

Final version:

De Moerloose, C., Antioco, M.D.J., Lindgreen, A., and Palmer, R. (2005), "Kiosk marketing: the case of the Belgian retail sector", *International Journal of Retail & Distribution Management*, Vol. 33, No. 6/7, pp. 472-490. (ISSN 0959-0552)

For full article, please contact LindgreenA@cardiff.ac.uk

**Information Kiosks:
The Case of the Belgian Retail Sector**

Chantal de Moerloose, PhD^{1,2}

Catholic University of Louvain, Belgium

Michael Antioco, MA³

Eindhoven University of Technology, the Netherlands

Adam Lindgreen, PhD⁴

Eindhoven University of Technology, the Netherlands

¹ Chantal de Moerloose, Department of Marketing, Catholic University of Louvain, Place des Doyens 1, 1348 Louvain-la-Neuve, Belgium. Telephone: + 32 - (0) 1047 8476. Fax: + 32 - (0) 1047 8324. E-mail: demoerloose@mark.ucl.ac.be.

² The authors wish to thank Mr. Xavier Dillen for data collection. They thank the firms that participated in the research. Also thanks to the two anonymous reviewers and the editor for providing valuable feedback on an earlier version of the article.

³ Michael Antioco, Department of Organisation Science and Marketing, Faculty of Technology Management, TEMA 0.06, Eindhoven University of Technology, Den Dolech 2, P.O. Box 513, 5600 MB Eindhoven, the Netherlands. Telephone: + 31 - (0) 40 247 4685. Fax: + 31 - (0) 40 246 8054. E-mail: m.d.j.antioco@tm.tue.nl.

⁴ Address for all correspondence: Adam Lindgreen, Department of Organisation Science and Marketing, Faculty of Technology Management, TEMA 0.07, Eindhoven University of Technology, Den Dolech 2, P.O. Box 513, 5600 MB Eindhoven, the Netherlands. Telephone: + 31 - (0) 40 247 3700. Fax: + 31 - (0) 40 246 8054. E-mail: a.lindgreen@tm.tue.nl.

Roger Palmer, PhD⁵

Cranfield School of Management, UK

⁵ Roger Palmer, Cranfield School of Management, Cranfield University, Cranfield, Bedford, MK43 0AL, England. Telephone: + 44 – (0) 1234 751122. Fax: + 44 – (0) 1234 751806. E-mail: r.a.palmer@cranfield.ac.uk.

Information Kiosks:

The Case of the Belgian Retail Sector

ABSTRACT

Purpose of this paper: The article focuses on how information technology allows firms to deliver services by means of information kiosks.

Methodology: 22 exploratory in-depth interviews were conducted with key informants in the retail and other sectors, in primarily Belgium or France. Subsequently, 14 hypotheses were developed that were tested by means of two exploratory surveys, one with 84 customers and one with 9 retailers.

Findings: Our findings suggest that information kiosks can be implemented successfully with up to three easy-to-use kiosks at the entrance of the mall or inside the store and, if retailers allow Internet access to a limited number of Web sites. Retailers must keep their information centrally updated and relevant, and customers are not interested in ordering all kinds of products and services.

Managerial implications: The managerial implications are discussed in terms of advantages and disadvantages vis-à-vis the customers and the retailers.

Research limitations: The study is limited by the number of respondents, both customers and retailers, and the way that the sample was taken across three different locations may not be truly representative.

Future research: It should be examined what customers want from an information kiosk so that an appropriate balance is struck between being customer and technology led. Also possible is to look at ways that allow firms to communicate with their customers using automatic speech recognition and verification by voice.

Value of article: Success factors for implementation of information kiosks have not previously been identified in the literature.

Paper type: case study.

Key words: information kiosks; Belgian retail sector; implementation; success factors; case study.

INTRODUCTION

The increasing role of information technology-enabled communication is a underlying driver behind many of the changes to marketing practice witnessed in recent years. Over the last two decades, information technology has moved to the front end in virtually all industry sectors (Cecil and Hall, 1988). Subsequently, this links firms and their suppliers, distributors, resellers, and customers into networks of relationships and interactions throughout an industry's entire value system. With the increasing need to provide enhanced levels of service this has led to de-coupling strategies that allow the possibility of enhanced service at lower cost (Metters and Vargas, 2000).

This article focuses on how firms are developing service strategies to manage contact and non-contact service encounters and improve the perceived quality of service, lower costs, and increase revenue by using information technologies and, in particular, information kiosks. In this respect the retail sector is relatively under researched in comparison with other service sectors such as hotels, banks, and restaurants. This exploratory research was conducted in the context of the Belgian retail sector. The article identifies factors involved in implementing information kiosks in retail outlets.

The article is organised in the following way. We first review the literature on information kiosks. Then we examine kiosk use in non-retail and retail sectors drawn from a series of 22 personal interviews with key informants. Next, the research methodology is presented, which was a survey of Belgian retailer and customer attitudes to information kiosks in a variety of different retail environments. Following that, the results of the research are discussed and conclusions are drawn on the factors that are important to implement an information kiosk

system. The article concludes with a consideration of managerial implications and some future research opportunities

INFORMATION KIOSKS

For customers away from their home or workplace, information kiosks¹ are often a comparable alternative to other mobile technologies such as the Internet (e.g., Paradi and Ghazarian-Rock, 1998; Rowley, 2000; Rowley and Slack, 2003; Slack and Rowley, 2002; Tung, 1999; Tung and Tan, 1998). For example, in contrast to portable technologies, the use of information kiosks is not disadvantaged by small screen size or difficult-to-manipulate keyboard (Slack and Rowley, 2002). Also, information kiosks that allow customers 'fast and hassle-free' (Rosencrance, 2003: p. 48) access to products or product information could constitute a competitive advantage (Ferriolo, 2003). Interestingly, it has been noted that "kiosks have received little media, professional or academic attention" (Rowley and Slack, 2003; Slack and Rowley, 2002: p. 248; see also Nicholas, Huntington and Williams, 2001). This is despite the fact that over the past few years information kiosks have become more widespread as an interactive means of providing information to the public (e.g., Hariri *et al.*, 1997; Rowley, 2000; Slack and Rowley, 2003). We also refer to the more popular business press (e.g., BusinessWeek Online, 2000; *La Revue de Presse de l'Atelier*, 1999; *The Vancouver Sun*, 2000). Indeed, Jupiter Media Metrix expects retail information kiosks to generate some US\$6.5 billion in annual sales by 2006 (Ferriolo, 2003). This suggests that whilst the use of kiosks is relatively widespread in other sectors such as banking and airports, their use in retail is relatively low (Ferriolo, 2003). Only in recent years has their adoption

¹ Information kiosks are also referred to as online kiosks, public access kiosks, and touch screen kiosks. In the text we will use 'information kiosk' and 'kiosk' interchangeably.

become more widespread. We ascribe this to ongoing technological developments such as the wider availability of broadband Internet access, as well as smart cards that record personal transaction history and enable easier access to data with minimal security and other pre-qualification.

In the banking sector Metters and Vargas (2000) discuss the means whereby front and back office activities and service provision can be managed. They identify and categorise various strategies, and in particular explain the role of kiosks as a strategy to compete on geographical convenience, combine front and back office activities and to provide high levels of service.

Considering kiosks in more detail, initial typologies of information kiosks include that of Tung and Tan (1998) who categorised kiosks according to their transaction power and information availability:

- Type 1 (low transaction power, low information availability), e.g. kiosks at airports and railway and bus stations for purchasing tickets;
- Type 2 (high transaction power, low information availability), e.g. kiosks at libraries for self-scanning of books;
- Type 3 (low transaction power, high information availability), e.g. kiosks at railway and bus stations for finding information on timetables, or kiosks at car dealers for visualising how a particular car would look;
- Type 4 (high transaction power, high information availability), e.g. kiosks allowing citizens to pay taxes or accessing public information.

Other typologies have appeared since then including that of Rowley and Slack (2002) who suggest that the following dimensions are useful: information provision and promotion; information exchange between users and the kiosk; commerce and sales; strength of

customer-retailer relationship; and number of functions that the kiosk supports. They also argue that the environment, users, task, and technology should be considered in the design of a public access system (Rowley and Slack, 1998). The IHL Consulting Group categorises kiosks into self-checkout, ticketing, check-in, deli, and food ordering, and predict huge growth for particularly deli and food-ordering kiosks (*Chain Store Age*, 2003).

Information kiosks can be placed in-store so that the stores use them as an alternative channel for delivering their services on a number of specified retail transactions. Information kiosks can also be situated in a public concourse or thoroughfare including shopping malls, hotel lobbies, airports, and railway stations (Slack and Rowley, 2002). The former kiosks are managed by the stores themselves such as Sainsbury's in the UK, Target Corp. in the US, and K-mart in Canada. The latter kiosks, which are frequently more complex in their interfaces, are managed by a kiosk company or infomediary such as Stone Telecom in Singapore (Chandiramani, 2002; Slack and Rowley, 2002). The expected life span of an information kiosk is some three-to-five years, while the cost of a kiosk is typically US\$5,000-US\$7,500 depending on the add-ons such as barcode scanners, credit card readers, and customer service telephone attachments. The software running a kiosk often costs US\$10,000-US\$50,000, and expenses for such different areas as connectivity, content creation, training, marketing, promotions, and cost of selling space should also be added (Ferriolo, 2003).

When considering their use in the retail sector, experience from the health care sector, in a study conducted by Hariri *et al.* (1997), suggests that ease-of-use with simple touch screens, inviting screen appearance, and limited choice menu options are positive factors that promote engagement. Their study also highlighted that the kiosk encounter stimulated the need for further information. This could be provided by a variety of means such as information leaflets

and the provision of personal service. In discussing service provision, Metters and Vargas (2000) note that the random nature of customer arrival could result in excessive waiting time in a conventional service encounter. The provision of kiosks reduces but does not eliminate the need for such personal service. However, this argues for the availability of staff to provide additional service and introduces the idea of idle time. This does not refer to time not usefully engaged in productive activity but rather to the division of time between front office service provision and other back office activities. It can be argued that staff need to be available in the retail context to provide additional service, but should be cross trained to handle other front or back office tasks (Thompson, 1992). Hence it is argued that kiosks are part of a more comprehensive approach to service provision in the retail context.

BELGIUM AND KIOSK USAGE

In order to develop a rich, contextual understanding of the usage of information kiosks the retail and other sectors are briefly reviewed prior to the development of hypotheses. This is based on a series of personal interviews with key informants and summarises 22 cases across seven different sectors in primarily Belgium and France. These cases were identified as being relevant because they had developed ideas for the use of information kiosks and, subsequently, implemented kiosks in their outlets.

The use of qualitative methods, discovery-oriented in nature, was believed to be appropriate because little was known about the use of information kiosks (Eisenhardt, 1989; Yin, 1994). The study employed the multiple-case study approach, with 22 cases in all. A case study, in this sense, refers to how one particular firm is using information kiosks. Eisenhardt (1989) proposed that richer theory could be generated through multiple-case studies, as opposed to

one-single case study. Despite criticism that such an approach may result in only surface-level insights (Dyer and Watkins, 1991), drawing on secondary data and multiple in-depth interviews in each case will help develop rich insights across multiple-case studies, and provide the basis for greater transferability of the findings from the non-retail sector to the retail sector (Eisenhardt, 1991). Each in-depth interview would last up to two hours. Following the primary interviews, further information provided by the interviewees or sourced by the authors was examined. This would also include on-site observations, for example how customers were interacting with the information kiosks. All the interviews would be transcribed to allow for a thorough analysis. From the coding of these interviews a list would be obtained of factors that had been important in developing and using information kiosks.

Non Retail

Municipalities

The Belgian municipalities, the local administrative authorities, of Woluwe-St-Pierre and Seneffe employ information technology as a means of improving both their services and institutional image. Initiatives include the creation of websites and the setting up of type 4 information kiosks (Tung and Tan, 1998), both available to the wider public. With regard to the kiosks it is possible to access a wide range of information appropriate to business, residents, and tourists. Interestingly, the locations favour residents rather than tourists. With respect to residents two projects are of interest. The first was initially halted due to vandalism and poor protection from bad weather and also because the Internet, an alternative source of information, took off from the early 1990s. In one area, Woluwe-St-Pierre, the information kiosk system was updated to provide users with free access to the city's Web site, and services

such as e-mail, payments, and requesting official forms and certificates. It is not possible, however, to surf the Internet as this would increase the waiting time for other customers. In the second project, in Seneffe, the municipality wanted to introduce its citizens to new information technology. Offering similar services to Woluwe-St-Pierre and in addition access to other public websites. Both projects started well, in Woluwe-St-Pierre residents asked for 260 certificates during the first 90 days of operation. The inability to transmit items such as electronic signatures and photographs, however, inhibited usage. Use of the remaining kiosks is at a modest level.

Museums/Galleries

A number of museums utilise kiosks in order to improve participation and engagement with their subject matter and offered various kiosks. This includes type 3 information kiosks (Tung and Tan, 1998) that offer a virtual presentation of the museum or a particular exhibit. Overall, the museums/galleries reported that visitors found the technology easy to use.

Tourism Offices

Two tourism offices are employing interconnected type 3 information kiosks (Tung and Tan, 1998). Seats are placed within the kiosks in order to encourage weary visitors to access information of interest. With kiosks networked to a printer the information can be printed out. The network is being updated and will eventually consist of 14 kiosks of which 10 will be placed in the Department of Tourism while the remaining four will be found next to the motorways. A test kiosk has also been installed linked to a database supported by partner companies rather than the Internet, and updated on a daily basis. This allows for high levels of customisation of the data and strong local relevance.

Recruitment Companies

Adecco is the world's largest recruitment firm, and their type 2 (Tung and Tan, 1998) ATM-like information kiosks are located in high people traffic locations such as universities, shopping malls, and transit stations. Employers can post details of vacancies which can be accessed by potential employees who can then contact the company to take their interest to the next stage .

Airport Self Check-ins

Self check-in desks at Zaventem airport are operated by British Airways, Lufthansa, and SAS to assist passengers at check-in. However, only business travellers or travellers with one piece of hand luggage can currently use the kiosks. The companies believe that the use of the kiosks is rather limited with most passengers searching for information.

Retail

Food Retailers

The Delhaize supermarket chain in Belgium is currently working on two different projects involving type 4 information kiosks. Following a six-month test of a loyalty card promotion, it was found that consumers were annoyed at the lack of relevance of the discount vouchers offered. Kiosks were introduced with the dual objective of segmenting customers and enabling them to print vouchers relevant to their interests, and to simulate an online shopping experience. Updating of the information was managed by outsourced partners. The second project centred around the ordering of wine for subsequent delivery to the home, again in conjunction with a partner. Experiences from the projects have been encouraging so far. During the trial period, 109,000 people had a 'Delhaize Plus' loyalty card of which 40 per cent

had used the kiosks at least on one occasion; 229,000 users in total had accessed the kiosks. Research showed that 78 per cent of customers would use the kiosks on all of their visits to Delhaize; 58 per cent would only shop where there would be a kiosk; and 61 per cent are highly satisfied with the kiosks' services and ease of use. Indeed, believing future growth to be high, Delhaize and their partners are now continuing to explore ways to employ information kiosks.

Other

According to Forrester Research (*Business Week Online*, 2000) some 80 per cent of retailers plan to set up kiosks and/or web-linked point-of-sale systems in their stores, providing a physical presence to the virtual shopping environment. The rate of adoption in Europe lags that of the US. The high capital costs involved may be a contributing factor. In early 2001, Cyberlink started installing information kiosks in all Belgian stores of Fnac (a book retailer) to form a cyber café environment. Customers can surf the Internet, and enquire as to order status and product availability on a range of products. Whilst kiosk presence is widespread in US bookshops, for example Chapters Inc has more than 300 in 77 stores, this would seem to be a popular retail application. Due to space limitations, the findings from this pilot study are summarised in Table 1 and, together with the literature review, inform the derivation of the following hypotheses.

H₁: Kiosks are useful for both customers and retailers

The literature suggests that kiosks have benefits for both retailers, by managing front and back office applications, and for customers, by providing an additional means of gaining information.

H₂: Not all products/services can be sold through kiosks; only information about these products/services can be given

Currently, most applications of kiosks centre to the provision of information as a support to the decision process. Transacting on line takes more time and utilises the facility for longer, in the retail environment the primary purpose is to enhance service.

H₃: Customers do not want to wait more than one minute

H₄: Kiosks help customers save time

As service enhancement is a primary role for kiosks then high perceived waiting time detracts from the service experience. By providing a route to information additional to the retail assistant, this minimises waiting time for the customer and idle time for the assistant.

H₅: It is an advantage to use the Internet as the kiosk interface

As consumers become more familiar with the Internet a common screen layout and design facilitates ease of use.

H₆: Internet access in kiosks is limited

By constraining site access and limiting menu options, this optimises the balance between the need for information and time utilisation and customer throughput of the kiosk

H₇: It is easy, but important to clean the area around the kiosks

Vandalism and litter detract substantially from the appeal of kiosks in a municipal environment. In the retail sector presentation and quality of surroundings are integral to the experience.

H₈: Information has to be updated

Operators of kiosks go to considerable lengths to ensure that information is relevant and up-to-date. This is particularly appropriate with time-sensitive information such as hotel room availability, this equates in the retail sector to issues such as discounts and promotions.

H₉: Initial investment is important for retailers

The relatively slow rate of diffusion, compared to the US retail environment, may be ascribed to the high set-up costs, as mentioned in the business press. This is particularly the case if online services are required, and also customer specific transactions such as the use of smart cards.

H₁₀: Up to three kiosks in each store are enough if no Internet access is allowed

Initial insights from the case studies suggest that kiosks are located either inside the entrance of the mall or within the immediate vicinity of the retail transaction point. There is little merit in placing kiosks that offer supplementary information to prospective purchasers in in-store locations inappropriate to the sale.

H₁₁: Kiosks must be easy to use

Research in the healthcare sector has demonstrated that the appropriate design of hardware and software facilitates the use of kiosks by customers.

H₁₂: Kiosks must be secure and safe

Security and safety are a basic need, and experience from the less controlled outdoor environment has suggested a rapid loss of interest when potential users feel uncertain and insecure.

H₁₃: The location of the kiosks is important

Within the retail environment kiosks are seen as offering supplementary information during the purchase process, therefore kiosks should be located in such a way that is easy and quick for customers to complete the sale once the purchase decision has been made.

H₁₄: Potential customers must be kept informed

Kiosks are only a part of the information dissemination process. Research from the healthcare sector and the use of kiosks by airlines for check-in purposes suggest that there are additional needs for information and that these should be considered alongside the provision of kiosks.

RESEARCH METHODOLOGY

Following the initial interviews an exploratory survey of the Belgian retail sector was conducted in order to evaluate if and how information kiosks should ideally be implemented. This part of the research would follow well-established guidelines (Churchill, 1999). It was decided to centre the research on specialised retailers, together selling a range of different types of products, in the region of Brussels, the capital of Belgium. Through a questionnaire we aimed at understanding the intended use of the information kiosks in addition to their functionalities. Two questionnaires were designed, one for the customers and one for the retailers. Also, there would be two versions of each questionnaire in French and in Flemish, as these are the two main languages.

The aim of the 'customer' questionnaire was to gather information on the extent to which customers use information kiosks. Another aim was to identify customer preferences to an information kiosk's purpose, design, features, and location, as well as the waiting time in

using the kiosk. Design covers aspects such as whether an information kiosk should work through a keyboard, mouse, or touch screen. Features cover aspects including product information, product advice, and product ordering. In addition to questions on a respondent's gender and age the questionnaire would ask respondents if they have access to the Internet and if they shop online. Many respondents did not have a clear idea about an information kiosk even though they had used one. We therefore used a person-administered survey to be sure that respondents would understand. The procedure consisted of reading out the questions to the respondents and recording their answers. In case a respondent required a visual of different types of information kiosks we would show various photographs. After six trial tests, the survey was carried out over a three-day period at three different locations (the street: Grand Rue, Louvain-la-Neuve; a central railway station: Gare Centrale; and the Free University of Brussels). This procedure secured a variety of respondents. The 84 respondents showed the following demographics. There were 47 female respondents and 37 male respondents. The ratio between French-speaking respondents and Flemish-speaking respondents was 78:6. 35 respondents were between 20-29 years old, with the rest of the respondents distributed relatively equally over the other age categories.

For the 'retailer' questionnaire we used a self-administered survey, as we believed retailers would be familiar with information kiosks and other types of information technologies. The nine participating retailers operated across a variety of retail sectors: books, electronics, hardware equipment, outdoor equipment, photo and multimedia, sanitary products, textiles and needlework, and pets. Seven of the retailers were French-speaking, and two retailers were Flemish-speaking.

DISCUSSION OF FINDINGS

The hypotheses that would be tested in the two surveys, together with the statistical results, are shown in Table 2. With regard to the customer survey we used t-tests and Chi-square tests at a significance level of $p=0.05$. For example, to the statement 'I think a kiosk could be very useful for customers' a respondent was given five possible answers: 'totally agree' (value: 5), 'agree' (value: 4), 'indifferent' (value: 3), 'do not agree' (value: 2), and 'do not agree at all' (value: 1). For the t-test the null hypothesis (H_0) consisted of comparing the mean of all the answers with regards to this particular hypothesis to a flag figure ('indifferent' in our example) and stating that the mean is smaller or equal to that figure. Because the Chi-square test analyses the association between two variables the null hypothesis comes to assuming the independence of those two variables. The findings and conclusions of the survey are shown in Table 3.

In the first survey, 62 per cent of the respondents would like to find information kiosks next to where they do their shopping, with most of the respondents explaining that this would save them time, especially when retail employees are busy. None of the respondents realised that certain types of information kiosks allow customers to order products. Respondents would most often have experienced information kiosks at railway stations, museums, cinemas, airports, tourist information desks, and banks. No respondent had used information kiosks for purposes other than these. In the second survey, 44 per cent of the retailers were not interested in setting up information kiosks. In the following discussion of the findings the percentage of respondents will therefore relate to the five retailers who did express interest in the use of kiosks.

In order to test H_1 , a t-test was conducted with H_0 being that consumers are 'indifferent', 'do not agree', or 'do not agree at all' with the usefulness of information kiosks (i.e. $H_0: \mu \leq 3$). This hypothesis was rejected at a $p=0.02$ level ($\mu=3.369$). A Chi-square test was then performed in order to verify whether age and gender were significantly correlated with the perceived usefulness of kiosks, but no association was found (p-values of 0.2 and 0.189 respectively). As for the retailers, naturally they all agreed that kiosks are useful since only those five retailers who had indicated that they consider adopting kiosks had been considered. Four of the retailers believed that information kiosks provide better customer service, but they also thought that having kiosks in a store can create administrative difficulties.

The second hypothesis (H_2) refers to whether different types of products can be sold through kiosks. A t-test for various product categories was performed, with product categories including perfume, shampoo, and cookies. H_0 was formulated as consumers being 'indifferent' to ordering through information kiosks or thinking that such ordering is 'not important' or 'not important at all'. H_0 could not be rejected ($\mu=2.1$, $p\text{-value}=0.9$), which suggests that consumers do not see ordering through information kiosks as important (or important at all). This would, however, depend slightly on the particular product category. In order to analyse the association between ordering products through an information kiosk and the fact that consumers have already bought by telephone, mail, or the Internet, a Chi-square test was performed stating H_0 as there being no association. With p-values ranging from 0.531 to 0.938, H_0 could not be rejected. Spearman's correlation coefficient test was also computed, which confirmed these results so that consequently we cannot assume an association between ordering products via an information kiosk and the fact that consumers have already bought by telephone, mail, or the Internet.

With regard to the level of importance of functions including product information, advice, coupons, and Internet access a t-test was performed with H_0 stating that 'consumers are indifferent or think it is not important, or not important at all, to have a given function via the information kiosks' ($H_0: \mu \leq 3$). For every function we rejected H_0 thus acknowledging the importance of these functions for consumers. We found that respondents would like to see some other functions in information kiosks including information about substitutes when a given product is out of stock; the possibility to order something and come back a few minutes later when it is ready to be delivered; and the opportunity to make telephone calls.

To the statement 'I would like to use the information kiosk to see what could be done with it' 69 per cent of the respondents were found to agree, or fully agree, with this statement. Further, no association was found between, on the one hand, age and gender of the respondents and, on the other hand, their desire in seeing how an information kiosk can be used. Of the retailers only two were interested in selling their products using information kiosks. It would appear that retailers understand the reticence of consumers in purchasing products through information kiosks. It seems that both consumers and retailers are not yet prepared to order products through an information kiosk. What consumers really want is to have access to information in order to compare price and use, and to have coupons. It is also important to note that consumers would appreciate access to the Internet.

The third hypothesis (H_3) refers to the waiting time that users of information kiosk are ready to accept. H_0 , which was rejected, consisted of testing $H_0: \mu \leq 3$. Indeed, 89 per cent of the information kiosks users emphasised that they did not want to waste their time. Further, we wished to enquire whether consumers would be willing to wait more than '30 seconds' or 'one minute' ($\mu \leq 2$) and concluded that they would ($\mu = 2.7$, $p\text{-value} = 0.000$). However, this

hypothesis might not have been well formulated since the information it provides is very limited and intuitive. Indeed, consumers do not want to waste their time, yet they are ready to wait more than one minute. Unfortunately, there is no further information to give greater insight to the issue of waiting time. In the fourth hypothesis (H₄) we further wished to test whether consumers perceive information kiosks as time savers. Consumers were found to agree, or strongly agree, with this statement. Further, a Chi-square test was performed in order to establish whether there is an association with the age and gender of the consumer, but no such association was found (p-values of 0.524 and 0.361 respectively).

The fifth hypothesis (H₅) consisted of testing whether respondents would like to find the same screen presentation (from the information kiosk) as with the Internet when they connect to the retailer's website at home. H₀, which stated that consumers are 'indifferent', 'do not agree', or 'totally disagree', was significantly rejected ($\mu=3.89$, p-value=0.000). Consequently, it was concluded that consumers agree, or totally agree, with having the Internet as interface on the information kiosk (65 per cent of our sample).

With regard to the retailers who view the implementation of information kiosks as interesting, 80 per cent totally agreed that using their website as the information kiosk's interface would be advantageous. However, they are not in favour of letting the consumers surf the whole web thus confirming the sixth hypothesis (H₆). It would seem that both the consumers and the retailers want limited Internet style access from the information kiosks.

Both hypotheses seven (H₇) and eight (H₈) were confirmed. Retailers see as very important the cleanliness around the kiosks, as do a large majority of consumers find very important

($\mu=4.74$, $p\text{-value}=0.000$) the fact that information, which can be accessed on the information kiosk, is updated regularly.

Hypotheses nine (H_9) and ten (H_{10}), respectively, refer to the importance of the initial investment for retailers and the number of information kiosks, which should be present in an individual store on the basis that no Internet access is allowed. In order to test H_9 , two different questions were formulated; one regarding the importance of the initial investment compared with the expected benefits and one referring to the possible lack of funds to implement information kiosks. In general, we observed that four retailers regarded the implementation as 'not a hurdle' or 'not a hurdle at all' or they were indifferent in both cases. Three other retailers saw the lack of money and the expected investment-benefit ratio as very significant hurdles to overcome. Finally, two retailers were more concerned about the investment-benefit ratio than the lack of financial possibilities, for which they qualified as being indifferent. As for the number of information kiosks that the interested retailers were willing to set up, up to three kiosks were said to be sufficient for each individual store.

Hypothesis eleven (H_{11}) refers to the ease of use. We enquired about the perceived ease of use, the best tools for using an information kiosk, and the importance of ease of use. It appears that 85 per cent of the respondents agreed with the fact that information kiosks are easy to use. Further, it was tested whether there is an association between perceived ease of use on the one hand and age and gender on the other hand. H_0 was not rejected. Additionally, it was tested whether the fact that respondents had already used an information kiosk before would be associated with a significantly higher or lower perceived ease of use. Such an association was found. However, even though many respondents had never used an information kiosk before, they regard it as logical and easy to use. In fact, most respondents

emphasised that the use of information kiosks is self-explanatory. Respondents were also asked which tool they preferred for using the information kiosk. It appears that 83 per cent of the respondents preferred touch screens. However, this result may be biased in the sense that when we explained and presented what an information kiosk was we had a photograph of a touch screen. Finally, consumers were asked to rate the level of importance of the ease of use. A t-test was performed in order to test $H_0: \mu \leq 3$, which was rejected ($\mu=4.62$, $p\text{-value}=0.000$). Consequently, it was concluded that ease of use of kiosks is an important, or very important, factor.

Hypotheses twelve (H_{12}) and thirteen (H_{13}) refer, respectively, to the security of payment and the location of information kiosks. As expected, consumers believed that security is important or very important ($\mu=4.79$). What could also have been tested, but was not, is the level of perceived security using the Internet in a well-known retailer store in comparison with less well known retailers. On the side of the retailers, 88 per cent evaluated vandalism problems as not an important hurdle (or not an important hurdle at all). Having faced problems in the past, as was pointed out in the exploratory phase of our research, one retailer evaluated vandalism as an important issue. In terms of location, consumers would prefer the information kiosks to be near the products in the department (41.6 per cent) or at the entrance of the store (38.1 per cent). The retailers have the same views, 60 per cent located at the entrance and 40 per cent in the department.

The final hypothesis (H_{14}) refers to the importance of help in order to keep potential consumers informed. Consumers were asked whether it was important to be helped by an employee when interacting with an information kiosk. A t-test was performed, with H_0 stating that 'consumers are indifferent or think it is not important, or not important at all, to have an

employee next to the information kiosk'. The findings show that H_0 cannot be rejected ($\mu=2.71$, $p\text{-value}=0.981$). Actually, due to a mean close to 3, consumers were basically distributed in the extremes of the continuum with 50 per cent stating that an employee is 'not important at all' or 'not important' and 36 per cent for which an employee is 'important' or 'very important'. It was then decided to verify whether there was an association between age and gender of respondents and the importance they give to the presence of an employee. However, the results show that there is no such association. The same tests were performed with the presence of a leaflet next to the information kiosk, but the same results were found. As for the retailers, the trend is the same regarding the presence of an employee, except in very early stages of the implementation of information kiosks. However, the presence of a leaflet was said to be 'important' or 'very important' by three retailers and 'not important' or 'not important at all' for the other two interested in information kiosks.

MANAGERIAL IMPLICATIONS

The study identifies various advantages to customers and retailers of implementing information kiosks. For example, customers have online access to product information that is updated on a regular basis, yet at the same time they can approach employees for advice or they can try the products offline. With information kiosks it is possible for retailers to improve service, for example through personalising customer information or attending to customer suggestions and complaints. There are other reasons why customer service is improved. Information is updated centrally and is made available to all the retailer's outlets at the same time. An information kiosk allows for freely available access to the retailer, and customer feedback can be immediate in many cases. Also, information kiosks can be accessed by all customers. All of these service initiatives should increase customers' loyalty toward the

retailer. Further, it is possible for retailers to differentiate their information kiosks from those of their competitors, manage the provision of service and utilisation of staff. Lastly, using such kiosks retailers can measure the impact of customers' buying attitudes.

However, there are also some disadvantages of using information kiosks. For example, it is not possible to order various kinds of products and services, and some information kiosks are not user friendly (i.e. easy or quick to use) or work properly. To use an information kiosk, customers would also need to leave their homes and go to the retailer, and may feel uncomfortable entering credit card details in the event of online ordering. Also, some retailers argued that with information kiosks it would be more difficult to establish close relationships with their customers. With information kiosks having to serve all customers it should not be too difficult to use the kiosks. The potential economical benefits of setting up such information kiosks could be difficult to evaluate.

CONCLUSIONS

Our research sought to identify factors that are important to the implementation of information kiosks. We found that with 62 per cent of consumers wanting to see information kiosks where they go shopping and 55 per cent of retailers having set up such kiosks (or considering doing so), it appears that information kiosks could be pursued in the Belgian retail sector. Within all the outlets of the group of retailers we interviewed there is a potential opportunity for up to 300 kiosks. Among the advantages are that consumers have direct access to updated information on a variety of different products and services, and retailers are able to provide a better service to their customers.

There are a number of limitations to our study. First, it is limited by the number of respondents, both customers and retailers. Also the way that the sample was taken across three different locations may not be truly representative. It would not appear that there is a difference between the Flemish and French speaking respondents but in attempting to generalise these results to Belgium this factor should be taken into account. With this being a largely exploratory project, with the benefit of hindsight several of the hypotheses, particularly number 3, could have been better worded to give more insight and avoid ambiguity.

There are a number of potential avenues for future research. We observe that several of the challenges in implementing kiosk marketing effectively and efficiently take their origin in technological problems. However, as it is important to focus on customers' needs when developing new technologies, future research could examine in more depth what customers want out of an information kiosk so that an appropriate balance is struck between being customer and technology led. Another possibility is to look at ways that allow firms to communicate with their customers using automatic speech recognition and verification by voice.

The information kiosks examined in this research were all free of charge to consumers. This finding is consistent with Slack and Rowley (2002) who suggest that information kiosks that offer public services, tourist information, leisure, and travel facilities are likely to continue not charging their customers. But what about information kiosks that are placed with, for example, food retailers? Perhaps they could charge customers for using the ordering facility – this is what has happened when customers want to purchase tickets in many cinema kiosks. Future research could consider this issue in more depth.

REFERENCES

- BusinessWeek Online* (2000), "Fast facts", 18 September.
- Cecil, J. and Hall, E. (1988), "When IT really matters to business strategy", *The McKinsey Quarterly*, Autumn, pp. 2-26.
- Chain Store Age* (2003), "Future of kiosks looks bright", p. 64.
- Chandiramani, R. (2002), "High-speed net kiosks to debut in malls", *Marketing*, 10 January, p. 5.
- Churchill, G. A. (1999), *Marketing Research: Methodological Foundations*, 7th edition. Orlando, Ohio: The Dryden Press.
- Dyer, W. G. and Watkins, (1991), "Better stories, not better constructs, to tenerate better theory: a rejoinder to Eisenhardt", *Academy of Management Review*, Vol. 16, No. 3, pp. 613-619.
- Eisenhardt, K. M. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14, No. 4, pp. 532-550.
- Eisenhardt, K. M. (1991), "Better stories and better constructs: the case for rigour and comparative Logic", *Academy of Management Review*, Vol. 16, No. 3, pp. 620-627.
- Ferriolo, S. (2003), "The key to kiosks", *Catalog Age*, Vol. 20, No. 7, pp. 103-108.
- Hariri, S., Goodyer, L., Anderson, C. and Meyer, J. (1997), "CardioPharm: interactive multimedia health prommotion software for community pharmacy", *Nutrition & Food Science*, Number 2, pp. 71-75.
- La Revue de Presse de l'Atelier* (1999), "Des hypers Leclercs testent en Bretagne une borne d'achat interactive", 10 June.

- Nicholas, D., Huntington, P., and Williams, P. (2001), "Establishing metrics for the evaluation of touch screen kiosks", *Journal of Information Science*, Vol. 27, No. 2, pp. 61-71.
- Paradi, J. C. and Ghazarian-Rock, A. (1998), "A framework to evaluate video banking kiosks", *International Journal of Management Science*, Vol. 26, No. 4, pp. 523-539.
- Rosencrance, L. (2003), "Best in class: self-service check-in kiosks give travelers more control", *Computerworld*, Vol. 37, No. 8, pp. 48-49.
- Rowley, J. (2000), "Loyalty kiosks: making loyalty cards work", *British Food Journal*, Vol. 102, No. 5/6, pp. 390-397.
- Rowley, J. and Slack, F. (1998), *Designing Public Access Systems*, Gower, Aldershot.
- Rowley, J. and Slack, F. (2003), "Kiosks in retailing: the quiet revolution", *International Journal of Retail & Distribution Management*, Vol. 31, No. 6, pp. 329-339.
- Slack, F. and Rowley, J. (2002), "Kiosks 21: a new role for information kiosks?" *International Journal of Information Management*, Vol. 22, No. 1, pp. 67-83.
- Slack, F. and Rowley, J. (2002), "Online kiosks: the alternative to mobile technologies for mobile users", *Internet Research: Electronic Networking Applications and Policy*, Vol. 12, No. 3, pp. 248-257.
- The Vancouver Sun* (2000), "Info touch terminals riding the wave", 15 July.
- Thompson, G.M. (1992) Improving the utilization of front-line service delivery personnel, *Decision Sciences*, 23, 5, 1072-1098.
- Tung, L. L. (1999), "The implementation of information kiosks in Singapore: an exploratory study", *International Journal of Information Management*, Vol. 19, No. 3, pp. 237-252.
- Tung, L. L. and Tan, J. H. (1998), "A model for the classification of information kiosks in Singapore", *Journal of Information Management*, Vol. 18, No. 4, pp. 255-264.

Table 1. Experiences on information kiosks from different sectors, Belgium and France

	Objective(s)	Type	Location	Problems	Growth volume
Municipalities	<ul style="list-style-type: none"> • Bring people closer to their municipalities 	<ul style="list-style-type: none"> • Type 4 	<ul style="list-style-type: none"> • Mainly inside public buildings 	<ul style="list-style-type: none"> • Use of electronic signature • Creation of additional work for employees • Kiosk vandalism 	<ul style="list-style-type: none"> • Low
Museums/Galleries	<ul style="list-style-type: none"> • Visualise exhibitions 	<ul style="list-style-type: none"> • Type 3 	<ul style="list-style-type: none"> • Inside buildings 	<ul style="list-style-type: none"> • Adding high-tech information technology to the experience 	<ul style="list-style-type: none"> • Low
Tourism Offices	<ul style="list-style-type: none"> • Access tourist information • Access to the Internet 	<ul style="list-style-type: none"> • Type 3 	<ul style="list-style-type: none"> • Mainly outside buildings 	<ul style="list-style-type: none"> • Kiosk vandalism 	<ul style="list-style-type: none"> • Medium
Food Retailers	<ul style="list-style-type: none"> • Link online and offline shopping experiences 	<ul style="list-style-type: none"> • Types 3 and 4 	<ul style="list-style-type: none"> • Inside food retailers 	<ul style="list-style-type: none"> • Apathy with coupon offers 	<ul style="list-style-type: none"> • High
Staffing Companies	<ul style="list-style-type: none"> • Match job candidates and employers 	<ul style="list-style-type: none"> • Type 2 	<ul style="list-style-type: none"> • Inside shopping malls and other public places 	<ul style="list-style-type: none"> • Only screened candidates can be matched with employers' requirements 	<ul style="list-style-type: none"> • Medium
Airport self check-ins	<ul style="list-style-type: none"> • Check-in without staff assistance • Access tourist information • Access to the Internet 	<ul style="list-style-type: none"> • Types 2, 3, and 4 (with Internet access) 	<ul style="list-style-type: none"> • Inside airports 	<ul style="list-style-type: none"> • Allowance of one hand luggage only 	<ul style="list-style-type: none"> • Small to medium
Retailers	<ul style="list-style-type: none"> • Link online and offline shopping experiences 	<ul style="list-style-type: none"> • Type 4 	<ul style="list-style-type: none"> • Mainly inside buildings 	<ul style="list-style-type: none"> • Pricing of similar products online and offline 	<ul style="list-style-type: none"> • High

Table 2. Hypotheses and statistical results

Hypothesis	Value (df)	Sig. (1 or 2 tailed)
H ₁ : Respondents are either <i>indifferent</i> , <i>do not agree</i> , or <i>do not agree at all</i> when saying that kiosks could be very useful for them while shopping (H ₀ : $\mu \leq 3$)	t: 3.088 (83)	0.002 (1)
There is no association between age (A) and gender (G) with the level of agreement to the previous statement	Chi (A): 5.994 (4) Chi (G): 3.328 (2)	0.200 (2) 0.189 (2)
H ₂ (1): Respondents are either <i>indifferent</i> or think it is <i>not important</i> or <i>not important at all</i> to be able to order the given product through a kiosk (H ₀ : $\mu \leq 3$) (washing machines (WM), perfume (P), shampoo (S), cookies (C))	t WM: -6.096 (83) t P: -6.805 (83) t S: -6.304 (83) t C: -7.454 (83)	0.000 (1) 0.000 (1) 0.000 (1) 0.000 (1)
There is no association between the product and the previous use of other ordering techniques (mail, telephone, or Internet)	Chi (WM): 2.206 (3) Chi (P): 2.060 (3) Chi (S): 0.411 (3) Chi (C): 0.829 (3)	0.531 (2) 0.560 (2) 0.938 (2) 0.842 (2)
H ₂ (2): Respondents are either <i>indifferent</i> or think it is <i>not important</i> or <i>not important at all</i> to have access to any of the following functions (H ₀ : $\mu \leq 3$) (product information (PI), general information (GI), coupons (CO), advice (Ad), Internet access (IA))	t PI: 10.481 (83) t GI: 1.895 (83) t CO: 5.337 (83) t Ad: 5.906 (83) t IA: 2.099	0.000 (1) 0.031 (1) 0.000 (1) 0.000 (1) 0.019 (1)
H ₂ (3): Respondents are <i>indifferent</i> , <i>do not agree</i> or <i>do not agree at all</i> when saying that they could use the kiosk to see what could be done with it (H ₀ : $\mu \leq 3$)	t: 4.861 (83)	0.000 (1)
There is no association between the level of agreement and age (A) and gender (G)	Chi (A): 20.262 (4) Chi (G): 1.420 (2)	0.060 (2) 0.492 (2)
H ₃ (1): Respondents are either <i>indifferent</i> or think that it is <i>not important</i> or <i>not important at all</i> to wait more than one minute (H ₀ : $\mu \leq 3$)	t : 14.507 (83)	0.000 (1)
H ₃ (2): Respondents do not mind waiting more than one minute (H ₀ : $\mu \leq 2$)	t: 6.197 (83)	0.000 (1)
H ₄ : Respondents are <i>indifferent</i> , <i>do not agree</i> , or <i>do not agree at all</i> when saying that kiosks could make them save time while shopping (H ₀ : $\mu \leq 3$)	t: 6.369 (83)	0.000 (1)
There is no association between the level of agreement and age (A) and gender (G)	Chi (A): 5.156 (6) Chi (G): 3.205 (3)	0.524 (2) 0.361 (2)
H ₅ : Respondents are <i>indifferent</i> , <i>do not agree</i> , <i>do not agree at all</i> with having Internet as an interface (H ₀ : $\mu \leq 3$)	t: 8.231 (83)	0.000 (1)
H ₆ : Respondents are either <i>indifferent</i> or think that it is <i>not important</i> or <i>not important at all</i> to update the information (H ₀ : $\mu \leq 3$)	t: 36.015 (83)	0.000 (1)
H ₁₁ (1): There is no association between easiness of use and age (A) and gender (G)	Chi (A): 6.358 (4) Chi (G): 1.111 (2)	0.174 (2) 0.574 (2)
H ₁₁ (2): There is no association between easiness of use and the fact that respondents have already used a kiosk	Chi: 21.618 (2)	0.000 (2)
Association measure (Interval by Interval: Pearson's R)	-0.480	0.000 (2)
Association measure (Ordinal by Ordinal: Spearman Correlation)	-0.485	0.000 (2)
N of valid cases	84	
H ₁₁ (3): Respondents are either <i>indifferent</i> or think that it is <i>not important</i> or <i>not important at all</i> for kiosks to be easy to use (H ₀ : $\mu \leq 3$)	t: 26.610 (83)	0.000 (1)
H ₁₂ : Respondents are either <i>indifferent</i> or think that it is <i>not important</i> or <i>not important at all</i> for kiosks to be secure (H ₀ : $\mu \leq 3$)	t: 37.11 (83)	0.000 (1)
H ₁₄ (1): Respondents are either <i>indifferent</i> or think that it is <i>not important</i> or <i>not important at all</i> to have a hostess helping them how to use the kiosk (H ₀ : $\mu \leq 3$)	t: -2.099 (83)	0.19 (1)
There is no association between the importance of the presence of a hostess and age (A) and gender (G)	Chi (A): 8.894 (4) Chi (G): 0.628 (2)	0.064 (2) 0.731 (2)
H ₁₄ (2): Respondents are either <i>indifferent</i> or think that it is <i>not important</i> or <i>not important at all</i> to have a leaflet explaining to them the use of the kiosk (H ₀ : $\mu \leq 3$)	t: 0.354 (83)	0.361 (1)
There is no association between the importance of a leaflet and age (A) and gender (G)	Chi (A): 7.062 (4) Chi (G): 2.230 (2)	0.133 (2) 0.328 (2)

Table 3. Hypotheses, findings, and conclusions of survey

Hypothesis	Customers	Retailers	Conclusions
H ₁ : Kiosks are useful for both customers and retailers	Customers agree, or totally agree, that kiosks are useful	Retailers believe that kiosks can be useful, but that the kiosks can also be a major hurdle	Kiosks are mainly regarded as being useful, although some retailers view them as a major hurdle
H ₂ : Not all products/services can be sold through kiosks; only information about these products/services can be given	Customers are not ready to order all products/services; they want to have good, direct information on products/services	Retailers want kiosks for product information, but not product ordering	Kiosks should be set up for product information, but not allow product ordering
H ₃ : Customers do not want to wait more than one minute	For customers not having to wait too long is important or very important	N/A	For customers not having to wait too long is important or very important
H ₄ : Kiosks help customers save time	Two thirds of the customers agree, or fully agree, that kiosks make them save time	N/A	Most customers agree, or fully agree, that kiosks make them save time
H ₅ : It is an advantage to use the Internet as the kiosk interface	Two thirds of the customers agree, or fully agree, that it is an advantage to use the Internet as the kiosk interface	All of the retailers agree, or fully agree, that it is an advantage to use the Internet as the kiosk interface, but do not want to give access to the whole Web	The Internet should be used as the kiosk interface, but retailers do not want to give access to the whole Web
H ₆ : Internet access in kiosks is limited	N/A	All of the retailers agree, or fully agree, that Internet on kiosks should be restricted to particular sites	All of the retailers agree, or fully agree, that the use of Internet should be restricted to particular sites
H ₇ : It is easy, but important to clean the area around the kiosks	N/A	All of the retailers agree, or fully agree, that it is easy, but important to keep the area clean around the kiosks	All of the retailers agree, or fully agree, that it is easy, but important to keep the area clean around the kiosks
H ₈ : Information has to be updated	All of the customers regard updated information on the kiosk as important	N/A	All of the customers regard updated information on the kiosk as important
H ₉ : Initial investment is important for retailers	N/A	The initial investment is the all important issue for retailers, and can be a hurdle for some retailers	The initial investment is the all important issue for retailers, and can be a hurdle for some retailers
H ₁₀ : Up to three kiosks in each store are enough if no Internet access is allowed	N/A	Retailers believed that up to three kiosks would be enough, and no retailer would allow customers to surf the Web	Retailers believed that up to three kiosks would be enough, and no retailer would allow customers to surf the Web
H ₁₁ : Kiosks must be easy to use	85 per cent of customers believe that touch screens are easy to use	N/A	Most of the customers believe that touch screens are easy to use
H ₁₂ : Kiosks must be secure and safe	99 per cent of customers state that payment security is important, or very important	89 per cent of the retailers think that it is not a hurdle to secure kiosks to use, and against vandalism	Almost all of the customers state that payment security is important, or very important
H ₁₃ : The location of the kiosks is important	42 per cent of customers think that the store is the best location for the kiosks, although 38 per cent of customers state that the entrance to the mall is also appropriate	60 per cent of the retailers prefer to locate the kiosks at the entrance to the mall, while the remaining of the retailers prefer to locate the kiosks in the store	Customers and retailers alike are divided between what is the better location of the kiosks: the entrance to the mall or in the store
H ₁₄ : Potential customers must be kept informed	44 per cent of the customers think that printed materials are important, while only 34 per cent of the customers believe that an employee is important	60 per cent of the retailers believe that printed materials are important, while only one retailer thinks that an employee next to a kiosk is key at the introduction	A high percentage of the retailers believe that printed materials are important although fewer of the customers would agree. Neither the customers nor the retailers find an employee to be key.

