

MON NOM EST SSIT, JE SUIS LA POUR VOUS AIDER !

**UNE ETUDE EMPIRIQUE SUR LA CREATION DE VALEUR EN MAGASIN AVEC LES AIDES A LA
DECISION DIGITALES**

Florence Feenstra*, ESSCA School of Management, France

Valentina Stan, ESSCA School of Management, France

Armelle Glerant-Glikson, IAE Gustave Eiffel, France

Résumé:

L'essor des SSIT (*Self-Service Information technologies*) fait partie de l'évolution phygitale du retail où la recherche d'information du consommateur devient une expérience interactive. Cette étude quantitative examine l'impact de la valeur globale perçue sur l'adoption des tablettes digitales intégrées, analysant les bénéfices et coûts retirés d'une expérience utilisateur avec la technologie. Les résultats démontrent que les SSIT digitales créent de la valeur au cours du parcours d'achat en magasin, à travers trois bénéfices principaux : l'utilité perçue, le plaisir et l'autonomie perçue. Cependant, les efforts à l'usage détériorent l'expérience et sont contreproductifs pour la création valeur, et au final pour les intentions d'adoption des SSIT.

Mots-clés : Self-Service Information Technologies, aide à la décision, valeur globale perçue, expérience utilisateur, distribution phygitale

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**AN EMPIRICAL INVESTIGATION ON VALUE CREATION WITH DIGITAL DECISION AIDS IN-
STORE**

Abstract :

In-store SSIT (*Self-Service Information technologies*) expansion is part of the Phygital evolution in retail, where consumer information search becomes an interactive experience. This study examines the adoption of digital integrated tablets from the value perspective taking into account both benefits and costs derived from an user experience with the technology. The findings demonstrates that digital SSITs are source of value during the purchasing trip in-store though 3 main benefits: perceived usefulness, enjoyment and autonomy. Nevertheless, the efforts in-use destroy the user experience and are counterproductive for the value creation and *in fine* SSIT adoption.

Key-words: Self-Service Information Technologies, Decision aid, global perceived value, user experience, phygital retail

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*Auteur correspondant: florence.feenstra@essca.fr

Résumé managérial

A l'heure du phygital (contraction de « digital » et de « physique »), les techniques digitales d'aide à la décision (tablettes intégrées, QR code, bornes tactiles d'informations, réalité augmentée, stop rayons avec QR codes, etc..) fleurissent partout en magasin pour accompagner les clients dans leur recherche d'information omnicanale. Après une phase de « *Test and Learn* » tout azimut, place au choix. Pour développer un support technique efficace et orienté service, il s'agit de replacer le *shopper* au centre de la réflexion. Ses solutions sont-elles vraiment utiles pour le client ? Quelle valeur en retire-t-il au cours de son expérience d'achat ? Quels sont les points de blocage à l'usage qui pourraient en freiner l'adoption ?

La décision de mettre en place une technologie digitale d'aide à la décision doit être évaluée selon son ROI mais aussi selon la valeur qu'elle procure réellement pour les clients dans leur parcours de shopping. L'essor des SSIT se justifie par l'élargissement considérable des offres en magasin, une pression temporelle grandissante et une surcharge informationnelle. Les SSIT sont aussi utiles dans un contexte de complexité de choix liée à la multiplicité des attributs produits, ou de risque perçu à l'achat élevé, nécessitant un niveau d'explication important.

Cette recherche vise précisément à comprendre quels sont les bénéfices et coûts à l'usage des technologies interactives d'aide à la décision en se plaçant du côté de l'utilisateur. La question est aussi de savoir si la valeur globale finale générée au cours de la recherche d'information du consommateur peut expliquer les intentions d'usage futures des SSIT.

Une étude empirique quantitative a été réalisée à la fois en GSS et GSA, en collaboration avec 5 enseignes de distribution françaises (Leclerc, Carrefour, Auchan, Leroy Merlin et Castorama). La technologie sélectionnée car majoritairement présente en rayon, sont les tablettes intégrées. Ici deux catégories de produit complexes ont été choisies pour leur pertinence au regard de leur fonction d'aide (le bricolage et l'alcool en hypermarchés). Au total, 330 shoppers ont été interviewés *in situ* à l'issue de leur expérience utilisateur vécue en rayon.

Cet article apporte un éclairage intéressant pour les distributeurs portant une attention croissante à la création d'une expérience de shopping gratifiante. Les résultats montrent en effet que les tablettes intégrées sont bien source de valeur pour le shopper au cours de sa recherche d'information. Trois bénéfices principaux ressortent : l'utilité perçue au cours de la recherche d'information (facilité et accès rapide à l'information, qualité de l'information) le plaisir procuré au cours de la navigation et l'autonomie perçue du shopper dans sa collecte d'information. Il est intéressant de noter que ce troisième bénéfice est en ligne avec l'objectif avoué des distributeurs de rendre le consommateur davantage indépendant du vendeur, dans un souci à la fois économique de gain de productivité et d'attractivité. Cependant, les efforts à l'usage restent une source de destruction forte de l'expérience vécue, appelant une réflexion plus globale sur l'accompagnement du shopper et le rôle assigné au vendeur dans l'éducation du client. Cette recherche ouvre enfin des pistes de réflexion stratégiques pour les distributeurs et industriels. Car les SSIT peuvent être sources de différenciation et de fidélisation pour l'enseigne dans un contexte de shopping où les dimensions temporelles, expérientielles et de commodité sont devenues des variables d'ajustement clefs du parcours d'achat et du choix du canal. Les SSIT digitales accompagnent les nouveaux comportements technophiles de recherche des clients en proposant une expérience à la carte, autonome, sans couture, qui peut dépasser le canal physique. Les SSIT digitales élargissent aussi les sources informationnelles du client en supprimant l'ancrage physique et temporel et en ouvrant l'espace relationnel au-delà du magasin.

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AN EMPIRICAL INVESTIGATION ON VALUE CREATION WITH DIGITAL DECISION AIDS IN-STORE

1. Introduction

The increased number of shopping alternatives with diversified retail formats calls more than ever for a deeper understanding of how to turn in-store shopping into high-value pursuit. In the new retailing landscape, improving customer experience is at the heart of the on-going digital transformation and is fast becoming a top strategic priority¹. During the past decade, the expansion of interactive self-service technologies has transformed the way retailers aim to achieve differentiation and sustainable competitive advantages. Retailers are integrating the new technologies to provide customers with innovative “do it yourself” services mostly for transactional purposes. However, customer demand has changed and has intensified at the same time. “Consumers expect a similar user experience from physical stores as they find online, wishing to use technology to help them engage with the store at every step of the shopping journey”².

SSITs (self-service information technologies) are a growing part of this *phygital* evolution in retail, where consumer information search becomes an interactive and connected experience. A large range of new digital interfaces are now being experimented in retail (Feenstra and Glérant-Glikson, 2017; Beck et Crié (2015), for example mobile shopping apps, QR code equipped shelf-tags, information kiosks, digital walls, augmented reality devices, social media mirrors, and so on.

SSITs are defined as interactive consumer decisions aids (Murray and Häubl, 2008). SSIT implementation has both economic and relational objectives and strive to reduce costs by turning customers into co-producers of services and enhancing customer experience by offering convenient information-related services. Prior research (Kallweitt, Spreer and Toporowski, 2014) has suggested that SSITs are particularly attractive for shoppers since they reduce waiting times and search costs. They provide more relevant and customized information that enables shoppers to make better decisions.

Previous research (Kallweitt Spreer and Toporowski, 2014; Chih Hung Wang, 2012; Davis, 1989) mainly focused on the reasons for SSIT acceptance using the Technological Acceptance Model (TAM). For SSITs in particular, this research has shown the positive effect of the utilitarian service-related value of SSITs (perceived adequacy of information, usefulness of content and perceived ease of use) on the attitude to use, the intent to reuse, and a higher perception of the service quality (Kallweit Spreer and Toporowski, 2014). However, this conceptualization has come under criticism (Van der Heijden, 2004), as being inappropriate for capturing hedonic or social factors which are key motivations for store visits (Tauber, 1972; Anteblian, Filser and Roederer, 2013). Moreover, the significant changes in modern-day consumers’ shopping patterns - where the shopper frequently interacts with technology-mediated services - calls for a new focus on the customer as co-producer and value co-creator of the service (Hilton, 2013). The value-based Adoption model could be an alternative to the traditional SST assessment models (Kim, Chan and Gupta, 2007), and takes on relevance in the analysis of the contextual and individual nature of a co-produced experience (Mencarelli and Rivière, 2014).

Despite retailers’ growing effort to offer a great self-service shopping experience, little is known about how to maximize value and usage of SSIT in-store. Our research address this

¹ Accenture (2015) Digital Transformation In The Age Of The Customer

² Source: Capgemini (2017), Rapport Digital Transformation : “Making the Digital Connection: Why Physical Retail Stores Need a Reboot” 6 000 personnes interrogées (US, UK, France, Germany, Italy, Spain, Sweden, Netherlands ,Chine) en November 2016.

gap by explaining the SSIT adoption from the consumer perspective, and not just from a technology user perspective. More specifically, we examine the effects of both the benefits and cost while interacting with integrated tablets in store on the SSIT's perceived overall value and intentions to reuse.

2. Conceptual Background

2.1. Why maximizing SSIT usage in-store?

A self-service technology is defined as a “*technological interface that allows customers to produce and consume services without direct assistance from employees*” (Meuter et al. 2000). For retailers, SSTs are a component of phygital strategies of points of sale, which were adopted in response to business challenges (e.g. increasing point-of-sale appeal, reducing labor costs, boosting productivity) and relational challenges (e.g. making the store a place for customer service and support, strengthening brand attachment by improving the cross-channel shopping experience) (co-auteurs, 2017).

SSITs are a category of SSTs, designed to help shoppers make better purchase decisions, and / or to do so with less effort (Murray and Häubl, 2008). As suggested by Murray and Häubl (2008), 4 types of assistance can be identified during the interaction with customers depending on the functions and nature of the interface, assistance that covers the different phases of the purchasing process (pre-purchase information search, determination of alternatives, and final choice):

Assistance	Description
Assistance	Help the consumer to gather information on the products through an interactive presentation of the desired information and/or possible alternatives.
Education	Help the consumer to learn about the products and form his/her preferences by assisting with identification of the important characteristics to consider in a product category. Explain the expected benefits, how to use the products and services, and how to make the best purchase.
Reassurance	Provide expert opinions/consumer reviews based on pre-selected consumers. This category depends on whether content can be customized/personalized and/or whether users can be put in contact with connected staff.
Recommendation	Propose products that best meet customer expectations and profile, or suggest associated purchases. This category depends on whether content can be customized/personalized, and whether individual expectations and intended use of products can be integrated.

Source: adapted by Feenstra and Glérant-Glikson, 2017

SSITs appear particularly suitable in a context of overly abundant choices, decision complexity and time pressure (Murray and Häubl, 2008; Meuter et al. 2005).

2.2. Using perceived value to explain adoption

Value is evaluated based on an interactive experience with an object; evaluation is therefore relative, personal, contextual, and evolving (Riviere and Mencarelli 2012). Several conceptual constructs for value exist (Riviere and Mencarelli 2012). Two are distinguished by the moment when value is created and by the components of value. One construct considers value as transactional and integrative (value of purchase, utilitarian and purely cognitive view of purchase, cost/benefits ratio); the other construct considers value as experiential and analytical (value of use, affective, symbolic, emotional value derived from consumption of a good or

service). The majority of research on value in retailing is based on an analytical and multidimensional approach (Davis and Hodges, 2012) to Holbrook's value of consumption (1999). This typology is comprehensive in explaining the benefits customers get from consumption but fails to take into account the costs associated with SSIT experience. And Zeithaml's definition of perceived value, which is the most widely accepted (Kim, Chan and Gupta, 2007), suggests that both what is received and what is given determine the consumer's overall assessment of the utility of a product or service. In this study, we refer to the perceived value of SSIT user experience as a consumer's overall perception of SSIT based on a cognitive trade-off between the efforts required to use it and the gains in return.

3. Research model and hypotheses

3.1. Benefits Derived from an SSIT User Experience

Customers are especially attracted to SSITs when the perception of the tool's practicality, usefulness, and usability are high (Meuter et al. 2005; Wang 2012; Kallweitt Spreer and Toporowski, 2014; Feenstra and Glérant-Glikson, 2017; Burke, 2002). The criteria of information availability and accessibility (Meuter et al. 2005) are particularly relevant when time is a constraint.

Feelings of autonomy appear to be another key intrinsic benefits derived from SST usage (Meuter et al. 2003; Feenstra and Glérant-Glikson, 2017) which could impact global value. Self-service technology provides the advantage of not having to interact with service personnel to reach the service outcome (Meuter et al. 2000; Meuter et al. 2003; Mencarelli and Rivière, 2014). This is particularly suitable in a retail context with large sales spaces manned either by a low number of sales clerks or one where too many remain unavailable (Kallweitt Spreer and Toporowski, 2014).

Nevertheless, this benefit can be offset by the need for personal interaction which may lead to decreased interest in SSIT (Meuter et al. 2005; Mencarelli and Rivière, 2014). However, recent research on retail digital transformation suggests, on the contrary, that digital kiosks represent an opportunity for retailers to improve customer-retailer relationships via new opportunities of getting in touch with a sales clerk (Lapassouse-Madrid and Vlad, 2016).

Furthermore, enjoyment or fun is also mentioned extensively in the literature as a benefit in relation to the use of SST (Hilton, 2013; Curran and Meuter, 2007) and hedonic aspects are well known as a key sources of shopping experience value (Kim et al,2014).

We assume that these benefits impact the SSIT's perceived overall value. In line with the above we hypothesize:

H1: Perceived autonomy in information search has a positive effect on SSIT's perceived overall value

H2: Relational benefit has a positive effect on SSIT's perceived overall value

H3: Enjoyment during user experience has a positive effect on SSIT's perceived overall value

H4: Perceived usefulness for information search has a positive effect SSIT's perceived overall value

3.2. Costs Derived from an SSIT User Experience

An experiment among eight SSITs in France (Feenstra and Glérant-Glikson, 2017) shows that creating value is hardly clear all the time, bringing to the foreground cognitive, physical, social and time-related efforts.

The self-services literature points out that customers express the need to feel control while receiving a service, perceived control (i.e. subjective assessment of control over a task in an environment) leading to favorable evaluation of technologies (Bateson, 1985; Hoffman and Novak, 1996; Zhu et al. 2007). In contrast, a perceived lack of control over technology

impacts the use of SST negatively (Gelderman, Paul and Van Diemen, 2011). Building upon these results, we might assume that a perceived lack of control over information search with SSITs could constitute a cost during the user experience and impact negatively the global value.

SSITs sometimes need to compile some information about the customer for providing intelligent individual-level recommendations. A major issue concerns the privacy of the consumers and their openness to sharing personal information, due to the potential risk concerning others' usage of their private data (Feenstra and Glérant-Glikson, 2017). This perceived risk represents a cost for the consumer which might reduce the SSIT's perceived overall value. Hence, we put forward the following hypotheses:

H5: Perceived efforts in-use have a negative effect on SSIT's perceived overall value

H6: Perceived lack of control over information search with SSIT has a negative effect on SSIT's perceived overall value

H7: Perceived risk with private data usage has a negative effect on SSIT's perceived overall value

3.3. Intentions to Re-use

Furthermore, previous research found results supporting the direct effects of perceived service value on service usage intentions, this relationship being relevant in a self-service technology setting (Cronin, Brady and Hult 2000; Collier and Sherrel, 2010). Thus, we may posit the following hypothesis:

H8: The SSIT's perceived overall value has a positive effect on the intention to reuse the SSIT.

4. Research methodology

We carried out a consumer survey in collaboration with five French retailers (Leclerc, Carrefour, Auchan, Castorama, Leroy Merlin). The study was conducted using interactive tablets set up in two complex product categories that require in-depth information and explanation (DIY retail and alcohol retailing in grocery hypermarkets). A total of 331 shoppers were interviewed *in situ* just after their information search experience with the SSIT. To test our research hypotheses, we used the Partial Least Squares (PLS) approach with XLSTAT 2016 software. We designed the survey questionnaire using scales adapted from the marketing literature. All the constructs meet the criteria (i.e. annex 3) concerning: construct reliability (Cronbach's Alpha is superior to 0.8) and unidimensionality, as well as convergent validity (Average Variances Extracted are greater than 0.7) and discriminant validity (AVE values are superior to squared correlations between the constructs).

5. Results

The overall model fit, estimated using the Goodness of Fit (GoF) index, was satisfactory (GoF = 0.68), which is above the recommended level of 0.5 (Tenenhaus et al. 2005).

Five over eight hypotheses are supported (*H1, H3, H4, H5, H8*). Four factors are found to be significantly related to the SSIT global perceived value ($R^2 = 0.723$). Our findings reveal that three main benefits explain the SSIT's perceived overall value: the perceived usefulness during information search (path coef = 0.330; CR = 13.946), the enjoyment while interacting with SSIT (path coef = 0.245; CR = 10.07), and the perceived autonomy (path coef = 0.185; CR = 7.60). The relational benefit doesn't impact significantly the SSIT perceived global value. Two reasons could explain this last result: tablets are commonly developed and set up by suppliers to enhance shopper autonomy, and the screen size isn't adapted for sharing with sales clerk (on the contrary to other SSITs like digital kiosks).

Furthermore, the SSIT's perceived overall value is only negatively impacted by the perceived efforts during information search with the SSIT (path coef = -0.300; CR = -11.09). Neither the perceived lack of control, nor the perceived risk with private data usage have a significant effect. Finally, this study also demonstrate that the SSIT's perceived overall value is a significant and positive determinant of intentions to reuse ($R^2= 0.411$; path coef = 0.641; CR = 17.47).

6. Research discussion, implications and future research avenues

6.1. SSIT: a relevant phygital solution for value creation during the purchasing process

From a theoretical point of view, the results support the validity of the value-based adoption model (Kim, Chan and Gupta, 2007), in the specific phygital context of the retail sitting. The five supported hypotheses suggest that not only utilitarian but also affective elements (with enjoyment while browsing) can turn in-store shopping into high-value pursuit and prompt customer's intention to reuse SSIT. This is in line with previous research on SSIT (Van der Heijden, 2004; Kallweit Spreer and Toporowski, 2014) and the shopping experience literature (Anteblian, Filser and Roederer, 2013). Nevertheless, although a solid backdrop exists, there is need for additional research to understand the value creation process regarding the impact of moderators as product expertise or technology familiarity. Moreover, if these results could probably be generalized for the connected fixed SSIT's category due to similar functions (Feenstra and Glérant-Glickson, 2017), the wide range of mobile SSIT's technology interfaces noted in annex 1 lets imagine a number of areas for future research for generalizing this model.

From a managerial perspective, it is interesting to note that a main SSIT objective for retailers (render shoppers independent from sales clerks) is also assessed as a major source of value for the shoppers. Increasingly, technology is empowering customers to research and shop in new ways and the next generation of shoppers expects even smarter retail experiences. As integrated tablets transfer more power and freedom to customers during their shopping experience, they can offer a sustainable advantage for the retailer as relevant solution to the new "ATAWAD" (AnyTime, AnyWhere, Any Device) shopping trip patterns.

6.2. The human factor: decisive and crucial element to these tools' success in store

For retailers, minimizing both the efforts required for the use of integrated tablets and the sources of dysfunction (whether specific to the device or the connection) must be a priority, especially in the context of everyday shopping, which is often perceived as a chore. For both manufacturers and retailers, the question is how to assist the customer in using connected interfaces. SSITs deployment strategy therefore requires managers to consider: (1) whether the target has the capacity and interest to accept these buying assistance tools; (2) the role allocated to sales staff (manufacturer and/or retailer) in the use of SSITs in store and in customer assistance; (3) the sales action plan, and training of sales staff tasked with carrying out that plan; (4) whether to sub-contract maintenance, logistics, and/or a back-up sales force. And last but not least, even if SSIT leads to more autonomy, the human presence of sales clerks seems to remain key for education, guidance and final adoption of the SSIT. The line between buying assistance tools and selling assistance tools is blurring, and raises the issue of whether sales staff are competent and willing to use these tools. At stake: their ROI!

Finally, this research provides dive insights for retailers searching for creating a superior customer experience. Digital SSITs can be sources of differentiation and loyalty for the banner in the shopping context, in which time, convenience, and the entertainment experience

become critical adjustment variables in the buying process and the choice of channel. The results validate that digital SSITs conform to customers' new technology-friendly behaviors for gathering information by offering an individualized, seamless experience that goes beyond the physical channel.

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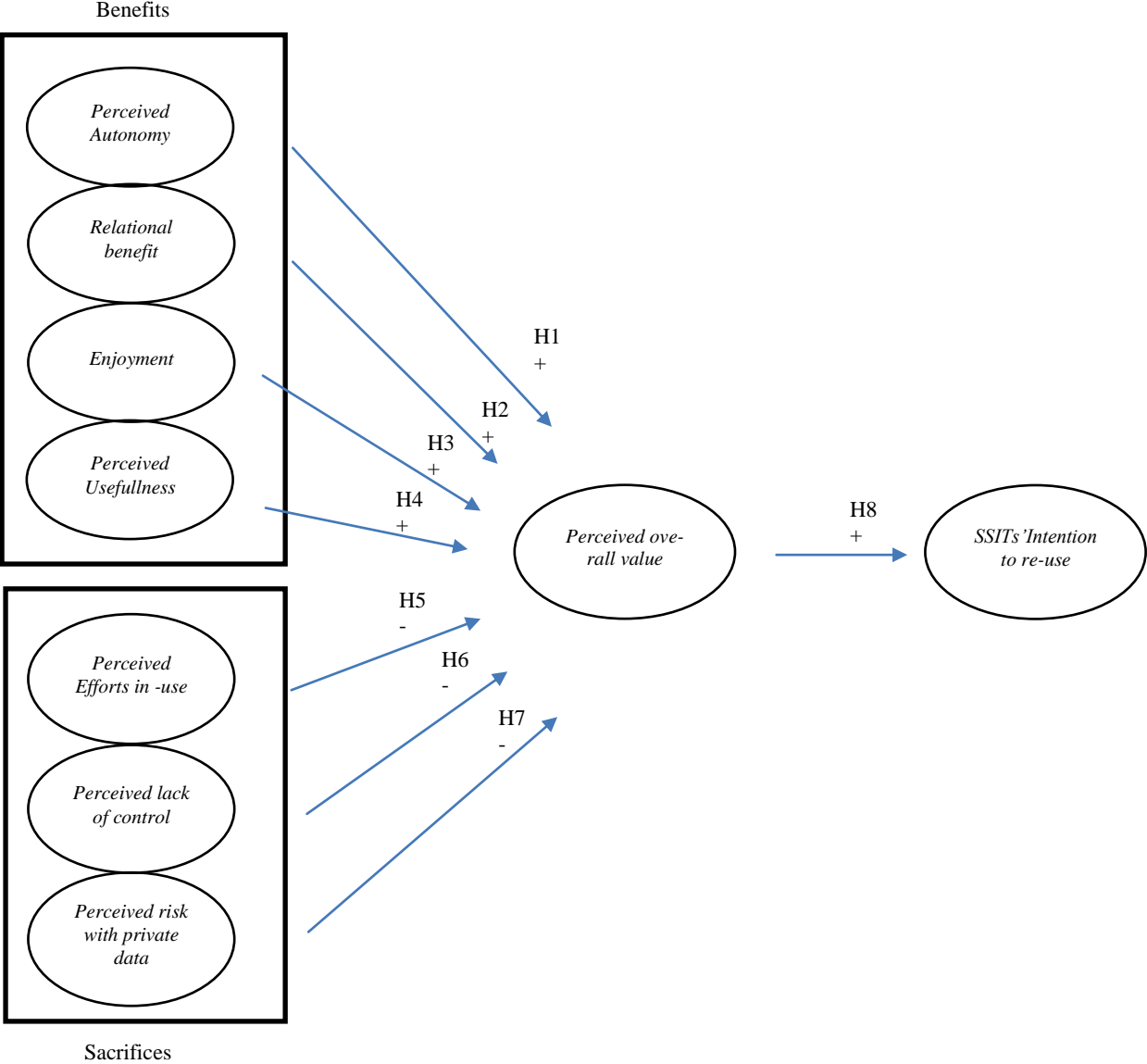
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Annex 1: In-store SSITs categories and description of tool functions

Tool function	Operand resource	Tool type			
		Unconnected		Connected	
		Manual	Sensory	Mobile	Fixed
		<i>Informational pull, ruler, or wheel</i>	<i>Visual, sound, smell, or feel tester</i>	<i>Customer's smartphone, watch with QR code application, NFC tags, Belem, Beacon, Li-Fi, RFID, visual recognition, tablet-equipped shopping carts</i>	<i>Informational kiosk, tablet, digital wall, or interactive mirror</i>
Assistance	Drop-down presentation of technical characteristics	Product test for sensory characteristic: - fragrance strip - sound button - texture tester (Dessange, l'Oréal)	Product spec sheets (NFC) Downloaded game (QR code) for presentation of product innovation Price comparison Promotion search (Carrefour) Cross-channel search: information saving	Interactive consultation of product catalogue* Comparison of product spec sheets Price comparison Cross-channel search: pre-selection of products saved and sent by e-mail	
Education	Information on complementary product: food and wine pairing; engine oil matched to car model		Recipe ideas (violators with QR code) Suggestions for complementary products (NFC tags) Educational programs (augmented reality Belem interactive logo)	Demonstration of use: - recipe ideas - instructional content - video tutorials (ex: Secret hair bar Babyliiss)	
Reassurance		Instantaneous visualization of results using: - augmented reality (Lego) - intelligent mirror (L'Oréal lipstick test)	Demonstration of results through an application (ex: Maybelline make-up "try it on") Social Shopping: Consumer reviews (OR code: brand or store website)	Presentation of images or video of situation Contact with sales assistant (Darty, Samsung) Social Shopping: Consumer reviews (Likes); Validation of choice or result through reviews from friends and family (Kiabi kiosk; Sephora selfie mirror)	
Recommendation			Social Shopping: consumer suggestions	Pre-selection of products according to chosen criteria* Personalized product suggestion** (digital sommelier)	

source :Feenstra and Glérant-Glikson , 2017

Annex 2: Conceptual SSIT's value-based model



Annex 3: Measurement Model

Psychometrics properties.

- Constructs reliabilities

latent Variables	items	Cronbach's alpha
Usefulness	6	0,938
Enjoyment	2	0,909
Auto	3	0,894
Relbenef	3	0,954
Control	3	0,834
Risk	3	0,910
Effort	4	0,909
Value	1	
Intention	2	0,856

- Matrix of loadings and crossloadings : Convergent and Discriminant validity

latent variables	Usefulness	Enjoyment	Auto	Relbenef	Control	Risk	Effort	Value	Intention	AVE
Usefulness	1	0,445	0,570	0,124	0,189	0,067	0,168	0,613	0,430	0,763
Enjoyment	0,445	1	0,387	0,091	0,064	0,043	0,267	0,469	0,319	0,917
Auto	0,570	0,387	1	0,158	0,146	0,049	0,145	0,423	0,355	0,826
Relbenef	0,124	0,091	0,158	1	0,129	0,270	0,036	0,088	0,199	0,917
Control	0,189	0,064	0,146	0,129	1	0,073	0,192	0,139	0,242	0,742
Risk	0,067	0,043	0,049	0,270	0,073	1	0,005	0,045	0,093	0,842
Effort	0,168	0,267	0,145	0,036	0,192	0,005	1	0,404	0,206	0,781
Value	0,613	0,469	0,423	0,088	0,139	0,045	0,404	1	0,411	
Intention	0,430	0,319	0,355	0,199	0,242	0,093	0,206	0,411	1	0,874
average	0,763	0,917	0,826	0,917	0,742	0,842	0,781		0,874	0