

SUCCESS FACTORS FOR PRODUCT AND SERVICE INNOVATION: A CRITICAL LITERATURE REVIEW AND PROPOSED INTEGRATIVE FRAMEWORK

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Abstract

This paper presents a critical but integrated overview of the factors that play a role in success product and service innovation respectively. The difference between service and product innovation is highlighted. The factors are drawn from a wide and diverse body of academic literature and classified into one of four categories namely strategic, organization, market and development factors. The integrated and summarized overview of critical success factors for innovation should be of considerable importance, not only to practitioners but also for researchers wishing to build an integrated and comprehensive framework for service or product innovation.

Keywords: *Product Innovation, Service Innovation, Innovation*

INTRODUCTION

Innovations are historically related to the development of new products and services. Innovation management is complex and multidimensional. Researchers from diverse disciplines adopted numerous ontological and epistemological interpretations to investigate innovation (Wolfe, 1994). Abundant literature on innovation exists, but the research offers diverse perspectives. The field of innovation research lacks a theoretical model that contains comprehensive determinants of innovations success factors (Ernst, 2002). This paper looks at the success factors for both product and service innovation by means of a critical review of the academic literature by. The paper also discusses the differences between product and service innovation. The discussion and integration is guided by a framework based on four orthogonal dimensions or categories of factors: strategic factors, development and process factors, environment or market factors, and organizational factors. The summation and integration of this huge body of knowledge should be of value to practitioners, students and researchers in the field of product and service innovation.

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WHAT IS INNOVATION?

Definition of Innovation

The concept of innovation includes many facets. The OECD (1991) definition is quite comprehensive in defining innovation as an "iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based intervention which leads to development, production, and marketing tasks striving for the commercial success of the invention".

The OECD definition acknowledges three major characteristics of an innovation. Firstly, an innovation should not merely occur, but it should also be successfully introduced and adopted in the marketplace. An innovation is not the same as an invention. An invention becomes an innovation only when it provides economic value by diffusion in the market place (Garcia et al, 2002). Secondly innovation is an iterative process which implies that cycles of innovation repeats and that improved versions of innovations can be continuously introduced to the market. Varying degrees of innovativeness exist. Thirdly the definition is comprehensive enough to acknowledge that many different types of innovation can exist in an organization. Innovation can therefore accommodate a range of dissimilar innovations types which could include product and services innovation, process as well as technological innovation. This paper only focuses on one aspect of innovation namely product and service innovation.

Categories of Innovation

Empirical studies often fail to provide a definition for the "degree of newness" of an innovation. The lack of accepted definitions present challenges to innovation research as it limits the comparability of findings (Ernst, 2002). It is important to classify innovation into typologies as the factors that influence these different types of innovations might differ (Freeman, 1994; Song et al 1998). Radical innovations would potentially not require detailed customer needs analysis as much as other types of innovations. Steve Jobs stated on various occasions that customer participation is not essential to the design of innovations as "a lot of times people don't know what they want until you show it to them" (Isaacson, 2011).

A standardized typology does not currently exist to define categories of innovations, but most researchers refer to four types, described as (1) new to the organization products that could include copies of competitor products; (2) new products for the market (3) extension of existing product lines by including new features and (4) improvements to existing products. These four categories will all be studied in this research. Category 1 also includes radical new inventions that establish landmark new products and create new industries such as the internet (Garcia et al, 2002).

SUCCESS FACTORS FOR NEW PRODUCT DEVELOPMENT

This section seeks to provide criteria for and evidence of good innovation practices for product innovation or new product development (NPD).

Four Dimensions of Success Factors

Many researchers have identified critical success factors in product innovation. We have elected to structure the discussion using the drivers for project level success as defined by Montoya-Weiss et al (1994). They used four main dimensions namely strategic, market, development and organizational factors. Other innovation authors such as Cooper et al (1995) identified other categories. Cooper establishes the factors for new product performance in order of importance as: NPD process, NPD strategy, organization, culture and management commitment. Cooper's criteria is described as being 'techno-centric' in nature and fails to acknowledge the role of knowledge and other non-technical components of innovation (Leonard et al, 1998).

Montoya-Weiss et al (1994) offer a wider range of variables that considers the product development process from inception to commercialization activities as well as focusing on cultural issues. These four dimensions have been used to structure the remainder of the section. Appendix 1 summarizes the studies from which the factors below have been drawn.

Strategic Factors

Strategic factors include the existence of an innovation strategy that details how a company will compete within its competitive environment by means of its new product and service development plans (Dyer et al, 1998). Researchers that only focused on the strategic view of a product exclude consideration of internally focused practices (Adams et al, 2006). An effective innovation strategy should be embedded in the culture and behaviours of the organization (O'Brien, 2003). An embedded innovation strategy is demonstrated by long-term commitment and clear allocation of resources. An effective NPD strategy should include clearly defined objectives that are efficiently communicated. It furthermore should provide a strategic focus that provides direction to individual NPD projects as well as a long-term view (Cooper et al, 1995).

The effectiveness of an innovation strategy can be evaluated by the extent to which supporting structures and systems are aligned to the strategy and the degree to which innovation objectives succeed in meeting the strategic objectives of the company (Bessant, 2003). A key theme that emerged from the strategic focus on new product development is portfolio management (Cooper et al 1995). This can be attributed to the requirement to manage resource constraints as resources are rapidly consumed during the innovation process (Cebonet al, 1999). The effectiveness of portfolio management is often seen as a key determinant of competitive advantage (Cooper et al, 1999). Clear selection criteria can optimize portfolio selection. Scoring models is often based on financial indicators such as cost/benefit analysis, net present value and return on investment as the portfolio is seen as a method to optimize the trade-off between investments and the associated risks.

Best practices for strategic innovation initiatives usually include investments in Research and Development (R&D). R&D spend was found to be useful for products but not service industries (Hippel et al, 2005). R&D was additionally not found to be a useful innovation measure for SMEs (Kleinknecht, 1987) which could indicate that B2B and service industries have different sources for product ideas. The existence of a new product development strategy is considered as the second most important indicator of a successful NPD programme (Cooper et al, 1995). However NPD strategy has not been sufficiently empirically examined and more research is required in terms of its influence on the success of new products (Ernst, 2002).

Market Factors

Market factors refer to mainly two main themes. The first relate to the commercialization cycle of the product development phase whilst the second theme centers on market and customer information input that supports the design of the product and target market. Commercialization is the process of taking an innovation to market. Very little research was conducted in measuring the effectiveness of these activities (Adams et al, 2006). Measures include the number of products launched in a given period (Yoon et al, 1985). The proficiency of commercialization can be measured in terms of sales, distribution and promotions (Song et al 1996).

The following factors relating to market was found to improve innovation performance. These include market analysis, monitoring, competitive analysis and adherence to a formal schedule (Verhaegde et al, 2002; Calantone et al, 1988; Griffin et al, 1983). The NPD process should further be oriented towards the needs of the market (quality of market research) and a thorough understanding of customer needs should exist (Atuahene-Gima, 1995; Parry et al, 1994). The evaluation of the market potential should be accurate (Balbontin et al, 1999) as well as the competitive analysis (Calantone et al, 1988).

Customer integration during the NPD process where the customer is an active participant in the process was found to have a positive impact on success (Gruner et al, 1999). Ernst (2002) warns that research about customer integration should be evaluated for robustness to determine if results are meaningful. The transition phase between development and commercialisation sees marketing capabilities becoming of primary performance and technological capabilities reduce in importance (Kelmet et al, 1995).

Commercial launch is the area where the biggest gap in terms of research in innovation has been identified and which requires urgent further development (Adams et al, 2006).

Process Factors

An efficient product innovation process is critical to innovation. An efficient product innovation process is described as formal processes that contain stage-gate processes where the product development process is separated into distinct stages with milestones, checkpoints and stop/go decisions (Cooper, 1990). Alternatives to Cooper's stage-gate processes include project methodologies such as Total Design, Cycle-time excellence and phased development (Jenkins et al. 1997). Cooper's stage-gate processes have received the most attention in popular literature and are potentially more widely utilized in practice.

The proficiency with which activities are carried out in the individual phases of the new product development process has a significant positive influence on the success of new products (Ernst, 2002). Specific activities are more beneficial to successful products than others in the product development process. Valuable activities include development, marketing testing and market orientation (Cooper, 1990). Work conducted during the initial phases of the NPD process was also found to have a bigger impact on the success of new products (Calantone et al., 1997).

Stage-gate processes are not always to be understood as being sequential in nature and activities may overlap. The flexibility of the NPD process should be an additional factor contributing to increased product performance (Cooper et al, 1998). Continuous assessment of the project during the different phases is important to ensure that unprofitable products are not developed (Cooper et al, 1995). The stage where selected products are approved for development is of primary importance (Song et al, 1996). The NPD process should additionally be orientated towards the market- and customer.

The innovation process is complex with many inputs that differ on a project-by-project basis. Five (5) factors were deemed to be critical success indicators for new product innovation. These include a cross-functional project team, a strong project leader, end-to-end responsibility for the project by the NPD team, commitment of team members and effectiveness of communication between team members (Cooper et al, 1995). Project management criteria include project efficiency, collaboration tools and communication (Adams et al 2006). The speed of innovation has been shown to improve customer satisfaction and quality (Adams et al, 2006). Innovation speed is measured as duration, speed and performance against schedule (Cebonet al, 1999; Chiesa et al, 1994). Unused capacity or slack resources were determined as another prime indicator of innovation. Slack time allow resources to experiment and time to resolve uncertainties that might arise during the product lifecycle (Kimberley, 1981) and address risks. The project leader plays an important role in innovation. The effectiveness of the project leader role can be established by evaluating their decision-making capabilities (Cooper et al, 1995). It is likely that project managers that primarily function in a coordination role are not vested with the authority to make decisions and are therefore not likely to have an effective impact on the product lifecycle. Post implementation reviews of new products are recommended (Atuahene-Gima, 1995) as well as the use of certified processes (Chiesa et al, 1996).

Knowledge management (KM) is the management of explicit and implicit knowledge held by the organisation. KM was found to play a critical role in the process of innovation (Hull et al, 2000; Davis, 1998). During the innovation process the following three areas of knowledge management were found to be of importance, namely (1) idea generation, (2) knowledge repository and (3) information flows. For the purposes of this study it is not assessed how ideas are generated. However, the effectiveness of screening the ideas during the different stage/gate processes as well as the number of ideas generated is considered important. These factors were found to significantly impact on the probability of a successful product (Cooper, 1998). The second most important knowledge management criteria (as it relates to innovation) are the existence of a knowledge repository. Thirdly the combination of information (new and existing, internal and external) as well as the way with which it flows

in the organisation is considered important (Pitt et al, 1999). The extent to which organisations have the capacity to effectively absorb and apply new knowledge, termed as their 'absorptive capacity' positively relates to innovation and performance (Tsai, 2001).

Good communications are essential for effective project management. Good internal communication has been shown to positively influence innovation as it facilitates the flow of ideas (Damanpour, 1991). The effectiveness of communication is measured by counting the frequency (number) of internal and external communications as well as the level at which it occurs and the parties to whom is communicated (Cebonet al, 1999). Other more subjective measures to measure communication include assessing the participation in extra-organisational professional activities and the extent to which consultation with suppliers take place (Parthasarthy et al, 2002). Collaboration with suppliers and customers has been shown to improve innovation. Collaboration can be measured by calculating the percentage of projects that take place in co-operation with third parties (Kerssens-van-Drongelen, 1999). Adequate funding are defined as a critical criteria for innovation but determination of what constitutes adequate funding, measurement thereof and the extent to which it improves innovation have not been defined (Kerssens-van-Drongelen, 1999).

Organizational Factors

Organizational culture includes the extent to which values, perceptions and assumptions of the innovation team influence their behaviour. The type of resources and their generic characteristics is considered to be important for innovation. Teams who comprise members with diverse skills and experience culminating from several areas in the business are found to significantly improve innovation (Damanpour, 1991; Griffin, 1997). Team members with high levels of education and self-esteem improve the effectiveness of project teams (Kessler et al, 1996 and Bantelet al, 1989).

The existence of a product champion was identified as a success factor (Barczak, 1995). Product champions play the role of advancing the project through potential obstacles posed in the organisation. The role of senior management can be seen as that of a power promoters (Ernst, 2002) or product champion. The behaviour of senior management is regarded as an important indicator of innovativeness. If senior management accepts personal accountability for a product the chances of a successful product increase (Cooper et al, 1995). Incentives allocated to senior management plays a role in innovation practices. Incentives associated with the achievement of short-term profits will potentially lead to many incremental developments, in favour of more substantial innovations (Ernst, 2002). Senior management support is evaluated by means of the presence of support indicators such as whether sufficient resources have been assigned to the product. Senior management support forms part of the construct of culture and not project management since senior manage support is validated by the sufficient provision of resources (Ernst, 2002). The likelihood of products being terminated during the product development lifecycle decreases with improved senior management support. This can be attributed to senior management acting as power promoter overcoming internal resistance. Definitive conclusions cannot be drawn from current research whether senior management support of their preferred products eventually leads to success or failure (Ernst, 2012).

Organizational flexibility is another indicator of innovation as it shows responsiveness to change (Rothwell, 1992). The flexibility of personnel is described as the willingness to experiment and try new procedures to improve the product or service (Abbey et al, 1983). A complex organization with task specialization has a positive impact on innovation (Damanpour, 1996). However organizational complexity can favour the initiation of new innovations but not necessarily be conducive to ensure that innovations are implemented (Wolfe, 1994).

Creating a culture and climate for innovation has received much attention by scholars. Robust measurement instruments to measure culture exist such as The Team Climate Inventory (TCI) and the KEYES instrument (Anderson et al, 1998; Amabile et al., 1996). Allowing resources the freedom to experiment were regarded as important for both group and individual autonomy (Abbey et al, 1983). High morale and motivation were found to indicate an innovative organization. The criteria to measure these indicators include assessment of job satisfaction and reward (Keller, 1986). Propensity to take risks was found to be an important indicator for innovation (Voss, 1985). Risk taking is however not seen as reckless risk taking but rather informed decision making. A disposition to risk taking are defined as the willingness to confront opportunities, tolerate failure and learning from mistakes (Salehet al, 1993).

A project organization group that is dedicated to the development of new products is conducive to successful new products (Ernst, 2002). A dedicated project organization structure is more likely to facilitate successful products. The two organization forms that were found to be most conducive to innovation were matrix and task force models. Barczak's (1995) found that task force models were the only organization model that had a positive influence on the success of products. However these finding could be attributed to the fact that Barczak's studies focused on the telecommunication industry where reduced time to market is essential (Ernst, 2002). In cases where time to market is important, the utilization of task forces is regarded as the superior form of project organization. Centralization of decision-making at the top of the organization has a negative impact on innovation. It makes little sense to have a decentralized organizational structure and a task force, but retaining the power of decision-making at the top.

Comments on the Success Factors for Product Innovation

The discussion above and the table in appendix 1 demonstrate clear gaps in research. A comprehensive new product model has not yet been defined. Gaps in innovation management research indicate potential for further research in this regard. Practitioners should be able to identify gaps and weaknesses in their own innovation management activity for improvement.

Service Innovation

This section investigates how service innovation differs from product innovation and what the fundamental impact of these differentiations is. Most innovation studies focus on products that are tangible. Five factors distinguish services from products: (1) Intangibility; (2) Inseparability of service from supplier; (3) heterogeneity; (4) perishability and (5) ownership. These distinctions are explained by using the services provided by a Telecommunication company as an example. Service products are predominantly processes rather than physical off-the-shelf objects. A new handset would be a product whilst access to the telecommunication service by means of SMS and data will be via a certain tariff package that is an intangible service. The customer is unable to feel, taste or touch a tariff package. The service is additionally inseparable from the company as the consumer needs to be a subscriber of a particular Mobile Network Operator (MNO) before they can utilize the services. The service can vary in quality because the customer could have a different service experience depending on the type of handset and the customer interface where the service is consumed. The degree of variation depends on the standardization of the system and the technology applied at the customer interface. Services are inherently perishable and not held in inventories, but produced and consumed simultaneously. Ownership of the service is not transferred to the customer as the service is only consumed by the customer. The customer cannot re-sell the service could be done with a physical product.

Due to these different characteristics of services, it is not obvious that results from studies on the adoption of tangible products can be generalized to settings where services are considered. However it is also not obvious (from current research) that they can be excluded as insufficient academic attention has been focused on services (Spohrer, 2008). The process of service innovation also differs from product innovation as it is less institutionalized (Leiponen, 2005). A research gap has been identified in the service industry where research regarding service development processes is lacking (Adams et al, 2006).

The Role of Technology in Service Innovation

The research is focused on enhancing knowledge in the discipline of Information Systems. Product innovation is sometimes seen as a function of marketing and therefore the relevance of studying innovation in the discipline of IS could be questioned. Eris et al (2006) explain that technology refers to all the theoretical and practical knowledge, skills and artifacts that can be used to develop products and services as well as their production and delivery systems. Technology is the devices and knowledge that mediate between inputs and outputs that create new products or services. Some innovations use technology as a basis whilst others are facilitated by technology. Technology plays roles in the technological innovation process as the principal input and output of the innovation. The difference between innovation and technological innovation is that innovation is the application of a new idea and technological innovation is the process which commercializes the innovation. Innovation is also defined as technology changes which manifest in the development of new products and services. This study focuses on new service innovation that includes all the technology, knowledge and processes that are required to initiate, build, commercialize and

maintain the product or service. This study exclusively focuses on innovation resulting from new service development. A comprehensive theoretical model to identify success factors for innovation does not currently exist within the product or service development innovation environment. It would therefore be wise to consider studies from both product and service innovation to ensure that all potential gaps and weaknesses in innovation management activity are identified.

Categories of Service Products

Researchers of products and services have been criticized for not considering the context of innovations. Some researchers have presented evidence that different categories of products and services have different characteristics and the critical success factors for these products will differ from those with different characteristics. The type of categories for services does not differ dramatically from those of products. Lovelock (1984) distinguishes between 6 types of service categories namely (1) Major innovations: New products for markets (2) Start-up businesses: New products for a market that is already served by existing products (3) New products for the currently serviced market: new products offered to existing customers (4) Product Line extensions: Augmentation of existing product lines (5) Product improvements and (6) Highly visible style changes to existing products. These service categories are similar to the product categories. Style changes could be incorporated as part of the product improvement category whilst start-up businesses could be seen as new products for a market that is already served by competitors and therefore relates to new products for the market.

Davis (2002) provides an analysis of product-portfolio categories that are divided into four categories to assess the market and product risks to improve the chances for success of the product. The categories are 'new ventures', 'new categories', 'derivative products' and 'new platforms'. (1) New ventures are "new to the world" products that use new technology applied to new markets with uncertain needs. (2) New categories are "new to the company" products that use existing technology applied to new markets with uncertain user needs. (3) New platforms are "additions to existing product lines" utilizing a defined platform and existing technologies that is applied to current markets with known user needs. (4) Derivative products are "improvements and revision to existing products" that include cost reductions. The product is already defined using existing technology applied to current market with known user needs. New venture is approximately 10% of all new products but might be as high as 20% in high-technology companies. Davis product portfolio categories classify products according to their risk profile and would therefore be utilized as classification method for this study.

As noted, services innovations differ from product innovation and service innovation has insufficiently been studied by researchers in innovation (Leiponen, 2005). Services differ from products mainly due to the distinguishing characteristics of intangibility. The main differences between products and service innovation are subsequently discussed.

Main Differences between Product versus Service Innovation Factors

The reason for launching products is to ensure the sustainability of the company and ensure continued competitiveness. However the reasons for developing new services do not always conform to these objectives. The reasons for developing new services could also relate to reducing obsolescence, responding to competition, having spare capacity, change of seasonal effects and risk reduction (Cowell, 1988).

Product advantage is the number one success factors in NPD, but with new services it is only rated third (Atuehene-Gima, 1996). In services, the interaction between customers and skilled contact staff are considered to be more important than the product itself (Storey and Easingwood, 1995). Intangible products are more difficult to evaluate for potential customers. As a result customers' attention may shift to peripheral, more tangible aspects of the service that indicates quality such as the prestige or reputation of the supplier (Frambacht et al, 1998). More contact with consumers is suggested as an alternative to market testing well as offering the new service to internal employees (Bowers, 1989). Testing of the market was almost never conducted as it would allow competitors to copy the product.

Services are characterized by more intense competitive pressures than products. In services the most important source of new ideas is those of competitors, which explains the prevalence of 'me too' products. A service can be copied relatively easily as the cost of development for a service is perceived to be low and the service is not protected by a patent. If the service attracts many customers, it is more attractive for the competition to copy it. A radically new product innovation is slow to be copied. Products that are perceived to cannibalize existing services will not be easily copied. Products that are not suited to the company's current portfolio of products are also not likely to be copied. Competitors are more likely to respond with 'me-too' products in cases where the product has high visibility in the market and the competitor is directly attacked (MacMillian et al 1985). Barriers to prevent fast copying of products are introduced by technological barriers such as new operating systems, requirements for substantial investment and the introduction of complex products which require specialized skills (MacMillian et al, 1985). A lack of a competitive and innovation culture could further inhibit the ability to respond fast to competitors. A lack of resources, due to them being occupied in other strategic objectives could also inhibit fast response (ibid).

It is easier to design new services than products. This leads to a propagation of products that can cause confusion amongst customers and information overload experienced by employees. The heterogeneity of service makes branding particularly difficult which necessitate the need to continually introduce new services (Cowell, 1988). Corporate and brand image are more important for new service introductions (Easingwood, 1986). Innovation does not play such a big role in service development as low-risk incremental types of products dominate (John, 1993).

New technology plays a more important role in services than product development as service innovation is essentially a process. For products, technical synergy is regarded as more important (Atuehene-Gima, 1996a). New services are intangible in nature and concept testing is therefore not feasible (Cowell, 1998). It is difficult to patent services therefore there is a low investment in R&D expenditure and more incremental products are introduced during service development (Cowell, 1988). The cost of failure for a service is regarded as lower than products (Davison et al, 1989). Services should therefore have a lower risk profile than products. Calculating the cost and profitability of new services is challenging as the cost of shared delivery systems and the cannibalization impact of new services is difficult to assess (Easingwood, 1986). Once products are launched they are not easily withdrawn as 'exit barriers' exists. It is therefore likely that unprofitable services will be remain in operation for a prolonged time.

The intangibility of service products and the fact that services are predominantly processes rather than objects would introduces additional complexities and risks. The more intense competitive pressures necessitate the need to launch more products, faster, introduce greater risk.

Success Factors for Service Innovation

Continuing on the theme of investigating the drivers for successful innovation projects, the variables as they impact on the four dimensions of Montoya-Weiss et al (1994) are discussed in the following sections. The distinction is that these variables relate to the introduction of services. In the literature, some researchers still tend to refer to services as products even when it is explicitly clear that they are discussing a service. To ensure clarity and focus the next section will refer to these as services, rather than products.

Strategic Factors

New services are introduced primarily to increase profitability, respond to competitor actions and fit with existing product portfolio. In the financial services industry, the most important sources of ideas were generated from competitive action. Ideas for new services were additionally generated internally via top management and marketing sources. Marketing specialists were making increasing contributions to generate product ideas but their expertise were not fully utilized (Johne, 1993). However Drew (1995) found that less successful firms use the marketing function as the key driver. Service researchers have not focused much on the strategic component of service delivery and it could therefore not be regarded as such an important factor for service effectiveness.

Market Factors

An important success indicator is market synergy and launch effectiveness (Atuehene-Gima, 1996a). Inadequate research into customer needs and limited market testing results in problems after launch. Services must ensure that specific market segments are targeted with unfulfilled user needs (Bortree, 1991). For banking products it was found that services often lacks relevance to the customer and therefore a customer view is proposed as an important factor (Berry and Hensal, 1973). In more successful products, there was higher customer involvement during product development (Martin and Horne, 1993). Customer information is predominantly utilised during three stages of the development process namely idea generation, business evaluation and marketing plan preparation (Martin and Horne, 1995).

Effective customer communication states the benefits of the service (Berry and Hensal, 1973). Risk perception of the customer can be reduced by free trials or offering a low introduction rate. It is necessary to explicitly communicate the relative advantages of the innovation and reduce the perceived risk and complexity of the product. Customers are reluctant to adopt services that incorporate new technologies as it require substantial behaviour changes, therefore a risk free trial is proposed (Berry and Hensal, 1973).

Senior management and not Marketing were identified as the main drivers for changes to existing products as 'marketing is too important to be left to the marketing department'. Successful banks are driven by market vision rather than ideas generated by 'rocket scientists' and therefore Johnes (1994) suggests that successful service innovators should listen to the 'voice of the market' first before considering the 'voice of the company'.

Development Process Factors

Whilst much research has been done to identify factors that determine the success and failure of new services the innovation development activities and processes remains under-researched (Frambach et al, 1998). A formal development process, especially with a focus on the early new service development (NSD) process, is essential to prevent mistakes later (Grden-Ellson et al, 1986). Service firms use an incomplete NSD and the activities are not comprehensively applied. It is difficult to identify key activities in the NSD (Johnes, 1993). The overall level of new product activity is limited in most financial institutions. Activities that were found to be lacking include service development, testing (including test marketing) as well as formal idea generation (Easingwood, 1986). Activities that were regularly carried out include business analysis and commercialisation (Bowers, 1989).

Testing of the market is seldom conducted. The factors that inhibit test-marketing are cost, competitors and invalidated customer research (Mohammed-Salleh and Easingwood, 1993). The cost of launch is equal to the cost of testing and therefore not often instituted. If a product is extensively tested it provides the opportunity for competitors to respond, which is aggravated if launch is delayed. The risk of insufficient market testing is considered to be reduced if the product benefit research took place and validated the market potential.

Companies that were successful follow a more formal and proactive approach to NSD, spend more revenue on NSD and link rewards to performance (Drew, 1995). However Drew (1995) found that these top performing companies use shorter development times. This could however relate to the top performing banks following a more structured service development process and performing more phases of the service development process. The type of product and its characteristics determine the type of NSD process that is used (Easingwood, 1986). The main requirement for a 'me-too' product (copy from a competitor) is speedy implementation that could lead to the bypass of processes. In many cases the main objective of products is not profitability, but other factors such as retaining customers.

It is not only the existence of a formal NSD process that is important but also the quality thereof. Successful new services have a more comprehensive and systematic service development processes when compared to less successful service. Top performing organisations score highest on quality of execution (Edgett, 1996). A robust process delivers increased quality of services to customers, reduces the cost of developing services and eventually leads to more innovative services (Easingwood, 1986). An effective NSD process produces non-direct benefits such as enhanced company reputation, increased adoption of existing products, improved NPD capability, enhanced loyalty and providing new directions to the company (Easingwood and Percival, 1990). Very successful new services yielded more non-direct benefits than modestly successful new products, indicating the benefits of a robust product development process.

In addition to the existence of a process and increasing the quality thereof, the following aspect is also important. For service firms it is a major strategic initiative to increase the rate of product development. Faster service development has become a competitive necessity to increase responsiveness towards competition, accommodate the fast changing needs of customers and retain customers. Companies who succeed in rapid innovation are rewarded by having a more innovative image and enhanced reputation (Drew 1995b). The 'first mover' advantage is described as the reputation and credibility that cannot be achieved merely through advertising. The speed of service development is measured in terms of development time and response time - how long it takes to adopt an external concept (Voss, 1992).

The time that innovative companies spend at each phase was determined by Reidenbach et al, (1986). Service testing and test marketing only took place approximately 20% of the time. The service development phase and the idea generation stage were regarded as the least important whereas the development of the service specifications and the evaluation thereof were regarded as the most important (Reidenbach et al, 1986).

An important requirement is the design of the service itself. Special attention should be paid to critical incident points, standardised as well as unconventional activities and the integration of suppliers and partners into the development process (Edvardsson and Olsson, 1996). Technological design should consider the fit of the new service within the technology especially if there is a degree of interdependence between existing and new services (including customer service systems) (Lovelock, 1984). Additionally the degree to which the new service varies from existing services such as time utilisation variations (i.e. counter-cyclical services) must also be considered. Blueprints can be used to model the service process (Edvardsson et al, 1996). However Locklock (1984) advised that service blueprints often fail due to operational efficiency overriding customer concerns and therefore two sets of blueprints are recommended (one for the company and one for the customer's point of view).

Meyer and Zack (1996) introduced an architecture framework for information service products that were based on the development of platforms. Every service should be developed as a technological platform to ensure that incremental new products can be introduced speedily and niche market potentials are exploited. It is further suggested that the platform should be designed to be seamless with standardised procedures to ensure that the marginal cost of adding new product variants remain cost-effective.

Barriers to innovation are introduced by inflexible and slow organisational and technical systems (De Brentani, 1993). Customer facing staff with insufficient skills hampers innovation. This is however a barrier than can be overcome by sufficient training (Drew 1995). Internal marketing was deemed an essential aspect of to obtain the support from front-line staff and provide them with sufficient knowledge to sell the product (Gden-Ellsoin et al, 1986)

The one area where researchers have seemed to reach consensus on is that investing in a formal new service development process will improve new services.

Organizational Factors

The major organizational influences on new service development are the style of management communication, organizational structure, vision, leadership, idea generation and simultaneous development activities. Heavy reliance on product champions, employee effectiveness, the marketing function, risk management, technology and market knowledge were depicted as additional organizational influences (Thwaites, 1992). For services it is most important that the human resource strategy aligns to product development and good teamwork (Atuehene-Gima, 1996). The rate of NPD development can be facilitated by linking rewards structures to performance and ensuring that a separate business unit is responsible for product development (Drew, 1995).

Key problems that resulted in costly project delays includes a lack of communication between line and cross-divisional functions, intra-organization conflicts and the struggle for power between functions. Scarborough et al, (1989) state that in the interest of exploiting improved strategic innovations, it is necessary that management should overcome 'structural inertia rooted in internal political forces' and 'blinkered perceptions' due to 'bounded rationality'.

The main barriers that slow down the rate of innovation are a lack of top management support and a lack of focus (De Brentani, 1993). Greater involvement by senior management and staff increase potential success of products (Martin and Horne, 1995). A limited number of top managers provided support that can be described as 'energising, enabling and envisioning' (Johne, 1993). Organization culture and structure can be changed by reengineering and a greater commitment to teamwork and empowerment (Drew, 1995b). The importance of an innovation champion was identified (Scarborough et al, 1989). Differences exist between active innovators and less active innovators. Active innovators had high 'functional specialization', 'low centralization' and a 'tight structure' for product development which were lacking in the less active innovations. Active innovators shifted from 'lose control' at initiation phase to 'tights controls' during the implementation stage. Less active innovators was reliant on generalist and top management to close controls through the development cycle. (Johne, 1993). Insurance industries used new product committees that comprise a mix of functional specialists to manage development (Johne, 1993).

Comments on the Success Factors for Service Innovation

Similar to product development, gaps still exist and that a comprehensive new service model has not yet been defined. From the 28 researchers that studied success factors of new product development only Montoya-Weiss (1994) on whose categorization the table was based focused on all four dimensions of strategic, market, development and organizational factors. Five researchers investigated three of these categories, Twelve investigated only two dimensions and Ten (researchers only identified variables restricted to one category.

Fewer researchers have conducted studies on services when compared to products. From the 16 service researchers, two investigated all four categories, six investigated three of the categories, five investigated two categories and three investigated only one category. It is evident from viewing the differences between the product and the service variable table that service researchers have established a broader range of variables across the four categories during their investigations. It could be that services due to its complexity require more focus on many more factors than focus on one or two specific success factors.

CONCLUSIONS

This paper conducted a review of the literature into the success factors for both product and service innovation. An overarching framework based on four dimensions was used to consolidate and integrate these success factors: strategic factors, development and process factors, environment or market factors, and organizational factors.

Although plenty of literature exists on the critical success factors for product innovation and new product development, less can be found on the factors determining success in service innovation. Overall, it was clear that a clear gap exists in the current innovation literature: most researchers and innovation success models focus on only a few variables, and no overarching model exists that incorporates all or even a major subset of factors.

This paper also highlighted the differences between product and service innovation. However, even though fewer studies could be found, it appears that service researchers have established a broader range of variables across the four categories during their investigations than product innovation researchers. It could be that services due to its complexity require more focus on many more factors than focus on one or two specific success factors. However, it must be noted that fewer factors relating to strategy were found in the service innovation research.

The summation and integration of the huge but diverse body of knowledge around success factors for product and service innovation should be of value to practitioners, students and researchers in the field of product or service innovation.

Further research should attempt to provide measures as to the relative importance of the various factors. It is highly likely that the relative importance of these factors is highly context-dependent. Thus a meta-analysis of a number of innovation case studies could potentially lead to a validated contingency framework.

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APPENDIX 1: SUCCESS FACTORS FOR PRODUCT INNOVATION

The following table provides an overview of the research conducted by various authors in product management and how they relate to four categories introduced by Montoya-Weiss et al (1994).

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Montoya-Weiss et al (1994)	Product advantage Technological synergy Marketing synergy Company resources Strategy of product	Market potential/size Market competitiveness External environment	Proficiency of: technical activities, marketing activities, up-front homework product definition top management support speed to market financial and business analysis	Internal and external relations Organisational factors
Atuahene-Gima, 1995		Market performance	Project performance	
Balbontinet al, 1999			Selection of products	Project manager with the necessary skills High level of information flow between technical and commercial entities Ensuring adequate resources especially with market research skills and adequate sales and marketing skills
Barczak, 1995			A professional NPD process especially regarding screening of ideas Idea generation	
Calentoneet al, 1988		Marketing activities (resources and skills) Competitive marketing intelligence	Technical activities (technical resources and skills) Competitive and market intelligence	

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Cooper et al (1995)	NPD strategy		NPD process	Organisation, Culture and management commitment
Chiesa et al. (1996)			Systems and tools	Resource provision
Chakrabarti, 1974				Leadership Existence of a product champion
Dwyer et al, 1991		Test market, trial sell and market launch	Initial screening Preliminary market and technical assessment Product development Trial production	
Kotzbauer, 1992 cited from Ernst, 2002		Marketing impact (efficiency of marketing activities)	Planning quality prior to development, including identification of target market, customer requirements analysis, product concept developments, assessment of technical specification	
Maidique et al, 1984				Clearly identifiable product champion
Mishra et al, 1996		Market intelligence especially customer requirements and specifications, price sensitivity and competitor strategies	Proficiency of formal NPD processes especially regarding initial product screening, market research and in-house prototyping testing	
Parry et al, 1994		Market research and preliminary market assessment	Proficiency of process activities such as product development, financial analysis and initial product screening	

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Pinto et al, 1990			Cross-functional cooperation	
Rothwell et al, 1974		Strong customer orientation better understanding of customer needs, early indication of customer dissatisfaction, intensive customer training, update of customer information during NPD process	Careful project selection	Strength of management and characteristics Role of product champion
Song et al, 1997		Market information Market research proficiency	Proficiency of the predevelopment planning process Concept development and evaluation proficiency Technological information Cross-functional co- operation and cross- functional integration	Internal commitment (people dedicated to product success) Existence of product champion
Souder et al, 1997		Proficiency of marketing activities Marketing skills and knowledge about the market	Proficiency of technical activities Completeness of information exchanged during project	
Thamhain, 1990			Experienced and qualified project team	Team autonomy High team involvement and visibility Good communication
Voss, 1985				Good management practice especially regarding risk taking climate

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Verhaegdeet al 2002			Idea generation Technology acquisition Networking Development Commercialisation	
Yap et al, 1994				Ensuring high quality interdepartmental communication Recruiting influential product champion

APPENDIX 2: SUCCESS FACTORS FOR SERVICE INNOVATION

The following table provides an overview of the research conducted by various authors in service management and how they relate to four categories introduced by Montoya-Weiss et al (1994). Activities that were found to differentiate on performance in the service industry are shown below.

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Atuahene- Gima, (1995)		Proficiency of launch Marketing synergy	The use of new technology	HR strategy Good coordination and team work
Atuahene- Gima, (1996)			Market orientation as it relates to the project	
Berry, LL and Hensal, S. (1973)		Customer view Targeted market segments Behaviour change Customer risk (free- trial) Customer communication		

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Bortree (1991)		Product target market		
De Brentani (1989)		Understanding customer needs Proficient marketing	Proficient service delivery Internal marketing	
De Brentani (1991)		Market attractiveness	Proficiency of NSD process Overall product synergy Service offering factors such as innovativeness, quality of service and consumer-based	
De Brentani (1993)		Formal and extensive launch programme	Formal up-front design and evaluation Marketing and customer driven orientation towards NSD process	Supportive NSD environment with high-management involvement
De Brentani (1995)	Overall corporate synergy	Client need/market attractiveness	Effective NSD management Formal market-based NSD process Quality of service Expert/people based service	
Easingwood and Storey (1991)		Offering a differentiated product Product fit and internal marketing	Overall quality of product Use of technology	
Edgett (1996)		Preliminary market assessment Detailed marketing study	Initial screening Product Development Post-launch review	

Author	Category 1 Strategic factors	Category 2 Market-environment factors	Category 3: Development- process factors	Category 4 Organisational factors
Edgett and Jones (1991)		Clearly defined target market A strong launch campaign supported with sufficient funding Differentiated product	Thorough and well organised development process Effective performance by the product development manager	Assumption of product champion role by the product manager Strong top management support
Edgett and Parkinson (1994)	Synergy between market, product and company		Intra-organisational development across functions Rigorous NPD process	
Grden-Ellson et al (1986)	Commitment to product development and clear strategy for products	Customers should be used extensively for ideas generation and evaluation	Formal development process especially early stages Internal marketing and training to front-line staff	Promotion of teamwork to ensure cross-function coordination
Hodgson (1986)	Well-defined corporate vision Concentration on existing strengths	Better market knowledge (extensive research)	High quality and experience staff Clear objectives for the product.	Culture and systems to support the innovation process Accepting the limitations of available resources
Martin and Horne (1993)	Fit of services to current portfolio	Make better use of customers information		Ensure product champions manage launch phase