



# Structural equation modelling of determinants of customer satisfaction of mobile network providers: Case of Kolkata, India

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## KEYWORDS

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**Abstract** The Indian market of mobile network providers is growing rapidly. India is the second largest market of mobile network providers in the world and there is intense competition among existing players. In such a competitive market, customer satisfaction becomes a key issue. The objective of this paper is to develop a customer satisfaction model of mobile network providers in Kolkata. The results indicate that generic requirements (an aggregation of output quality and perceived value), flexibility, and price are the determinants of customer satisfaction. This study offers insights for mobile network providers to understand the determinants of customer satisfaction.

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## Introduction

The telecommunication services market has witnessed considerable growth worldwide during the past two

decades. Telecommunication services are classified into two broad categories – fixed line and mobile communication services. According to [Kenny and Keremane \(2007\)](#), there has been a record increase in landline subscribers all over the world, from 524 million to more than one billion during the period 1990 to 2004. More than 50% of households the world over had a fixed telephone in the year 2003, compared to 49.8% in the year 2002 ([World Bank, 2005a,b](#)). Fixed telephone lines existed for 113 years before the fixed tele-density reached 1 in 10 of the global population, and the same level of penetration was achieved by mobile phones in just 15 years ([Kenny & Keremane, 2007](#); [Kenny, Lanvin, & Lewin, 2003](#)). Mobile phone ownership leapfrogged during the period 1990 to 2004. Mobile phone subscribers

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worldwide numbered 11 million in 1990 and increased to 1.7 billion in 2004, which surpassed the number of fixed subscribers in 2002 (Kenny & Keremane, 2007). The research on mobile phones carried out by Minges and Simkhada (2002) suggested that more than 95% of rural India could have access to a telephone in their villages. India is one of the fastest growing markets of communication networks in the world (DOT Annual Report, 2006–2007).

The telecom reform process started in India with the National Telecom Policy in 1994. The Telecom Regulatory Authority of India (TRAI) was set up in 1997. The National Telecom Policy in 1999 pushed reforms further. The contribution of private network providers has been significant post 1998. The Government of India has opened up the telecom sector and foreign players are allowed to have equity participation up to 74%, considerably higher from the earlier 49% (DOT Annual Report, 2006–2007), a move that will encourage foreign players to operate in India. The Department of Telecommunications (DOT) Annual Report (2006–2007) stated that the National Target Plan was to have a 250 million subscriber base by December 2007. India has crossed the 250 million mark of mobile subscribers in February 2008 (Times of India, Kolkata, 2008). These developments led India to become the world's second largest wireless market and TRAI declared that there were 261.07 million wireless users in India at end-March 2008, which recorded a 58% jump from the previous year (Times of India, Kolkata, 2008). This unprecedented growth of the mobile phone service industry was mainly due to tariff reductions, compared to tariff rates in 1994, making mobile telephony affordable for all groups of customers. The initiatives of TRAI have encouraged healthy competition and, together with maintenance of standards in quality of services at prices affordable to customers, have resulted in the transformation of the telecommunications sector, benefitting Indian consumers who enjoy a wide choice of services with low tariff. This has led to a large number of subscribers in the market which helped in meeting the objectives of the Telecom Policy 1999. The subscriber base was 391.76 million and tele-density rose up to 37% as on 31st March 2009 (TRAI Annual Report, 2008–09). In 2010 the subscriber base reached 584.32 million and tele-density at the end of March 2010 rose to 53% as on 31st March 2010 (TRAI Annual Report, 2009–10).

According to the TRAI Annual Report, 2009–2010, the goals and objectives of the telecom policy were to increase tele-density and access to telecommunication services in India at affordable prices, and to make available telecommunication services which in terms of range, price, and quality are comparable to the best in the world. The telecom policy also aims to provide a fair and transparent environment which promotes a level playing field and facilitates fair competition, establish an interconnection regime that allows fair, transparent, prompt, and equitable interconnection, re-balance tariffs so that the objectives of affordability and operator viability are met in a consistent manner, protect the interest of consumers, and address general consumer concerns relating to availability, pricing, and quality of service provided by the various operators.

Many researchers have conducted studies in this field which, however, mainly focussed on the acceptance and adoption of wireless service (Anckar & D'Incau, 2002; Chae

& Kim, 2001; Malhotra & Segars, 2005; Sarkar & Wells, 2003) but there is little research on the retention behaviour of consumers, a vital factor in the post adoption stage in the highly competitive markets of mobile network providers (Seo, Ranganathan, & Babad, 2008). Seo et al. (2008) suggested that it is more difficult and expensive to acquire new customers than retain existing customers. The cost to attract a new customer can be as much as six times the cost to keep a current customer (Rosenberg & Crepiel, 1984). Edward and Sahadev (2011) suggested that there is a high cost of customer acquisition compared to the lower cost of serving repeat customers. This is one important reason for companies being advised to increase levels of customer retention. Perceived service quality, perceived value, and customer satisfaction have traditionally been associated with customer retention (Bloemer, Ruyter, & Wetzels, 1999; Edward & Sahadev, 2011; Sirdeshmuk, Singh, & Sabol, 2002). Surveys of customers of mobile network providers in the US indicate that the level of satisfaction is much lower for mobile network providers compared to other service sectors (Consumer Report, 2005). It is important to understand drivers of customer satisfaction and loyalty intentions (Braff & Laogue, 2004).

Mobile network providers may investigate satisfaction level of customers as it may affect service adoption and use (Turel & Serenko, 2006). The significance of customer satisfaction, loyalty, and retention are vital determinants of financial performance of the industry (Lin & Wang, 2006). Porter (1985) asserted that in order to achieve superior performance it is important to develop and sustain competitive advantage. Companies have always faced a challenge in knowing how to achieve competitive advantage in an uncertain and swiftly changing environment (Dobni & Luffman, 2000; Javalgi, Whipple, & Ghosh, 2005). In order to maintain competitive advantage, mobile network providers need to adapt to changing customer needs and preferences and offer choices to different segments of customers on a continuous basis, which would exhibit company flexibility to adapt to uncertain environment conditions. Flexibility is defined as an organisation's ability to adapt to substantial and uncertain environmental changes that require the capacity to react quickly and that have a significant impact on performance (Aaker & Mascarenhas, 1984; Verdu-Jover et al., 2004). A study conducted by Ivens (2005) indicated that flexibility of service providers can have a positive impact on customer satisfaction. The current research has taken into account this determinant (flexibility) of customer satisfaction in a high-growth market.

The objective of this paper is to develop a customer satisfaction model of mobile network providers in Kolkata, where the market of mobile network providers is growing at a rapid pace. This is also the first study on determinants of customer satisfaction of mobile network providers in the city of Kolkata, India.

## Characteristics of the Indian mobile telecommunications market

Mobile phones have become an integral part of the daily lives of urban Indians. The growth driver of mobile network providers is urbanization with increasing income of

consumers. Apart from its regular use as a medium of communication, the mobile phone has also become a fashion accessory to the new generation of urban consumers. Now, mobile phones have progressively become a convenient networking tool and have penetrated to all sections of society, including the urban poor and the rich rural class.

Table 1 indicates that the Indian market has been growing at a rapid pace. As the market is in growth stage it has attracted a large number of mobile network providers. Intense rivalry among mobile network providers has led to low tariffs and a wide choice of services becoming available to customers. This has resulted in an increase in usage of mobile phones and customers becoming extremely demanding. Mobile network providers have to understand their customers' exact need, want, attitude, and behaviour intention so that the services they offer are more innovative and customer oriented (Barnes, 2002; Nohria & Leetsma, 2001). As competition intensifies, mobile network providers find it difficult to stay and compete in the market, especially when the market is constrained by policies and regulations of the concerned national government. In such a situation, it is a challenge for the players to create a market differential. A price differential may be created by means of intelligent consumer schemes, although there are risks of such schemes being replicated subsequently by competitors. The usage of advanced mobile services like 3G may cater to the needs of experienced niche customers, depending on the adoption and knowledge of usage of new services. The requirements of relatively experienced users are general packet radio service (GPRS), multimedia messaging service (MMS), voice mail and basic generic services. The needs of the mass market are basic generic services such as conversations, short message service (SMS) and caller identification. In India most of the consumers are prepaid users because of which mobile network providers offer new services and promotional offers on an ongoing basis depending on consumer adoption and knowledge of usage of new services.

In a high growth market like India, according to Annual Reports of TRAI, the top four major mobile network providers (referred to here as Brand 1, Brand 2, Brand 3 and Brand 4) have captured and maintained their market share of more than 64% of the total market during the past six years (2006–2011) (Table 2), despite the fact that the market has grown rapidly during the period. The leading players have been successful by retaining existing customers and acquiring new customers.

**Table 1** Subscribers of mobile network providers (in million).

Period	Number of subscribers	Index
March 2006	90.14	100.00
March 2007	165.11	183.17
March 2008	261.07	289.62
March 2009	391.76	434.61
March 2010	584.32	648.24
March 2011	811.59	900.37

Source: TRAI Annual Reports 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010, 2010–2011.

**Table 2** Market share in percentage of the top four mobile network providers.

Period	Brand 1	Brand 2	Brand 3	Brand 4	Total
March 2006	21.72	17.04	19.21	19.58	77.55
March 2007	22.49	16.01	16.96	18.77	74.23
March 2008	23.74	16.90	17.54	15.62	73.80
March 2009	23.97	17.55	18.55	13.31	73.38
March 2010	21.84	17.29	17.53	11.89	68.55
March 2011	19.99	16.58	16.72	11.32	64.61

Source: TRAI Annual Reports 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010, 2010–2011.

Customer satisfaction becomes important in retaining customers. According to Cronin and Taylor (1992), satisfaction affects purchase intentions of customers. In this scenario, there exists a need to further understand the determinants of customer satisfaction in the context of mobile network providers in a high growth market like India.

## Theoretical background

The market of mobile network providers is growing rapidly resulting in fast changing characteristics of both network services and handset manufacturers. Along with constraints enforced by the regulatory body, this will force players to have a pertinent growth strategy. Estimation of customer satisfaction will pose a real challenge to researchers in such a situation. Research has indicated that service quality has a direct impact on customer satisfaction (Anderson, Fornell, & Lehmann, 1994; Edward & Sahadev, 2011; Fornell, Johnson, Anderson, Cha, & Bryant, 1996; Malhotra & Malhotra, 2013; Negi, 2009; Spreng & Mackoy, 1996), as well as switching intentions (Malhotra & Malhotra, 2013; Zeithaml, Berry, & Parasuraman, 1996), and service loyalty (De Ruyter, Wetzels, & Bloemer, 1998; Malhotra & Malhotra, 2013). Customer retention has been found to be a behavioural consequence of service quality as it produces a direct and immediate impact on the market share of the service provider (Lee, Lee, & Feick, 2001; Steenkamp, 1989). Phillips, Chang, and Buzzell (1983), Buzzell and Gale (1987), and Lee et al. (2001), proposed that service quality be considered a strategic factor for differentiation to increase market share, which would boost profits. According to some researchers, service quality influenced customer retention only through satisfaction (Al-Hawari, Ward, & Newby, 2009; Caruana, 2002; Cronin & Taylor, 1992) and service quality influenced customer satisfaction through perceived value (Turel & Serenko, 2006). Research conducted by Alexander, Dimitriadis, and Markata (2002); Al-Hawari et al., 2009, and Ranaweera and Neely (2003) indicates that there exists a direct effect of service quality on customer retention. The work of the above mentioned researchers indicates that the key element of success in the mobile network industry is service quality.

Customer satisfaction, however, has been hypothesized by many researchers as a consequence of perceived quality of services (Cronin & Taylor, 1992). Hence we may conclude

that service quality is a predictor of customer satisfaction. In this context we may measure service quality in terms of network quality (Lim, Widdows, & Park, 2006) which may be referred to as output quality and functional quality as suggested by Gronroos (1984).

### Customer satisfaction

Satisfaction has been defined as a consumer's post purchase evaluation and affective response to the overall product or service experience (Oliver, 1992). It is the consumer's fulfilment response (Oliver, 1997; Zeithaml, Bitner, Gremler, & Pandit, 2011) resulting from usage of services. In this paper we use this definition of customer satisfaction. Customer satisfaction plays a major role in brand sustainability of any company. For a long term relationship to sustain between a company and its customers, customer satisfaction is an important factor (Anderson & Srinivasan, 2003; Lim et al., 2006). Kim, Park, and Jeong (2004) indicate in their study that satisfaction may be assessed by a customer's rating of the brand, which is based on all the encounters and experiences of the customer with the brand. Studies suggest that sometimes satisfaction is a function of all previous transaction-specific satisfaction (Johnson, Anderson, & Fornell, 1995; Shin & Kim, 2008). Eggert and Ulaga (2002) and Lin and Wang (2006) suggest that satisfaction is also a strong predictor for behavioural variables such as intentions of repurchase, recommendations, and loyalty. According to Wang, Tang, and Tang (2001) satisfaction is a reliable predictor of repurchase intentions. Lin and Wang (2006) and Javalgi et al. (2005) suggest that satisfaction is significantly influenced by a customer's evaluation of service features. Studies conducted by Zeithaml and Bitner (2003) and the work of Javalgi et al. (2005) indicate that satisfaction is influenced by customers' perceptions of equity and their emotional responses and the perceptions of customers may include price and value comparisons as well as equity assessments among other customers. Oliver (1980) suggests that the antecedents of customer satisfaction include expectations and disconfirmations, and the consequences of customer satisfaction include positive influences on post purchase attitude and intentions, as supported by Javalgi et al., 2005.

We have considered (1) overall satisfaction with the mobile network provider, (2) the provider always meets the customers' needs and the customer is happy with the network provider, and (3) the customer feels good using the services of the mobile network provider – as items for conceptualizing satisfaction (Anderson & Srinivasan, 2003; Cronin & Taylor, 1992; Kim et al., 2004; Oliver, 1997; Shin & Kim, 2008; Turel & Serenko, 2006) as mentioned in the Appendix. However the above mentioned items became dominant indicators in our study as explained in Table 3 and Table 4.

### Service quality

The concept of service quality in the service sector is an abstract and elusive construct as it has three features unique to services – intangibility, heterogeneity, and

**Table 3** Final measurement of variables.

Variables	Measurement items
GR1	Ability to connect to other networks smoothly
GR2	Good quality of voice
GR3	Good service for a reasonable price
GR4	Meets both high quality and low price requirements
GR5	Satisfy the needs for a reasonable price
FQ1	Courtesy, proactive service calls
FQ2	Good quality of customer services
FQ3	Accurate billing details
FQ4	Timely bills for post paid connections
PR1	Tariff rates offered by network providers
PR2	Overall billing costs
PR3	Cost of calls to other networks
FL1	Ample choice of consumer promotion schemes
FL2	Latest services like multimedia services (MMS), mobile internet services, 3G
SAT 1	Overall satisfaction with the mobile network provider
SAT2	The provider always meets my needs and I am happy with my provider
SAT3	Feel good using my mobile network provider

GR: generic requirement; FQ: functional quality; PR: price; FL: flexibility; SAT: satisfaction.

inseparability of production and consumption (Parasuraman, Zeithaml, & Berry, 1985), and hence it is difficult to measure service quality objectively (Zhao, Bai, & Hui, 2002). As services are intangible (Bateson, 1977; Berry, 1980; Lovelock, 1981; Shostak, 1977), it is important to understand how consumers perceive services from their providers and evaluate service quality (Zeithaml, 1981). Services are heterogeneous as the performance varies from producer to producer, from customer to customer and from day to day (Parasuraman et al., 1985). It is difficult to assure uniform quality due to inconsistency of behaviour from service personnel (Booms & Bitner, 1981) as what the firm intends to deliver may be different from what the consumer actually receives (Parasuraman et al., 1985). Production and consumption of many services are inseparable (Carman & Langeard, 1980; Gronroos, 1978; Parasuraman et al., 1985; Regan, 1963; Upah, 1980). Thus to explore determinants of customer satisfaction, it is essential to estimate perceived quality of a service by using a suitable scale.

The SERVQUAL scale (Parasuraman, Zeithaml, & Berry, 1988) measured five dimensions of service quality, viz. tangibles, reliability, responsiveness, assurance, and empathy. The SERVQUAL scale (Parasuraman et al., 1988) was used by many researchers for various types of services such as hospitals, departmental stores, the software industry, banking etc (Carman, 1990; Finn & Lamb, 1991; Pitt, Oosthuizen, & Morris, 1992). The measurement instrument SERVQUAL developed by Parasuraman et al. (1988) was later modified by Cronin and Taylor (1992) with the help of an augmented instrument called SERVPERF. They emphasized the performance only index (SERVPERF) instead of the

**Table 4** Results of the measurement model.

Measurement items	Standardized estimates	<i>p</i> value	AVE	CR
Construct 1				
GR1	0.738	*	0.52	0.84
GR2	0.746	*		
GR3	0.683	*		
GR4	0.698	*		
GR5	0.727	*		
Construct 2				
FQ1	0.584	*	0.56	0.83
FQ2	0.878	*		
FQ3	0.659	*		
FQ4	0.842	*		
Construct 3				
PR1	0.809	*	0.65	0.85
PR2	0.857	*		
PR3	0.743	*		
Construct 4				
FL1	0.827	*	0.66	0.79
FL2	0.789	*		
Construct 5				
SAT 1	0.703	*	0.58	0.81
SAT 2	0.812	*		
SAT 3	0.768	*		

Note: The factor loadings are significant at  $*p < 0.001$ .  
 GR: generic requirement; FQ: functional quality; PR: price; FL: flexibility; SAT: satisfaction; CR: composite reliability; AVE: average variance extracted.

gap based SERVQUAL scale (Lai, Hutchinson, Li, & Bai, 2007). Their research also provided empirical support for service quality leading to customer satisfaction. The same five constructs were considered as determinants of service quality in both the instruments. Studies conducted by Cronin and Taylor (1992, 1994) have investigated the conceptualization and measurement of service quality and suggested relationships between service quality, consumer satisfaction, and purchase intentions. Later research conducted by Donthu and Yoo (1998) indicated that culture was also an important factor in this context. According to Mattila (1999) and Lai et al. (2007) customers with Western cultural background might rely more on tangible cues when compared to customers with an Asian background.

Gronroos (1984) suggested that there are two aspects to service – technical quality and functional quality. Technical quality, also referred to as output quality, involves what the customer gets as an outcome of an interaction with a service provider. This was later referred to as core service quality or product service related offering (Lim et al., 2006; McDougall & Levesque, 2000). Functional quality deals with how the service is delivered (Gronroos, 1984; Lim et al., 2006). In our study items were identified based on a literature review and we have used the definition of quality as suggested by Gronroos (1984) to measure the construct. In the context of mobile network providers, Gerpott, Rams, and Schindler (2001) considered customer satisfaction as an important goal for telecommunication network operators in the German market, with perceived

network quality and assessment of customer care as determinants of customer satisfaction. In this context network quality refers to the quality of indoor and outdoor coverage and the clarity of voice reproduction without any connection break downs. Customer care refers to the quality of the exchange of information between the customer and the mobile network provider in response to customer enquiries and in the course of interactive activities initiated by the mobile network provider. The study indicated that perceived network quality was found to be a significant determinant of the overall satisfaction of customers. Overall satisfaction refers to the customers' rating of the brand, based on all encounters and experiences (Kim et al., 2004; Shin & Kim, 2008). The study could not establish a significant relationship between customer satisfaction and perceived quality of customer care.

A study conducted by Lee et al. (2001) in France indicated that core services which included coverage of the calling area, clarity of sound, and precision of billing service were determinants of customer satisfaction. Research conducted by Kim et al. (2004) in South Korea indicated that call quality and customer support were determinants of customer satisfaction. Call quality refers to call clarity and coverage of services. Customer support refers to the variety of customer support systems, speed of complaint processing, ease of reporting complaint, and friendliness when the customer reported a complaint. Wang and Lo (2002) study on the telecommunications industry in China took into consideration service quality, customer satisfaction, and behavioural intentions. They considered the same constructs adopted by Cronin and Taylor (1992) to measure service quality. Their study indicated that tangibles, reliability, and assurance were determinants of customer satisfaction.

Turel and Serenko (2006) study on customer satisfaction of mobile network providers in Canada indicated that perceived quality is a determinant of customer satisfaction. Lim et al.'s (2006) study conducted in the US indicated a direct relationship between consumers' quality perceptions and satisfaction, and that none of the functional service attributes was statistically significant. Santouridis and Trivellas (2010) conducted a study in Greece to study the relationship between service quality and customer satisfaction. They found that customer service and billing system were positively significantly associated with satisfaction.

In our study, based on the literature review, we have considered ability to connect to other networks smoothly, good quality of voice, courtesy, proactive service calls, good quality of customer services, accurate billing details, and timely bills for post paid connection as items for conceptualizing the concept of service quality (Cronin & Taylor, 1992; Gerpott et al., 2001; Kim et al., 2004; Lee et al., 2001; Lim et al., 2006), which is a determinant of customer satisfaction as considered by researchers. However the above mentioned items became dominant indicators in our study as explained in Tables 3 and 4. Our suggested proposition in the context of the study is – Service quality is a determinant of customer satisfaction.

### Perceived value

Customer perception of value may be composed of (1) low price, (2) whatever the customer wants in the product, (3)

the quality the customer gets for the price the customer pays, and (4) what the customer gets for what the customer pays, and perceived value means customers' overall assessment of the utility of a product based on perceptions of what the customer receives and what is given by the customer (Lai, 2004; Zeithaml, 1988). In this paper we use the definition of customer perception of value as suggested by Zeithaml (1988). A study conducted by Fornell et al. (1996) indicated that perceived value is positively related to customer satisfaction. Research by Caruana, Money, and Berthon (2000), De Ruyter, Bloemer, and Peeters (1997), Howard and Sheth (1969), Kotler and Levy (1969), and Rust and Oliver (1994) also corroborates that customer satisfaction depends on perceived value. Value was defined as a ratio between what the customer gets and what he/she gives (Kotler, 2000). A study conducted by Bolton and Drew (1991) indicates that perceived value is a "richer measure of customers' overall evaluation of a service than perceived service quality", and this is seconded by Lin and Wang (2006). Ravald and Gronroos (1996) suggested that the value of an offering as perceived by customers is different based on their personal values, needs, preferences, and financial resources. Pura (2005) and Anckar and D'Incau (2002) suggested that the value perception may also differ according to the usage situation. Customer satisfaction is the result of a customer's perception of the value received (Athanasopoulos, 2000; Fornell et al., 1996). The multiple dimensions of perceived value include quality, economic, emotional and social value (Lim et al., 2006; Sweeney & Soutar, 2001). According to Lim et al. (2006) economic value is related to perceived economic benefits received in comparison to the monetary cost of the service. In the context of mobile network providers, Turel and Serenko (2006) study in Canada indicates that perceived value is a determinant of customer satisfaction. Lim et al.'s (2006) study in the US to identify the drivers of customer satisfaction of mobile network providers indicated that perceived economic value increases with the positive perception of pricing plans and data services (which consists of messaging services, entertainment services and locator services), but the relationship between network quality and perceived economic value was not statistically significant. Their research indicated that perceived quality of data services is a significant predictor of perceived emotional value. The study also indicated that there is a negative relationship between customer service quality and perceived emotional value. Their research suggests that the satisfaction level of the customer increases with improved economic and emotional value.

In our study items for conceptualizing the concept of perceived value were identified based on the literature review. We have considered (1) good service for a reasonable price, (2) meets both high quality and low price requirements, and (3) satisfy the needs of customers for a reasonable price, as items for conceptualizing the concept of perceived value (Sweeney & Soutar, 2001; Zeithaml, 1988) which is a determinant of customer satisfaction as considered by researchers. However the above mentioned items became dominant indicators in our study as explained in Tables 3 and 4. Our suggested proposition in the context of the study is – Perceived value is a determinant of customer satisfaction.

## Flexibility

It is important for service providers to adopt market orientation. Market orientation consists of three behavioural components – customer orientation, competitor orientation, and inter-functional coordination, and two decision criteria – long term focus, and profitability (Narver & Slater, 1990). Jaworski and Kohli (1993) defined market orientation as "the organization wide generation of market intelligence pertaining to current and future needs of the customers, dissemination of intelligence horizontally and vertically within the organization, and organization wide action or responsiveness to it". Market orientation is valuable as it drives the organization to collect information on a continuous basis about the target customer's needs and competitors' capabilities, and companies can use this information to create superior value (Javalgi et al., 2005; Slater & Narver, 1995). In our study we consider market orientation according to Narver and Slater (1990), as an enabler of the construct flexibility.

Johnson, Pui-Wan Lee, Saini, and Grohmann (2003) defined market focussed strategic flexibility as "the firm's intent and capabilities to generate firm specific real options for the configuration and reconfiguration of appreciably superior customer value propositions". They also suggested that if a service company's objective is to create a superior value proposition for its customers, this may lead to competitive advantage, and an advanced conceptualization of strategic flexibility should incorporate a market focussed perspective and directly consider a company's options with regard to services and markets (Javalgi et al., 2005). According to Johnson et al. (2003), without market focus any strategic, tactical, or operational flexibility will not help the provider create superior value and competitive advantage.

According to Stevenson and Spring (2007), strategic flexibilities consist of new design, expansion, and market. According to them, new design refers to speed and cost effectiveness at which the firm can design and introduce new products into the system, expansion refers to the ease with which the company can add long term capacity to the system, and market refers to in-house ability to adapt to changes in the market environment.

Rowe and Wright (1997) defined flexibility as an organization's ability to change its policies, practices, or procedures easily and quickly in order to adapt to different and changing environment demands, which was echoed by Verdu-Jover, Montes, and Morales (2004). In this paper we use the definition of flexibility as suggested by Rowe and Wright (1997). According to Ivens (2005) flexibility of service providers can have a positive impact on customer satisfaction. Flexibility of network providers is the differentiator in the US market (Malhotra & Malhotra, 2013). It is important for mobile network providers to study flexibility of providers as it may help them satisfy the needs of their customers. In the context of mobile network providers, changing or upgrading service plan easily was considered as illustrative of flexibility of service providers (Malhotra & Malhotra, 2013). Their study indicated that flexibility of service determines perception of mobile network providers' service quality – the more flexibility the service

provider can build into the service, the better is the perceived service quality. The Indian telecommunication market has witnessed a steady growth and the customers of mobile network providers are provided with a wide range of choices (Edward & Sahadev, 2011). Malhotra and Malhotra (2013) suggested that mobile network providers, in order to combat new entrants, entice their customers into contracts by offering incentives. Based on the work of above mentioned researchers we have included in our study a network provider's flexibility as a determinant of customer satisfaction.

An earlier study conducted by Kim et al. (2004) indicates that value added services is a determinant of customer satisfaction; value added services refers to the variety and convenience of use of value added services, and whether they are up to date. The study highlights the continuing growth of the importance of value added services, which includes mobile internet, multimedia services and location based services. Santouridis and Trivellas (2010) have also considered value added services as a determinant of customer satisfaction.

Flexibility could be offered to customers of mobile network providers in many ways – a wide choice of products or services, choice of flexible promotional schemes, and introduction of the latest services, which may lead to customer satisfaction. This would enable mobile network providers to deliver superior value consistently to their customers leading to competitive advantage (Slater & Narver, 2000). If this strategic flexibility is market focussed, it may lead to wider choice for customers which may satisfy the needs of customers and it may in turn lead to higher customer satisfaction. Greater the mobile network provider's flexibility, the possibility is that it may lead to greater customer satisfaction. In our study items were identified based on the literature review. We have considered (1) ample choice of consumer promotion schemes (Malhotra & Malhotra, 2013) and (2) latest services such as multimedia messaging services (MMS), mobile internet services, 3G (Kim et al., 2004) as items for conceptualizing the concept of flexibility which is a determinant of customer satisfaction as considered by researchers. However the above mentioned items became dominant indicators in our study as explained in Tables 3 and 4. Our suggested proposition in the context of the study is – Flexibility is a determinant of customer satisfaction.

## Price

According to Zeithaml (1988), Fornell (1992), Anderson and Sullivan (1993), Anderson et al. (1994), and Cronin, Brady, and Hult (2000), price is an important factor for consumer satisfaction, usually taken into consideration when consumers evaluate the value of an acquired product or service. Studies show that there is a relationship of price to satisfaction, and the extent of satisfaction was subject to the factors of service quality, price, situation and personal factors (Consuegra, Morlena, & Esteban, 2007; Zeithaml & Bitner, 1996).

Bolton, Warlop, and Alba (2003) have defined fairness as a judgment of whether an outcome and/or the process to reach an outcome is reasonable, acceptable, or just.

According to Consuegra et al. (2007) the cognitive aspect of this concept indicates that price fairness judgments involve a comparison of the price of procedure with a relevant standard, reference, or norm. We have borrowed the definition of Consuegra et al. (2007) for the construct price.

It is observed by researchers that price plays an important role in affecting diffusion of new products and services and thus it is difficult to estimate the effective price (Foxall, 1984; Munnukka, 2005). Understanding a potential customer's perceptions and characteristics may help companies make more accurate pricing decisions for new products and services (Munnukka, 2005). This is equally applicable to mobile network providers in a competitive market.

In the context of mobile network providers, Gerpott et al.'s (2001) study conducted in Germany indicated that the assessment of mobile prices was found to be a significant determinant of the overall satisfaction of customers. Kim et al. (2004) took into consideration pricing structure which refers to reasonability of price and variety of price schedules and a possibility of freely choosing price schedules. It was found that pricing structure did not contribute to customer satisfaction. According to Santouridis and Trivellas (2010), pricing structure was positively significantly associated with satisfaction.

In our study items were identified based on the literature review. We have considered tariff rates offered by network providers, overall billing costs, and cost of calls to other networks as items for conceptualizing the concept of price (Gerpott et al., 2001; Kim et al., 2004; Lim et al., 2006) which is a determinant of customer satisfaction as considered by researchers. However the above mentioned items became dominant indicators in our study as explained in Tables 3 and 4. Our suggested proposition in the context of the study is – Price is a determinant of customer satisfaction.

## Objective of the study

The main objective of this paper is to develop a customer satisfaction model of mobile network providers in the city of Kolkata, India.

The literature review clearly illustrates that a body of research exists on the determinants of customer satisfaction. We make an attempt with the help of exploratory factor analysis, to conceptualize the constructs with respect to the measurement variables as mentioned in the literature review, and later confirm the constructs with the help of confirmatory factor analysis testing how well the measured variables represent the constructs as suggested by Hair, Anderson, Tatham, Babin, and Black (2007). With the help of a structural equation model the study will reflect the cause and effect relationships between the latent constructs (Gerpott et al., 2001) and will help us to test the propositions. We put forward the below propositions based on the constructs as mentioned in the literature review which will help us to conceptualize a customer satisfaction model.

P1: Service quality is a determinant of customer satisfaction.

P2: Perceived value is a determinant of customer satisfaction.

P3: Price is a determinant of customer satisfaction.

P4: Flexibility is a determinant of customer satisfaction.

We make an attempt to explore whether the above mentioned propositions hold good with respect to mobile network providers in Kolkata, a metropolitan city in India.

We consider in our proposed model output quality, functional quality, perceived value, price, and flexibility as determinants of customer satisfaction.

## Methodology

### Sample, data collection, and questionnaire development

The sampling frame considered for the purpose of the study was the telephone directory of Kolkata, where telephone numbers of all the fixed line phones are recorded in alphabetical order. The sampling procedure used for the purpose was simple random sampling and we chose 2500 persons from the directory by using a random number table. We contacted all these people over phone and it was ascertained whether any member of the family was using a mobile phone. In the course of the experiment, we could obtain responses from 1883 contacts but only 1347 were found to possess mobile phones for considerable amount of time. In these 1347 families, where mostly multiple mobile phones were available, a person in the family was picked at random for the interview using a questionnaire. Nine hundred and eighty two respondents agreed to take part in the interview. Finally 748 respondents were able to fill the questionnaire through telephone survey. Out of these, 554 respondents qualified for analysis after a thorough scrutiny and this was the size of the sample. The data were collected from students, service personnel, businessmen, professionals, unemployed and retired persons.

In a market like Kolkata, customers of mobile network providers tend to be extremely heterogeneous in terms of tastes and preferences. In Kolkata, it was observed from a data sample that approximately 80% of users used prepaid connections. They frequently recharged validation time and talk time through attractive offers provided by the mobile network providers. Most of the customers purchased such services from multi-brand outlets and hence could not differentiate among brands in terms of what Cronin and Taylor (1992) termed as cues of tangibles and empathy. Mattila (1999) suggested that customers with a Western cultural background might rely on tangible cues when compared to customers with an Asian background. We take this argument into consideration for Kolkata, a metropolitan city in India and do not consider tangible cues in our study. However, a few measurements of other constructs adopted by Cronin and Taylor (1992) viz. reliability, responsiveness and assurance as mentioned in the literature review section were also included in the scale.

The concepts of price, flexibility, functional quality, output quality, and perceived value were found to be important in measuring independent variables for the study.

## Measures

A scale comprising 30 items was considered in the study (refer Appendix for details of items). We have developed the survey instrument based on the review of literature. The items included in the study have been adapted from existing literature and these items measure constructs such as output quality, functional quality, perceived value, price, flexibility and satisfaction and hence were considered in our study. We have referred to studies conducted by Zeithaml (1988), Cronin and Taylor (1992), Oliver (1997), Gerpott et al. (2001), Lee et al. (2001), Sweeney and Soutar (2001), Anderson and Srinivasan (2003), Kim et al. (2004), Turel and Serenko (2006), Lim et al. (2006), Zeithaml et al. (2011), and Malhotra and Malhotra (2013) for our scale development and adapted them to our research context.

Hair et al. (2007) suggested pretesting of the scale as the scale may be applied in a specific context. In our case the context is that of customers of mobile network providers. Hair et al. (2007) also suggested that the pretest should use respondents who are similar to the sample population as this may screen items for appropriateness. We conducted a pretest before the actual study using face to face interview on a representative set of 25 respondents. We obtained feedback from the respondents relevant to question ambiguity and ease of response to the questions used. In the review process, 10 items were eliminated owing to ambiguity and lack of proper interpretation, leaving only 20 items for the final scale. The 20 items used in the study were measured in terms of performance rating for the existing brands on a 7 point Likert scale ranging from 1: Strongly disagree to 7: Strongly agree as used by Cronin and Taylor (1992).

We split the sample into two, each of size 277. The first sample of size 277 was used for exploratory factor analysis in order to understand the underlying constructs and the second sample of size 277 was used to confirm the factor structure. Exploratory factor analysis helps the researcher to explore the data and provides information pertinent to factors needed to best represent the data, and all measured variables are related to pertinent factors by a factor loading estimate (Hair et al., 2007). In the case of confirmatory factor analysis the researcher specifies the number of factors that exist within a set of variables, which factor each variable will load highly on before the results are computed, and the confirmatory factor analysis statistics tell us how well the specification of the factors matches the actual data (Hair et al., 2007). Structural equation modelling (SEM) using AMOS 16.0 was used to perform the confirmatory factor analysis.

## Results and discussion

The analysis of the respondents' demographic information reveals that 70% of the respondents were male. Approximately 46% reported an age of 21–30 years, 27% were aged between 31 and 40 years, 14% were aged between 41 and 50 years, 11% were aged between 51 and 60 years, and the rest above 60 years. The occupation of the respondents was as follows: approximately 28% in service, 16% in business, 11%



were professionals, 39% were students and the rest were not employed or were retired individuals. Approximately 40% of the respondents had a monthly income of less than Rs. 3001, 6% in the range Rs. 3001–Rs. 5000, 7% in the range Rs. 5001–Rs. 10,000, 20% in the range Rs. 10,001–Rs. 20,000 and the rest above Rs. 20,000.

With the help of the propositions as stated in the literature review and before making a measurement model, we explored the determinants of customer satisfaction. In the light of this an exploratory factor analysis was carried out on the items taking into account 20 items with principal axis factoring and it was found that 3 items had communalities less than 0.45. These items were deleted from the scale as these variables were poorly accounted by the factor solution. The final scale containing 17 items (Table 3) were all subjected to exploratory factor analysis with principal axis factoring and Varimax rotation. The factor loadings of each item ranged from 0.61 to 0.80 all exceeding the minimum loading criterion of 0.40 (Nunnally & Bernstein, 1994). The internal reliabilities of each construct ranged between 0.67 and 0.88 and it was more than the minimum criteria of 0.60 (Bagozzi & Yi, 1988; Hair et al., 2007). The exploratory factor analysis produced a five factor solution pertinent to the research conducted by us. The items reduced to five factors which were interpreted as generic requirements (an aggregation of output quality and perceived value), price, functional quality, flexibility and satisfaction.

The five constructs along with a working definition are as follows:

- Generic requirements of customers of mobile network providers refers to output quality as suggested by Gronroos (1984), and value as suggested by Zeithaml (1988) in order to satisfy the needs of customers of mobile network providers.
- Functional quality consists of variables which are pertinent to service delivery for satisfying needs of customers of mobile network providers.
- Price consists of variables which consumers of mobile network providers consider important for assessment of price in order to satisfy their needs.
- Flexibility: Introduction of new services and flexible promotional schemes by the mobile network provider are considered important for satisfying the needs of customers of mobile network providers.
- Satisfaction is the consumer's fulfilment response (Oliver, 1997; Zeithaml et al., 2011) resulting from usage of services provided by a mobile network provider.

The generic requirement factor consists of smooth connectivity to other networks of other providers, good voice quality, good service for a reasonable price, meet both high quality and low price requirements of customers, satisfy needs of customers for a reasonable price. The functional quality factor consists of courtesy, proactive service calls at regular interval of time by mobile network providers, provide good quality of customer service, provide accurate billing details to customers, and always send timely bills for postpaid connections. The price factor consists of mobile network providers offering different tariff rates, overall

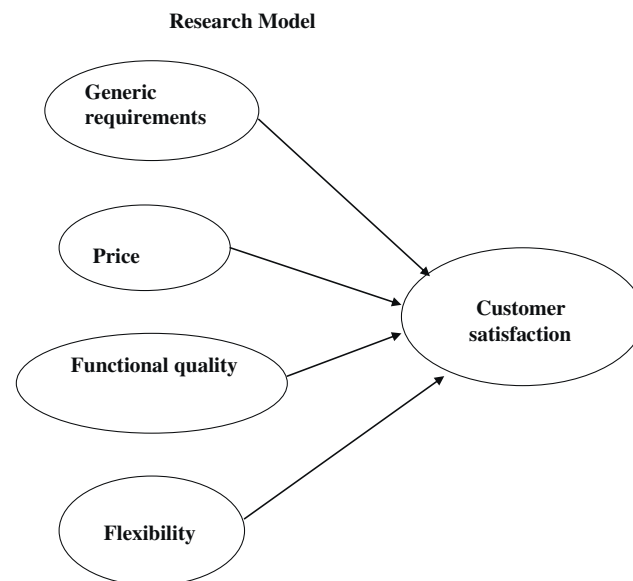
billing cost to be paid by customers, and cost of calls to other networks of other mobile network providers. The flexibility factor consists of mobile network providers offering ample choice of promotional schemes, and offering the latest value added services. The satisfaction factor consists of overall satisfaction with the mobile network provider, the provider always meets the needs of the customer and the customer is happy, and the customer feels good using the services of mobile network provider (see Table 3).

## Research model and hypotheses

Based on the exploratory factor analysis and the literature review, we propose our final research model (Fig. 1) and hypotheses to depict determinants of customer satisfaction of mobile network providers in Kolkata. The study suggests that generic requirements (an aggregation of output quality and perceived value), price, functional quality and flexibility are determinants of customer satisfaction which we have obtained from exploratory factor analysis.

## Measurement model reliability and validity

The quality of the measurement model can be tested via confirmatory factor analysis (Teo, 2011). According to Hair et al. (2007) confirmatory factor analysis enables us to test



**Figure 1** Customer satisfaction model of mobile network providers in Kolkata.

- H<sub>1</sub>: Generic requirements will have a positive influence on customer satisfaction.  
 H<sub>2</sub>: Price will have a positive influence on customer satisfaction.  
 H<sub>3</sub>: Functional quality will have a positive influence on customer satisfaction.  
 H<sub>4</sub>: Flexibility will have a positive influence on customer satisfaction

how well the measured variables represent the constructs or to test our measurement theory. A measurement model which describes the indicator variables-based latent constructs is used by the researcher in the development of the cause and effect hypotheses (Gerpott et al., 2001). A confirmatory factor analysis using Amos 16.0 was conducted to test the measurement model. We identified five factors with the help of exploratory factor analysis, and subsequently confirmed the factors on a sample size of 277 respondents. The demographic characteristics of both the samples used in the exploratory and confirmatory factor analysis had similar characteristics. The parameters in the model were estimated, the algorithm of maximum likelihood estimation was used as it has been shown to be robust from normality assumptions (Bollen, 1989; Byrne, 2000; Lai et al., 2007). We had to test the convergent validity and discriminant validity of the constructs used in our study. A structural equation model reflects the cause and effect relationships between the latent constructs (Gerpott et al., 2001). We have used structural equation modelling to test the relationship between generic requirements and customer satisfaction, the relationship between functional quality and customer satisfaction, the relationship between price and customer satisfaction and the relationship between flexibility and customer satisfaction. The convergent validity was established by testing the significance of individual item loading (Teo, 2011). According to Hair et al. (2007) root mean square error of approximation (RMSEA) values ranging from 0.05 to 0.08 are deemed acceptable, goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), normed fit index (NFI) and comparative fit index (CFI), each has to exceed a threshold value of 0.9 if a model is to fit the data well. A ratio of  $\chi^2$  model-fit statistics by degrees of freedom should not exceed 2.5 (Gerpott et al., 2001; Homburg & Baumgartner, 1995).

The measurement model indicated an acceptable model fit for the data collected. Pertinent details of fit indices for measurement model are given below:

$\chi^2 = 197.38$ ,  $df = 109$ ,  $\chi^2/df = 1.81 < 2.5$ , goodness of fit index (GFI) = 0.94, adjusted goodness of fit index (AGFI) = 0.92, normed fit index (NFI) = 0.93, comparative fit index (CFI) = 0.94, and root mean square error of approximation (RMSEA) = 0.063. The model indicates that the items are reliable indicators of the constructs. According to Teo (2011) the adequacy of the measurement model indicates that the items are reliable indicators of the hypothesized constructs which allow tests of the structural relationships in the model.

According to Malhotra and Dash (2011), composite reliability is the total amount of true score variance in relation to the total score variance. Composite reliability of 0.7 or higher is considered good (Malhotra & Dash, 2011; Nunnally & Bernstein, 1994). In our case the values of composite reliability were higher than 0.70. According to Teo (2011), convergent validity examines whether the respect indicators are measuring the constructs. Hair et al., (2007) suggested that high loadings on a factor would indicate that they converge on some point. According to them all factor loadings should be statistically significant and standardized loadings estimates should be 0.5 or higher and ideally 0.7 or higher. The convergent validity for each construct in our study was examined by the values of composite reliability and average variance extracted (AVE) as suggested by Lim et al. (2006). The indicators have captured an acceptable amount of variance ( $>0.50$ ) as suggested by Fornell and Larcker (1981). The AVE for each construct was greater than 0.50. The indicators had significant factor loadings onto their respective constructs with values varying between 0.584 and 0.878 and  $p < 0.05$  (Table 4), which supports the construct validity of the construct. According to Fornell and Larcker (1981), the discriminant validity can be assessed by comparing the AVE with the corresponding inter construct squared correlation estimates. From Table 5 it can be inferred that the square root of the AVE values of all the constructs are greater than the inter construct correlations. This indicates the discriminant validity of the constructs. So we may conclude that the measurement model demonstrates good construct validity.

### Structural model

We have used structural equation modelling to test the hypotheses H1 to H4. The structural model is shown in Fig. 2 which indicates the determinants of customer satisfaction of mobile network providers.

Results indicate an adequate model fit with the data ( $\chi^2 = 199.16$ ,  $df = 112$ ,  $p < 0.001$ ) goodness of fit index (GFI) = 0.93, adjusted goodness of fit index (AGFI) = 0.92, normed fit index (NFI) = 0.94, comparative fit index (CFI) = 0.96 and root mean square error of approximation (RMSEA) = 0.057. Results of hypotheses testing are shown in Table 6.

The test of the structural model indicated that generic requirements ( $c = 0.68$ ,  $p < 0.01$ ), flexibility ( $c = 0.62$ ,  $p < 0.01$ ), price ( $c = 0.44$ ,  $p < 0.05$ ) were significant determinants of customer satisfaction. Functional quality

**Table 5** Discriminant validity.

	Generic requirements	Functional quality	Price	Flexibility	Satisfaction
Generic requirements	0.72				
Functional quality	0.53	0.75			
Price	0.48	0.46	0.81		
Flexibility	0.42	0.62	0.58	0.81	
Satisfaction	0.61	0.56	0.49	0.63	0.76

Note: The diagonal elements are the square root of average variance extracted values; and the other elements are correlations between constructs with  $p < 0.01$ .

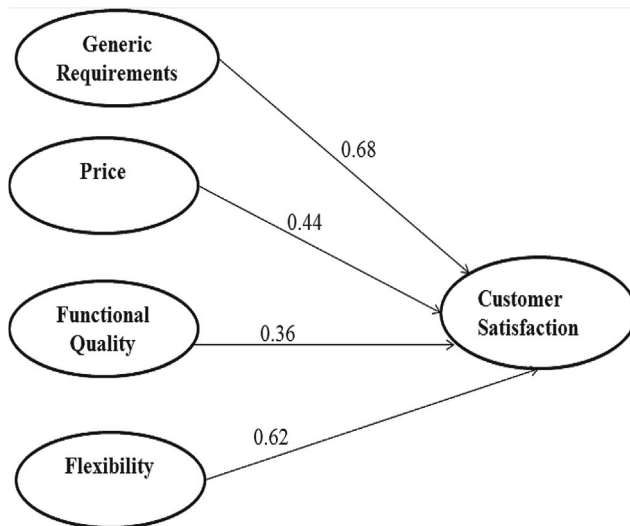


Figure 2 Results of the structural model.

( $c = 0.36$ ,  $p > 0.05$ ) was not a statistically significant determinant of customer satisfaction.

The structural model suggests that generic requirements will have a positive influence on customer satisfaction. Generic requirements consists of output quality as per Gronroos (1984), and value as per Zeithaml (1988), and is the most important driver of customer satisfaction, as the regression weight is 0.68. All network providers have to ensure that they satisfy the needs of customers in terms of generic requirements. Generic requirements will act as points of parity as stated by Kotler, Keller, Koshy, and Jha (2009). Flexibility will have a positive influence on customer satisfaction and is the second most significant determinant of customer satisfaction in a growing market, as the regression weight is 0.62. Price will have a positive influence on customer satisfaction and is the third most significant determinant of customer satisfaction, as the regression weight is 0.44. Despite the insignificant association of the construct functional quality (Gronroos, 1984) and customer satisfaction, there was a positive relationship. Our study was consistent with the work of Gerpott et al. (2001) in Germany in terms of determinants of customer satisfaction such as perceived network quality and the assessment of mobile prices. Our study was consistent with respect to the work of Lee et al. (2001), who explored determinants of customer satisfaction of mobile network providers in France. The determinants of customer satisfaction in our study were consistent with respect to core services which included coverage of the calling area, clarity of sound, and pricing as stated by Lee

et al. (2001). Kim et al.'s (2004) study in the South Korean market indicated that call quality and customer support led to customer satisfaction. The pricing structure and convenience in procedures did not contribute to customer satisfaction whereas in our study generic requirements (an aggregation of output quality and perceived value), price, and flexibility are the determinants of customer satisfaction. The result of our study is consistent with Turel and Serenko (2006) study on customer satisfaction of mobile network providers in Canada with respect to the perceived value and quality being determinants of customer satisfaction. Our study also supports the work of Santouridis and Trivellas (2010) in Greece, which indicated that pricing structure and customer service are determinants of customer satisfaction. The construct flexibility is a unique determinant of customer satisfaction in our study. Customers in different segments are different in terms of affordability, and adoption and usage of value added services; hence flexibility becomes an important determinant of customer satisfaction. In a growing market the determinant generic requirements (an aggregation of output quality and perceived value) is a single determinant of customer satisfaction and may be considered as a necessary factor because customers are extremely demanding and multiple network providers are trying to satisfy them, where as in a mature market of mobile network providers perceived value and quality may be considered as two separate determinants of customer satisfaction.

### Managerial implications

The independent variables which we have considered in our study are generic requirements, functional quality (Gronroos, 1984), price, and flexibility, and the dependent variable is customer satisfaction. Generic requirements are the most significant determinant of customer satisfaction. Mobile network providers may offer good quality of voice, ability to connect to other networks, reasonable price and good service so that it meets both high quality and low price requirements of consumers in order to retain and satisfy their existing customers. The construct flexibility is the second most significant determinant of customer satisfaction, and hence mobile network providers may offer wide choice of promotion schemes for customers in different segments depending on affordability, adoption and usage of value added services, which may help them retain customers. The third significant determinant of customer satisfaction is price. Customers of mobile network providers compare tariff rates offered by different network providers, they take into consideration overall

Table 6 Results of hypotheses testing.

Hypotheses	Path	Standardized path coefficient	p Value	Results
H1	Generic requirements → satisfaction	0.68	0.006	Accepted
H2	Price → satisfaction	0.44	0.024	Accepted
H3	Functional quality → satisfaction	0.36	0.671	Rejected
H4	Flexibility → satisfaction	0.62	0.008	Accepted

billing costs incurred by them for using different services, and cost of calls to other networks. Hence mobile network providers must understand affordability of different groups of customers with different demographic profiles and offer a fair price for their services to different groups of customers which may help them retain their customers and attract new ones.

Mobile network providers may formulate their strategy based on the above determinants of customer satisfaction. It is suggested that network providers differentiate their offerings in terms of perceived value which may help them to retain their market share.

In our study the final determinant functional quality was found not to be a significant determinant of customer satisfaction and does not support the work of other researchers. A majority of the customers in a market like Kolkata use prepaid services (approximately 80% of the sample) and visit outlets which are multi brand; they may not be concerned with postpaid billing and they cannot differentiate brands in terms of tangibles and empathy. This may lead to functional quality (Gronroos, 1984) not being a significant determinant of customer satisfaction in our study. In future, mobile network providers may differentiate themselves in terms of flexibility, generic requirements, and price in the short run and functional quality in the long run. Mobile network providers may emphasize customer relationship management systems which will help them be in touch with their customers and retain their existing customers. It is suggested that mobile network providers hire the right people in their organization, train them to deliver service quality, provide the needed support systems and retain the best people (Zeithaml et al., 2011).

## Limitations and directions for future research

Since the fixed line telephone directory was the sampling frame, all the respondents considered in the survey had a fixed line but there could be situations where a customer subscribes only to a mobile phone. It is also necessary to study other metropolitan cities of India to validate the results. Future studies with the help of cluster analysis may help in segmenting the market based on determinants of customer satisfaction. The work may be further extended to study possible relationships between customer satisfaction, repurchase intentions, and loyalty. It is also suggested that studies be conducted on decision making styles of consumers of mobile network providers.

## Conclusions

This empirical research examined factors affecting customer satisfaction. The study suggests that generic requirements (an aggregation of output quality and perceived value), flexibility, and price are determinants of customer satisfaction as obtained from the structural model. This study offers insights to mobile network providers to understand the determinants of customer satisfaction. It is possible that the determinants of customer satisfaction may be different for different network providers. This study would help network providers understand their customers

in different segments and decide which determinant satisfies which customer segment the most. This study may become the base for further studies to be conducted by researchers and practitioners for further understanding of customers in terms of repurchase intentions and loyalty.

## Acknowledgements

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## Appendix

### Survey items used in the study

#### Output quality

- Ability to connect to other networks smoothly (Gerpott et al., 2001; Kim et al., 2004; Lee et al., 2001)
- Good quality of voice (Gerpott et al., 2001; Kim et al., 2004; Lee et al., 2001)
- Frequency of dropped calls (Lim et al., 2006)

#### Functional quality

- Courtesy, proactive service calls (Cronin & Taylor, 1992; Gerpott et al., 2001; Kim et al., 2004; Lim et al., 2006)
- Good quality of customer services (Gerpott et al., 2001)
- Accurate billing details (Cronin & Taylor, 1992; Lee et al., 2001; Lim et al., 2006)
- Timely bills for post paid connections (Cronin & Taylor, 1992; Lim et al., 2006)
- Makes it easy to understand and resolve billing issues (Lim et al., 2006)
- Speed of complaint processing (Kim et al., 2004)
- Friendliness when reporting complaint (Kim et al., 2004)
- Ability in fixing a problem (Lim et al., 2006)

#### Perceived value

- Good service for a reasonable price (Sweeney & Soutar, 2001)
- Meets both high quality and low price requirements (Zeithaml, 1988)
- Satisfy the needs for a reasonable price (Zeithaml, 1988)

#### Price

- Tariff rates offered by network providers (Gerpott et al., 2001)
- Overall billing costs (Kim et al., 2004)
- Cost of calls to other networks (Gerpott et al., 2001)
- Reasonability of price (Kim et al., 2004)
- Variety of price schedule (Kim et al., 2004)
- Possibility of freely choosing price schedules (Kim et al., 2004)

- Offers overall superior pricing plans compared to other providers (Lim et al., 2006)
- Offers the best possible plan that meets need (Lim et al., 2006)

#### Flexibility

- Ample choice of consumer promotion schemes (Malhotra & Malhotra, 2013).
- Latest services like multimedia services (MMS), mobile Internet services, 3G (Kim et al., 2004)
- Convenience of use of value added services (Kim et al., 2004)
- Whether value added services are up to date (Kim et al., 2004)

#### Satisfaction

- Overall satisfaction with the mobile network provider (Kim et al., 2004; Turel & Serenko, 2006)
- The provider always meets my needs and I am happy with my provider (Shin & Kim, 2008; Oliver, 1997; Zeithaml et al., 2011)
- Feel good using my mobile network provider (Cronin & Taylor, 1992; Anderson & Srinivasan, 2003)
- The choice to use mobile service from my provider was a wise one (Anderson & Srinivasan, 2003)

#### References

- Aaker, D., & Mascarenhas, B. (1984). The need for strategic flexibility. *Journal of Business Strategy*, 5(2), 74–82.
- Alexander, K., Dimitriadis, N., & Markata, D. (2002). Can perceptions of service quality predict behavioral intentions? An exploratory study in the hotel sector in Greece. *Managing Service Quality*, 12(4), 224–231.
- Al-Hawari, M., Ward, T., & Newby, L. (2009). The relationship between service quality and retention within the automated and traditional contexts of retail banking. *Journal of Services Management*, 20(4), 455–472.
- Anckar, B., & D'Incau, D. (2002). Value creation in mobile commerce: findings from a consumer survey. *Journal of Information Technology Theory and Application*, 4(1), 43–64.
- Anderson, E. W., Fornell, C., & Lehmann, D. R. (1994). Customer satisfaction, market share, and profitability: findings from Sweden. *Journal of Marketing*, 58(3), 53–66.
- Anderson, R. E., & Srinivasan, S. S. (2003). E-satisfaction and e-loyalty: a contingency framework. *Psychology & Marketing*, 20(2), 123–138.
- Anderson, E. W., & Sullivan, M. W. (1993). The antecedents and consequences of consumer satisfaction for firms. *Marketing Science*, 12(2), 125–143.
- Athanassopoulos, A. D. (2000). Customer satisfaction cues to support market segmentation and explain switching behavior. *Journal of Business Research*, 47, 191–207.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74–94.
- Barnes, S. (2002). The mobile commerce value chain: analysis and future developments. *International Journal of Information Management*, 22(2), 91–108.
- Bateson, J. E. G. (1977). *Do we need service marketing in marketing consumer Services: New insights* (77–115). Cambridge, MA: Marketing Science Institute. Report.
- Berry, L. L. (1980). Services marketing is different. *Business*, 30(3), 24–28.
- Bloemer, J., Ruyter, K., & Wetzels, M. (1999). Linking perceived service quality and service loyalty: a multi-dimensional perspective. *European Journal of Marketing*, 32(5/6), 499–513.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.
- Bolton, R. N., & Drew, J. H. (1991). A longitudinal analysis of the impact of service changes on customer attitudes. *Journal of Marketing*, 55(1), 1–9.
- Bolton, L. E., Warlop, L., & Alba, J. W. (2003). Consumer perceptions of price (un) fairness. *Journal of Consumer Research*, 29(4), 474–491.
- Booms, B. H., & Bitner, M. J. (1981). Marketing strategies and organization structures for service firms. In J. Donnelly, & W. George (Eds.), *Marketing of services* (47–51). Chicago: American Marketing.
- Braff, A., & Laogue, S. M. (2004). Mobile's dissatisfied customers. *McKinsey Quarterly*, 3, 10–12.
- Buzzell, R. D., & Gale, B. T. (1987). *The PIMS principles*. New York, NY: The Free Press.
- Byrne, B. M. (2000). *Structural equation modeling with AMOS: Basic concepts, application and programming*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Carman, J. M. (1990). Consumer perceptions of service quality: an assessment of the SERVQUAL dimensions. *Journal of Retailing*, 66(1), 33–55.
- Carman, J. M., & Langeard, E. (1980). Growth strategies of service firms. *Strategic Management Journal*, 1(1), 7–22.
- Caruana, A. (2002). Service loyalty: the effect of service quality and the mediating role of customer satisfaction. *European Journal of Marketing*, 36(7/8), 811–828.
- Caruana, A., Money, A. H., & Berthon, P. R. (2000). Service quality and satisfaction: the moderating role of values. *European Journal of Marketing*, 34(11/12), 1338–1352.
- Chae, M., & Kim, J. (2001). Information quality for mobile internet services: a theoretical model with empirical validation. In *Proceeding of the 22nd international conference on information systems* (43–54). New Orleans, L.O.
- Consuegra, D. M., Morlena, A., & Esteban, A. (2007). An integrated model of price, satisfaction and loyalty: an empirical analysis in the service sector. *Journal of Product and Brand Management*, 16(7), 459–468.
- Consumer Report. (2005). *There are differences among the major carriers*. available at: [www.wsj.consumerreports.org/wsj/report/59c.html](http://www.wsj.consumerreports.org/wsj/report/59c.html) (accessed on 17 Feb 2005).
- Cronin, J. J., Jr., & Taylor, S. A. (1992). Measuring service quality: a reexamination and extension. *Journal of Marketing*, 56(3), 55–68.
- Cronin, J. J., Jr., & Taylor, S. A. (1994). SERVPERF versus SERVQUAL: reconciling performance-based and perceptions-minus-expectations measurement of service quality. *Journal of Marketing*, 58(1), 125–131.
- Cronin, J. J., Jr., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193–218.
- De Ruyter, K., Bloemer, J., & Peeters, P. (1997). Merging service quality and service satisfaction: an empirical test of an integrative model. *Journal of Economic Psychology*, 18(4), 387–406.
- De Ruyter, K., Wetzels, M., & Bloemer, J. (1998). On the relationship between perceived service quality, service loyalty and switching costs. *International Journal of Service Industry Management*, 9(5), 436–453.
- Dobni, C. B., & Luffman, G. (2000). Implementing marketing strategy through a market orientation. *Journal of Marketing Management*, 16, 895–916.

- Donthu, N., & Yoo, B. (1998). Cultural influences on service quality expectations. *Journal of Service Research*, 1(2), 178–186.
- Department of Telecommunications (DOT), Govt. of India annual report, 2006–2007.
- Edward, M., & Sahadev, S. (2011). Role of switching costs in the service quality, perceived value, customer satisfaction and customer retention linkage. *Asia Pacific Journal of Marketing and Logistics*, 23(3), 327–345.
- Eggert, A., & Ulaga, W. (2002). Customer perceived value: a substitute for satisfaction in business markets. *Journal of Business and Industrial Marketing*, 17(2–3), 107–118.
- Finn, D. W., & Lamb, C. W. (1991). An evaluation of the SERVQUAL scales in a retailing setting. In R. Holman, & M. R. Solomon (Eds.), *Advance in consumer research* (483–490). Provo, UT: Association for Consumer Research.
- Fornell, C. (1992). A national customer satisfaction barometer: Swedish experience. *Journal of Marketing*, 56(1), 6–21.
- Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., & Bryant, B. E. (1996). The American customer satisfaction index: nature, purpose, and findings. *Journal of Marketing*, 60(4), 7–18.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measure. *Journal of Marketing Research*, 18(1), 39–50.
- Foxall, G. (1984). *Corporate innovation: Marketing and strategy*. New York, NY: St. Martins Press.
- Gerpott, T. J., Rams, W., & Schindler, A. (2001). Customer retention, loyalty, and satisfaction in the German cellular telecommunications market. *Telecommunications Policy*, 25(4), 249–269.
- Gronroos, C. (1978). A service-oriented approach to marketing of service. *European Journal of Marketing*, 12(8), 588–601.
- Gronroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4), 36–44.
- Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., Babin, B. J., & Black, W. C. (2007). *Multivariate data analysis* (6th International ed.). Delhi: Dorling Kindersley(India) Pvt. Ltd.
- Homburg, C., & Baumgartner, H. (1995). Beurteilung von Kausalmodellen. *Marketing*, 17(3), 162–176.
- Howard, J. A., & Sheth, J. N. (1969). *The theory of Buyer Behavior*. New York, NY: Wiley.
- Ivens, B. S. (2005). Flexibility in industrial service relationships: the construct, antecedents, and performance outcomes. *Industrial Marketing Management*, 34, 566–576.
- Javalgi, R. G., Whipple, T. W., & Ghosh, A. K. (2005). Market Orientation, strategic flexibility, and performance: implications for service providers. *Journal of Services Marketing*, 19(4), 212–221.
- Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: antecedents and consequence. *Journal of Marketing*, 57(3), 53–70.
- Johnson, D., Anderson, E., & Fornell, C. (1995). Rational and adaptive performance expectations in a customer satisfaction frame work. *Journal of Consumer Research*, 21(4), 695–707.
- Johnson, J. L., Pui-Wan Lee, R., Saini, A., & Grohmann, B. (2003). Market focused strategic flexibility: conceptual advances and an integrative model. *Journal of the Academy of Marketing Science*, 31(1), 74–89.
- Kenny, C., & Keremane, R. (2007). Toward universal telephone access: market progress and progress beyond the market. *Telecommunications Policy*, 31(3–4), 155–163.
- Kenny, C., Lanvin, B., & Lewin, A. (2003). The access divide in World Bank global information and communication technology department. In *ICT and development*. Washington, DC: The World Bank.
- Kim, M., Park, M., & Jeong, D. (2004). The effects of customer satisfaction and switching barrier on customer loyalty in the Korean mobile telecommunication services. *Telecommunications Policy*, 28(2), 145–159.
- Kotler, P. (2000). *Marketing management* (10th ed.). Prentice Hall of India Pvt Ltd.
- Kotler, P., Keller, K. L., Koshy, A., & Jha, M. (2009). *Marketing management, a South Asian perspective* (13th ed.). Dorling Kindersley (India) Pvt, Ltd., Licensees of Pearson Education in South Asia.
- Kotler, P., & Levy, S. J. (1969). Broadening the concept of marketing. *Journal of Marketing*, 33(1), 10–15.
- Lai, L. T. (2004). Service quality and perceived value's impact on satisfaction, intention and usage of short message service (SMS) image. *Information Systems Frontiers*, 6(4), 353–368.
- Lai, F., Hutchinson, J., Li, D., & Bai, C. (2007). An empirical assessment and application of SERVQUAL in mainland China's mobile communications industry. *International Journal of Quality and Reliability Management*, 24(3), 244–262.
- Lee, J., Lee, J., & Feick, L. (2001). The impact of switching costs on the consumer satisfaction-loyalty link: mobile phone service in France. *Journal of Services Marketing*, 15(1), 35–48.
- Lin, H.-H., & Wang, Y.-S. (2006). An examination of the determinants of customer loyalty in mobile commerce contexts. *Journal of Information and Management*, 43(3), 271–282.
- Lim, H., Widdows, R., & Park, J. (2006). M-loyalty: winning strategies for mobile carriers. *Journal of Consumer Marketing*, 23(4), 208–218.
- Lovelock, C. H. (1981). Why marketing management needs to be different for services. In J. Donnelly, & W. George (Eds.), *Marketing of services* (5–9). Chicago: American Marketing.
- Malhotra, N., & Dash, S. (2011). *Marketing research – An applied orientation* (6th ed.). Dorling Kindersley (India)Pvt, Ltd., Licensees of Pearson Education in South Asia.
- Malhotra, A., & Malhotra, C. K. (2013). Exploring switching behavior of US mobile service customers. *Journal of Services Marketing*, 27(1), 13–24.
- Malhotra, A., & Segars, A. H. (2005). Investigating wireless web adoption patterns in the US. *Communications of the ACM*, 48(10), 105–110.
- Mattila, A. S. (1999). The role of culture in the service evaluation process. *Journal of Service Research*, 1(3), 250–261.
- McDougall, G. H., & Levesque, G. T. (2000). Customer satisfaction with services: putting perceived value into equation. *Journal of Services Marketing*, 14(5), 392–410.
- Minges, M., & Simkhada, P. (10 December, 2002). Telecommunication in Asia: a closer look. *ITU News*. available at: [www.itu.int/itu-news/issue/2002/10/southasia.html](http://www.itu.int/itu-news/issue/2002/10/southasia.html).
- Munnukka, F. (2005). Dynamics of price sensitivity among mobile service customers. *Journal of Product and Brand Management*, 14(1), 65–73.
- Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, 54(4), 20–35.
- Negi, R. (2009). Perceived service quality: a study of Ethiopian mobile users. *International Journal of Mobile Marketing*, 4(1), 31–38.
- Nohria, N., & Leetsma, M. (2001). A moving target: the Mobile Commerce customer. *MIT Sloan Management Review*, 42(3), 104.
- Nunnally, J. C., & Bernstein, I. (1994). *Psychometric theory*. New York, NY: McGraw-Hill.
- Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 17(4), 460–469.
- Oliver, R. L. (1992). An investigation of the attribute basis of emotion and related affects in consumption: suggestions for a stage specific satisfaction framework. In J. Sherry, & B. Sternthal (Eds.), *Advance in consumer research* (237–244). Provo, UT.
- Oliver, R. L. (1997). *Satisfaction: A behavioral perspective on the consumer*. New York, NY: Mc Graw Hill.

- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4), 41–50.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: a multiple item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12–40.
- Phillips, L. D., Chang, D. R., & Buzzell, R. D. (1983). Product quality, cost position and business performance: test of some key hypotheses. *Journal of Marketing*, 47(2), 26–43.
- Pitt, L. L., Oosthuizen, P., & Morris, M. H. (1992). Service quality in a high-tech industrial market: an application of SERVQUAL. In R. Leone, & V. Kumar (Eds.), *Proceedings of American marketing association Summer Educators conference* (46–53). Chicago: American Marketing Association.
- Porter, M. E. (1985). *Competitive advantage*. New York, NY: The Free Press.
- Pura, M. (2005). Linking perceived value and loyalty in location based mobile services. *Managing Service Quality*, 15(6), 509–538.
- Ranaweera, C., & Neely, A. (2003). Some moderating effect on the service quality-customer retention link. *International Journal of Operations & Production Management*, 23(2), 230–248.
- Ravald, A., & Gronroos, C. (1996). The value concept and relationship marketing. *European Journal of Marketing*, 30(2), 19–30.
- Regan, W. J. (1963). The service revolution. *Journal of Marketing*, 27(3), 57–62.
- Rosenberg, L. J., & Crepiel, J. A. (1984). A marketing approach for customer retention. *Journal of Consumer Marketing*, 1(2), 45–51.
- Rowe, W. G., & Wright, P. M. (1997). Related and unrelated diversification and their effect on human resource management controls. *Strategic Management Journal*, 18(4), 329–338.
- Rust, R. T., & Oliver, R. L. (1994). Service quality: insights and managerial implications from the frontier. In R. T. Rust, & R. L. Oliver (Eds.), *Service quality: New directions in theory and practice* (1–19). London.
- Santouridis, I., & Trivellas, P. (2010). Investigating the impact of service quality and customer satisfaction on customer loyalty in mobile telephony in Greece. *The TQM Journal*, 22(3), 330–343.
- Sarkar, S., & Wells, J. P. (2003). Understanding mobile handheld device use and adoption. *Communications of the ACM*, 46(12), 35–40.
- Seo, D., Ranganathan, C., & Babad, Y. (2008). Two level model for consumer retention in the US mobile telecommunication service market. *Telecommunications Policy*, 32(3–4), 182–196.
- Shin, D.-H., & Kim, W.-Y. (2008). Forecasting customer switching intention in mobile services: an exploratory study of predictive factors in mobile number portability. *Technological Forecasting and Social Change*, 75(6), 854–874.
- Shostak, G. L. (1977). Breaking free from product marketing. *Journal of Marketing*, 41(2), 73–80.
- Sirdeshmuk, D., Singh, J., & Sabol, B. (2002). Consumer trust value and loyalty relational exchanges. *Journal of Marketing*, 66(1), 15–37.
- Slater, S. F., & Narver, J. C. (1995). Market orientation and the learning organization. *Journal of Marketing*, 59(3), 63–74.
- Slater, S. F., & Narver, J. C. (2000). The positive effect of a market orientation on business profitability: a balanced replication. *Journal of Business Research*, 48(1), 69–73.
- Spreng, R. A., & Mackoy, R. D. (1996). An empirical examination of a model of perceived service quality and satisfaction. *Journal of Retailing*, 72(2), 201–214.
- Steenkamp, J.-B. E. M. (1989). *Product quality*. Assen/Maastrichts: Van Gorcum.
- Stevenson, M., & Spring, M. (2007). Flexibility from a supply chain perspective: definition and review. *International Journal of Operations and Production Management*, 27(7), 685–713.
- Sweeney, J. C., & Soutar, G. N. (2001). Customer perceived value: the development of a multiple item scale. *Journal of Retailing*, 77(2), 203–220.
- Teo, T. (2011). Modeling the determinants of pre-service teachers' perceived usefulness of e-learning. *Campus-Wide Information Systems*, 28(2), 124–140.
- Times of India, Kolkata, Day of publication NA, April 2008.
- Telecom Regulatory Authority of India (TRAI), *Annual report, 2005–2006*.
- Telecom Regulatory Authority of India (TRAI), *Annual report, 2006–2007*.
- Telecom Regulatory Authority of India (TRAI), *Annual report, 2007–2008*.
- Telecom Regulatory Authority of India (TRAI), *Annual report, 2008–2009*.
- Telecom Regulatory Authority of India (TRAI), *Annual report, 2009–2010*.
- Telecom Regulatory Authority of India (TRAI), *Annual report, 2010–2011*.
- Turel, O., & Serenko, A. (2006). Satisfaction with mobile services in Canada: an empirical investigation. *Telecommunications Policy*, 30(5–6), 314–331.
- Upah, G. D. (1980). Mass marketing in service retailing: a review and synthesis of major methods. *Journal of Retailing*, 56(3), 59–76.
- Verdu-Jover, A. J., Montes, F. J. L., & Morales, V. J. G. (2004). The concept of fit in services flexibility research: an empirical approach. *International Journal of Service Industry Management*, 15(5), 499–514.
- Wang, Y., & Lo, H.-P. (2002). Service quality, customer satisfaction and behavioral intentions- evidence from China's telecommunication industry. *Info*, 4(6), 50–60.
- Wang, Y.-S., Tang, T.-I., & Tang, J.-T. D. (2001). An instrument for measuring customer satisfaction towards websites that market digital products and services. *Journal of Electronics Commerce Research*, 2(3), 89–102.
- World Bank. (2005a). *Financing information and communication infrastructure needs in the developing world: The role of the public and private sectors*. Washington, DC: World Bank.
- World Bank. (2005b). *World development indicators*. Washington, DC: World Bank.
- Zeithaml, V. A. (1981). How consumer evaluation processes differ between goods and services. In J. Donnelly, & W. George (Eds.), *Marketing of services* (186–190). Chicago: American Marketing.
- Zeithaml, V. A. (1988). Customer perceptions of Price, quality and value: a means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2–22.
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing Management*, 60(2), 31–46.
- Zeithaml, V. A., & Bitner, M. J. (1996). *Services marketing*. New York, NY: McGraw-Hill.
- Zeithaml, V. A., & Bitner, M. J. (2003). *Services marketing: Integrating consumer focus across the firm* (3rd ed.). New York, N.Y.: McGraw Hill/Irwin.
- Zeithaml, V. A., Bitner, M. J., Gremler, D. D., & Pandit, A. (2011). *Services marketing* (5th ed.). McGraw-Hill Publishing Company Limited.
- Zhao, X., Bai, C., & Hui, Y. V. (2002). An empirical assessment and application of SERVQUAL in a Mainland Chinese department store. *Total Quality Management*, 13(2), 241–254.