Mass customisation implementation models and customer value in mobile phones services

Preliminary findings from Greece

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Abstract

Purpose – To analyse the mass customisation strategies (MC) developed by mobile phone operators and to identify the types of customer value perceived by mobile phone users that customise services to their profiles.

Design/methodology/approach – A customer-centre approach was adopted for analyzing MC strategies that enhance both extrinsic and intrinsic customer value. A convenience sample was surveyed for gathering data regarding the customer value dimensions perceived by users of customised mobile phone services in Greece.

Findings – Findings revealed that MC strategies that are customer centred are vital as, users of customised mobile phone services perceive both "give" and "get" customer value dimensions. As MC does not come for free, to persuade customers to get involved and invest time and effort in value chain operations for designing customised services, companies need to identify and provide enhanced customer values.

Research limitations/implications – Research findings have great implications in the new service development processes and marketing – communication strategies of mass customisers. Due to the small sample size, future research should test the wider and global generalisability of findings.

Practical implications – Findings help practitioners increase the adoption and use of mass customised mobile phone services by providing insight on how to: develop MC strategies from a customer-centric perspective; and conduct a customer value-based market segmentation for enhancing marketing effectiveness and MC customer adoption.

Originality/value – The MC literature is dominated by operation-supplier approaches to MC strategies in the manufacturing sector. In services, customer involvement in value chain operations is also significant. The study contributes by suggesting a customer-centric approach for developing MC in services that enhances customer value. The study also extends and adapts a multi-dimensional construct for measuring customer value in customisable mobile phone services environments.

Keywords Mobile communication systems, Mass customization, Services, Customer satisfaction, Greece

Paper type Research paper

Introduction

Intense competition and sophisticated demand trends for personalised products have rendered mass customisation (MC) a competitive imperative for all businesses. As consumers become more sophisticated and aware of issues pertaining to the design, quality and functionality of their products and services, they increasingly demand to take part in the design and production process (i.e. to become co-designers and/or

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co-producers), so that they can customise products and services to their particular demands, profile and requirements. The mobile phone service sector is not an exception of such developments. For example, advances in internet tools and mobile phone features allow users to personalise ring tones, phone interface and style, screen savers, information, SMS alerts, address books, pictures albums and MMS services. Overall, MC is mainly reflected on the increased adoption and development of personalised mobile phones services by several operators, e.g. myVodafone, myQ from Q Telecom, myTIM. Consequently, as mobile phone technological advances allow customers to participate in the mobile services development, design, production and delivery process, mobile phone users increasingly demand for affordable and reliable services that correspond exactly to their specific individual needs, lifestyle and preferences (Sigala, 2002). Increases in disposable income and users' mobility further reduces demand for static mass services, while on the other hand, the wide adoption of MC in the mobile phone services sector inhibits operators charge heavy fees for additional personalised services. Thus, in order to address competition and differentiate their offerings, mobile phone operators should adopt and develop MC strategies that directly enhance customer value. Customer value perceptions are found to significantly impact and drive consumers' intentions in terms of repurchase intent, word-of-mouth referrals, customer commitment and loyalty (e.g. Brady and Cronin, 2001; Cronin *et al.*, 2000; Duman and Mattila, 2005; Christou, 2003). Recent research in location-based mobile services also illustrated that increased customer value leads to greater user commitment and behavioural intentions (Pura, 2005). In this vein, customer value based MC strategies are proposed as a competitive strategy for mobile phone operators for differentiating their services, boosting customer loyalty and ultimately, creating users' inertia in changing mobile phone operators.

Although MC has become a business imperative, research into MC in mobile phone services, in electronic environments as well as in services is general, is limited (Peters and Saidin, 2000). The greatest majority of studies have primarily focused on investigating the operational and technological capabilities of mass customisers specifically in the manufacturing sector (Papathanassiou, 2004; Sigala and Christou, 2005). Consequently, little discussion and evidence are also provided in terms of how to develop effective MC strategies that create enhanced customer value. Moreover, as customer integration and participation in value chains are the major requirements for implementing MC strategies, previous studies on MC typologies have adopted a value chain and business process approach for developing and categorising MC strategies (e.g. Spira, 1996). Overall, it becomes evident that the focus of MC research has been so far on operations and/or from an operators' perspective. However, having value chains instead of customer value at the centre of the development of MC strategies is not appropriate for guaranteeing customer adoption of MC (Piller *et al.*, 2004). Previous MC typologies implicitly assume that the greater customer involvement in the value chain is, the greater the success of MC would be, without questioning whether customers are willing, have the competencies and/or perceive any value and usefulness in participating in value chains and becoming co-producers and/or co-designers. These gaps in the MC literature highlight the importance to develop a customer-centric approach for designing MC strategies that enhance customer perceived value. This study aims to fill in this gap by identifying the customer values perceived by users of mass customised mobile phone services.

Customer value is also a construct that has received substantial research. Despite the interest, empirical operationalisation of customer value is complicated with many uni-dimensional and multi-dimensional metrics and it is still unsettled (Lin *et al.*, 2005). Recent conceptualisations of the value emphasise both the functional (extrinsic) and experiential (intrinsic) or emotional aspects of service experiences (e.g. Holbrook, 1994; Duman and Mattila, 2005). The importance and co-existence of emotional and functional values were also validated in online environments (Sigala, 2004; Mathwick *et al.*, 2001), mobile internet (Kim *et al.*, in press) and location-based mobile services (Pura, 2005). The latter studies also represent the very scant research conducted so far within the field of customer value in electronic and specifically in mobile services. The need to further test and wider replicate these studies was also noted. Thus, as a generally established metric for measuring customer value in mobile services and environments does not exist, the current study also aims to contribute in this field of research by further extending and testing previous research.

Overall, the aim of this paper is twofold. First, the paper aims to develop a customer-centric approach for identifying and developing MC strategies in mobile phone services that create customer value. Second, the study also aims to identify and measure the types of customer value that users of MC mobile phones services perceive. By focusing on MC strategies in mobile phone services, the study not only addresses research gaps in MC and specifically in MC in services, but it also investigates a critical m-commerce issue that of the development of successful personalised MC mobile phone services. Personalised m-commerce is considered as a current business necessity for mobile operators and it is predicted to boom in transaction values within the next few years (Kim *et al.*, in press; Pura, 2005). To achieve these, the study first analyses the drivers, concept and implementation models of MC strategies and it then proposes a customer centric approach to MC strategies in mobile phone services that can create and provide enhanced customer value. Later, the literature review in the field of customer value in general as well as in the mobile environment is critically reviewed and a model for measuring customer value in mobile phone services is proposed. The model is tested by gathering data from a convenience sample from Greece. Data are analysed and their practical and research implications for further studies are discussed.

Mass customisation

Drivers, concept and implementation

The term "mass customisation" was coined by Stan Davis (1997) who predicted that the more a company was able to deliver customised goods on a mass basis, relative to their competition, the greater would be their competitive advantage, a view supported by Pitt *et al.* (1999), and Duray and Milligan (1999). Pine *et al.* (1993) describe the synergy of mass customisation as a "new" competitive strategy to challenge "old" strategies such as mass production. Hart and Taylor (1996) offer an operational definition: "MC is the use of flexible processes and organisational structures to produce varied and often individually customised products/services at the price of standardised, mass produced alternatives". MC means that firms can reach the same large customer numbers as in mass production, but they have the additional ability to address their customers individually as in customised markets (Parker, 1996). Flexibility, variety and responsiveness of processes and resource reconfiguration are

all essential to MC, while companies need to understand what customers really want and then respond quickly with an offering which costs the customer relatively little more than standardised, mass produced alternatives (Duray and Milligan, 1999; Pine *et al.*, 1995).

The justification for the development of MC systems is based on three main ideas (e.g. Pitt *et al.*, 1999; Duray and Milligan, 1999; Pine *et al.*, 1995). First, new flexible manufacturing and ICT enable production systems to deliver higher variety at lower cost. Second, there is an increasing demand for product variety and one-to-one customisation. Finally, the shortening of product life cycles and expanding industrial competition has led to the breakdown of many mass industries, increasing the need for production strategies focused on individual customers. Pine (1993) also introduced a useful tool for identifying MC drivers named as the market turbulence map, consisting of the following MC driving factors. With quickly changing needs, which in turn lead to shorter product life cycles, mass production processes can become strained. If the market is heterogeneous, the economies of scale of mass production may also diminish. The rate of technological change, the service level required, the "quality consciousness"; of customers, and the competitive activity in the environment are also considered by the market turbulence map. Quality is no longer "meeting product specifications designed by the producer", but increasingly "meeting whatever the customer wants". Thus, high competitive intensity can result in uncertain product demand, the need to differentiate offerings, and the search for niches to fill.

Considering m-commerce, the following trends led to the urgency and need of MC practices in mobile phone services (Sigala, 2002; Pura, 2005):

- technological advances enabling information personalisation and customisation;
- the maturity of the mobile market and so the need of individual mobile phone operators to gain customer loyalty and increase transaction values of existing customers;
- increased competition in the mobile phone service sector through the entrance of new mobile no-frill operators, e.g. ones that do not carry mobile network infrastructure costs; and
- the increased mobility of customers and their increased expectations for ubiquitous personalised services.

For implementing MC and defining the boundaries of the MC concept, Duray *et al.* (2000) identified two critical MC dimensions:

(1) the basic nature of customisation; and

(2) the means for achieving customisation at or near mass production cost.

The first dimension concerns customer's involvement in the value chain process (e.g. design, production, assembly, delivery, usage) and is used for determining the degree of customisation. The second dimension is related to modularity. Modularity is used as the critical aspect for gaining scale volume or "mass" in mass customisation, as a modular approach: can reduce the variety of components while offering a greater range of end products; allows part of the product to be made in volume as standard modules; and creates product distinctiveness through combination or modification of the modules. Overall, modularity provides both economies of scale and economies of scope,

as component modularity restricts the range of choice, decreasing the possible variety of components and thus allowing for repetitive manufacturing.

Modularisation is clearly evident in mobile phone services as the latter consists of different components, e.g. SMS alerts, ring tones, screen savers, games, wake-up calls, from which one can dynamically create its own mobile device and service. Hence, software, hardware and information-based features of mobile phone services can be considered as MC modules. When considering the customer participation in the value chain, mobile phone service operators provide several options for involving users in the production value chain of mobile services. For example, users can design customised mobile phones by: changing colours of devices' covers; customising the functionality menu of mobile phones; choosing the payment form and their tariff-services programme; selecting the delivery medium of mobile phone services (e.g. photo album stored on a personalised web page or in the mobile device) etc.

Typologies of MC implementation models

The few studies in the MC models field have used the two previous MC dimensions, i.e. modularisation and customer involvement in the value chain, for identifying the levels and types of MC strategies. Indeed, most authors have based their MC classification on the stage of customer involvement in the value chain process by proposing a continuous framework on which MC may be developed; namely, MC can occur at various points along the value chain, ranging from the simple "adaptation" of delivered products by customers themselves, up to the total customisation of product sale, design, fabrication, assembly, and delivery. Pine *et al.* (1995) identified four customisation levels based mostly on empirical observation: collaborative (designers dialogue with customers), adaptive (standard products can be altered by customers during use), cosmetic (standard products are packaged specially for each customer), and transparent (products are adapted to individual needs). Lampel and Mintzberg (1996) defined a continuum of five MC strategies and levels involving different configurations of process (from standard to customised), product (from commodities to unique) and customer transaction (from generic to personalised). Pine (1993) suggested five stages of modular production: customised services (standard products are tailored by people in marketing and delivery before they reach customers), embedded customisation (standard products can be altered by customers during use), point-of-delivery customisation (additional custom work can be done at the point of sale), providing quick response (short time delivery of products), and modular production (standard components can be configured in a wide variety of products and services). Spira (1996) develops a similar framework with four types of customisation: customised packaging, customised services, additional custom work, and modular assembly. By combing these frameworks eight generic MC levels are created ranging from pure customisation to pure standardisation, while the last column illustrates how such value chain based MC strategies are applied in mobile phone services (Table I).

Customer value centric MC strategies

The development and use of value chain and operations-centric MC models are valuable for understanding how to incorporate individual customer needs in value chains and how to cost efficiently operationalise and implement different MC strategies. On the other hand, these MC models are more operator rather than customer

Table I.
Generic levels of MC

MC generic levels	Pine *et al.* (1995)	Lampel and Mintzberg (1996)	Pine (1993)	Spira (1996)	Mobile phone services
8. Design	Collaborative, transparent	Pure customisation			Change of mobile phone cover Add extra memory
7. Fabrication		Tailored customisation			
6. Assembly		Customized standardisation	Modular production	Assembling standard components into unique configurations	Selection of information services to available to mobile phone, e.g. SMS alerts, phone book
5. Additional custom work			Point of delivery customisation	Performing additional custom work	Customisation of mobile phone functionalities to user profile, e.g. calendar, ring tones, etc
4. Additional services			Customised services, quick response	Providing additional services	SMS alerts for flight departure times, changes and gates
3. Packaged and distribution	Cosmetic	Segmented standardisation		Customising packaging	Selection of: tariff-services programme; delivery medium of information services
2. Usage	Adaptive		Embedded customisation		Adaptation of ring tones when using the phone
1. Standardisation		Pure standardisation			

value oriented, as they also provide limited insight regarding the customer value and benefits that customers gets from MC. For example, the frameworks do not provide answers to questions such as: does the higher degree and level of customer involvement in value chain stages reflect more customer value and benefits? Do customers always require to get more involved? What are the dimensions based on which modules' customisation can provide enhanced customer value? Moreover, as it is generally accepted that the adoption of any technology depends on users' technology perceived easy of use and usefulness (e.g. Technology Acceptance Model – TAM), frameworks for developing successful MC strategies for mobile phone services should be based on and identify the MC dimensions that create enhanced customer value and benefits.

Piller *et al.* (2004) argued that MC enhances customer value when customers are allowed to customise the form, fit, functionality and modality of a product features. In this vein, one should firstly identify the product's features and components that can be adapted in terms of their form, fit, functionality and modality to the customers' profile, needs and wants. In the case of mobile phone services, the product and services of mobile phone service operators are closely interlinked with and inseparable from the information and communication technology (ICT) system that supports them. Thus, in order to develop customer value added MC strategies for mobile phone services one should first identify the features of ICT system that supports and enable them. To decompose mobile phone service operators' ICT systems into their features, the three major layers of digital communication systems were used (Benkler, 2000): physical, code and content layer. The physical layer, the bottom component of an ICT system, includes the physical technological device and the connection channel that is used to transmit communication signals. In the middle, there is a code layer that consists of the protocols and software that make the physical layer run and determines the user interface. At the top, there is a content layer, which consists of multimodal information. The content layer includes both the substance and the form of multimedia content (Saari, 2002). Substance refers to the core message of the information. Form implies aesthetic and expressive ways of organising the substance, such as using different modalities and structures of information (Saari, 2002). These ICT components are amenable for numerous customisations (Table II). This decomposition of the ICT system in its components was used because:

- It is consistent with the concept of modularisation, i.e. the MC dimension facilitating MC strategies implementation through complexity reduction and production efficiency at nearly mass production prices. Product features are the modules to be customised.
- As most customers frequently do not know what they want, product-service modularisation helps customers to easier specify and satisfy their needs by selecting and evaluating different customisation options-features for each product-service module.
- The ICT system components-modules can directly affect customer value. Research (Vrechopoulos *et al.*, 2004; Chen and Yen, 2004, Saari, 2002) is advancing showing how ICT components' customisation (in terms of fit, form, functionality and modality) to individual preferences, needs and characteristics enhances customer value (emotional, cognitive and functional).

Table II.
ICT system components and value based MC strategies in mobile phone services

Layer	Key factors	Mobile phones services
Physical	*Hardware* – large or small versus human scale – mobile or immobile – close or far from body (intimate personal-social distance)	Customisation of mobile phone cover's colour and/or design
Code	*Interaction* – degree of user verus system control, proactivity through user interface *Visual-functional aspects* – way of presenting controls in an interface visually and functionally	*Customisation of interaction* Controlling and customising the delivery of alerts for customised services (calendar, wake-up calls, celebrations etc) Controlling and customising the delivery of SMS information alerts, e.g. stock exchange, celebrations, horoscope etc Controlling and customising the services of voice mail and the delivery of voice messages *Customisation of visual-functional aspects* Customisation of screen interface and/or of key functions, e.g. include popular functionalities and short cuts to favourite functions
Content	*Substance* – the essence of the event described – type of substance (factual/imaginary; genre, other) – narrative techniques used by authors *Form* 1. Modalities: text, video, audio, graphics, animation, etc. 2. Visual layout – ways of presenting various shapes, colours, font types, groupings and other relationships or expressive properties of visual representations – ways of integrating modalities into the user interface 3. Structure – ways of presenting modalities, visual layout, other form elements and their relations – linear-non linear structure (sequential versus parallel; Narrative techniques, hypertextuality)	*Customisation of SUBSTANCE*: – Customisation of screen (e.g. picture/background) – Customisation of ring tone, e.g. based on who is calling – Customisation of phone tone when somebody is calling, e.g. myTone (TIM) – Customisation of calendar services – Customisation of address book – Customisation of m-internet functions – Customisation of game options *Customisation of FORM* Possibility to store, access and share personal content through a customised web page (dual modality of mobile phone content) Customisation of social interaction and communication services, e.g. customising chatting and dating services with friends by grouping information from the address book and using it for sending mass group SMS Customise MMS by using-linking content stored in the mobile phone, e.g. mobile phone taken pictures, text and music Future possibilities of MC by interrelating content of mobile phones with other mobile phone functions and services

- The application of the ICT system components-module has also been used for proposing customer value based MC strategies in another service sector, that of online travel agent sector (Sigala, 2006).

The physical layer of a mobile phone (e.g. colour, design) can be changed to match the preference and personal style of the user. Code customisation allows the user customisation and control of interaction with mobile phone services (i.e. determine the way and time of access and delivery). So, the user can also customise the screen interface functionality and the functionality of sort cut keys of his/her mobile phone for making it easier and saving time to access his/her popular mobile functions and services. For example, Vodaphone has recently launched two devices that have three additional keys that directly divert users to three popular functionalities, e.g. voice mail, address book and SMS services. The popularity of such devices highlights the fact that few users do want to customise and particularly simplify the mobile phone functionality to better match their mobile phone services usage style and needs. Code customisation also means that the user may want to customise the way and time to be alerted by the mobile device or operator with SMS information services (e.g. horoscope, stock exchange, weather). Similarly, users can also determine the way to be alerted and interact with voice mail services for receiving, storing and delivering voice messages. Lastly, users can also customise both the substance (type) as well as the form of mobile phone content (i.e. services and information). For example, the user can customise the appearance of the mobile screen (e.g. pictures, background), the ring tones, key tones and call waiting ring tones to music that matches his/her taste and personality. Actually, the user may be allowed to customise and adapt all mobile phones services to his/her style and needs, e.g. calendar, address book, games, internet favourites and other mobile Internet services. Apart from customising the substance (type) of mobile information, the user can also customise the way information is presented and structured, i.e. its overall layout and modality (i.e. delivery medium). So, the user can group and organise information (e.g. create group of contacts and send mass SMS), interrelate mobile phone information for creating customised MMS, select the delivery and modality method for storing, accessing and sharing mobile information (e.g. through a personalised web page). The possibilities to change the content structure and interrelations at the later ICT system layer provide also numerous opportunities for future MC possibilities in the mobile phone service that can further enhance customer value. For example, imagine the situation whereby a user customises the calendar content (substance) to include all his/her friends' anniversaries and celebrations. Customised content interrelations may be created that will in turn allow the user to further determine and customise how the calendar content can be interrelated with other mobile phone functions, e.g. the automatic placement of telephone calls to the particular person who celebrates an anniversary, the automated and programmed purchase of user pre-selected flowers at a specific day-anniversary through mobile internet commerce services.

The value of the previous framework for designing MC strategies is highlighted by Piller *et al.*'s (2004) study that revealed the direct link between product features' customisation and customer value. Particularly, they argued that the customisation of a product's form enhances customers' aesthetic value while the customisation of the product's fit, functionality and modality usually leads to functional customer benefits,

e.g. time savings, convenience/fit of product with user's size. However, most emphasis on customisation-personalisation systems is geared so far towards the utilitarian aspects of personalised information delivery (Abidi, 2003), whereas despite their increasing popularity and significance, the other customer value dimensions driven by ICT customisation have attracted limited attention. For example, users are often active in tailoring ICT systems to better reflect their own personality and identity (e.g. ring tones, backgrounds) (Moon, 2002), but these customisation forms and customer value dimensions have been overlooked in literature (Saari and Turpeinen, 2003). In reviewing the literature, Abidi (2003) have also recognised the importance of both types of customer value by identifying two types of personalisation: utilitarian and emotional/symbolic personalisation. Nevertheless, the specific types and aspects of utilitarian and emotional customer value that MC of services can provide have not been studied yet in more depth and detail. Moreover, research has not examined so far the user segments and types of customised products-services that may prefer particular types of customer value (e.g. utilitarian versus emotional) as well as the customisation types/dimensions that may lead to certain types of customer value. The investigation of customer value derived from MC is also vitally important, since it is widely argued that the possibility to have more influence in the products' properties and to be enabled to interactively adapt their form, fit, functionality and modality according to own needs and preferences, is one of the fundamental motivations for customers to accept the extra efforts for configuring and customising products-services. In other words, customer acceptance and willingness to develop and adopt MC services – products is heavily dependent on the capability of MC strategies to provide additional customer value. So far, the previous discussion developed and analysed a framework for developing MC strategies in the mobile sector that lead to enhanced customer value, however the dimensions and types of customer value that such MC strategies can deliver have not been identified yet. Hence, it is the aim of the following section to in-depth identify and measure the types of customer value derived from the above mentioned MC strategies by reviewing the relevant literature and by testing the proposed customer value framework in a sample of Greek mobile users.

Customer value

Customer value is a focal concept that has been examined in multiple disciplines. Value is emphasised in the fields of economics, and it has its foundations in exchange, utility, labour value theories, marketing, accounting, finance and information systems literature. For example, the traditional constructs of technology usefulness and easy of use found in technology adoption theories and models (e.g. see Christou and Kassianidis's (2003) review on technology adoption models (TAM)), diffusion of innovations, theory of planned behaviour etc) have been replaced by concepts such as emotions, image, social influence, control, perceived enjoyment, perceived value and needs, as the latter are found to better predict and explain customer adoption and use of technologies (e.g. see review provided by Pura, 2005). Customer value perceptions are also found to significantly impact and drive consumers' post-purchase intentions, e.g. repurchase intent, word-of-mouth referrals, customer commitment and loyalty in off line (e.g. Brady and Cronin, 2001; Cronin *et al.*, 2000; Christou, 2004) and mobile environments (Pura, 2005). Thus, the extension and further investigation of both

utilitarian and emotional customer value of MC strategies in mobile phone services becomes crucially important.

Initial conceptualisations of value were mainly price-based. For example, Thaler (1985) claimed that customer value perceptions result from comparisons between various price structures (i.e. advertised selling and reference price, internal reference price), while Monroe (1990) proposed that customer value is the weighted sum of acquisition and transaction value. Zeithaml's (1988) common conceptualisation of value as a "get-versus-give" model has helped to broaden the concept of value by linking it to a wide array of antecedents that represent not only what consumers give but also what they get from the consumption experience. So, for example Parasuraman and Grewal (2000) further extended the dimensions of customer value by identifying utilitarian benefits in different stages of the product consumption process: acquisition, transaction, in-use, and redemption value. However, their customer value conceptualisation was again price-based ignoring other types of sacrifices-gives, e.g. the perceived sacrifice may also include non financial aspects such as time, search costs and physical or mental effort that the customer has to give for consuming the service (Dodds and Monroe, 1991). Initial conceptualisations of value also tended to measure value as a single overall value construct, e.g. "fair price", "good value" (Baker *et al.*, 2002; Sweeney *et al.*, 1999), "value for money" and "meeting quality and price requirements" (Grewal *et al.*, 1998) or to use a multi-item scale to measure perceived value as a unidimensional construct that traditionally has emphasised price perceptions (e.g. Grewal *et al.*, 1998; Baker *et al.*, 2002; Brady and Robertson, 1999; Sweeney *et al.*, 1999). The unidimensional conceptualisation of value is effective and important, but it cannot discern the complex nature of perceived value, the multi-dimensionality of decision making and the full representation of perceived customer benefits and sacrifices (both utilitarian and emotional). Lin *et al.* (2005) also argued a methodological limitation of such unidimensional models. Previous models have also applied structural models to measure not only the unidimensional perceived value, but also give-get components, concepts that have been incorporated in the unidimensional value domain. Thus, the relationships between give-get and value are conceptually tautological because the existence of high value perception automatically implies that existence of high get perception, or low give perception, or both. The tautological hypothesis is self-verifying and may not be disconfirmed; i.e. it is not falsifiable (Lin *et al.*, 2005). Overall, the need to conceptualise customer value as a multidimensional construct both in terms of its "give" and "get" was recognised. As a result, numerous studies emerged treating customer value as a multidimensional construct.

Holbrook (1994) proposed a typology of customer value based on three dimensions: self-oriented versus other-oriented, depending if one is consuming a product-service solely for his/her own pleasure or also for his/her companion (i.e. social environment) pleasure; active versus reactive value reflects the collaboration between supplier and customer, the role of customer during the service encounter and so, it depends on whether the consumer is active or passive viewer during the service experience; and extrinsic versus intrinsic, extrinsic value refers to the ability of a product and service experience to achieve a specific goal (e.g. fulfil hunger) while intrinsic value derives from the "appreciation of an experience for its own sake, apart from any other consequence that may result" (e.g. enjoy the meal experience, window shopping

without any specific goal to buy anything). However, Holbrook (1994) recognised that consumption experiences most likely involve more than one type of value simultaneously, while consumers buy products and evaluate service experiences based on both utilitarian (extrinsic) and experiential (intrinsic) values. Thus, differentiating between utilitarian and hedonic aspects is difficult and meaningless in service experiences. Particularly, in mobile phone service experiences, users place and receive telephone calls, SMS alerts and play games on their mobile phones not only for getting information and solving a problem (extrinsic), but also because they enjoy the process and have fun and/or gain recognition from their peers (i.e. other-oriented value). Hence, mobile phone service experiences may render all three proposed types of customer value (Holbrook, 1994), but it will be interesting to identify how MC possibilities impact the existence and significance of value types within different segments of mobile users.

Sheth *et al.* (1991) developed a framework containing both the utilitarian and hedonic view of consumption by including goal oriented consumption in functional value as well as the emotional aspects of hedonic consumption: functional, social, emotional, epistemic and conditional value. The simultaneous existence of both utilitarian and hedonic value is stressed also in other multi-dimensional value constructs as follows. Lapierre (2000) identified the following customer value dimensions in industrial contexts: alternative solutions, product quality, product customisation; responsiveness, flexibility, reliability, technical competence, supplier's image, trust, solidarity, price, time/effort/energy, conflict. Lapierre (2000) showed that product customisation is perceived as a type of customer value but without identifying what types of customer value it can render. Using Holbrook's (1994) experiential motives framework in an online shopping environment, Mathwick *et al.* (2001) proved that the following customer experiential values are replicated in internet – technological service consumption environments: aesthetic (enjoyment and escapism), playfulness (visual appeal and entertainment), customer return on investment (efficiency and economic value) and service excellence (perceived service excellence). Petrick (2002) provided the SERV-PERVAL scale (quality, emotional response, reputation, monetary and behavioural price) highlighting that the prestige and status that the brand reputation can give to consumers is also perceived as a customer value. Finally, Sweeney and Soutar's (2001) SERVAL construct had the following dimensions: emotional value, social value, functional value due to quality, functional value due to price. In comparison to Sheth *et al.*'s (1991) framework, the previous studies also highlighted the importance of the "give" value dimensions that Sheth *et al.* did not extensively consider;, e.g. time/effort/energy and conflict dimensions stressed by Lapierre (2000). "Give" value dimensions are quite important in MC mobile phone services and equally significant to "get" value dimensions, as mobile phone users need to spend considerable time and effort configuring the mobile device to their own profile. Moreover, the easy of use and speed of learning the mobile device functionalities are significant factors that can affect customer perceived value. Hence, due to the indispensable customer involvement and effort in customising mobile phone services, evaluations of the customer value of MC mobile phone services should also consider the "give" of users.

Within the mobile services sector, two studies have aimed to examine the customer value so far. Pura (2005) examined customer value in location-based mobile services by

adapting Sheth *et al.*'s framework. Sheth *et al.*'s framework was used, as it accounts for context dependency (i.e. location and time issues of consumption) that is important for location-based mobile services that are accessible and available at any time and anywhere. Context dependency is also important for MC mobile phone services as well and so, Pura's (2005) adaptation of Sheth *et al.*'s framework was also adapted in this study. However, as Sheth *et al.*'s (1991) framework did not sufficiently account for the sacrifices that mobile users have to "give" for customising their mobile phones Pura's (2005) model was further extended for addressing the latter. To do this, perceived sacrifices constructs were adopted from the Kim *et al.* (in press) framework. Kim *et al.* (in press) conducted the second study within the mobile environment by developing a value-based approach for examining the adoption of mobile internet. However, although their framework effectively accounted and measured the "give" value dimensions of mobile internet (including both financial and non-financial sacrifices), the "get" value dimensions did not sufficiently distinguished and measure the different extrinsic and intrinsic value dimensions as other frameworks (e.g. Sheth *et al.*, 2001; Holbrook, 1994) do. Specifically, Kim *et al.*'s (in press) framework measured only two value dimensions namely usefulness and enjoyment, ignoring other value dimensions (e.g. social, contextual, novelty) that MC mobile phone services can render.

Within the MC mobile phone services, users also "get" another value dimensions that can significantly impact their intrinsic motivation and benefits. In Table II, it becomes evident that users of customised mobile phone services can also determine and control the way, time and modality by which services and information are produced, delivered and are made available. In other words, MC provides users the capability to control the service process and encounter. The ability of users to control the service setting, environment, process and technology interaction (in mobile settings there is only interaction with the technology as face-to-face encounters do not exist) is similar with the concept of freedom of choice, dominance and control of Mannell and Kleiber (1997) and Otto (1997). Mannell and Kleiber (1997) found that leisure experiences are characterised by three basic attributes freedom of choice (control), intrinsic motivation (novelty) and enjoyment (hedonics), which were found congruent with Otto's (1997) pleasure (hedonics), arousal (novelty) and dominance (control) framework. Thus, control was also considered and added in the proposed framework of customer value in MC mobile phone services.

Table III summarises the proposed framework for measuring customer value in MC mobile phone services.

Functional value refers to value derived from effective task fulfilment and sometimes relates to superiority compared with alternatives (Sheth *et al.*, 1991). Holbrook (1994) referred to it as output/input ratio, convenience, availability or easy of use. Mathwick *et al.* (2001) replicated Holbrook's (1994) constructs in online environments and identified values referring to efficiency of completing a task and economic value of items purchased online. Time savings and (time and place) convenience were also found to be important factors in mobile phone adoption and use (Kim *et al.*, in press; Pura, 2005). Thus, convenience was also included as a value item.

Social value relates to social approval and the enhancement of self-image among other individuals (Bearden and Netemeyer, 1999) and is defined as the utility derived from the product's ability to enhance social self-concept (Sweeney and Soutar, 2001). Esteem, fashion and sociability are also constructs supporting social recognition

Customer value dimensions	Sources
Get	
Functional-convenience value	Mathwick *et al.* (2001); Pura (2005); Kim *et al.* (in press)
Social value	Sweeney and Soutar (2003); Pura (2005)
Emotional value	Sheth *et al.* (2001); Sweeney and Soutar (2003); Mathwick *et al.* (2001); Pura (2005)
Conditional value	Sheth *et al.* (2001); Holbrook (1994); Pura (2005)
Epistemic value	Sheth *et al.* (2001); Pura (2005)
Control, freedom of choice value	Otto (1997); Mahrabian and Russell (1974); Duman and Mattila (2005)
Give – sacrifices	
Monetary sacrifice: perceived fee	Kim *et al.* (in press); Voss *et al.* (1998)
Non-monetary sacrifice: technicality	Kim *et al.* (in press); De Lone and McLean (1992); Davis (1989)

Table III.
Customer value dimensions (get and give) in MC mobile phone services

(Sheth *et al.*, 1991; Holbrook, 1994; Sweeney and Soutar, 2001) and research has indicated that use of mobile phones is a way of expressing personality, status and image in a public context and among peers (Leung and Wei, 2000; Moon, 2002). Particularly, social value is specifically relevant when customising mobile phone services, as users can select and use the ring tones, colours, pictures, SMS information alerts that best match with their personality and/or the status that users want to show off to their peers.

Emotional value is the utility derived from feelings or affective states that a product generates (Sweeney and Soutar, 2001). Play or fun, enjoyment, escapism and aesthetic value gained by participating in service experiences in their own right are also related to emotional value (Holbrook, 1994, Mathwick *et al.*, 2001). Individuals, who experience immediate pleasure or joy using a technology and perceive any activity involving the technology to be personally enjoyable in its own right aside from instrumental value of the technology are also more likely to use and adopt the technology (Davis, 1989). Within mobile technology environments, enjoyment and fun are also found as strong motivators of mobile phones services (Pura, 2005; Kim *et al.*, in press).

Epistemic value relates to curiosity, novelty or gained knowledge that can significantly motivate the purchase of a product and service (Sheth *et al.*, 1991; Duman and Mattila, 2005). Sometimes, consumers buy technology not for a specific goal or use, but only from curiosity and novelty seeking.

Conditional value refers originally to situations that impact choice such as seasonal situations (anniversaries), once in a life time occasions (birth of a child) or emergency situations (accident) (Sheth *et al.*, 1991). However, this definition of conditional value only referred to the use of traditional experiences-products in specific events-conditions and so, it does not reflect the capability of mobile services to be consumed, accessed and used at any time and place. Moreover, in the case of customised mobile phone services, it should be recognised that the accessibility and use of their services is also dependent on the specific controls and selections of the mobile user and his/her profile and needs. As a result, conditional value in this study is defined as: "value existing in a specific context, whereby customisation options and dimensions, allowed by the ICT system and chosen and configured by the user, result

in customised information and services according to the user's profile, preferences and needs".

Averill (1973) distinguished between three forms of control: behavioural (actual rather than perceived control); cognitive (the way a potentially harmful event is interpreted; and decisional (a choice in the selection of outcomes and goals. Decisional control is thus highly linked with freedom, which is a fundamental component of experiential services. Freedom of choice is particularly important in MC mobile phone services, whereby the user is given the capability to get engaged in the service process and control the time, way and modality of mobile phone service outcomes. Customer control in service environments and of service processes has been found to significantly enhance other hedonic values and overall perceived customer value (Otto, 1997; Duman and Mattila, 2005).

Thaler (1985) and Zeithaml (1988) found that perceived fee directly influence perceived value and that perceived prices symbolises the encoding or internalisation of the objective selling price of a product/service. The fee structure of mobile phone services consists of a pay-as-you-use scheme and subscription-based pricing. Without any experience with new services such as mobile phone services (e.g. ring tones, mobile internet), customers cannot judge whether the fee quoted is high or low. In mobile phone contexts, Kim *et al.* (in press) claimed that customers can hold internal, previously encoded reference prices (e.g. prices of mobile phone calls, stationary internet access), compare these prices with the ones they are quoted and the comparison result forms the customers' perception of the fee. This definition of perceived fee was also adopted in this study.

By adapting De Lone and McLean's (1992) definition of system quality and Kim *et al.*'s (in press) definition of mobile internet technicality, non-monetary sacrifice or technicality is defined as the degree to which the MC mobile phone services are perceived as being technically excellent in the process of providing customised services. The technically of MC mobile phone services is determined by users' perceptions of easy of use (whether the system is free of physical, mental and learning effort; Davis, 1989), system reliability (whether the system is error-free, consistently available and secure), and efficiency (whether it is fast to configure the mobile phone options). Easy of use has been widely used as an element of technicality and it has been defined (Davis, 1989) as the degree to which an individual believes that using a particular system would be free of physical and mental effort. Here, easy of use refers to the overall user-friendliness of using and customising the features of mobile devices. Technicality of mobile phones has been considered and proved as a sacrifice "get" value component by Kim *et al.* (in press). Moreover, as it was also found to crucially affect the adoption of mobile phones, technically is quite important for MC mobile phone services as the users have to provide extra efforts and time in configuring the system's features to their own profile and preferences.

Research methodology

This study aimed to identify and examine how MC strategies of mobile phone operators enhance customer value. To achieve that, the concept and implementation of MC within the mobile phone sector were analysed and a framework for developing MC strategies that enhance customer value was proposed. Later, the literature regarding customer value was critically reviewed with the aim to investigate and propose a

framework that in turn identifies the dimensions of customer value provided by MC strategies developed by mobile phone operators. Table III summarises the dimensions of customer value in MC mobile phone services. Regarding construct operationalisation, this study has either adopted or adapted validated scales and experimental procedures wherever possible. Measurements were also checked for reliability and validity as shown later. So, the customer value dimensions were measured with items previously tested and developed in the literature (Table III provides the sources of scales), while items were also modified to reflect the particular value dimensions provided by mass customised mobile phone services. Items were measured using a seven-point response scale anchored strongly disagree (1) and strongly agree (7). Three academics were also used for checking the relevance and appropriateness of the modified scales by asking them to relate the items with the concept they thought. The final list of items reflects the feedback received (Table IV). Research questions were also developed for gathering demographic data regarding the profile of mobile phone users as well as the ways in which users have customised their mobile phone services (based on the framework presented in Table II).

Empirical data were received from a convenience sample of three shopping mall visitors located in Thessaloniki, Greece. Five doctoral students were explained about the aim of the study and they were trained on using the research instrument and asking people to fill it in. The three shopping malls were selected based on their visitor popularity and their geographical location, so that they could cover habitants coming from all the parts of the city. One shopping mall is located at the eastern entrance of the city covering the east part of the city, one shopping mall served the central part of the city and it was located right at the core of the city centre and the third shopping mall is located at the west entrance of the city covering the north-west part of Thessaloniki. It should also be noted that Thessaloniki represents the second biggest city and port in Greece (an important logistics and commerce centre not only for Greece but also for the Balkan area) that is located around a naturally formed golf (U-shaped city) whereby the post represents the south part of the city; meaning that at the south of the city, there is only see and port infrastructure. The study took place during the first week (Monday to Saturday) of June 2005 and during mornings and evenings (when the shops where open) in order to have a more representative and diverse sample. Students were asked to stop every 8th person and ask him/her to fill in the questionnaire only if that person answered positively that he/she has customised in any aspect (e.g. hardware, software, information) of his/her mobile phone. This screening question was used for identifying qualified MC mobile phone users that were needed for this study. Overall, 327 usable responses were gathered with a somewhat equal representation of visitors among the three shopping malls: 96 responses from the mall located at the east of the city, 119 from the north-west and 112 from the city centre mall.

Data analysis

Respondents' profile

Table V reports the findings regarding the demographic profile of mobile phone users that have reported to customise at least one feature-aspect of their mobile phone(s). Although respondents correspond to a somewhat equal representation of the two genders, customised mobile phone users seem to refer more to females (51.4 per cent) than males (48.6 per cent). The great majority of mobile phone customisers also

	CFA Load		
Functional-convenience value		Cronbach α	0.91
Customisation of my mobile phone services enables me to accomplish tasks more quickly	0.88	KMO	0.891
		Bartletts	0.001
Customisation of my mobile phone services enhances my task effectiveness	0.83		
Customisation of my mobile phone services makes it easier to do my tasks	0.84	Chi Square	9.43
I value the convenience of customising my mobile phone services	0.71	Prob.	0.061
I value the possibility to customise the mobile phone services in order to fit to my own profile and needs	0.77	GFI	0.95
		RMSEA	0.063
		RMR	0.036
		AVE	0.73
		MEAN	5.1
Social value		Cronbach α	0.87
Customisation of my mobile phone services helps me to feel accepted by others	0.84	KMO	0.90
Customisation of my mobile phone services makes a good impression on other people	0.91	Bartletts	0.001
Customisation of my mobile phone services gives me social approval	0.85	Chi Square	2.86
		Prob.	0.620
		GFI	0.98
		RMSE	0.060
		RMR	0.031
		AVE	0.81
		MEAN	5.6
Emotional value		Cronbach α	0.81
Customisation of my mobile phone services makes it aesthetically appealing	0.75	KMO	0.79
Customisation of my mobile phone services entertains me	0.72	Bartletts	0.001
Customisation of my mobile phone services makes me feel good	0.81	Chi Square	21.7
Using and customising my mobile phone services makes me feel I am in another world	0.74	Prob.	0.124
		GFI	0.95
		RMSEA	0.041
		RMR	0.051
		AVE	0.71
		MEAN	4.7
Conditional value		Cronbach α	0.88
I value the personalised services and information I get, when I customise my mobile phone services to my own profile, preferences and needs	0.84	KMO	0.851
I value the personalised services and information I get, when I control the timing of their provision	0.87	Bartletts	0.001
		Chi Square	2.43
		Prob.	0.78
		GFI	0.97
		RMSEA	0.061
		RMR	0.026
		AVE	0.77
		MEAN	4.3
Epistemic value		Cronbach α	0.91
I customise my mobile phone services to experiment with new ways of doing things	0.92	KMO	0.872

(*continued*)

Table IV.
Data analysis of customer value constructs: measurement items and CFA results

	CFA Load		
I customise my mobile phone services to test the new technologies	0.78	Bartletts	0.001
I customise my mobile phone services out of curiosity	0.83	Chi Square	0.419
		Prob.	0.812
		GFI	0.99
		RMSEA	0.000
		RMR	0.009
		AVE	0.68
		MEAN	4.6
Control, freedom of choice value		Cronbach α	0.86
By customising my mobile phone services, I feel I played a role in or contributed to the service process	0.78	KMO	0.81
By customising my mobile phone services, I have some choice in the way tasks can be completed	0.86	Bartletts	0.001
By customising my mobile phone services, my privacy can be assured whenever I like	0.88	Chi Square	11.753
By customising my mobile phone services, I have some control over the way tasks are done	0.79	Prob.	0.091
By customising my mobile phone services, I can interact freely with the technology	0.85	GFI	0.96
By customising my mobile phone services, I can have a hassle-free lifestyle	0.74	RMSEA	0.042
By customising my mobile phone services, I have some control on how technology penetrates my daily life[a]	0.89	RMR	0.053
		AVE	0.65
		MEAN	4.8
Monetary sacrifice: perceived fee		Cronbach α	0.87
The fee I have to pay for customised mobile phone services is too high	−0.89	KMO	0.813
The fee I have to pay for customised mobile phone services is reasonable (reversed)	0.82	Bartletts	0.001
I am pleased with the fee I have to pay for the use of customised mobile phone services (reversed)	0.80	Chi Square	12.76
		Prob.	0.127
		GFI	0.97
		RMSA	0.000
		RMR	0.009
		AVE	0.71
		MEAN	5.7
Non-monetary sacrifice: technicality		Cronbach α	0.88
It is easy to customise mobile phone services to my own profile, preferences and needs	0.73	KMO	0.84
Customised mobile phone services are provided reliably	0.73	Bartletts	0.000
Customisation of mobile phone services can be done fast[a]	0.75	Chi Square	13.41
It is easy to use customised mobile phone services[a]	0.81	Prob.	0.141
		GFI	0.97
		RMSEA	0.044
		RMR	0.062
		AVE	0.69
		MEAN	4.4

Table IV.

Note: [a]= new item added in this study

Demographics	Frequency	Percentage
Gender		
Female	168	51.4
Male	159	48.6
Age		
Under 15 yrs	8	2.4
15-25	147	45.0
25-35	106	32.4
35-45	56	17.1
above 45 yrs	10	3.1
Highest education (already achieved or currently studying)		
High school	29	8.9
Vocational education	146	44.6
University	152	46.5
Use of mobile phone [a]		
Business	16	4.9
Personal	121	37.0
Both	190	58.1
Number of years using mobile phones		
Less than 1 year	4	1.2
1-2 yrs	12	3.7
2-4 yrs	133	40.7
More than 4 yrs	178	54.4
Type of mobile phone device		
Second generation mobile phone	44	13.5
3G mobile phone	261	79.8
PDA	22	6.7

Note: [a]Many respondents have reported to have more than one mobile phone and number (usually two phones); one from the work and one for personal use. The answer "both" was used for recording the use of at least two mobile phones whereby at least one was used for personal reasons and the other for work. However, users were asked to report the use and customisation of their mobile phones as they were using only one phone and number (e.g. the two mobile phones were asked to be regarded as one)

Table V.
Respondents' demographic profile

represent: the younger technology savvy and seeking generation (e.g. 45 per cent of respondents were between 15-25 years old, 32.4 per cent were between 25-35 years old); and well educated citizens (e.g. 46.5 per cent have either finished or are currently studying at university, and 44.6 per cent have finished or are currently studying at a vocational college or lyceum). The use of customised mobile phone services mainly refers to both personal and work purposes (58.1 per cent), less frequently (37 per cent) to personal use only (e.g. housewives) and very infrequently (4.9 per cent) to solely work related purposes. In other words, customised mobile phone services have greatly penetrated the daily life and lifestyle of their users. The tendency of respondents to adopt and use the latest technology (i.e. early technology adopters, innovators) is also evident in statistics referring to the number of years respondents have been using mobile phones and the type of mobile phone devices they use. Specifically, the majority of respondents uses third generation mobile phones (79.8 per cent) for more than four years or between 2-4 years (54.4 per cent and 40.7 per cent respectively). Such statistics

are not surprisingly, since press releases in Greek national newspapers of studies conducted by mobile phone operators in Greece show mobile phone penetration percentages more than 100 per cent (meaning that many Greeks have more than one mobile phone) as well as that the majority of Greeks change their mobile phone device every six months.

Table VI provides statistics regarding the features and dimensions of mobile phone services that respondents reported to customise. Respondents claimed to customise all three ICT layers of mobile phone services. It is evident that customisation of interaction (control) and of content are the two most popular customised mobile phone features (all respondents claimed to customise at least these two features). The next most popular customisation feature is customisation of content (31.2 per cent) and customisation of layer (21.7 per cent), while the least popular customised feature is customisation of visual-functional aspects. Some years ago, customisation of mobile phones' cover was very fashionable in Greece, but nowadays is not trendy any more.

Customer value analysis of mass customised mobile phone services

Several analyses were undertaken for purifying and testing the customer value measures. First, data underwent a number of evaluative procedures which included correlation analysis and reliability analysis. Hair *et al.* (1998) recommended that the data matrix can be initially tested via measures such as the Kaiser-Meyer Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. Should sufficient correlations are found within the correlation matrix then confirmatory factor analysis can proceed. KMO compares the size of the observed correlation coefficients with the magnitude of the partial correlation coefficients and is calculated as a value between 0 and 1. A value close to 1 indicates a large number of interrelations among the variables. Bartlett's test of sphericity is also used for testing the statistical probability that the correlation matrix had significant correlations among at least some of the variables computed and it is indicated by a significant level less than 0.05 (Hair *et al.*, 1998). Table IV provides the KMO and Bartlett's test results. High KMO statistics (ranging from 0.79 to 0.90) and a significant probability level ($p < 0.001$) for the Bartlett's test of all constructs indicated sufficient correlations to proceed with confirmatory factor analysis. Moreover, item-to-item correlations within each construct were inspected in order to check whether all coefficients fell within the acceptable range of factor analysis of 0.40 to 0.80. The latter was confirmed and so all items were retained for confirmatory factor analysis (CFA). Construct reliability was also tested by calculating cronbach α for each construct. High alpha's (ranging from 0.81 to 0.91) indicated high reliability measures.

Table VI.
Respondents' profile regarding their customisation of mobile phone services

ICT dimension and layer of mobile phone services customisation	Frequency	Percentage
Customisation of layer (e.g. hardware, colour, cover)	71	21.7
Customisation of code		
Customisation of visual-functional aspects	17	5.2
Customisation of interaction	327	100.0
Customisation of content		
Customisation of substance	327	100.0
Customisation of form	102	31.2

CFA was then conducted for determining if the dimensions, measured by items, were convergent and unidimensional. Unidimensionality and convergent validity of the scale is achieved if the goodness of fit index (GFI) is above 0.95 and the adjusted goodness of fit index (AGFI) is above 0.90, while the root mean square residual (RMR) and the root mean square error of approximation are less than 0.008 (Chandon *et al.*, 1997). CFA confirmed good to strong loadings (ranging from to 0.71 to 0.92) for all items. As indicated in Table IV, chi-square statistics for each scale ranged from 21.7 to 0.419, with probability levels ranging from 0.061 to 0.812. The GFI (ranging from 0.95 to 0.99) were all above 0.90, and the RMSEA and RMR for each construct ranged from 0.000 to 0.063 and from 0.009 to 0.062 respectively, which is also less than the recommended level 0.08. Convergent validity of constructs was tested by calculating the average variance explained (AVE) of items and checking if it is greater than the variance unexplained, i.e. AVE $>$ 0.05, (Fornell and Larcker, 1981). The squared multiple correlations from the CFA were used to calculate AVE of all items, which were also found greater than 0.05. Having computed the composite measures, discriminant validity also needs to be tested (Gaski, 1984). Discriminant validity exists when the correlation between two composite constructs is not higher than their respective reliability estimates. By calculating constructs correlations and comparing them to cronbach's α, discriminant validity was also confirmed for all constructs.

Discussion and implications of the findings

Findings reveal that all customer value dimensions are important for customised mobile phone users. Specifically, the most important "get" customer value dimension was reported to be social value (5.6 = mean) followed by functional value (5.1), control (4.8), emotional value (4.7), epistemic value (4.6) and conditional value (4.3). Mean values of the "give" customer value perceptive highlight that customers also perceive the additional costs-fees that they have to pay for using customised mobile phone services. The mean value (4.4) of non-monetary sacrifices in terms of the technicality of customisation also illustrates that users also perceive somewhat difficulty and/or time and effort for customising their mobile phones. Thus, it is evident that users are aware that customisation is not free, however, users have adopted and use customised mobile phone services because of the different customer values they get. This is an important finding for mobile phone operators that have to realise that their services will only be widely adopted only when they are delivering enhanced customer value in exchange for their perceived fee. Therefore, in order to increase the adoption and use of their mobile phone services, mobile operators need to invest first on the development of more customer value added services as well as on the promotion and communication to users of the value of their services. In other words, the proposed models as well as the findings can significantly help mobile operators in the design and development of new mobile phone services. New service development efforts can significantly enhance their effectiveness when customer feedback and perceived values and use of new services are considered and taken into consideration by the designing team. Moreover, respondents did not seem to currently appreciate and be aware of the conditional value of customised mobile services (lowest mean value of 4.3). On the contrary, respondents' adoption and use of customised mobile phone services was found to be mainly motivated by the achievement of social recognition rather than the utility benefits (e.g. functional value and conditional value). In this vein, it might also be the case that mobile companies may also have to "train" and

"educate" users how to best use customised mobile services to make their life more convenient. Currently, a technology high street retailer is promoting its store as a place where customers can be shown and test new mobile phones and services, and this practice is believed to further boost the adoption of customised mobile services.

T-tests and factor analyses were undertaken in order to examine whether different types of users (Table V) perceive different levels of customer values. *T*-tests did not confirm that male perceive different levels of any dimension of customer value than female, although previous studies have shown that women are more emotionally driven than man, while men are more technology savvy and innovation seekers and users (e.g. Sigala, 2004). However, the sample used in this study is a convenient and small sample that cannot be claimed to be representative of the whole population. Hence, further studies should try to test and replicate these findings in larger scale studies. On the other hand, further examination of the levels of customer value that different market segments perceive are critically important for mobile operators. By understanding which customer value dimensions are more important for which market segments, mobile operators can more effectively target and communicate the benefits of customised mobile phone services to more appropriate markets. In other words, customer value-based market segmentation can be used for further enhancing the adoption, use and so revenues from customised mobile phone services. Finally, as cultural background of users may also influence their use and perceived customer values of mobile phones, cross-cultural research is also required in order to further investigate the issue of customer value provided by customised mobile phone services.

Conclusions

Although customisation has become a business necessity, research into mass customisation in services has been scant. This study aimed to fill in this gap by investigating the development of mass customisation strategies in mobile phone services and examining the dimensions of customer value that users of customised mobile phone services perceive. To achieve that, previous studies in mass customisation models and implementation were critically reviewed and then used for further proposing a model for designing mass customised mobile phone services. In developing MC strategies in services, it was shown that a customer value approach should be adopted as MC does not come for free. Customers need to invest on time, efforts and money in order to receive a customised service to fit their needs and preferences. Since, developing MC strategies that can further enhance customer values is vitally important, the paper developed a model for identifying "get" and "give" dimensions of customer value perceived by users of customised mobile phone services. The model was tested by using a convenience sample in Greece, and findings provided several critical practical and theoretical implications.

Overall, findings showed that users of customised mobile phone services perceive both "get" and "give" customer value dimensions. However, it seems that current users are using and have adopted customised mobile phone services solutions mainly due to social, emotional and epistemic values rather than functional values. Such a model for promoting customised mobile phone services is not sustainable and competitive and it cannot guarantee revenues for long-term periods to mobile operators. This is because as soon as customised mobile services would be out of "fashion" and do not deliver aesthetic and social values anymore, users will stop paying and using them. Social and emotional

benefits are in somewhat not controllable benefits from the company (societal variables can easily influence and change them). In the same vein, after using the services for a while users will not perceive services as new anymore and stop using them. In other words, a long term sustainable mass customisation strategy should focus on the continuous upgrade and development of new mobile phone services that can be mass customised and that provide multiple customer value benefits catering for and targeting different market segments and users' profiles. Table II that identifies ICT layers of mobile phones, i.e. the modules and dimensions, that can be further customised provides a very useful framework to mobile operators that want to focus on continuous new service development and design. As previously illustrated Table II can be used for identifying several potential ways of future MC designs. Overall, findings suggest that mobile phone operators should use the customer value based MC framework for enhancing the effectiveness of the following functions: new service development processes; marketing and promotion (value based segmentation); and customers' training on the use of mobile phone services. However, due to the limited size of the ample, it is argued that cross cultural and larger scale research is needed to further test and enhance the proposed models.

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