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RETAIL STORE DESIGN CLASSIFICATION IN CONVENTIONAL AND ONLINE (2D AND 3D) ENVIRONMENTS

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Abstract

The present paper reviews the available store design classification studies both in conventional and online retailing. Several studies in the past attempted to classify available retail store formats. However, most of these studies refer to conventional retailing while those referring to online retailing employ mainly an Information Systems approach (e.g. Human-Computer Interaction). Our findings show that there is need for multidisciplinary research, taking into account insights from the management and marketing fields as well, in order to develop classification frameworks for the graphical user interface (GUI) design of all the alternative online retail channels (e.g. 2D Web, 3D Web, mobile, etc.), correspondingly to the available research practice in conventional retailing. Particular emphasis is given to Virtual 3D retail store interfaces by underlying the unique and innovative characteristics and capabilities in such stores.

Keywords: Online Retail Store Design, Classification, Store Layout, GUI

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1. INTRODUCTION

The concept of store image has been widely studied in traditional and online stores. From the early 60s, researchers attempted to define store image, identify its attributes and their importance, and study how these attributes affect consumer behavior (Kunkel and Berry, 1968; Lindquist, 1974-75). Store atmosphere is another concept that seems to influence consumer behavior. Kotler (1973-74) used the term store atmosphere to describe “the conscious designing of space to create certain effects in buyers”. Some researchers (Oh, Fiorito, Cho, and Hofacker, 2008) consider store atmosphere as a concept that affects store image both in traditional and online stores, while others consider that store atmosphere is one of the components that constitute store image (Lindquist, 1974). The review work of Donovan and Rossiter (1982) found that store atmosphere is considered by some studies as a distinct variable whilst other studies measure it alongside other variables. A common denominator in all studies is that store atmosphere and store image influence consumer behavior and dimensions of store image have been shown to be of different value in each market sector (Hirschman, Greenberg, and Robertson, 1978).

Store layout has also been considered as an important influencing factor of store image (Kunkel and Berry, 1968). Ng (2003) investigated how the environmental designing factors influence the psychological needs of the consumers, and found that store layout and signage influence consumers’ responsiveness when visiting a store. Mazursky and Jacoby (1986) stated that interior design factors and store layout are two important factors forming shoppers’ impression of the store. Building on these findings, Vrechopoulos, O’ Keefe, Doukidis and Siomkos (2004) considered layout as an important influencing factor regarding online consumer behavior. They investigated how the three different layouts of conventional retailing (i.e. freeform, grid and racetrack), adapted in an online context, affect online users and found significant differences among layouts in terms of users’ behaviour.

The objective of the present research is twofold. First to provide an overview of research studies classifying retail stores both in traditional and online environments. Second, to explore the issues that should be considered when performing classification in 3D virtual stores in terms of store layout. Specifically, there is evidence that the three established layout forms of traditional retailing (i.e. freeform, grid and racetrack) influence consumer behavior (Levy and Weitz, 2004; Bitner, 1992). For example, retail supermarkets adopt grid layout to help customers easily find the products that they are looking for, while duty free shops deploy the free form layout to provide a pleasant store atmosphere and increase the time spent within the store. The same (i.e. the influencing role of store layout on consumer behaviour) stands for online 2D stores (Vrechopoulos et al., 2004). More recently, Vrechopoulos, Apostolou, and Koutsouris (2009) studied the behavior of consumers in virtual 3D stores and identified the socializing and entertaining motives of the consumers. However, they didn’t find significant store layout effects on consumer behaviour but they strongly encourage further research on that topic.

In terms of retail store design classification, we begin by providing a holistic view of research studies in traditional and online environments, followed by a discussion of current business practice in 3D environments (i.e. Virtual Worlds) in terms of their characteristics and classification attempts. We conclude with some implications and we provide direct suggestions for further research.

2. REVIEW OF RETAIL STORE CLASSIFICATION STUDIES

2.1. Traditional retail environments

In traditional retailing there have been various attempts to classify retail stores in terms of merchandize, business sectors, geographic region, store atmosphere, and other dimensions, Indicatively, Table 1 summarizes some of them. Some of these studies have as their main purpose to

provide classification schemes, while others use classification schemes as a means to execute experimental studies designs.

<i>Authors</i>	<i>Objective</i>	<i>Findings</i>
Mayer, L. Mason, B. and Gee, M. (1971).	A classification of retail stores based on past and current literature.UK government classification of retail stores.	The study resulted in five broad groups: Convenience store-convenience goods, convenience store-shopping goods, convenience store-specialty goods, shopping store-shopping goods, and specialty store-specialty goods.
Kotler, P. (1973-74).	An attempt to define store atmosphere and classify its components. Also, to study how store atmosphere affects consumer behavior in various retailing and business sectors.	Kotler introduced the “causal chain connecting atmosphere”. He discussed the role of atmospherics in various business sectors and found considerable differences in each sector.
Jain, A. and Etgar, M. (1976-77).	An attempt to define store image and its components and to classify store image components.	Three store image dimensions were identified. The first one was “social prestige dimension” which comprised atmosphere, layout, and store décor. The second dimension was related to price or non-price strategy and the third describes “generalist’ or “specialist” stores.
Clifford, M. G. (1998).	A review of the methods for classifying retail stores.	None of the classifications is based on users’ perceptions options. The dimensions that dominate in classifications are: goods, size of store, trip purpose, ownership, development type and history, function, location, physical form, and catchment area.
Levy, M. and Weitz, A.B. (2004)	Presentation of the general types of layout in retailing	The three types of layout are: grid (mostly adopted by grocery stores), racetrack (encourages impulse buying), and free-form (mostly adopted by specialty stores).

Table 1. Traditional Retail Store Design Classification Studies

The earliest of these studies, by Mayer, Mason, and Gee (1971), reviewed past classification studies and found that they are mostly descriptive. The authors proposed an extended retail classification framework which was mostly based on Bucklin’s (1963) and Gist’s (1968) earlier work. They used a multidimensional approach and took into consideration cognitive dimensions to develop a framework of five broad categories: *convenience store-convenience goods*, *convenience store-shopping goods*, *convenience store-specialty goods*, *shopping store-shopping goods*, and *specialty store-specialty goods*. Three years later, Kotler (1973-74) stated that the “total product” matters and not just the nature of the product (e.g. clothes, furniture, books). Some of the dimensions of the “total product” are packaging services, price and warranties. After defining the store atmosphere concept, he examined how store atmosphere influences consumer behavior in various business sectors. Kotler concluded that managers should develop their management strategies based on the total image of the product. Store atmosphere, among others, should be linked directly to the nature of the product, the retail sector and the target audience. Along these lines, Jain and Etgar (1976-77) determined that there are two research methodologies regarding store image evaluation. The first one that is mostly adopted is based on

questionnaires asking respondents' opinion about store image attributes. The second one is based on collecting free response data using unstructured instruments. They note that the second is not widely used because marketing researchers cannot easily quantify free response data. To this end, they attempted to classify store image attributes based on the second methodology and concluded in three categories: "social prestige dimension", "price or non-price related strategy", and "generalist or specialist stores". Clifford (1998) also reviewed the methods used for classification of retail stores. He adopted a deterministic approach (i.e. *perceptions of property developers and town planners*) in the classification studies that he presented. He did not include the classification studies that take into consideration shoppers' opinions and perceptions of shopping. Thus, he presented the UK government classification of retail businesses (i.e. *food retailers drink, confectionery and tobacco retailers, clothing, footwear and leather goods retailers, household goods retailers, other non-food retailers, mixed retail businesses, hire and repair businesses*) and goods (i.e. *convenience goods, comparison goods, recreational goods, other goods*). Then, he continued by providing retail classifications based on "shopping trip purpose", "size and type of stores", and "store ownership". He also provided classification of shopping centers based on "the central place hierarchy", the "size", the "physical form", "trip purpose" and lastly, he presented a classification based on retail "location". Levy and Weitz (2004) presented the three established types of layout of traditional retailing. The "grid" layout type is mainly used by grocery stores, the "racetrack" is mainly used by department stores and encourages impulse buying, and the free-form layout is mainly used by specialty stores, making personal selling an important characteristic.

2.2. Online retail environments

In online environments (Table 2), Spiller and Lohse (1997-98) adopted an empirical method to classify internet retail stores. Their classification was based on 35 observable site attributes. Descriptive statistics of the respondents provided 44 site features. Five categories of online stores resulted from factor and cluster analysis. According to their research, this categorization is important for marketers to develop their strategy. Also, the categorization is important for designers, in order to design their graphical interface so as to meet their customers' needs. Vrechopoulos, Papamichail, and Doukidis (2002) transformed the established layout types of traditional retailing (i.e. "grid", "freeform" and "racetrack") in corresponding online retailing ones ("tree", "pipeline", and "guiding pathway" respectively). They run a preliminary survey in order to develop an online store design attribute selection framework and empirically tested 551 retail sites. Based on the scores of the observable attributes they concluded that almost half of the retail sites (51.3%) use the pipeline layout, 21.2% use the tree hub, and a mere 1.5% adopt the guiding pathway. Along these lines, Vrechopoulos, O'Keefe, Doukidis, and Siomkos, (2004) based on the "Object-Oriented Hypermedia Design Methodology" developed virtual store layouts that simulate traditional states. The three different stores in terms of layout, that were developed, were tested through lab experiment. Based on t-Tests and ANOVA, the researchers confirmed that the layout of online stores affects consumer behavior. Also, a mixed grid/freeform layout seems to be promising in the context of online retailing. Similarly, Griffith (2005) based on information processing theory and the Technology Acceptance Model (TAM), investigated how two different types of layout (i.e. tree and tunnel) affect consumers in terms of elaboration and response. He designed two interfaces based on the layout types and employed a two-treatment, between-subjects design. Among others, Griffith (2005) thinks of layout as a viable designing factor in decision making process and considers TAM as an adequate research model for such issues.

<i>Authors</i>	<i>Objective</i>	<i>Findings</i>
Spiller, P. and Lohse, G. (1997).	An attempt to classify online retail stores based on objective attributes.	The five categories/clusters that resulted from their research are "super stores", "promotional store front", "plain sales stores", "one page stores" and "product listings". The size of the store, quantity of information (service) and the interface design are key dimensions

		that differentiate the aforementioned categories.
Vrechopoulos A. Papamichail, G. and Doukidis, G. (2002).	To provide evidence about the effects of store layout on consumer behavior and to allocate discrete layout categories.	They allocated three different online layout types; <i>tree hub, pipeline, and guiding pathway</i> .
Vrechopoulos, A. O’Keefe, R. Doukidis, G. and Siomkos, G. (2004).	Design/transform online and measure the influence of the virtual grid, freeform, and racetrack layout on online consumers.	Layout is an important factor regarding online consumer behavior. However, the three layout types do not influence consumers in the same way in the traditional and online environments.
Griffith, A.D. (2005).	To identify the influence of two types of online store layout (i.e., tree and tunnel) on consumer behavior.	The tree layout type achieved greater scores than tunnel layout type in terms of perceived ease of use, elaboration, and consumer response.
Vrechopoulos, A. and Atherinos, V. (2009).	Design/transform online and measure the influence of the virtual traditional, modern, and future layout on online consumers.	Significant store layout effects on user behaviour were observed.
Vrechopoulos, A. Apostolou, K. and Koutsouris, V. (2009)	Classify and measure the influence of the virtual grid, freeform, racetrack and boxes layout on online consumers in the context of 3D VWs.	No significant store layout effects on user behaviour were observed

Table 2. Online Retail Store Design Classification Studies

More recently, Vrechopoulos and Atherinos (2009) elaborating on the work of Vrechopoulos (2004) designed and developed a web banking site employing three different layouts (traditional, modern, future) as treatments of a laboratory experimental setting. They employed the TAM and found that layout affects users’ behaviour confirming the findings of previous studies. Similarly, Vrechopoulos, Apostolou, and Koutsouris (2009) replicating the work of Vrechopoulos, O’Keefe, Doukidis, and Siomkos (2004) in a 3D virtual world context, employed a fourth store layout format labeled “boxes” in their classification scheme, which served as one of their treatments in their experimental design.

3. CURRENT BUSINESS PRACTICE IN VIRTUAL WORLDS

In recent years, Virtual Worlds (VWs) have become an emerging retailing channel. VWs are 3D environments, where users can interact simultaneously. In VWs, people can be engaged in various activities through the avatars, which are their inworld representatives. They initially started as game-oriented environments. Very soon, adopting Web 2.0 applications and services from “traditional” online environments (i.e., 2D), the social aspect became one of their distinguishing components. According to Messinger et al., (2009), VWs’ root is these two characteristics (i.e. gaming and social aspect).

Users can buy or sell virtual products such as skin, clothes, homes, and furniture for their avatars. There is an extensive list of products being sold in VWs as the only limit is human imagination. Users build their own store or multiple stores in order to display and sell their creations. In VWs, the cost of buying virtual land for commercial purposes is significantly lower opposite to buying real land in real world. Indicatively, in order to buy a private island (65.536 sqm) in the VW Second Life, enabling the highest performance, you have to pay 1000 US Dollars at the beginning and 295 US Dollars fees per month (Linden Lab, 2011a). To that end, there are low barriers to entry in a virtual market and the constraint of space is not a matter in the designing of the store and display of products. However, there

are crowded places in VWs where users should buy or rent space from other users in higher prices than those mentioned above, if they want to have a place in the specific region. In that case, the money that they have to spend is also much lower in relation to similar real life activities.

Some VWs retain their own in-world currency. There are also real world brands that entered VWs for advertising purposes, or for testing new or high risk products. “Second Life”, launched in 2003, is considered as one of the leaders of VWs (Shin, 2008). Indicatively, the average monthly repeated logins rose 8% in 2010 compared to 2009, and Web merchandise sales volume increased 5.8% in the fourth quarter of 2010 reaching 956 million Linden Dollars (in-world currency) (Linden Lab, 2011b). While there are thousands of virtual stores in VWs, academic research regarding the attributes that influence consumer behavior is still in its infancy (Apostolou, Koutsouris, and Vrechopoulos 2008).

3.1. Classification attempts in virtual worlds

Porter (2004) was one of the first to propose a typology of virtual communities. Virtual communities included the “member initiated” (subsequent level: “social”, and “professional”) and “organization sponsored” (subsequent level: “commercial”, “nonprofit” and “government”) categories. He also contended that the five attributes of virtual communities are, “purpose”, “place”, “platform”, “population interaction structure”, and “profit model”. Messinger et al., (2009) adopted and extended Porter’s typology in order to classify VWs. They proposed five categories of VWs: “education-focused”, “theme-based”, “community-specific”, “children-focused”, and “self-determined”. According to their classification scheme, Second Life is a “self determined” virtual world as there is no specific objective but urging users in business and social activities. Porter (2004) and Messinger et al. (2009) argue that researchers from different disciplines (Marketing, Information Systems) study virtual communities. Yet, Marketing related phenomena regarding the layout dimension of store image have not been adequately studied in VWs. To that end, Messinger et al. (2009) consider that an open research question is whether store layout in virtual 3D stores, should be customizable or not. Vrechopoulos, Apostolou, and Koutsouris (2009) in an initial research attempt on that topic, studied the influence of store layout in virtual 3D stores and found that various layout types (i.e. grid, freeform, racetrack and boxes), do not affect “ease of use, perceived usefulness, entertainment, time spent within the store, and promotional and impulse purchases”. However, they call for future research towards further investigating 3D store layout effects on consumer behaviour by employing experimental designs in the context of causal conclusive research initiatives that will exploit all the specific attributes that characterize such environments (e.g. teleporting capability, flying within the store, etc.).

3.2. Distinctive characteristics of virtual worlds’ retail store environments

One of the most important capabilities of virtual environments is that they can simulate real world situations. Retailers have the ability to mirror an existing retail store in a 3D setting. There are some characteristics in VWs such as teleporting and flying that are probably of great importance regarding the store layout dimension. Teleporting provides a user with the ability to be transferred instantly to a specific virtual place. Some virtual 3D stores’ owners have developed teleporting stations in their store in order to help consumers find easily the products they are looking for. For example, a teleporting sign would offer a user the ability to instantly teleport to the first floor where there is men’s fashion, or to the second floor where there is women’s fashion e.t.c. Also, teleporting provides a retailer with the ability to develop multiple stores and offer customized services. For example, a retailer could develop three or more floors, each meeting preferences and needs of a specific group of customers. When the consumer approaches the store, the retailer teleports him/her to the appropriate floor. Customization has been widely studied in traditional and online environments (Kamis, Koufaris, and Stern 2008; Basu, and Muylle 1999; Kaarst-Brown, and Evaristo 2001). This, combined with the social aspect dominating in VWs becomes an important issue in terms of one-to-one customization applicability. For instance, when two or more friends go shopping together, will they or can they experience the store’s attributes (e.g., lighting, music, layout and display of products) differently?

Flying instead of walking in the store, is another characteristic that may affect store layout design. Flying avatars could have an overview of the ground plan and focus on a specific place of the store. Also, avatars could fly through an open ceiling and visit the next store, or could use the stairs, or even the lift. It is important to mention that the owner of a store has the ability to disallow the flying capability in the store.

Specific manipulation of lighting and signs could also help consumers navigate through the store. Conjunction of 3D visualization of products and touch through electronic gloves, could provide an interesting shopping experience. Also, appropriate manipulation of music may help retailers control crowding in rush hours.

4. OPEN ISSUES, FUTURE RESEARCH AND EXPECTED CONTRIBUTION

The present study provides a holistic view of the classification studies in traditional, online, and 3D virtual retail environments and the methods that they adopt. It is worth noting that retailing issues as far as store design is concerned are examined by different disciplines (i.e., Marketing, Information Systems, Management, Architecture, Environmental Psychology). Store layout proved to be an important dimension of store image that influences consumer behavior in traditional and online retailing. However, an interesting issue is which are the available layout types in 3D virtual retail environments and how these various layout types affect consumer behavior.

Retailing activity has become a widespread phenomenon in 3D virtual environments (Krasonikolakis and Vrechopoulos, 2009). Some traditional retail stores have already tested the waters, while there are numerous that retain only a virtual (2D) presence. Lohse and Spiller (2000) found that there are similarities between physical and online stores. Similarly, 3D virtual stores can simulate the traditional retail situations and at the same time provide all the services and capabilities offered by the internet. Thus, another interesting research question is how all these attributes affect consumer behavior in virtual 3D environments and how they can be combined to meet needs of specific groups of consumers.

The next phase of this ongoing research effort aims to provide a classification scheme of the available 3D store layout types. To that end, it was attempted to find the most suitable methodology in order to classify store layout types in VWs through a robust approach. After a thorough review of the literature combined with a series of personal communication attempts with experts in the field, it was decided to adopt the Delphi method for that purpose. This method is considered as appropriate in order to investigate the components of store layout in 3-dimensional environments and explore whether distinct layout types could be formulated, accordingly. The Delphi method is considered a popular method in the Information Systems research domain and is applicable both in forecasting issues and for the development of frameworks and concepts (Okoli, and Pawlowski, 2004).

Then, the resulting layout types (i.e. the ones provided through the Delphi method) will be employed as manipulated variables (treatments) in the context of a field or a laboratory experimental conclusive design towards investigating causal relationships between layout and consumer behaviour dependent variables (similarly to the common research practice evidenced both in conventional and 2D online retailing). These relationships should be moderated by several important dimensions, like product type, situational effects, demographics, behavioural and psychographic data.

The expected contribution of the present study (both in terms of theoretical and practical implications) reflects the need to provide a classification scheme of store layout and design in the context of the 3D online environment, as well as provide experimental evidence regarding whether and how 3D stores' layout affects users' behaviour.

References:

- Apostolou, K. Koutsouris, V. and Vrechopoulos, A. (2008). Retail store atmosphere effects on consumer behaviour in the context of virtual reality. 5th Student Research Conference of Management Science and Technology, Athens, May (in greek).
- Basu, A. and Muylle, S. (1999). Customization in online trade processes. wecwis, International Workshop on Advance Issues of E-Commerce and Web-Based Information Systems, 166.
- Bitner, M.J. (1992). Servicescapes: the impact of physical surroundings on customers and employees. *Journal of Marketing*, 56(2), 57-71.
- Bucklin, L. (1963). Retail strategy and the classification of consumer goods. *Journal of Marketing*, 27, 50-55.
- Clifford, M. G. (1998). Classifications of retail stores and shopping centres: some methodological issues. *GeoJournal*, 45, 255-264.
- Donovan, R. and Rossiter, J. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing*, 58(1), 34-57.
- Gist, R. R. (1968). *Retailing: Concepts and decisions*. New York: John Wiley and Sons.
- Griffith, A.D. (2005). An examination of the influences of store layout in online retailing . *Journal of Business Research*, 58, 1391- 1396.
- Hirschman, E. Greenberg, B. and Robertson, D. (1978). The intermarket reliability of retail image research: an empirical examination. *Journal of Retailing*, 54(1), 3-12.
- Jain, A. and Etgar, M. (1976-77). Measuring store image through multidimensional scaling of free response data. *Journal of Retailing* 52 (4), 61-71,95-96.
- Kaarst-Brown, M. and Evaristo, J. (2001). Physical retailing takes on internet retailing: A preliminary model of book retailer web strategies based on perceived threats and opportunities. HICSS, vol. 8, pp.8059, 34th Annual Hawaii International Conference on System Sciences (HICSS-34).
- Kamis, A. Koufaris, M. and Stern, T. (2008). Using an attribute-based decision support system for user-customized products online: An experimental investigation, *MIS Quarterly*, 32(1).
- Kotler, P. (1973-74). Atmospheric as a marketing tool. *Journal of Retailing*, 49(4), 48-65.
- Krasonikolakis, I., and Vrechopoulos, A. (2009). Setting the Research Agenda for Store Atmosphere Studies in Virtual Reality Retailing. *In the proceedings of 4th Mediterranean Conference on Information Systems, September 2009, Athens*.
- Kunkel, J. and Berry, L. (1968). A behavioral conception of retail image. *Journal of Marketing*, 32, (October), 21-27.
- Levy, M. and Weitz, A.B. (2004). *Retailing management*. 5th Edition. New York: McGraw-Hill/Irwin.
- Linden Lab. (2011a). Private region pricing. Retrieved July 9, 2011 from <http://secondlife.com/land/privatepricing.php?lang=en-US>
- Linden Lab. (2011b). The second life economy in q4 2010. Retrieved July 9, 2011 from <http://community.secondlife.com/t5/Featured-News/The-Second-Life-Economy-in-Q4-2010/ba-p/674618>
- Lindquist, D.J. (1974-75). Meaning of image. *Journal of Retailing*, 50(4), 29-38.
- Lohse, L. G. and Spiller, P. (1999). Internet retail store design: How the user interface influences traffic and sales. *Journal of Computer-Mediated Communication*, 5(2). Accessed at: <http://www.ascusc.org/jcmc/vol5/issue2/lohse.htm>.
- Mayer, L. Mason, B. and Gee, M. (1971). A reconceptualization of store classification as related to retail strategy formulation. *Journal of Retailing*, 47(3), 27-36.
- Mazursky, D. and Jacoby, J. (1986). Exploring the development of store images. *Journal of Retailing*, 62(2), 145-165.
- Messinger, P. Stroulia, E. Lyons, K. Bone, M. Niu, R. Smirnov, K. and Perelgut, S. (2009). Virtual worlds - past, present, and future: New directions in social computing. *Decision Support Systems*, 47, 204-228.
- Ng, C.F. (2003). Satisfying shoppers' psychological needs: From public market to cyber-mall. *Journal of Environmental Psychology*, 23, 434-450.
- Oh, J. Fiorito, S. Cho, H. and Hofacker, C. (2008). Effects of design factors on store image and expectation of merchandise quality in web-based stores. *Journal of Retailing and Consumer Services*, 15, 237-249.

- Okoli, C. and Pawlowski, S. (2004). The Delphi method as a research tool: an example, design considerations and applications. *Information & Management*, 42, 15–29.
- Porter, C.E. (2004). A typology of virtual communities: a multi-disciplinary foundation for future research. *Journal of Computer-Mediated Communication* 10 (1). Article 3.
- Shin, H.D. (2008). Understanding purchasing behaviors in a virtual economy: Consumer behavior involving virtual currency in Web 2.0 communities. *Interacting with Computers*, 20, 433-446.
- Spiller, P. and Lohse, G. (1997-98). A classification of internet retail stores. *International Journal of Electronic Commerce*, 2 (2), 29-56.
- Vrechopoulos A. Papamichail, G. and Doukidis, G. (2002). Identifying patterns in internet retail stores layouts. In V. Pardalos, P. Tsitsiringos, editor, *Financial Engineering, E-Commerce and Supply Chain*, Kluwer Academic Publishers, 231-246.
- Vrechopoulos, A. O’Keefe, R. Doukidis, G. and Siomkos, G. (2004). Virtual store layout: an experimental comparison in the context of grocery retail. *Journal of Retailing*, 80, 13–22.
- Vrechopoulos, A. Apostolou, K. and Koutsouris, V. (2009). Virtual reality retailing on the Web: emerging consumer behavioural patterns. *International Review of Retail, Distribution and Consumer Research*, 19 (5), 469 – 482.
- Vrechopoulos, A. and Atherinos, V. (2009). Web banking layout effects on consumer behavioural intentions. *International Journal of Bank Marketing*, 27(7).