the global perceived value of mobile commerce. In addition, the direct impact of the perceived value on mobile commerce loyalty is more pronounced for women than for men, which may result from a more developed sense of economic rationality. Finally, perceived value influences more satisfaction when the consumer

belongs to a smaller household. Thus the size of the household seems to play a recurring role, people included in a larger group give less importance to the social benefits and less associate value to satisfaction.

Conclusion

This chapter first introduced the design of the questionnaire as well as the names of the various variables and items, which include the following 9 variables: perceived ease of use (PEU); perceived usefulness (PU); confidence (CONF); perceived cost advantages (PCA); perceived social value (PSV); Perceived service quality (PDQ); perceived value (PV); satisfaction (SAT); loyalty (LOY), as well as customers characteristics acting as moderator variables. We used 58 items to measure these variables. Then we introduced the method of data collection and analysis.

Secondly, the structural equation model was tested. According to the hypotheses and items proposed, the formal survey questionnaire was tested with Smart-PLS 3 software. As a result, 18 items had to be deleted, but every variable could be kept in the model and correctly measured by the 40 remaining items. Moreover, the measurement model proved to be better accepted by the data.

In the data analysis phase, the tests of reliability and validity of the scale were conducted and the results shows that all the latent variables present satisfying measures statistics, which confirms that the variables can be used to model their relationships with PLS. The 337 valid answers collected were used to verify if they could accept the relationships between the predictive variables, the mediating variables (perceived value and satisfaction) and the target variable (Loyalty). The obtained estimates showed that none of the hypothesized was rejected by the data collected, a result that corroborates the hypotheses formulated in the conceptual model.

- Consumer's perceived value and satisfaction have the significant positive effect on consumer's loyalty of retail mobile commerce. Their impact weights on mobile commerce loyalty are different, the satisfaction's direct influence on loyalty is higher than perceived value, but the total influence from perceived value to loyalty

via satisfaction turned stronger than satisfaction. It refers that the perceived value will not only directly affect the loyalty, but also impact the loyalty via satisfaction. This build a triangle relationship between satisfaction, perceived value and loyalty of this exploratory stage of the research.

- Satisfaction of mobile commerce is influenced by perceived after-sales service quality which is the third significant variable to influence consumer's loyalty. It means consumers of mobile commerce pay a lot of attention on after-sales service quality such as logistic quality.
- The perceived value of mobile commerce consists five dimensions: perceived ease of use, perceived usefulness, perceived trust, perceived social value, and perceived cost advantage. Perceived social value has a most significant positive impact on mobile shopping loyalty among the five components of perceived value. The perceived cost advantage has a greater impact on mobile shopping loyalty than perceived ease of use and perceived usefulness. However, perceived confidence in mobile shopping perceived value has the least significant impact on mobile shopping loyalty.
- The perceived value, satisfaction and loyalty of retail mobile commerce are influenced by different demographic characteristics of mobile users. Therefore, enterprises should carry out different marketing strategy according to the different attributes of users. Table 16: Different Amount of mobile consumption influence coefficient.

General conclusion

Introduction

In the 21st century, E-commerce is gradually shifting to M-commerce, and the trend of mobile commerce has gradually emerged. The rapid development momentum and huge application prospects of mobile commerce have not only made it becoming one of the focuses of the business community, but also made it a hot topic for discussion in the academic community. Customers play a decisive role in the development of mobile commerce. Therefore, it is necessary to conduct an in-depth analysis of user's behavior. At present, the research on mobile commerce users has been relatively mature, but the research on mobile commerce user's loyalty is still in the rising stage. However, the long-term success of enterprises depends on the continued use of users. In addition, some studies have shown that the lack of awareness of the value of mobile commerce has become an important obstacle to the development of mobile commerce, and perceived value in the traditional marketing area is considered to be the main influencing factor for customers' repeated purchases.

In the first two chapters, the author first reviews the concept, characteristics and classification of mobile commerce in the retail industry. After having a clearer understanding of mobile commerce, we also summarize the research on users' continued use of behavior in the field of information systems, and sorted out the theoretical basis for this study. After that, the influencing factors of the mobile business users' behavior were sorted out, and the main influencing factors of the mobile business users' behavior were obtained. The main contents of the mobile business users' attention were clarified. Finally, the author analyzed the research of perceived value.

And in the last two chapters, based on the theory of expectation recognition and technology acceptance, we use the content analysis tools of exploratory research to initially obtain the structural dimension of consumer perceived value of mobile commerce and its influencing mechanism for repurchasing intention, and introduce 9

variables: perceived ease of use (PEU); perceived usefulness (PU); perceived security (PS); perceived cost advantages (PCA); perceived social value (PSV); Perceived service quality (PSQ); perceived value (PV); satisfaction (Satis); loyalty (Loy).. And then focus on the basic research proposition of "the influence of perceived value on loyalty of mobile commerce" through content analysis, theoretical research, structural equation modeling, by using Nvivo, SmartPLS.

1. Synthesis of answers to the research questions

Above all, the structural dimensions of each variable were determined. The model shows that the perceived value plays a central role which is validated by the empirical test. The analyses of perceived value is related to many determinants which create more variables. Satisfaction as mediate variables in the role of mobile shopping loyalty structural equation model for verification analysis. The perceived value, satisfaction and loyalty of retail mobile commerce are influenced by different demographic characteristics of mobile users. Therefore, enterprises should carry out different marketing strategy according to the different attributes of users.

Answer to the second research question: What constitutes the perceived value of mobile commerce consumers? And how do these determinants influence the loyalty of mobile commerce?

The perceived value of mobile commerce consists five dimensions: perceived ease of use (PEU); perceived usefulness (PU); perceived security (PS); perceived cost advantages (PCA); perceived social value (PSV). Perceived social value has a most significant positive impact on mobile shopping loyalty among the five components of perceived value. The perceived cost advantage has a greater impact on mobile shopping loyalty than perceived ease of use and perceived usefulness. However, perceived confidence in mobile shopping perceived value has the least significant impact on mobile shopping loyalty.

Does the perceived value influence the fidelity of mobile commerce? And what is the relationship between perceived value, satisfaction and the loyalty of mobile commerce?

Consumer's perceived value and satisfaction have the significant positive effect on consumer's loyalty of retail mobile commerce. Their impact weights on mobile commerce loyalty are different, the satisfaction's direct influence on loyalty is higher than perceived value, but the total influence from perceived value to loyalty via satisfaction turned stronger than satisfaction. It refers that the perceived value will not only directly affect the loyalty, but also impact the loyalty via satisfaction. This build a triangle relationship between satisfaction, perceived value and loyalty of this exploratory stage of the research. Satisfaction of mobile commerce is influenced by perceived after-sales service quality which is the third significant variable to influence consumer's loyalty. It means consumers of mobile commerce pay a lot of attention on after-sales service quality such as logistic quality.

What is the impact of socio-demographic variables on consumer behavior and loyalty of mobile commerce?

First of all, we found that the answers for different profiles of consumers are not balance to establish groups. So, we decide to analyses different demographic groups. The vast majority of model relationships are not significantly altered when considering one group of consumers to another. However, three relationships are slightly more sensitive for different groups: when consumer has a lower level of education or when his family group has moderate size, the perceived social value contributes more to the perceived value of mobile commerce. In addition, the direct impact of the perceived value of mobile commerce loyalty is more pronounced for women than for men, which may the result from more developed economic rationality. Finally, the influence of perceived value on satisfaction is lower when the consumer belongs to a larger family group. The size of the family group therefore seems to play a recurring role, people included in a larger group give less importance to the social benefit and associate less value and satisfaction.

2. Limits and perspectives

This research uses the normative research method to draw some meaningful conclusions, which makes the research of this paper have a theoretical value. However, the research on the perceived value of mobile shopping and its impact on loyalty is only a preliminary attempt, and is subject to my own level and inevitably has many deficiencies, which will also be the direction of the next phase of research.

2.1 Limits of research

Due to the many factors were discussed in this study, the questionnaire structure was slightly long. Although the author has done his utmost to collect data within the allowable time, the sample data in this study is still relatively small. It may has a certain influence on the research results. Therefore, in the selection of research samples, future researchers should use scientific sampling methods and adopt multiple questionnaire collection methods to make the samples more representative. The author expands the ECM-ISC model and considers the impact of perceived value and user satisfaction. However, the various dimensions of perceived value are also affected by many other external variables, such as information quality, service quality, and so on. The author believes that the study of the relationship between these external variables and perceived value will help companies to better create the value they need for users and enrich existing research. Therefore, we can further study the factors that influence the dimensions of perceived value in the future.

The mobile commerce in this article belongs to the category of retail mobile commerce, but the scope is still relatively large. This research does not subdivide the type of mobile shopping, nor does it distinguish between product types and mobile shopping operators. This will inevitably affect the external applicability of this article. Because the behavior of different products or services in different mobile commerce types is different, the value obtained by mobile commerce users in different types of mobile shopping will also be different.

2.2 Perspectives of research

This research initially constructs a research model for mobile commerce consumer's loyalty. According to the above research limitations and the thinking of the research process, the following aspects can be further studied in the future:

- Further expand the scope of research and sample size, and collect research data in a combination of offline and online surveys. Minimize the error created by sample selection and increase the randomness of the sample selection, making the research conclusion more representative.
- Subsequent studies should continuously tap and extend each influencing factor, and incorporate other potential influencing factors into the research model to further improve the model in this study.
- In the future research, the types of mobile commerce and the subdivided fields should be divided in a targeted manner. For example, B2C, C2C, consumer-oriented products, entertainment-type products, etc. This may be more targeted for the corresponding enterprise.

3. Research contributions

As the latest method of electronic commerce, mobile commerce is changing more and more the lifestyle of users, but the mechanism of loyalty is also a problem to be deepened. Based on the ECM-ISC model and the technology acceptance model, this thesis proposes factors such as: perceived ease of use, perceived usefulness, perceived quality of service, perceived confidence, perceived benefit cost, social value perceived. Two types of contributions are expected from this research:

3.1 Theoretical contribution

- Although many researchers have realized the importance of the continued use of information systems, research in this area is relatively weak compared to user's adoption. In the past, research on information system continued usage is mainly based on the TAM model, and Bhattacharjee (2001) proposed an ECM-ISC model based on the deficiencies of the TAM model. However, many researchers have found that the ECM-ISC model is a general model, and that the correct expansion of the model in a specific application can increase the explanatory power of the model. Based on previous research, this thesis develops and corrects the ECM-ISC model from the point of view of the perceived value of mobile commerce users, and empirically studies the extended model through empirical analysis.
- In the mobile commerce environment, the perceived value of consumer has a significant impact on behavior and behavioral intent. In the field of consumer products in general, researchers have realized that findings from the study of perceived values in one dimension have limited enlightenment and guidance for managers. In the field of mobile commerce, research on the dimensions of perceived value by the user is relatively small. This thesis systematically studies research on the factors influencing the perceived value and behavior of mobile commerce users. On this basis, the composition of the value perceived by the user in a mobile business environment is proposed.
- Perceived value and consumer satisfaction has a significant positive effect on consumer loyalty to mobile retail. Their impact on loyalty to mobile commerce is different, the direct influence of satisfaction on loyalty is greater than the perceived value, but the total influence of perceived value on loyalty via satisfaction is stronger than Satisfaction. It refers that perceived value will not only directly affect loyalty, but will also have an impact on loyalty through satisfaction. This builds a triangular relationship between the satisfaction, perceived value and loyalty of this exploratory stage of research.

3.2 Managerial contribution

With the constant improvement of mobile devices and the constant renewal of mobile network technologies, competition for mobile commerce will become more and fiercer. Many companies use various promotional methods to attract new users. However, they ignore the problem of how to keep old users. Retaining old users on the mobile shopping site is even more important for businesses, and also more complicated. The use of some promotional tools can help them attract new users, but this often has a short-term effect and may be less appealing to old users. This is because old users are more familiar with mobile commerce websites or applications and its products and services, their expectations of the value are higher. Efforts to improve the perceived value of old customers are the key for mobile commerce operators to increase the number and quality of transactions. Therefore, in the mobile commerce environment, how to retain old customers has become a problem for all mobile commerce operators. Research in this thesis has practical significance for mobile commerce companies:

- Develop social interaction functions.

Mobile commerce users have a greater demand for social interaction and consumers are influenced by their families, friends and social media. According to the empirical result of this thesis, perceived social value has the most influence on the willingness of consumers to continue to use mobile commerce. The use or recommendation of their friends or acquaintances and, the mobile shopping environment will positively impact the perceived value of mobile shopping.

Therefore, it is particularly important to increase the perceived social value of the consumer. Businesses can enhance social service functions or directly integrate social functions into apps, to guide consumers to create their own shopping circle, share business information and shopping experiences. Use social platforms to promote mobile shopping, reinforce and extend positive effects, actively interact with consumers, value consumer assessments. Create a positive word to mouth environment, encourage business groups to use their chains of relationships to spread and build consumer

confidence. Use the influence of the social relations of the client groups and the influence of the media propaganda to augur the will of the consumers to continue to use the mobile commerce.

- Reasonably reduce the cost of using mobile commerce.

Perceived cost advantage has a greater impact on mobile commerce loyalty than perceived ease of use and perceived usefulness. Customers who use mobile commerce have largely accepted E-commerce. If the cost is too high when using mobile commerce, this part of the consumer group will shift the interest back into E-commerce. Therefore, when companies promote mobile commerce, they must set reasonable standards for fees, such as prices for products and services, logistics fees, mobile payment fees, and so on. Inform consumers that the use of mobile commerce is not more expensive than E-commerce.

- Simplify purchasing operations and optimize the consumer experience

According to the results of this thesis, the perceived ease of use will directly affect the perceived value of mobile commerce consumers. Mobile Apps interface design must be clear and concise so that consumers can search for purchase information easily. Secondly, the procedure should be simplified: for example, voice, photography and other input methods can free up hands, simplify operations and save time. Finally, when the account is registered, the consumer is allowed to request sub-accounts to allow customers to manage multiple accounts at the same time, this facilitates payment to the consumer of the sub-account that does not have a payment function.

- Improve and optimize basic functions to increase perceived usefulness

According to the empirical analysis of this research, perceived usefulness has a significant positive effect on the perceived value of mobile commerce consumers. Companies should continue to strengthen the construction of utility to improve the effectiveness of Apps. The nature of mobile commerce allows customers to purchase products or services anywhere, anytime, shopping activities are more personal and convenient, and operators can enhance their shopping functions around this unique advantage. For example, the push of commercial information combined with

geographical location. Encourage consumers to connect and disseminate up-to-date information on food, entertainment, shopping, hotels, transportation, etc. by protecting their personal information. At the same time, collaborate with physical stores to combine offline business opportunities.

Promote products or online stores, guide consumers to online or offline payment, and integrate mobile shopping into the local circle. On the one hand, consumers benefit from the convenience of online payment. On the other hand, benefit consumers with offline experience and after-sales service. At the same time, mobile shopping providers can also perform more specific personalized marketing and promotion based on the information and purchase data collected.

- Establish a reliable buying environment and enhance consumer confidence.

Perceived trust, although it has a significant impact on the perceived value of online shopping, but overall, this impact is secondary that it is not an important determinant of mobile commerce. The vast majority of trade commerce users are former users who have already used E-commerce. Their perception of risk is not as sensitive as before. However, the protection of customer confidentiality and the development of security technology is always a basic and daily job to do.

- Differentiated services for mobile commerce users attributes

This research analyzes the differences of sociodemographic of mobile commerce users and finds that the user's gender, age, personal income, education level and occupation and other attribute characteristics are different, and the perceived value of mobile shopping experiences are different. Differentiated user experience has become the focus of competition for online retailers in the future. Mobile commerce operators should pay attention to differences in user attributes of mobile commerce, and formulate appropriate marketing strategies, in order to promote the formation of repurchase intentions.

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Annex

List of annex

Annex 1: Interview guide

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Annex 1: Interview guide

The interviews process was devised into two stages. First, we asked the interviewees when and where they use the mobile phone and what kind of function was most useful for them, have they already purchased with their mobile phones and what kind of products were most interested. Have they already used the apps of retailers? To capture the entire use context, they were asked to describe

One situation where they use the mobile apps of retailers

The reason they use it and what experience they got from that situation

- Which m-service they feel the most useful?
- What are the advantages and the defects of mobile apps?

Second, we asked them the level of interaction in each stage of their purchase, the objective is to find out the factors of interaction in each stage of consumer decision process in m-commerce. In this part, the interviewees were asked to describe

- The stage of their purchasing and;
- What interaction they made;
- How they feel about these interactions for their shopping experience?
- Have they feel about the change of their purchasing activities?

Annex 2: Open coding

No.	Open coding raw data examples	Nodes
1	<p>“...We were in this small town and we don’t know where we could find the store, so Nicolas used his phone to find a Casino which is 10 minutes from us. We were so happy because otherwise we will have nothing to eat for that night.”</p> <p>“It’s useful to use the store model because I could find what I want quickly. And I can use my phone to scan the product for more information when I find it. Like a bottle of wine, I can’t find the price and I scan it with my phone, the price came up.”</p> <p>“Payment is easier than before, I don’t have to bring my wallet every time I go to shopping. I could pay with my smart phone. ”</p> <p>“It’s very useful to keep the member card in my phone. I hate when I have to take three or four members card with me, they take a lot of place. Now I can just scan it in my phone.”</p>	<p>a1. technology of LBS</p> <p>a2. in-store mode</p> <p>a3. payment with phone</p> <p>a4. member-card collection</p>
2	<p>“Well, it’s different to connect to Internet at the train from the toilet. I usually take a book when I take the train or a plane because I can’t get the Wi-Fi, if I have it everywhere, I will never finish one book in my life.”</p> <p>“They have Wi-Fi in Carrefour and the speed is not bad, so I really enjoy the shopping with my wife there.”</p> <p>“I think it’s very important for me if I can connect to Internet or not, sometime there is no connection and I don’t know what to do.”</p> <p>“This is a really problem if Wi-Fi is bad and I feel panic when it happened.”</p> <p>“Yes, I think it’s really important because we all need to use Internet every day. I want to search some information with my mobile.”</p> <p>“Convenience, I can consume as long as the network works at anytime, anywhere. Mobile phone is relatively lighter compared to the computer, easy to carry, and do not limited to cable Internet, nor by the access point restrictions”</p>	<p>a5. Wi-Fi connection</p> <p>a6. Wi-Fi in store</p> <p>a7. Internet connection is very important</p> <p>a8. panic without connection</p> <p>a9. need Internet everyday</p> <p>a10. no limitation of cable access</p>
3	<p>“And they will send some promotion information personalized for me according to these two pairs of shoes I bought. It makes me feel very intimate.”</p> <p>“If they have some more detailed personal advice, it is best to be able to give me some advice of my characteristics, more personal. For example, I am very thin, if they can remember and to give me some suggestions for this feature, it is better.”</p>	<p>a11. personalized information</p> <p>a12. more personal advice</p>

4	<p>“I’m so glad to use my smart phone when I have a little time between work and other activities. For example, I could watch the products and promotion information when I go to the toilet or when I take a little rest between my work times. This is really useful for me to notice and capture the new products because I don’t have enough time to go to store every day. I used to be bored when I go to the toilet, but now I feel I could stay there for the whole afternoon.”</p> <p>“Convenience is time-saving, you don’t need to go out, and there is a wide variety of products, it is also very convenient to compare.”</p> <p>“I just like to reserve my tickets or hotels via my iPhone, it’s very easy to use and I can do it anytime I want. So, I feel a lot of liberation with it. I even order my pizza with my phone; I don’t want to go to store with too many other customers on the waiting line.”</p>	<p>a13. use the fragmented time</p> <p>a14. no need to go out</p> <p>a15. anytime</p>
5	<p>“Mobile shopping is too convenient, there is no limit of time and location.”</p> <p>“It’s a progressive for business or consumer, businesses has more consumers, consumers have a more efficient way of shopping at home, you can buy the favorite products.”</p> <p>“Good question. The biggest feature is convenient, very convenient! No limited to time, not limited to location.”</p> <p>“Mobile shopping do not have to go out to buy what I need.”</p>	<p>a16. no limit of time and location</p> <p>a17. shopping at home</p> <p>a18. anytime and any where</p>
6	<p>“Followed by benefits. I can compare around and search on different shopping sites and app. I need to compare the quality and price, choose my most satisfied.” “Yes, I think now through the phone I can first browse some products to get the price information.” “Mobile phone is better for comparing, because a lot of data is complete, and the information is easy to compare, the store is more trouble, you need to remember all the information to compare. In the information comparison it has a relatively large advantage.”</p>	<p>a19. compare around</p> <p>a20. learn about price information</p> <p>a21. a lot of price information to compare</p>
7	<p>“I will shop with mobile phones, look at product information, discount information, and look at the site. I received a product on clothes on my phone yesterday.” “For example, when I chat with friends, I heard a product I did not hear, I will go to search it, I see a product in the mall, I would like to know the price or information, I will also search. Or at my spare time, I will also search. Basically, as long as there are interesting things, in any time I can use mobile device to search, this is the mobile phone convenient place.”</p> <p>“I think because I wrote barbecue meat in my shopping list, when I was driving to the Carrefour, they sent me the message that they are having the promotion for the barbecue sauce. I mean this is interesting because I just forgot to write the sauce in my list.”</p>	<p>a22. watch all sort of information of products</p> <p>a23. instant search information</p> <p>a24. promotion message in store</p>

8	<p>“It is very important. Because they can give me a detailed introduction to the product information, we can also discuss. And some professional staff communication is very good. We can learn a lot of things, and maybe he will give me recommend of some products I do not know, but the network did not do so well in this regard.” “Will be better, but I think it is better the face to face communication. For example, when we talk to a machine or message, I will feel a bit uncomfortable. I am more accustomed to face to face with people. But I think at least it’s better than before, so I can have communication channels. If they can do better later, then I will be more inclined to mobile shopping” / “Shopping APP online customer service.” / “And the friends may have a common interest to communicate, such as price and quality.”</p>	<p>a25. communication with professional staff a26. communication channels a27. online customer service a28. communicate with friends</p>
9	<p>“Search is convenient, I can quickly find the goods I need without having distress to choose which shopping malls to go, and do not need to spend time on the road and to find it.” “First because I do not want to spend too much time on the road, do not want to go to the store with so many guests crowded together, I think the use of mobile shopping is more convenient and more efficient.” “Convenient to save time, I can buy products at anytime, anywhere and I can buy what I want, very convenient.”</p>	<p>a29. no need to choose the store a30. more efficient a31. don’t waste time</p>
10	<p>“I don’t trust mobile commerce because I have to put all my personal information in it, if they use it in other purpose...” “In fact, I think all things are convenient after the frequent use, but I do not worry about security problems. I was worried before, but I am now basically do not worry. Because there was no problem.” “I think the security of mobile phones may be the point I will worry about, but this is almost the same as computer shopping. There will be the risk of someone else to violate my account, even if PayPal security mechanism still has some risks. But I think the probability is still very low, in general, there will be no problem. I have not encountered before.”</p>	<p>a32. don’t trust a33. no security problem a34. worry about security issues</p>
11	<p>“I heard someone lost money by using the mobile phone to purchase something, so I am worried a little.” “We can go online to see the product, the forum to see the evaluation, to understand the business reputation and so on.”</p>	<p>a35. worry from something heard</p>
12	<p>“I’m a little bit worried about my privacy in this context, I don’t know if my personal information is well secured or not. But everything has risk, like visa card. We have to pay attention to protect it by ourselves.” “If my information is kept confidential, I will use it. Because I will leave my bank card information, my personal information, travel information which will be recorded. If someone stole my cell phone, maybe he can get all my information.”</p>	<p>a36. worry about the privacy a37. personal information</p>

13	<p>“No, I do not think my phone has any security problems. So far, all my payments are safe, I bind my bank card, it needs me to enter a security code to complete every time the shopping behavior, then send me an email to confirm, so it is safe.” “No, I feel safe. And bank cards are almost the same, there is not such fraud, may be the first time I will be careful, but after I do not worry.”</p>	<p>a38. payment is safe a39. just as safe as a bank card</p>
14	<p>“Mobile screen is too small so I can’t compare different products with it, and I don’t want to take my iPad every day because I live in Marseille, it’s very risky to do that.” “Mobile screen is also an inconvenient point for me, can’t use it as a computer. Sometimes, I need to compare products but it’s not very easy to do it with my mobile.For security problem, I think it is ok because iPhone is much better than android system. I’m not worried.”</p>	<p>a40. screen is too small a41. screen is also an inconvenient point</p>
15	<p>“The promotion they sent me is very interesting because they seem to know what I’m looking for. For example, I need to buy a print machine two weeks ago which I searched it a lot for the best price. And then the Carrefour sent me a list of printers with promotion, I was so happy and surprised that I found it this way.” “The price is maybe the most important for me to use M-commerce. I found one pair of shoes which I really like and very expansive in store, so I decided to search it with my mobile, I found the same thing with a very attractive price and I made the order very quickly.”</p>	<p>a42. promotion caused my purchase interest a43. price is important</p>
16	<p>“I’d love to change my phone, but I feel a little expensive”</p>	<p>a44. mobile phone is expensive</p>
17	<p>“I may not use too much when I don’t have Wi-Fi, because it will cost a little bit more.” “my data cost me 30 euros per month, I think it’s expensive”</p>	<p>a45. cost more without Wi-Fi a46. data cost is expensive</p>
18	<p>“I’d like to take the pictures of what I bought and share it with my friends. I can put it on Facebook, twitter and Instagram.” “Every time I see my friends share some nice food, I want to go buy it immediately. Maybe I’m so greedy.”</p>	<p>a47. share with friends a48. influence by friends</p>
19	<p>“Of cause, now young people should be keener on mobile consumption. If someone does not it would be very strange”</p>	<p>a49. afraid to be mocked</p>
20	<p>“This is a good question. Very much. Daily use. And the people around me also use it frequently, smart phones in the current Chinese market are quite popular and important.”</p>	<p>a50. people around me all use it</p>
21	<p>“And after the purchase I have to wait for delivery, usually 3-5 days, compared to the traditional shopping I need to be more patient.” “I cannot immediately get it after the payment of goods, I need to wait 2-3 days or more time.” “Like the shoes I just said, from Italy to France took only a week, very fast.”</p>	<p>a51. need more patient to wait for delivery a52. can’t have the product after payment a53. delivery is fast</p>

22	<p>“Yes, I think this may be a mobile inconvenient point. We cannot have face to face communication with the store. After-sales service may not be so convenient. For example, once, I bought a watch with bracelet problem. I called but they said the warranty does not contain the bracelet, but these are not very clear on the app to understand. If I was in the store, I will ask very clearly. I have no way to do that on the app.”</p> <p>“Mobile phone shopping more flexible, targeted search is more autonomy with a clear purpose, after-sales service is more detailed and humane.”</p>	<p>a54. after-sales service is not convenient a55. after-sale service is meticulous and humanized</p>
23	<p>“Yes, I think now through the phone I can first browse some products, understand the price information. And then have the right products I can book first, when I have time to go to the store, I can get the goods directly and buy some things I need. I think this is a very good innovation. So that we can save a lot of time.”</p> <p>“Because it is convenient, fast, and it is easy to find the Internet platform to browse and compare each product more broadly, even the same product can have different prices and quality. Companies have more consumers, consumers have a more efficient way of shopping at home, I can buy my favorite products without go out.”</p> <p>“Shopping rhythm is different, mobile shopping is more efficient and convenient.”</p>	<p>a56. reserve the products a57. good innovation a58. Convenient a59. more choices A60. rhythm faster</p>
24	<p>“After payment, I was looking forward to it, the next day it arrived. When the refrigerator arrived, I was very excited to accept the feeling that the Internet is really convenient for life.”</p> <p>“The deepest impression should be that I have bought my favorite health care products, there is no store in the country, but in the red book it can be purchased, and the day I bought it, it just a has a preferential activity, save almost one-third of my money, I do not only bought the domestic favorite goods, but also with very low prices, feel very happy....”</p> <p>“My shoes, because I received a discount information, the second pair is half price. This is very attractive, so I immediately bought them. And because of these two pairs of shoes, they push some of the information according to my habit. It makes me feel very intimate.”</p>	<p>a61. excited to be satisfied a62. products I like a63. very happy a64. most comfortable a65. good service a66. very attractive a67. very intimate</p>
25	<p>“I can show you. Very simple use interface, it’s from the brand of Jule which has a physical store in the city center. I have subscribed to their product information, so every week I will receive this kind of information as new product information, discount information, trends and so on. I often prefer to buy their products through my mobile phones, rather than go to the store. I can also accumulate points to get discounts. Nearly every products in the store I could get it from my mobile phone, so I do not need to go to the store. I</p>	<p>a68. often purchase a69. accumulate points a70. exchange for a discount a71. repeat to search a72. share experience</p>

	<p>can wait for the delivery at home, I can also go directly to the store to pick it up. This is really very easy to use, very efficient, help me to save a lot of time, money. Mobile shopping prevent me to waste my energy. But I may go to the store when I went to pick up my clothes and try some other clothes, this will be better.”</p> <p>“The more information I get, the more information I searched about the product I want to find will give me. Then I will go to see other users evaluation, and then to buy or book online, and then I will go to the store to see. I will be sharing with others after I have finished buying. In the process of buying I will also search for other products, in short, the whole process is not as simple as a line.”</p>	
26	<p>“I don’t use regularly apps of supermarkets because I don’t need to buy a lot of products. Normally, I buy something I need after work. But I think I will use it after I have a family.”</p> <p>“It’s very useful for me because I have a baby and I need to buy a lot of things for him, diaper; food; clothe and so on. That’s why I started to search the price with my mobile.”</p>	<p>a73. family status</p> <p>a74. have a baby</p>
27	<p>“I’m open for new technology and concept, nothing is better than this.” “No, I am not interested every time they said a new business mode, I prefer the traditional way. I can go to store and talk to sellers.”</p>	<p>a75. open mind</p> <p>a76. less passion with new things</p>
28	<p>“Taobao, after all, experts said that women do not consume could easily get depression, then like Meituan, Dazhong. In fact, when it is inconvenient to super-fresh products, it is also excellent, even if a few dollars raising fee I am also happy.” “Yes, because I think mobile shopping is a kind of enjoyment, the greatest benefit to us is convenience, and then if I have more time and mood, I will wait go to the website when I am in home or go to the store.”</p>	<p>a77. bring happiness</p> <p>a78. it is a enjoy</p>
29	<p>“Are generally my favorite brands, shopping malls. Chanel, lv and so on. And the shopping platform, Taobao, 58 city and so on.”</p> <p>“How to say that, I think when I use APP to buy things that I pay more attention to brand. If I immediately need something, for example, I need a pair of slippers, I do not care about brand, I will go to Taobao. But like Carrefour, first, it is not my favorite, nor the most concerned about. In addition, these are also within reach. I do not deliberately use APP”</p>	<p>a79. favorite brand</p> <p>a80. focus on a brand</p> <p>a81. don’t care about the brand</p>
30	<p>“Then one day my girlfriend found this brand is discounting on Vente privée APP, she told me to look at it. I found it’s really cheap, and it is playing half discount. Then I bought two pieces of clothes through the mobile app.”</p> <p>“Because the computer is more expensive, so I will spend a lot of time to understand the information, I do not want to waste money, about half an hour to compare information. But if I buy clothes, I will be faster to complete.”</p>	<p>a82. discount to attract me to buy</p> <p>a83. do not want to waste money</p> <p>a84. purchased faster when it’s cheaper</p> <p>a85. use mobile phone to purchase because of</p>

	<p>“I will, for example, some products of Taobao will have a price discount by mobile shopping. This will let me abandon the use of computers.”</p> <p>“Mobile shopping do not need to go out, so save a lot of time. When we do not have much time to go shopping, no time to try, this will be much faster. The price will be cheaper.”</p>	<p>discount</p> <p>a86. save money</p>
31	<p>“I do not like to buy things through the phone, I prefer to go to the store for shopping. Because of security problems.”</p> <p>“In addition to security issues I feel better, last week my phone was invaded. Although I feel it’s very easy to use, but I still worry.”</p>	<p>a87. don’t use because of security</p> <p>a88. safety is more important than convenience</p>

Annex 3: Questionnaire

Mobile channel USE AND Purchase SATISFACTION



I am a PhD student at the CERGAM, the Aix-Marseille University research center devoted to the business management.

*My research tries to better understand how consumers perceive the value of **purchasing via mobile device** and what can be done to better satisfy them.*

*If you have recently made a purchase with your Smartphone or other mobile devices, your experience and opinion are highly valuable to my thesis research. Thank you for spending a little time (**about 10 minutes**) answering the following questions about your experience with mobile shopping.*

Kindly note that all answers will remain fully anonymous and no confidential information is requested in this questionnaire. This research is made within the

If you never consumed via a mobile device, this survey doesn't concern you.

Your purchase habits *via* mobile

1. When do you make your orders or reservations *via* your mobile device? (Multiple answers possible):

Any time Shopping time Working time Leisure time Moving time

2. Which type of product do you usually purchase *via* your mobile device? (Multiple answers possible):

Food and commodity Household electrical appliances Clothes and fashion
 Children's products Books and entertainment products Travel (flight/train/taxi...)
 Entertainment tickets (cinema, theatre, sport, etc.) Flowers & gifts
 Personal services (healthcare, body care, fitness, hairdresser...)
 Other, please specify:

3. How many **RETAIL** applications do you have in your mobile phone:

0 1 2 3 4 or 5 6 to 9 10 or more

Your opinion on the mobile apps you mostly use when purchasing:

Do you agree with the following statements?

Use ratings from 1 to 7

Strongly Disagree <-----> Agree
 Strongly Neutral Strongly

01_ The functions of apps I have in my mobile are very easy to use	1	2	3	4	5	6
02_ The apps I have in my mobile are very easy to download and unload	1	2	3	4	5	6
03_ My mobile device offers many functionalities that are useful for shopping	1	2	3	4	5	6
04_ It is worth to spend some time learning how to use a mobile for shopping duties	1	2	3	4	5	6
05_ The websites or apps are well adapted for mobile devices	1	2	3	4	5	6
06_ The websites or apps introduce me directly to the right product or service	1	2	3	4	5	6
07_ The websites or apps narrowly fit with my personal shopping habits	1	2	3	4	5	6
08_ The websites or apps I use for shopping with my mobile are really reliable	1	2	3	4	5	6

09_ The websites or apps provide me with selected special offers or information	1	2	3	4	5	6
10_ My mobile device gives access to a very large range of shops and services	1	2	3	4	5	6
11_ I truly find pleasure in using my mobile for shopping	1	2	3	4	5	6
12_ The products sold via my mobile are strictly the same as in the store	1	2	3	4	5	6
13_ With my mobile, I more easily find the nearest store	1	2	3	4	5	6
14_ With mobile shopping you never have to queue	1	2	3	4	5	6
15_ Using a mobile for shopping spares much of your time	1	2	3	4	5	6
16_ When I use my mobile for shopping, I obtain what I'm looking for	1	2	3	4	5	6
17_ With my mobile device I can order or purchase even when I'm travelling	1	2	3	4	5	6
18_ You will be considered as innovative if you use a mobile for shopping	1	2	3	4	5	6
19_ It is valuable to use mobile device for shopping	1	2	3	4	5	6
20_ With my mobile device I can visit the websites or use the apps at any time and any where	1	2	3	4	5	6
21_ I made a wise choice when I decided to use my mobile for shopping	1	2	3	4	5	6
22_ Using a mobile for shopping gives a good reputation	1	2	3	4	5	6
23_ Using your mobile for shopping brings you some admiration	1	2	3	4	5	6
24_ Using mobile devices for shopping is a modern behavior	1	2	3	4	5	6
25_ I really know more than most people about mobile commerce	1	2	3	4	5	6
26_ When I use my mobile for shopping, my personal information is safe	1	2	3	4	5	6
27_ When I use my mobile for shopping, my transaction information will not be spread to other people	1	2	3	4	5	6
28_ The products or services I order via my mobile are delivered without delay	1	2	3	4	5	6
29_ The products I order via my mobile are in good condition when delivered	1	2	3	4	5	6
30_ The connection from my mobile to the Internet is quick	1	2	3	4	5	6
31_ When I need it, I can always find a good Wi-Fi connection for my mobile	1	2	3	4	5	6
32_ In case of no Wi-Fi connection, I can always find other affordable networks to be connected with	1	2	3	4	5	6
33_ My mobile connection to Internet is well secured	1	2	3	4	5	6

34_ In case of connection disruption, it will be easy to resume my shopping process later on	1	2	3	4	5	6
35_ With my mobile, I have a direct access to the retailer's customer service	1	2	3	4	5	6
36_ Should an issue occur during a mobile shopping, it will be more rapidly solved by the customer service	1	2	3	4	5	6
37_ After sales quality makes me feel satisfied of mobile shopping	1	2	3	4	5	6
38_ In order to assess the websites or apps, one can rely on users evaluations	1	2	3	4	5	6
39_ I only use mobile shopping after having checked users' evaluations about the retailer	1	2	3	4	5	6
40_ By using my mobile for shopping, I can benefit better bargain offers	1	2	3	4	5	6
41_ The prices of products or services I can buy via my mobile are attractive	1	2	3	4	5	6
42_ With my mobile, I more easily compare the prices between the different retailers	1	2	3	4	5	6
43_ With my mobile, I am always aware of the best price offers	1	2	3	4	5	6
44_ Mobile devices are not so expensive to buy, considering all the services they provide	1	2	3	4	5	6
45_ Mobile shopping allows to make a better use of connection costs	1	2	3	4	5	6
46_ Purchasing via mobile is worth it, even if it costs a bit more	1	2	3	4	5	6
47_ I would accept to pay a little higher Internet fee, in order to feel free to use my mobile for shopping any time I want	1	2	3	4	5	6
48_ Buying a better mobile device for shopping is worth it, even if it is costs some more	1	2	3	4	5	6
49_ On the whole, purchasing with your mobile allows to better spend your money	1	2	3	4	5	6
50_ With my mobile, I more easily find all information I need about the products or services I want buy	1	2	3	4	5	6
51_ With my mobile I get exact information about what service will be delivered	1	2	3	4	5	6
52_ With mobile shopping, I get the right information at the right moment	1	2	3	4	5	6
53_ It is very easy to pay with my mobile device	1	2	3	4	5	6
54_ The payment systems I use with my mobile are really trustworthy	1	2	3	4	5	6
55_ Shopping with a mobile says what person you are	1	2	3	4	5	6
56_ In future, I will warmly recommend other people to use their mobile for shopping	1	2	3	4	5	6

57_ In future, I will surely continue to purchase via my mobile	1	2	3	4	5	6
58_ In future, I will certainly use more and more often my mobile for shopping	1	2	3	4	5	6
59_ In future, I will certainly increase the amount I spend via mobile shopping	1	2	3	4	5	6
60_ I have a personal interest in mobile phone devices	1	2	3	4	5	6
61_ I often use my mobile as an entertainment tool	1	2	3	4	5	6
62_ Most of my friends do use their mobile for shopping duties	1	2	3	4	5	6
63_ My mobile phone improves my life quality	1	2	3	4	5	6
64_ My mobile phone improves the quality of myself	1	2	3	4	5	6
65_ My mobile device is always of the most recent fashion	1	2	3	4	5	6
66_ When I see something new in my shopping environment, I want to try it as soon as possible	1	2	3	4	5	6
67_ Enjoying what I am doing is very important to me, even when shopping	1	2	3	4	5	6
68_ I would feel deeply disappointed after a purchase, if I discover I could have got it at a better price	1	2	3	4	5	6
69_ I generally prefer choosing a brand I like than trying a new one	1	2	3	4	5	6

4. How often do you use a shopping application with your mobile phone?

- Every day
 3 or 4 times a week
 Every week
 2 or 3 times a month
 Every month
 Less regularly

5. Usually, when you do shopping with your mobile phone, it is:

- Only for yourself
 For your household: 2 persons
 For your household: 3 persons
 For your household: 4 persons or more

6. How much do you spend on average for shopping with your mobile phone each month?

- Less than 50€ 50-100€ 101-150€ 151-200€ 201-300€ 301-400€ More than 400 €

Few more questions about you

7. Please mention your gender:

- Male
 Female

8. Please mention your age:

- 16-20 years 21-25 years 26-30 years 31-35 years 36-40 years
 41-45 years 46-50 years 51-55 years 55-60 years

9. Your family status:

- Single Married In couple but not married Widowed Divorced Other

10. Please the higher level of studies you achieved:

- Secondary education or less Bachelor Master or higher

11. Your main occupation or status:

- Employee or Worker Executive Unoccupied or retired Student
 Other, please specify.....

12. Your monthly income:

- 1000 € or less 1,001 – 1,500 € 1,501 – 2,000 € 2,001 - 2,500 € Over 3,000 €

Thank you very much for the time spent answering this questionnaire.

**Your answers will be valuable for our ongoing research as to how
mobile channels are perceived by consumers.**

Annex 4: Measurement of variables

1. Final Results

● Path Coefficients

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
COST -> PVal	0.187	0.191	0.069	2.713	0.007
Confidence -> PVal	0.150	0.150	0.073	2.050	0.040
Delivery -> SAT	0.309	0.309	0.060	5.166	0.000
Ease_of_use -> PVal	0.198	0.199	0.062	3.170	0.002
PVal -> LOY	0.364	0.363	0.066	5.490	0.000
PVal -> SAT	0.559	0.560	0.056	10.033	0.000
SAT -> LOY	0.472	0.475	0.062	7.577	0.000
SOCIAL -> PVal	0.222	0.220	0.049	4.522	0.000
usefulness -> PVal	0.177	0.174	0.079	2.239	0.025

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
COST -> PVal	0.187	0.191	0.064	0.337
Confidence -> PVal	0.150	0.150	0.007	0.291
Delivery -> SAT	0.309	0.309	0.192	0.426
Ease_of_use -> PVal	0.198	0.199	0.075	0.321
PVal -> LOY	0.364	0.363	0.229	0.488
PVal -> SAT	0.559	0.560	0.449	0.666
SAT -> LOY	0.472	0.475	0.355	0.600
SOCIAL -> PVal	0.222	0.220	0.121	0.314
usefulness -> PVal	0.177	0.174	0.016	0.325

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
COST -> PVal	0.187	0.191	0.004	0.062	0.334
Confidence -> PVal	0.150	0.150	-0.001	0.009	0.294
Delivery -> SAT	0.309	0.309	0.000	0.193	0.426
Ease_of_use -> PVal	0.198	0.199	0.001	0.073	0.319
PVal -> LOY	0.364	0.363	-0.001	0.229	0.487
PVal -> SAT	0.559	0.560	0.001	0.447	0.664
SAT -> LOY	0.472	0.475	0.003	0.351	0.595
SOCIAL -> PVal	0.222	0.220	-0.003	0.128	0.321
usefulness -> PVal	0.177	0.174	-0.003	0.018	0.326

● Indirect Effects

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
COST -> LOY	0.117	0.121	0.045	2.620	0.009
COST -> PVal					
COST -> SAT	0.105	0.107	0.040	2.602	0.009
Confidence -> LOY	0.094	0.094	0.046	2.047	0.041
Confidence -> PVal					
Confidence -> SAT	0.084	0.083	0.041	2.047	0.041
Delivery -> LOY	0.146	0.147	0.036	4.068	0.000
Delivery -> SAT					
Ease_of_use -> LOY	0.124	0.125	0.039	3.167	0.002
Ease_of_use -> PVal					
Ease_of_use -> SAT	0.111	0.110	0.035	3.199	0.001
PVal -> LOY	0.264	0.266	0.045	5.849	0.000
PVal -> SAT					
SAT -> LOY					
SOCIAL -> LOY	0.140	0.138	0.033	4.197	0.000
SOCIAL -> PVal					
SOCIAL -> SAT	0.124	0.124	0.033	3.752	0.000
usefulness -> LOY	0.111	0.110	0.051	2.198	0.028
usefulness -> PVal					
usefulness -> SAT	0.099	0.098	0.047	2.121	0.034

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
COST -> LOY	0.117	0.121	0.039	0.218
COST -> PVal				
COST -> SAT	0.105	0.107	0.035	0.195
Confidence -> LOY	0.094	0.094	0.005	0.183
Confidence -> PVal				
Confidence -> SAT	0.084	0.083	0.004	0.165
Delivery -> LOY	0.146	0.147	0.082	0.222
Delivery -> SAT				
Ease_of_use -> LOY	0.124	0.125	0.047	0.203
Ease_of_use -> PVal				
Ease_of_use -> SAT	0.111	0.110	0.042	0.179
PVal -> LOY	0.264	0.266	0.185	0.360
PVal -> SAT				
SAT -> LOY				
SOCIAL -> LOY	0.140	0.138	0.073	0.205
SOCIAL -> PVal				
SOCIAL -> SAT	0.124	0.124	0.063	0.194
usefulness -> LOY	0.111	0.110	0.010	0.208
usefulness -> PVal				
usefulness -> SAT	0.099	0.098	0.009	0.189

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
COST -> LOY	0.117	0.121	0.003	0.038	0.217
COST -> PVal					
COST -> SAT	0.105	0.107	0.003	0.034	0.193
Confidence -> LOY	0.094	0.094	0.000	0.007	0.186
Confidence -> PVal					
Confidence -> SAT	0.084	0.083	- 0.001	0.006	0.166
Delivery -> LOY	0.146	0.147	0.001	0.084	0.224
Delivery -> SAT					
Ease_of_use -> LOY	0.124	0.125	0.000	0.045	0.201
Ease_of_use -> PVal					
Ease_of_use -> SAT	0.111	0.110	0.000	0.042	0.179
PVal -> LOY	0.264	0.266	0.002	0.185	0.360
PVal -> SAT					
SAT -> LOY					
SOCIAL -> LOY	0.140	0.138	- 0.001	0.075	0.208
SOCIAL -> PVal					
SOCIAL -> SAT	0.124	0.124	- 0.001	0.067	0.198
usefulness -> LOY	0.111	0.110	- 0.002	0.012	0.210
usefulness -> PVal					
usefulness -> SAT	0.099	0.098	- 0.001	0.012	0.192

● **Total Effects**

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
COST -> LOY	0.117	0.121	0.045	2.620	0.009
COST -> PVal	0.187	0.191	0.069	2.713	0.007
COST -> SAT	0.105	0.107	0.040	2.602	0.009
Confidence -> LOY	0.094	0.094	0.046	2.047	0.041
Confidence -> PVal	0.150	0.150	0.073	2.050	0.040
Confidence -> SAT	0.084	0.083	0.041	2.047	0.041
Delivery -> LOY	0.146	0.147	0.036	4.068	0.000
Delivery -> SAT	0.309	0.309	0.060	5.166	0.000
Ease_of_use -> LOY	0.124	0.125	0.039	3.167	0.002
Ease_of_use -> PVal	0.198	0.199	0.062	3.170	0.002
Ease_of_use -> SAT	0.111	0.110	0.035	3.199	0.001
PVal -> LOY	0.628	0.629	0.040	15.878	0.000
PVal -> SAT	0.559	0.560	0.056	10.033	0.000
SAT -> LOY	0.472	0.475	0.062	7.577	0.000
SOCIAL -> LOY	0.140	0.138	0.033	4.197	0.000
SOCIAL -> PVal	0.222	0.220	0.049	4.522	0.000
SOCIAL -> SAT	0.124	0.124	0.033	3.752	0.000
usefulness -> LOY	0.111	0.110	0.051	2.198	0.028
usefulness -> PVal	0.177	0.174	0.079	2.239	0.025
usefulness -> SAT	0.099	0.098	0.047	2.121	0.034

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
COST -> LOY	0.117	0.121	0.039	0.218
COST -> PVal	0.187	0.191	0.064	0.337
COST -> SAT	0.105	0.107	0.035	0.195
Confidence -> LOY	0.094	0.094	0.005	0.183
Confidence -> PVal	0.150	0.150	0.007	0.291
Confidence -> SAT	0.084	0.083	0.004	0.165
Delivery -> LOY	0.146	0.147	0.082	0.222
Delivery -> SAT	0.309	0.309	0.192	0.426
Ease_of_use -> LOY	0.124	0.125	0.047	0.203
Ease_of_use -> PVal	0.198	0.199	0.075	0.321
Ease_of_use -> SAT	0.111	0.110	0.042	0.179
PVal -> LOY	0.628	0.629	0.546	0.700
PVal -> SAT	0.559	0.560	0.449	0.666
SAT -> LOY	0.472	0.475	0.355	0.600
SOCIAL -> LOY	0.140	0.138	0.073	0.205
SOCIAL -> PVal	0.222	0.220	0.121	0.314
SOCIAL -> SAT	0.124	0.124	0.063	0.194
usefulness -> LOY	0.111	0.110	0.010	0.208
usefulness -> PVal	0.177	0.174	0.016	0.325
usefulness -> SAT	0.099	0.098	0.009	0.189

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
COST -> LOY	0.117	0.121	0.003	0.038	0.217
COST -> PVal	0.187	0.191	0.004	0.062	0.334
COST -> SAT	0.105	0.107	0.003	0.034	0.193
Confidence -> LOY	0.094	0.094	0.000	0.007	0.186
Confidence -> PVal	0.150	0.150	-0.001	0.009	0.294
Confidence -> SAT	0.084	0.083	-0.001	0.006	0.166
Delivery -> LOY	0.146	0.147	0.001	0.084	0.224
Delivery -> SAT	0.309	0.309	0.000	0.193	0.426
Ease_of_use -> LOY	0.124	0.125	0.000	0.045	0.201
Ease_of_use -> PVal	0.198	0.199	0.001	0.073	0.319
Ease_of_use -> SAT	0.111	0.110	0.000	0.042	0.179
PVal -> LOY	0.628	0.629	0.001	0.538	0.697
PVal -> SAT	0.559	0.560	0.001	0.447	0.664
SAT -> LOY	0.472	0.475	0.003	0.351	0.595
SOCIAL -> LOY	0.140	0.138	-0.001	0.075	0.208
SOCIAL -> PVal	0.222	0.220	-0.003	0.128	0.321
SOCIAL -> SAT	0.124	0.124	-0.001	0.067	0.198
usefulness -> LOY	0.111	0.110	-0.002	0.012	0.210
usefulness -> PVal	0.177	0.174	-0.003	0.018	0.326
usefulness -> SAT	0.099	0.098	-0.001	0.012	0.192

● Outer Loadings

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
AfterS <- Delivery	0.825	0.825	0.020	41.358	0.000
Comp1 <- usefulness	0.828	0.828	0.027	30.707	0.000
Comp2 <- usefulness	0.796	0.795	0.025	32.215	0.000
Conf1 <- Confidence	0.813	0.812	0.022	36.370	0.000
Conf3 <- Confidence	0.816	0.816	0.019	43.371	0.000
Conf4 <- Confidence	0.841	0.840	0.021	39.424	0.000
ConnPr <- COST	0.839	0.839	0.022	38.290	0.000
DeviPr <- COST	0.755	0.755	0.033	22.730	0.000
Flex1 <- Ease_of_use	0.801	0.798	0.028	28.749	0.000
Flex3 <- Ease_of_use	0.828	0.827	0.035	23.438	0.000
Flex4 <- Ease_of_use	0.802	0.800	0.029	28.016	0.000
Func1 <- Ease_of_use	0.828	0.828	0.021	39.391	0.000
Func2 <- Ease_of_use	0.779	0.778	0.035	22.092	0.000
Func3 <- Ease_of_use	0.829	0.828	0.024	34.861	0.000
Ident <- SOCIAL	0.841	0.840	0.024	35.143	0.000
Image1 <- SOCIAL	0.827	0.827	0.021	38.490	0.000
Image2 <- SOCIAL	0.738	0.737	0.046	15.869	0.000
Image3 <- SOCIAL	0.829	0.827	0.025	33.566	0.000
Inst1 <- usefulness	0.743	0.741	0.041	18.241	0.000
Inst3 <- usefulness	0.863	0.863	0.015	59.414	0.000
Inter1 <- usefulness	0.812	0.811	0.023	35.721	0.000
Logist1 <- Delivery	0.812	0.812	0.026	31.687	0.000
Logist2 <- Delivery	0.849	0.848	0.019	44.277	0.000
Loy1 <- LOY	0.833	0.834	0.022	38.360	0.000
Loy2 <- LOY	0.861	0.861	0.019	44.319	0.000
Loy3 <- LOY	0.858	0.857	0.029	29.868	0.000
Loy4 <- LOY	0.849	0.848	0.023	36.404	0.000
MonBen <- COST	0.830	0.830	0.022	38.121	0.000
PVal2 <- PVal	0.850	0.850	0.018	47.893	0.000
PVal3 <- PVal	0.833	0.833	0.021	40.326	0.000
PVal4 <- PVal	0.711	0.711	0.035	20.341	0.000
PVal5 <- PVal	0.770	0.769	0.033	23.201	0.000
Paym1 <- Confidence	0.804	0.803	0.024	34.095	0.000
Price1 <- COST	0.809	0.809	0.027	30.302	0.000
Price2 <- COST	0.797	0.796	0.027	29.824	0.000
Privac <- Confidence	0.791	0.790	0.025	31.699	0.000
Resume <- Confidence	0.784	0.784	0.025	31.936	0.000
Sat1 <- SAT	0.853	0.853	0.016	54.724	0.000
Sat2 <- SAT	0.875	0.875	0.015	58.212	0.000
Sat3 <- SAT	0.839	0.839	0.018	46.126	0.000

● Outer Weights

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
AfterS <- Delivery	0.434	0.434	0.027	16.030	0.000
Comp1 <- usefulness	0.248	0.248	0.015	16.849	0.000
Comp2 <- usefulness	0.239	0.239	0.015	16.129	0.000
Conf1 <- Confidence	0.175	0.174	0.011	16.256	0.000
Conf3 <- Confidence	0.228	0.229	0.013	17.436	0.000
Conf4 <- Confidence	0.207	0.207	0.013	16.507	0.000
ConnPr <- COST	0.274	0.274	0.018	15.378	0.000
DeviPr <- COST	0.240	0.240	0.015	15.813	0.000
Flex1 <- Ease_of_use	0.182	0.181	0.015	12.220	0.000
Flex3 <- Ease_of_use	0.193	0.193	0.016	11.988	0.000
Flex4 <- Ease_of_use	0.200	0.200	0.012	16.418	0.000
Func1 <- Ease_of_use	0.243	0.244	0.018	13.682	0.000
Func2 <- Ease_of_use	0.210	0.211	0.017	12.684	0.000
Func3 <- Ease_of_use	0.204	0.204	0.015	14.063	0.000
Ident <- SOCIAL	0.365	0.365	0.026	13.920	0.000
Image1 <- SOCIAL	0.346	0.347	0.025	13.586	0.000
Image2 <- SOCIAL	0.270	0.270	0.031	8.820	0.000
Image3 <- SOCIAL	0.250	0.249	0.023	11.108	0.000
Inst1 <- usefulness	0.214	0.213	0.017	12.435	0.000
Inst3 <- usefulness	0.285	0.286	0.016	18.362	0.000
Inter1 <- usefulness	0.246	0.246	0.014	18.129	0.000
Logist1 <- Delivery	0.387	0.386	0.029	13.156	0.000
Logist2 <- Delivery	0.386	0.386	0.023	16.716	0.000
Loy1 <- LOY	0.341	0.340	0.019	17.476	0.000
Loy2 <- LOY	0.295	0.295	0.017	17.333	0.000
Loy3 <- LOY	0.270	0.270	0.011	23.932	0.000
Loy4 <- LOY	0.271	0.272	0.012	21.997	0.000
MonBen <- COST	0.272	0.272	0.018	15.409	0.000
PVal2 <- PVal	0.353	0.353	0.014	24.903	0.000
PVal3 <- PVal	0.335	0.334	0.013	25.201	0.000
PVal4 <- PVal	0.275	0.275	0.016	17.420	0.000
PVal5 <- PVal	0.292	0.292	0.014	20.969	0.000
Paym1 <- Confidence	0.211	0.212	0.011	19.751	0.000
Price1 <- COST	0.214	0.214	0.016	13.721	0.000
Price2 <- COST	0.238	0.238	0.015	16.358	0.000
Privac <- Confidence	0.184	0.183	0.011	16.729	0.000
Resume <- Confidence	0.233	0.233	0.013	17.270	0.000
Sat1 <- SAT	0.421	0.420	0.015	28.780	0.000
Sat2 <- SAT	0.393	0.393	0.011	35.358	0.000
Sat3 <- SAT	0.354	0.355	0.012	30.159	0.000

2. Quality Criteria

- **R Square**

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
LOY	0.604	0.610	0.033	18.357	0.000
PVal	0.576	0.585	0.039	14.581	0.000
SAT	0.593	0.597	0.040	14.803	0.000

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
LOY	0.604	0.610	0.543	0.672
PVal	0.576	0.585	0.505	0.660
SAT	0.593	0.597	0.516	0.671

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
LOY	0.604	0.610	0.006	0.531	0.661
PVal	0.576	0.585	0.010	0.479	0.639
SAT	0.593	0.597	0.005	0.504	0.661

- **R Square Adjusted**

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
LOY	0.602	0.607	0.033	18.176	0.000
PVal	0.569	0.579	0.040	14.204	0.000
SAT	0.590	0.595	0.040	14.655	0.000

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
LOY	0.602	0.607	0.540	0.670
PVal	0.569	0.579	0.497	0.655
SAT	0.590	0.595	0.514	0.669

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
LOY	0.602	0.607	0.006	0.528	0.659
PVal	0.569	0.579	0.010	0.471	0.633
SAT	0.590	0.595	0.005	0.501	0.659

● **Average Variance Extracted (AVE)**

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
COST	0.651	0.651	0.023	28.833	0.000
Confidence	0.653	0.653	0.021	30.521	0.000
Delivery	0.687	0.687	0.024	28.404	0.000
Ease_of_use	0.658	0.657	0.029	22.892	0.000
LOY	0.723	0.723	0.026	27.384	0.000
PVal	0.629	0.629	0.023	27.406	0.000
SAT	0.732	0.733	0.020	36.785	0.000
SOCIAL	0.656	0.655	0.026	25.088	0.000
usefulness	0.655	0.655	0.024	27.655	0.000

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
COST	0.651	0.651	0.605	0.694
Confidence	0.653	0.653	0.610	0.694
Delivery	0.687	0.687	0.637	0.732
Ease_of_use	0.658	0.657	0.598	0.710
LOY	0.723	0.723	0.668	0.773
PVal	0.629	0.629	0.584	0.675
SAT	0.732	0.733	0.692	0.770
SOCIAL	0.656	0.655	0.602	0.704
usefulness	0.655	0.655	0.607	0.700

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
COST	0.651	0.651	0.000	0.604	0.693
Confidence	0.653	0.653	0.000	0.610	0.694
Delivery	0.687	0.687	0.000	0.636	0.730
Ease_of_use	0.658	0.657	-0.001	0.599	0.711
LOY	0.723	0.723	0.000	0.666	0.771
PVal	0.629	0.629	0.000	0.583	0.674
SAT	0.732	0.733	0.000	0.691	0.768
SOCIAL	0.656	0.655	-0.001	0.602	0.704
usefulness	0.655	0.655	0.000	0.607	0.700

● **Composite Reliability**

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
COST	0.903	0.903	0.009	102.618	0.000
Confidence	0.919	0.918	0.007	129.047	0.000
Delivery	0.868	0.868	0.013	66.865	0.000
Ease_of_use	0.920	0.920	0.010	96.458	0.000
LOY	0.913	0.912	0.011	86.136	0.000
PVal	0.871	0.871	0.011	77.449	0.000
SAT	0.891	0.891	0.010	90.296	0.000
SOCIAL	0.884	0.883	0.012	72.544	0.000
usefulness	0.904	0.904	0.009	98.243	0.000

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
COST	0.903	0.903	0.884	0.919
Confidence	0.919	0.918	0.904	0.932
Delivery	0.868	0.868	0.840	0.891
Ease_of_use	0.920	0.920	0.899	0.936
LOY	0.913	0.912	0.890	0.931
PVal	0.871	0.871	0.848	0.892
SAT	0.891	0.891	0.871	0.910
SOCIAL	0.884	0.883	0.857	0.905
usefulness	0.904	0.904	0.885	0.921

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
COST	0.903	0.903	0.000	0.884	0.919
Confidence	0.919	0.918	0.000	0.904	0.932
Delivery	0.868	0.868	0.000	0.839	0.891
Ease_of_use	0.920	0.920	-0.001	0.900	0.937
LOY	0.913	0.912	0.000	0.889	0.931
PVal	0.871	0.871	0.000	0.848	0.892
SAT	0.891	0.891	0.000	0.870	0.909
SOCIAL	0.884	0.883	-0.001	0.857	0.905
usefulness	0.904	0.904	0.000	0.885	0.921

● **Cronbach's Alpha**

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
COST	0.866	0.865	0.013	64.728	0.000
Confidence	0.894	0.894	0.010	89.312	0.000
Delivery	0.772	0.772	0.026	30.183	0.000
Ease_of_use	0.896	0.895	0.013	66.859	0.000
LOY	0.873	0.872	0.017	52.801	0.000
PVal	0.802	0.802	0.020	40.596	0.000
SAT	0.818	0.818	0.018	44.388	0.000
SOCIAL	0.825	0.824	0.020	40.412	0.000
usefulness	0.868	0.867	0.014	61.270	0.000

Confidence Intervals

	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
COST	0.866	0.865	0.837	0.890
Confidence	0.894	0.894	0.873	0.912
Delivery	0.772	0.772	0.718	0.817
Ease_of_use	0.896	0.895	0.866	0.918
LOY	0.873	0.872	0.836	0.902
PVal	0.802	0.802	0.761	0.839
SAT	0.818	0.818	0.779	0.851
SOCIAL	0.825	0.824	0.781	0.860
usefulness	0.868	0.867	0.837	0.893

Confidence Intervals Bias Corrected

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
COST	0.866	0.865	0.000	0.836	0.889
Confidence	0.894	0.894	-0.001	0.873	0.912
Delivery	0.772	0.772	-0.001	0.715	0.815
Ease_of_use	0.896	0.895	-0.001	0.867	0.919
LOY	0.873	0.872	0.000	0.836	0.901
PVal	0.802	0.802	-0.001	0.760	0.838
SAT	0.818	0.818	0.000	0.777	0.850
SOCIAL	0.825	0.824	-0.001	0.780	0.860
usefulness	0.868	0.867	-0.001	0.837	0.892

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