

# Insights from Architectural Elements of a Service Transformation Process— A Literature Review

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## Abstract

The transformation process is at the centre of the wider discipline of operations management. But whilst it is widely studied from both manufacturing and service perspectives, very few studies look at the underpinning relationships amongst its constituent parts. This paper seeks to enrich our understanding of linkages between customer input, service delivery system, and the service concept through a review of service operations management literature. The traditional service classification dimensions/theories are evaluated in light of the emergent information intensity aspect of virtual services. The emergent tentative insights are summarised in a conceptual framework.

## Keywords

Service Transformation Process, Information Intensive Services, Operations Management, Classification

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## 1. Introduction

Operations management (OM) literature is full of service classification characteristics and yet just scratching the surface as services continue to evolve (Lim et al., 2018). Lately, there are many OM researchers focusing on information processing service operations that are in their infancy (Lim & Maglio, 2018). Chase and Apte (2007) posit that service design frameworks in a virtual world (Girvan, 2018) are yet to receive sufficient consideration from an OM research perspective. Importantly, it is not clear how these characteristics relate to the service transformation process. Emergent seminal works such as the Service-Dominant Logic (Vargo & Lusch, 2004a) of marketing and the increasingly popular Unified Service Theory [UST] (Sampson & Froehle, 2006) of OM provide new scholarly

insights regarding the uniqueness of service operations in comparison to traditional manufacturing operations. However, the implication of these service ideas to the management of service delivery and the realisation of strategic competitiveness in this emergent business world remains empirically unclear. Business managers require insights that could help organise information about different services in a way that enhances strategic changes to the positioning of services. To enhance understanding of service design theories at the process level, the key process steps for each service offering ought to be summarised and compared in terms of managerial decisions. Overall it is hereby argued that services are understood or classified in terms of various service dimensions found in services marketing and service operations management (SOM) service classification literature (Shafti et al., 2007) or in terms of service positioning matrices that match service processes to service packages (Kellogg & Nie, 1995). These service classification schemes have limitations (Verma, 2000) that could be addressed by varying the unit of analysis from firm-level to transformation process level and by addressing the totality of the service concept rather than its discrete components. This paper purposes to look into the relationships, if any, between extant dimensions for classifying services and the architectural elements of a service process, including information intensive service (IIS) systems, via a review of OM literature. This paper is organised into sections; first, a review of underpinning classification constructs applied to classify services through various operations management theories, as found in the extant literature, is undertaken. Second, the various provisions of the service transformation process, as found in the literature, are reviewed with the aim of understanding important building blocks. Third, the findings of the two aforesaid literature review sections are summarised into a hypothetical framework, giving rise to tentative links between constituent elements of a service transformation process, the emergent insights therein are discussed and conclusions made.

## 2. Review of Dimensions and Theories of Service Classifications

Service classification relates to the categorisation of service organisations on the basis of shared commonalities. According to Hambrick, “to classify things is to know one or two key attributes about an object and then infer (sometimes reliably, sometimes not so reliably) other attributes of the object” (Hambrick, 1984: pp. 27). Wemmerlöv (1990) postulates that many problems in service management relate to inadequate study efforts toward the understanding of service classifications. Cook et al. (1999) highlighted the use of classifications in SOM theory building. There are many SOM classifications in literature based on numerous service characteristics/features. These characteristics are referred to as “service dimensions” (Silvestro et al., 1992). Given the many service dimensions, hundreds if not thousands of permutations of services are possible. Indeed Meyer et al. (1993) argue that increasing the number of dimensions makes clas-

sifications complex and unmanageable. To avoid complexity, two dimensional service classifications are the norm. However, trade-off between reality and simplification (Meyer et al., 1993) should be done cautiously because service classifications are by themselves not valuable but managerial insights therein are (Snyder et al. 1982) and thus service classifications should be matched with appropriate service delivery design attributes, i.e. "... once a service organization, or parts thereof, has been characterised, a set of matching organizational design attributes can be prescribed" (Wemmerlöv, 1990: p. 23). Service classifications aim at bringing out the management challenges inherent in different service classes and strategic positioning of services for productivity management (Shafti et al., 2007; Verma, 2000). Different service management researchers use different dimensions to classify services. Although there are several service models that categorise services, most of them are presented in the context of service marketing with a few in OM/SOM. In addition, since the discipline of economics long existed before the fields of marketing and operations management, it provides a good background to distinguishing manufacturing from services. Marketing and OM have borrowed and benefitted hugely from economists. Say (1803) defines economics as a discipline that addresses issues related to producing, distributing and consuming wealth. Wealth connotes abundance of goods and services that satisfy human needs and entails what operations management and marketing do. Traditionally, operations management (manufacturing) focused on production of goods whereas marketing focused on distribution of commodities as opposed to services. This outlook is known as goods dominant logic (GDL) and derives its roots from Smith (1776) (Vargo et al., 2008). GDL has been challenged by marketing researchers, claiming it is passé and thus suggested an alternative view referred to as service-dominant (S-D) logic (Vargo & Lusch, 2004a). Such efforts towards understanding the dominant and service skewed global economy are welcome. Fascinatingly, Sampson et al. (2010b) allude that the marketing S-D logic is deficient because it does not provide a theory of strategy (Porter, 1991). That it fails to address customer value realization and organizational failure and success and is not helpful to managerial decision making. Sampson et al. (2010b) observe that a service defining theory should not aim at breaking away from the 'goods' vantage point just for the sake of it, but should enhance understanding of services and subsequent effective and efficient delivery of those services.

Although production and operations management researchers have continually resisted autonomous study of service operations management (Nie & Kellogg, 1999), Sampson and Froehle (2006) developed an operations management perspective called the unified service theory (UST). The theory advocates for a middle ground perspective that distinguishes service processes from non-service processes in a way that aids decision making in organisations. According to Vargo & Lusch (2004a), GDL and S-D logics are at opposite ends of a continuum. The point of departure between the two logics is in the treatment of pro-

ductive resources. Whereas the 'hard' traditional factors of production (land, labour, capital and technology) are central to GDL, S-D logic is driven by the 'soft' resources such as skills and knowledge. Constantin and Lusch (1994) refer to 'hard' resources as operand resources because they are acted upon to produce the desired utility. Operant resources or 'soft' resources are employed to act on other resources (Constantin & Lusch, 1994). Proponents of GDL believe utility is entrenched in the physical output of the production system. This proposition implies that services are 'tertiary' or secondary to goods. The contrarian view by S-D logic is that value is co-created and that goods enrich value creation. Specific to OM though, there are three models that stand out; the IHIP (Intangibility, Heterogeneity, Inseparability and Perishability) model by Sasser et al. (1978), CCM (customer contact model) by Chase (1978) and unified services theory (UST) (Sampson & Froehle, 2006). In addition, information intensiveness is now considered a key dimension in virtual services.

### 2.1. Unified Services Theory

The unified services theory (UST) is founded on the premise that service processes are distinguishable from non-service processes (Sampson & Froehle, 2006). According to UST, the difference between a service process and a manufacturing process is explained by presence or absence of inputs brought into the transformation process by the customer. This observation echoes the heterogeneity dimension which is defined in terms of either; the level of service complexity, the composition of a service in terms of number of activities from its start to finish, and the nature of inputs that are transformed in delivery of that service which could be customers, information or materials (Hill, 2005). UST states that customer inputs are not only the sole necessary conditions for distinguishing service processes from non-service (manufacturing) processes but are undeniably sufficient (Sampson & Froehle, 2006). Furthermore, Sampson et al. (2010a, 2010b) propose that value and innovation are inherent to service process activities. These activities are the deoxyribonucleic acid (DNA) of a service process. Indeed, the strength of UST is in its possession of theory of strategy, meaning it not only provides an explanation of what comprises of service processes but supports decision making (Sampson & Froehle, 2006). UST is founded on the central theme that the presence and implications thereof of customer inputs, distinguish non-service process from service process. UST also relates to concept of co-production which is widely covered in service operations literature. Customers bring three inputs to the production or delivery system; their body/mind through direct interaction, their goods or their information (Sampson & Froehle, 2006) through surrogate interaction (Sampson, 2012b). UST considers service as processes (Shostack, 1987) rather than outcomes (Harvey, 1998) and these processes make use of inputs brought by customers. The UST suggests that optimal service delivery systems can be realised only if service operations managers distinguish between service processes and non-services processes.

## 2.2. IHIP Model

This model consists of four characteristics; Intangibility, Heterogeneity, Inseparability and Perishability (IHIP), that distinguish manufactured goods from service products. The model's four characteristics do not originate from marketing and operations disciplines but are traced to classical and neoclassical economics (Lovelock & Gummesson, 2004). The four characteristics were not always referred to using those exact words. For instance, intangibility was referred to as immateriality (Lovelock & Gummesson, 2004). However, the first authors to have all the four constructs as a set were Sasser et al. (1978) although inseparability was termed simultaneity. According to the IHIP model, 1) Intangibility is the most unique characteristic of services (Edgett & Parkinson, 1993) and is defined in terms of absence of sensory dimensions such as smell, touch, see and hear (Bateson, 1977; Sasser et al., 1978). This means services can neither be taken home after purchase nor dropped to the floor. 2) Heterogeneity means that services exhibit variability both inter- and intra-organisation and between individual employees (Sasser et al., 1978). Lovelock and Gummesson (2004) believe the word variability is more suitable than heterogeneity. To service providers, variability is a challenge to service standardisation attempts and realization of consistent performance from time to time (Edgett & Parkinson, 1993; Zeithaml et al., 1985). 3) Inseparability in services means that production and consumption happen simultaneously. In other words, the service provider has to physically interact with the service consumer during service delivery (Kotler, 1982). 4) Perishability means that unlike goods, services cannot be produced and stored for use in future (Edgett & Parkinson, 1993). Therefore demand and capacity management should be well managed to ensure optimal value to the service provider.

Lately, the IHIP model has encountered criticism from Lovelock and Gummesson (2004), Vargo & Lusch (2004b) and other researchers. Lovelock and Gummesson (2004) contend that the IHIP characteristics are not generalizable to all services just like the antonymous characteristics are not applicable to all goods. It is therefore flawed to distinguish services from material goods using the IHIP model (Lovelock & Gummesson, 2004). Nie and Kellogg (1999) posit that although intangibility is the most important service marketing dimension, operations management decision making is dominated by customer influence. Spring and Araujo (2009) are of the view that the IHIP model aggravates the residual definition of services (Judd, 1964) because the four characteristics are antonymous characteristics of material goods. Given the criticism against the IHIP model, this paper reviews literature on other relevant service characteristics, more so from an IIS perspective (see Section 2.4). In a paper about OM in information intensive economy, Karmarkar and Apte (2007) opine that the IHIP characteristics; particularly intangibility and inseparability, do not apply to information services. They observe that: "There are numerous other examples of information processes that combine characteristics of both services and "manufacturing" in that they exhibit some or all of tangibility, remote delivery, inven-

tories, and the decoupling of production and consumption” (Karmarkar & Apte, 2007: p. 446).

### 2.3. Customer Contact Model

The role of the customer in understanding of services and service process is well researched on in OM. In a survey of studies undertaken by OM scholars, Nie and Kellogg (1999) found that customer influence had the most impact on organisational operations when compared to labour intensity and the four IHIP characteristics. Customer contact model (Chase, 1978, 1981; Chase & Tansik, 1983) classifies service delivery systems on the basis of extent of customer contact, which ranges from high to low. Whereas Chase (1978) defined customer contact as “the physical presence of the customer in the system” (Chase, 1978: p. 138), Chase (1981) definition of facility efficiency presents customer contact as proportion of time in which the customer has direct contact with the service delivery system to the total time taken to create the service. The thesis of the contact model is that potential for efficiency of service delivery system is contingent on the level of customer contact. Higher level of customer contact implies lower service delivery efficiency. Chase (1981) provided twelve propositions about high contact service delivery systems. These propositions relate to service process characteristics ranging from people skills, performance measurement, reward systems, service location, capacity-demand considerations, and so on. The propositions suggest that the technical core of the main transformation process should be insulated from external environmental forces to ensure consistency in production throughput and quality (Chase, 1981). This alludes to the need to embrace decoupling strategy. Decoupling is associated with separating the front-office (FO), point of interaction with the customer, from the back-office (BO), internal operations that are invisible to the customer. The customer contact model “... seeks to specify how to decouple and regroup organizational subunits in services in light of the unique influence that the physical presence of the customer has on the operation of the organization” (Chase and Tansik, 1983: p. 1037).

### 2.4. Information Intensiveness Dimension

Although transition of economies from agriculture to manufacturing to services is not a recent occurrence, the evolution of service sector from ‘material’ services to ‘information’ services is on-going (Godin, 2008; Karmarkar & Apte, 2007). This kind of service segmentation connotes service heterogeneity characteristic (Sasser et al., 1978) and explains inconsistencies in services (Lovelock & Gummesson, 2004). Literal reading means ‘material’ services are high in physical element whilst ‘information’ services entail information exchange (Morris & Johnston, 1987). While this could be correct, the detailed meaning is much more complex. In addition to material and information aspects of services, the other important classification dimension is customer contact. Most traditional OM service classification schemes and the classical transformation process are based



on customer contact. As highlighted in Section 2.3, seminal service(s) studies such as Chase (1978), Maister and Lovelock (1982), Lovelock (1983), Schmenner (1986), Shostack (1987), Silvestro et al. (1992), and Kellogg and Nie (1995) are based on customer contact or its variant customer interaction/influence. Since most of the service classifications schemes were developed pre-internet (Chase & Apte, 2007), customer contact and interaction were understood to be the most important dimensions in service process design. However, there are research studies such as Lovelock (1983), Morris and Johnston (1987), Perrow (1967), Wemmerlöv (1990), Apte and Mason (1995), and Sampson and Froehle (2006) that go beyond customer contact. These studies consider three dimensions; interaction, information intensity and physical [material] manipulations in classifying services. For information intensive services, customer inputs as well as other inputs are provided in form of instructions, requests or documentations. Service provision entails the provider pooling complete set of relevant information and data about the customer requirements and delivering them in timely and accurate manner (Ojasalo, 2002). An economy dominated by information intensive services is referred to as information economy, implying that the nature of resource inputs and inherent processing manipulations into customer required outputs are informational. Early efforts towards understanding the structure and size of information economies were undertaken in the U.S by Machlup (1962) and Porat and Rubin (1977). The two studies, however, are incommensurable because whilst Porat and Rubin (1977) adopted the U.S income accounting framework to measure the service sector, Machlup (1962) used a varied version of the framework (Karmarkar & Apte, 2007). More recently, Apte and Nath (2007) conducted a study following Porat and Rubin (1977)'s approach to estimate the contribution of the information sector to the U.S GNP. An example of emergent information sector is the service offshoring and internationalisation. The increasing opportunities and capability for automating and digitizing service processes known as business process standardisation (Wullenweber et al., 2008) has led to growth of service offshoring. These advances are enabled by internet connectivity supported by high speed fibre, improved bandwidth connections and standard software like SAP and Oracle. According to Clark Jr. et al. (1995), the allure to source information services to other countries can be explained by four dominant forces: 1) Technological forces; 2) Technological management forces; 3) Industry considerations; and 4) Organizational forces. Clark Jr. et al. (1995) classify technological forces into two groups; service enablers and demand enhancers. Service enablers refer to information systems and technologies that enable service commoditization (Davenport, 2005; Sampson, 2012a; Sen & Shiel, 2006) allowing therein standardized services to be accessed by wide-ranging customers. Service enablers may as well refer to the technology that supports the firm's organization ability, e.g., technologies that distinguish management from operations and from delivery of information services (Clark Jr. et al., 1995). Demand enhancers relate to the rationale and reasons for increased global offshoring. These are threefold; i) technology has made it easy for

the head-quarter or clients to manage remote operations (Stratman, 2008), ii) the increased competitive pressure such as customers demanding variety in products requires that providers share skills, technology and resources along supply chains or in some instances with competitors, a concept prevalently referred to as co-competition (Wilhelm, 2011), and iii) the locational benefits (Aksin & Masini, 2008; Lewin & Peeters, 2006). The foremost locational driver of offshoring is cost arbitrage (Metters, 2008; Metters & Verma, 2008; Namasivayam, 2004) which is well pronounced by transaction cost economics (Williamson, 1979). Since offshored work is highly labour-intensive and labour cost indices show huge price differentials across countries, collocation of work from developed to developing countries realises cost arbitrage (Apte & Mason, 1995). Cost arbitrage in outsourcing arises from economies of scale and scope enjoyed by the service providers (Levina & Ross, 2003; Loh & Venkatraman, 1992). Secondly, for complex knowledge services the rationale is far from cost advantages (Youngdahl & Ramaswamy, 2008) but allied to access of specialised professional skills (Apte & Mason, 1995; Namasivayam, 2004; Sen & Shiel, 2006; Zhang et al., 2008). Thirdly, as noted by Zhang et al. (2008), access to new markets is one of the main driving forces for global engineering networks (GENs)/captive centres. Hence, offshoring gives firms in developed countries foothold to markets with high growth potential in emerging countries (Apte & Mason, 1995). Fourthly, reduced turnaround time benefits due to time zone difference (Bhat et al., 2010; Quinn, 1992) are considered in offshore decision. For instance, Nairobi has a 7 hour time zone difference with respect to Washington, DC, USA and as many as 13+ hours with respect to Honolulu in Hawaii, USA. Further, some countries such as Ireland and several Caribbean countries, provide irresistible tax advantages making global clients, particularly U.S firms, to offshore outsource from such destinations (Metters & Verma, 2008). Technology management forces relate to general trends in the world of information technology. Industry forces are about occurrences such as emergent third party providers and increased number of talents leaving institutions of higher learning. Organizational forces relate to internal happenings within outsourcing client entities.

#### *What then is an IIS?*

Metters (2008) studied the idea of offshoring and outsourcing of electronically transmitted services and combined the concept of outsourcing/offshoring with service information intensiveness to develop the concept of outsourced information intensive services. Similarly, a priori, though topsy-turvy, an IIS is defined as a service that meets the threshold of information intensiveness (Apte & Mason, 1995) and can effectively and efficiently be delivered, meaning IIS have highest proportion of total activity processing time spent working on information and the remainder of the time is spent on either physical manipulation, interacting with the customer or unnecessary activities.

### **3. Review on the Service Process**

The strategic planning landscape of SOM, involves finding the right alignment

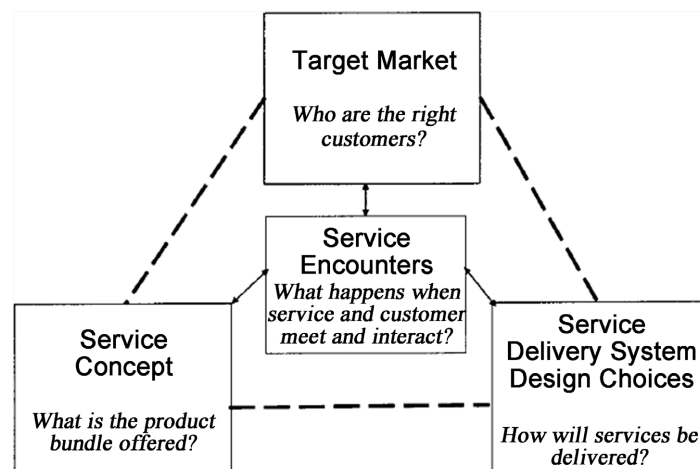


of three architectural elements of the service transformation process (**Figure 1**); target market, service concept and service delivery system design (Heskett et al., 1997; Metters et al., 2009; Roth & Menor, 2003).

### 3.1. Service Delivery System

Service delivery process is the means to realisation of service value through technology (Kingman-Brundage, 1991). Process strategy comprises the way organizations compete through effective and efficient utilisation of resources, process changes and adjustments, customer handling and vertical integration (Russell & Taylor, 2003). Several management study disciplines such as marketing, OM and SOM have addressed delivery process design decisions, with each having own outlook. Marketing researchers are mainly concerned with designing product/service exchange systems that support information sharing and customer satisfaction to win and retain customers. OM has varied literature about manufacturing processes with emphasis on flexibility of production equipment, assembly and customization technologies. SOM studies highlight the distinguishing features of service designs in high-to-low customer contact systems, focusing on service design issues; structural and infrastructural at a highly generic level (Chase, 1978). At the operational level, service delivery systems articulate technical as well as business dimensions (Hill, 2005). Engineering, research and development and information technology experts are responsible for the technical part while operations management is concerned with how the business dimension supports integration of process technology with people skills, knowledge and other operand resources to meet organizational and market needs (Hill, 2005).

Similar to manufacturing systems (Slack, 1989), dimensions of service delivery systems entail a configuration of two interactive resource clusters; structural resources, and infrastructural resources (Johansson & Olhager, 2004; Quinn, 1992; Roth & Menor, 2003; Tax & Stuart, 1997). Structural resources involve the hardware aspects of the service delivery system including technology, facility layout/location, and equipment. Infrastructural resources involve the ‘soft’ or



**Figure 1.** Basics of operations strategy (Roth & Menor, 2003: p. 147).

behavioural/people aspects of the service delivery system including employee skills, discretion/empowerment, hiring, and training. In attempting to better understand service delivery process from specific dimensions, the dimensions relevant to this paper are discussed next.

### **3.1.1. Employee Skills**

Following the definition that service processes are actions that integrate resources to create value, employee skills and knowledge could be defined as operant resources (Constantin & Lusch, 1994) because they are used in processing of other resources. The CCM categorises employee skills according to technical complexity dimension such that those skills that are used at the BO are referred to as technical skills while those utilised at the FO are termed interpersonal skills. Diagnostic skills cut across the BO-FO configuration and entail experience and knowledge necessary for decision making. In order to compare different service systems, employee skill levels are measured in a high-low continuum scale. Indeed, the main distinguishing characteristic of knowledge as well as professional services from other services is the level of skills utilised during service delivery (Miles et al., 1995). Educational qualifications such as degree, diploma, certificate and high school achieved are surrogate measures of employee skill levels.

### **3.1.2. Employee Discretion**

Employee discretion is defined in terms of choices made by employees in developing optimal procedures for undertaking tasks (March & Simon, 1958). It is the level of personal judgement allowed to employees during their work (Rolfe, 1990). Whereas marketing discipline associates employee discretion with the concept of employee empowerment (Kelley, 1993), OM considers it as an important service design dimension (Silvestro et al., 1992). However, its implications to service operations practice are still unclear (Bowen & Lawler III, 1995). This construct is measured by evaluating the degree of personal judgement allowed to employees executing different service processes. It could be realised by answering the question ‘do employees follow pre-conceived decision making templates, do they escalate decisions to supervisors/seniors and to what extent they make decisions?’

### **3.1.3. Employee Hiring and Training**

Schmenner (1986) considers hiring and training of employees as major challenges facing service operations managers. Roth and Menor (2003) suggest that this infrastructural question ought to be addressed through carefully crafted virtuous cycle. Hiring is the process whereby right employees are identified and selected for employment before commencement of requisite training. According to Kellogg and Nie (1995), different service processes demand distinct kinds of hiring and training procedures. For instance, hiring and training for business process outsourcing (BPO) firms is unique because process tasks are undertaken as service delivery goes on (Bhasin, 2011) i.e. to successfully deliver BPO/ITES

(information technology enabled services) services, for every newly secured client, employees are hired and trained. Hiring entails screening potential employees in-house or delegating to third party firms whilst training involves interdisciplinary tasks, interpersonal skills or repetitive versus skill based tasks (Kellogg & Nie, 1995).

#### **3.1.4. Technology**

According to Levitt (1976), services are industrialised using hard, soft or hybrid technologies. The mix of technologies requires different combinations and organisations of people, machinery, tools and procedures, connoting complexity of services and level of quality of service delivery. Perrow (1970) suggested that complex services have high degree of task variability and little analysability. Hill (2005) defines service complexity in terms of the number of steps that make up the end-to-end service process, similar to Sampson et al. (2010a)'s process DNA concept.

Other SOM authors have argued that value (innovation) in service delivery can be realised by choreographing technology on critical but problematic steps (Edvardsson & Olsson, 1996) or moving some steps from the FO into the BO through a procedure known as service commoditization. Alternatively, the contrary procedure referred to as service disintermediation could be undertaken whereby some activities are moved from BO into the FO (Sampson, 2012a). In Thompson (1998)'s words, BO steps are controllable and easy to optimise whereas FO steps are uncontrollable and are affected by customer demand heterogeneity. In other words, service innovation is achieved by breaking down complex services into intrinsic activities and subsequently reconfiguring the relations, shape, direction and interdependencies between activities. This resonates well with supply chain design principles where value is realised through the configuration decision (Slack et al., 2010a). The decision entails changing the shape of or cutting off some players from the network. To capture process steps, this study will adopt the process chain network (PCN) diagram (Sampson, 2012b) in laying down the process steps for each study case. The PCN diagram shows the process steps for which the service provider has absolute control and where control is shared with the customer. Specifically, the processes that entail direct interaction with the customer, surrogate interaction with the customer's resources and those that are independently processed by the provider (Sampson, 2012b) are captured. For each process category, the explicit process design features are identified. Technology is measured on the basis of whether it is designed to deliver effective or efficient services (Kellogg & Nie, 1995) or in terms of process automation; labour vis-à-vis equipment.

#### **3.1.5. Facilities**

Two important aspects of the facility infrastructure are found in SOM literature: Facility layout is related to the BO-FO decoupling decision whereby high customer contact service systems are laid out for different objectives [SOM objec-

tives are defined under service concept] from low customer contact systems. This construct is evaluated by answering the questions; ‘what is the motivation behind facility arrangement and set-up?’ and ‘does layout take customer or internal outlook?’ Facility location is a decision regarding proximity of the service delivery system to customers, labour, infrastructure and centralisation/decentralisation concept. This concept is measured by evaluating where service processing takes place and the reason why it matters to clients.

### 3.2. Target Market

Target market entails entities that potentially derive benefits from a service offering i.e. customers. It sets the external context [such as volume implications, service mix, order winners and qualifiers] against which internal operations processes are defined (Hill & Hill, 2012). Customers not only differ in demographics, psychographics and demands but also in terms of their roles within the service life cycle; providing ideas and stating demands during NSD process, integrating resources in the transformation process, and receiving service outputs. As such, customers’ surrogates such as type of customer inputs, type of customer inputs variability brought into the firm’s service delivery system (Frei, 2006) and volume of customer inputs (Silvestro et al., 1992) should be clearly understood.

#### *Customer Inputs*

According to the unified service theory, service firms process customers’ possessions. These possessions are either the customers themselves (body or mind) or their physical commodities or information. Sampson (2012b) refers to relationships where service providing firms act on customers’ bodies or minds as direct interactions whereas those that process customers’ commodity or information as surrogate interactions. This means that direct interactions entail processing of customers’ “self” inputs i.e. the customer is present in-person or indirectly (Apte & Mason, 1995) whilst surrogate or symbolic interactions process “non-self” customer inputs (Sampson & Froehle, 2006). If not well managed, customer inputs could cause disturbance to the service delivery system leading to inefficiencies (Chase, 1978). Disturbance, also referred to as variability (Buzacott, 2000) is of five different types: 1) customer arrival variability i.e. random customer arrival times leading to differences; 2) customer request variability i.e. scope of variety in customer demands; 3) customer capability variability i.e. customers possess different levels of ability; 4) customer effort variability i.e. customers exertion, toil and energy used during the process; and 5) customer subjective preference variability i.e. customer’s perception and thus satisfaction is personal (Frei, 2006). Larsson and Bowen (1989) suggest that variabilities arise because provider organizations lack complete information regarding what the customers may want, how they may want it processed, when they may want it delivered, and from what location. According to the current study, these aspects are consistent with Frei’s categorization of variability. The ‘what’ aspect takes after request variability, the ‘when’ is about arrival, whereas the ‘how’ explains customer capability differences. Consequently, these three categorises are con-

sidered relevant and will be addressed in the study.

Other important customer input dimensions found in literature are; i) service variety and volume (Silvestro et al., 1992) and, ii) emergent concept of service triads. Service variety relates to the number of products on offer to the customer, similar to the customer's choices dimension. As such, variety is a suitable dimension of service concept/package (Kellogg & Nie, 1995), because it helps establish whether service offerings differ [or otherwise] in terms of volume of customer inputs. Silvestro et al. (1992) define volume in terms of number of customers. For this study, the definition is slightly varied to include customer time and effort (De Ruyter & Wetzels, 2000; Johnston & Clark, 2001) utilised during the co-production process. Service triad refers to existence of three players in an outsourcing relationship; client, service provider and the consumer. First to address this concept were Niranjana and Metri (2008) in a study of service quality aspects in outsourcing scene. The concept has been embraced by scholars in purchasing and supply management resulting to several peer reviewed journal articles (Choi & Wu, 2009; Dubois & Fredriksson, 2008; Li & Choi, 2009; Van Der Valk & Van Iwaarden, 2011; Williamson, 2008). More recently the concept has elicited interest in operations management. For instance, in 2015 there was a call in the Journal of Operations Management for researchers to consider studies in service triads. Relevant to the extant study is the observation by Wynstra et al. (2015) that shifting the unit of analysis in studies from a dyad to a triad could bring forth new insights to SOM. Indeed, Menor and Johnson (2012) theorized the applicability of service management and SOM concepts to the concept of service triads and more so in outsourced context. They were alive to the fact that the service provider is faced with two sets of customer demands; one from the client with whom the provider has signed a contract and, the other from the customer who has the penultimate say about quality and utility of the service offering. This put together with the need to address the above question (Wynstra et al. 2015), implies that the triadic nature of services is an important customer input dimension.

### 3.3. Service Concept

Roth and Menor (2003) scent trail the term service concept to Sasser et al. (1978)'s SOM textbook that defines service concept as the sum of relative utility inherent in each component of the service bundle offered to the consumer. Johnston and Clark (2008) suggest that service concept has two views; (i) as viewed by customers in evaluating services before procuring, and (ii) as viewed by the service provider in measuring the value of the service product. Service concept supports the provider entity during: integration of various organisational departments that deliver the service; evaluation of considered adjustments to the service delivery system; and driving organisational competitive priorities (Johnston & Clark, 2008). The service concept ensures integration of customer requirements with provider resources such as people, technological configurations and process flows. Goldstein et al. (2002) explain the meaning of service concept and show

how it contributes to the design of service delivery systems. Borrowing from [Edvardsson and Olsson \(1996\)](#), service concept should be viewed in light of the ‘what’ of the customer and the ‘how’ of the provider. In other words, providers of services should be clear about what needs to be done to satisfy customers and how it should be done ([Roth & Menor, 2003](#)). [Kellogg & Nie \(1995\)](#) describe service creation, design and delivery in terms of customer influence and service concept by level of customization. Nonetheless, there seems to be variations in these definitions ([Fynes & Lally, 2008](#)). For example, service concept is defined as the organisational proposition to customers ([Heskett, 1986](#)), detailed layout of what the customers want and how they want it delivered ([Edvardsson & Olsson, 1996](#)) or the unifying factor of service marketing and service operations deliverables ([Goldstein et al., 2002](#)). To illustrate this diversity of definitions, the following quotes have been extracted from SOM literature:

- “The design of the service delivery system should support the realisation of the service concept ([Heskett et al., 1990](#); [Clark et al., 2000](#); [Johnston & Clark, 2001](#))” ([Silvestro & Silvestro, 2003](#): p. 402) .
- “The service concept (and its development) is a core task in managing service operations. It can be used as a central tool in the design, delivery and improvement of services, yet its potential is often underutilised” ([Johnston & Clark, 2005](#): p. 37).
- “The service concept defines the how and the what of service design, and helps mediate between customer needs and an organization’s strategic intent” ([Goldstein et al., 2002](#): p. 121).

The many meanings attached to the term service concept, as exemplified by the three quotes above, arise from the interdisciplinary composition of the authors; some taking the service marketing standpoint and others the SOM perspective. The first quote takes the view that customer demands are supreme but ignores fundamental organisational objectives that should be achieved, going against observations made in the service profit chain ([Heskett et al., 1994](#)) that an organisation has to grow revenue and register profits in addition to meeting customer needs. It implies that service concept is an outcome, akin to the view by [Sasser et al. \(1978\)](#) that the main elements of service concept include physical items, sensual and psychological benefits, facilitating information and peripheral/supporting services ([Edvardsson & Olsson, 1996](#); [Roth & Menor, 2003](#)) that are offered to the customer. The second quote combines what of customer demands with how aspect of service delivery suggesting total service view is the best way of defining service concept. The definition of service concept by [Johnston and Clark \(2008\)](#) fits this thinking because it includes the aspects of: service operations—how the service is delivered; customer direct experiences during the interaction phase; service outcome—benefits realised by the customer, and; perceptions of the customer about value. This definition is well suited to recent calls for interdisciplinary service research ([Ostrom et al., 2010](#)) since it uses notion of service concept to integrate service marketing with service operations ([Karmarkar, 1996](#); [Tatikonda & Montoya-Weiss, 2001](#)). The third quote just like



the second, advocates for a definition of service concept that incorporates both the process and the outcome but with each having own ground. It breaks down the elements of the service concept, as presented in the second view, into respective constituent parts (Goldstein et al., 2002) leading to a spectrum of customised-standardised service concepts (Ponsignon et al., 2011). Indeed, Apte and Vepsäläinen (1993) classify financial services, into mass transaction services and customised services, based on this view, suggesting that the extent of value of services [as perceived by consumers] is an important service classification dimension (Tinnilä & Vepsäläinen, 1995). This final view, as explained by Johnston and Clark (2008), is applicable to operational [micro] level of study.

Traditionally, OM views value from operations performance objectives lenses whereas customisation connotes ability of a firm to match and deliver products as required by individual clients. Skaggs and Huffman (2003) refer to a firm's ability to customise as service adaptability. Another service offering differentiating mechanisms found in literature is service focus (Johnston, 1996; Skaggs & Huffman, 2003), connoting a firm's extent or breadth of specialisation in a service offering as compared to competitors.

### 3.3.1. Operations Performance Objectives

These are measured through competitive priorities such as cost, quality, speed, flexibility, innovation and dependability (Slack et al., 2010b). Debate on whether an organisation can competitively deliver all the objectives simultaneously (Hill, 2005; Skinner, 1974) is as old as operations management and is beyond the scope of this study. In relation to service outsourcing, cost dimension is the most studied (Levina & Ross, 2003). Indeed from ITES perspective, Stauss and Jedrassczyk (2008) observe, performance can be evaluated in terms of the central maxim of the process which could be cost orientation vis-à-vis customer service orientation. Customer service orientation stands for factors beyond cost benefits i.e. a concoction of other competitive priorities including quality, speed and innovation. In this paper, the term 'service' as an operational objective is defined as advocated by Metters and Vargas (2000): "... the collection of service concepts that are distinct from a cost minimization perspective ... we intend to capture the various non-cost minimization strategies that have been articulated" (Metters & Vargas, 2000: p. 665).

However, the consumer perspective is conventionally, particularly in economics, two dimensional; consumers as individuals and consumers as firms (Patinkin, 1973) with marketing establishing it through the Industrial Marketing and Purchasing (IMP) group (Ford et al., 2003). OM researchers also believe utility should be viewed from the perspectives of both the provider and the consumer (Roth & Menor, 2003) but seem to largely interpret service concept from the consumer as an individual view with little research in B2B sphere (Staughton & Johnston, 2005). For this study, since most outsourced relationships are B2B notwithstanding the B2C element in delivery of services that are triadic in nature, the service operational objective category will be captured through the ge-

neric dimensions of B2B relationships (Staughton & Johnston, 2005).

### 3.3.2. Service Adaptability

This concept addresses degree of standardisation vis-à-vis customization (Skaggs & Huffman, 2003) of the service concept. High adaptability is present if service process is tailored to meet discrete customer requirements (Silvestro et al., 1992). Service processes delivering services whose characteristics are known a priori without direct influence of the customer suggest standardised service concept (Sousa & Voss, 2001). This construct is measured by evaluating the extent of process alteration to meet specific client requirements, customer say or influence during co-production and comparison of the service offering from client-to-client.

### 3.3.3. Service Focus

Is defined as “a narrow product mix for a particular market niche” (Skinner, 1974: p. 114). An organisation can choose to focus on any of the five methodical levels; service encounter, delivery system, site, business or service concept level (Johnston, 1996). At service concept level, four service concepts are identified based on two dimensions of focus—target customer segments served and range of services offered (Heskett et al., 1990), **Figure 2**. The resultant four service concepts are: service focused, providing few services to many markets; market focused, providing numerous services to few target groups in the market; service and market focused, providing few services to few specific groups in the market; and unfocused, providing wide range of services to many markets.

## 4. Links between Constituent Elements of a Service Transformation Process

It is clear, from the previous sections, that none of the service classification theories, UST, IHIP model and customer contact model relates service classification dimensions to three architectural elements of the service transformation process. Individual components are addressed paying little attention to intra the constructs linkages (Goldstein et al., 2002; Silvestro & Silvestro, 2003; Zomerdijk and Vries, 2007), leading to study outcomes that lack theory of strategy (Porter, 1991). For instance, the UST argues that customer inputs sufficiently distinguish service processes from manufacturing. The IHIP model compares incomparable features of the service delivery process with those of the service package and customer

Number of markets served	many	Service focused	Unfocused Everything for everyone
	few	Service and market focused	Market focused
		narrow	wide

**Range of services**

**Figure 2.** Service Concepts based on Focus (Johnston, 1996).

inputs giving rise to questions such as does intangibility refer to abstract nature of inputs (such as knowledge and skills) or outputs which could also be intangible? While it addresses aspects of the three constructs, the customer contact model does not consider customer dimensions such as information intensity. *Armistead et al. (1995: p. 47)* posit that OM as a “... subject is based on the concept of managing the transformation process”. Although, separately, the three architectural elements of the input-transformation-output model continue to get attention from SOM researchers, the research is at infancy and lacks clarity on the interdependencies among the elements (*Kellogg & Nie, 1995; Ponsignon et al., 2011; Wemmerlöv, 1990*). For instance, the following four operations-managerial issues/questions, deduced from the transformation model, are relevant to contemporary SOM and should be studied: i) each of the three architectural elements has features that distinguish manufacturing from service operations. Deconstruction of the delivery system into inputs or resources [the what] and delivery process [the how] constituent parts is important (*Goldstein et al., 2002*) and as such the transformation process should be understood as a package (*Sasser et al., 1978*). Other than that, the IHIP service model, for instance, compares aspects of different components that belong to different phases of the transformation model (*Laine et al., 2006*), ii) there are three types of transformed resources; materials, information and customers. According to *Wemmerlöv (1990)* and *Morris and Johnston (1987)*, material-transforming operations (MPO), information-processing operations (IPO) and customer-processing operations (CPO) should be managed differently. Whereas manufacturing transformation processes are largely MPO (*Morris & Johnston, 1987*), service operations are associated with CPO (*Chase, 1978*). The unified service theory (UST) argues that customer inputs brought into transformation process distinguish service from non-service processes (*Sampson & Froehle, 2006*) and that the inputs are either customer themselves, their possessions or information (*Sampson & Froehle, 2006*). Little research is directed towards the IPO context, specifically in relation to integration of inputs (resources), service delivery process and service product (outcome), (iii) characteristics of the service delivery phase are widely documented in manufacturing and traditional SOM research. *Hayes and Wheelwright (1979)* introduced process life cycle stages, showing relation between product phases. *Hill (2000)* developed a matrix linking manufacturing process characteristics to market requirements based on activity level. Characteristics related to nature of service are outlined in SOM literature (*Buzacott, 2000; Chase, 1981; Johansson & Olhager, 2004; Kellogg & Nie, 1995; Maister & Lovelock, 1982; Schmenner, 1986; Silvestro et al., 1992*) and used to classify services., and (iv) due to business process reengineering movement of 1990s (*Hammer & Champy, 1993*), the concept of transformation process has continued to gain prominence (*Hammer, 2007*).

SOM positioning matrices are used to match attributes of the service product to characteristics of the process with the aim of establishing optimal performance mix (*Collier & Meyer, 2000*). While in practice the process dimension inte-

grates the service firm's own production factors with the external uncertainties arising from customer introducing themselves into the process to effectively deliver the expected customer outcome (Bullinger et al., 2003), studies of interdependencies between what and how aspects of service design (Goldstein et al., 2002) emphasis structural and infrastructural components of the process dimension with little acknowledgement of specific customer dynamics. Sampson and Froehle (2006) argue that the nature of customer inputs provides sufficient background in definition of service processes. Similar arguments have been put forth regarding significance influence that the level of customization has on service package (Ponsignon et al., 2011; Zomerdijk & Vries, 2007). Empirical evidence suggests that the level of service customization is inversely related to degree of mechanisation i.e. highly customized services are better delivered through "people-based" rather than "equipment-based" service operations systems (Apte & Vepsäläinen, 1993; Huete & Roth, 1988; Ponsignon et al., 2011). Degree of mechanization denotes extent to which service processes are automated as well as employees' skill levels requirements (Thomas, 1978). Wemmerlöv (1990) in explaining the implications of service concept on service design considers technology as an important consideration. But even more important is customer contact which is the pre-dominant dimension in financial service operations studies. The thesis is that physical presence of the customer in service delivery system impacts operations efficiency leading to high operational costs. Technology in its simplest and original sense means everything that is used in the operational transformation process. In other words, it entails all "the work done in organizations" (Perrow, 1967, 1970). These routine processes can be characterised by rigidity and fluidity attributes (Wemmerlöv, 1990). Wemmerlöv (1990) provides broad and diverse service classification scheme that encompasses most of the service attributes presented by other SOM authors. Rigid service processes offer customers few task choices, do not require high levels of technical knowledge, are largely undertaken at the BO, workers have little room for deviating from work processes and procedures, customer demand is fairly homogeneous, can undertake several customers simultaneously and do not take long time to deliver. On the other hand, fluid service processes offer customers many task pathways, require high levels of technical knowledge, high degree of coupling between the service provider's employees and the customers, workers have more discretion, customer demand is fairly heterogeneous, and can serve only a single customer at a time and take long time to deliver. In theory, it seems easy and obvious that the three constructs should be consistently aligned. In reality however, alignment is difficult to achieve. The value of the alignment in understanding services deserves special attention, more so in emergent information intensive service market spaces.

Ponsignon et al. (2012) refer to findings of an empirical study done by Ponsignon et al. (2011) that suggested service process design is contingent upon service concept and customer inputs. They identify several SOM studies that relate

service concept to service process design. Sasser et al. (1978) are accredited for developing the idea and coining the name service concept. Their contribution was that service operations managers should not only define organisation's offerings in terms of the holistic package offered to customers but the relative value of each single component inherent to the package. The service offering should be linked to the service delivery system and the performance expectations of the customers. Internal operations should be detached from the customer with requisite alignment mediated by marketing function. Heskett (1986)'s strategic service vision model is centered on linear relationship flow from the target market to service concept to OM strategy to service delivery system, respectively mediated by market positioning, policies and procedures, and integration. Central to the model is that the service concept considers both the external demands of the customers and the internal process capabilities of the organisation. It is argued that high performing firms need to replicate the model internally with the employees taking the place of the target market/customers. Internal process capabilities entail paying attention to the role of employees. Kingman-Brundage et al. (1995) posit that any SOM logic that does not integrate all the components of the service system; the service logic and industrial logic drives organisational performance southwards. They propose a service logic that brings together the customer, employees and work procedures, programs and policies. The model brings out two perspectives of customer influence; (i) as consumers, customers are interested in knowing how to get what they want, and (ii) as co-producers, their role and how they should undertake it. Kingman-Brundage et al. (1995) were of the view that service concept, although should be integrated to, is independent of the service process. They emphasise the role of employees and importance of recruitment, training and motivation to service system design. Edvardsson and Olsson (1996) give insights about prerequisites in design of quality services and argue that the customer should be the centre of focus. They identify service concept, service system and service process as necessary prerequisites that should be ring-fenced by customer orientation [customer outcome and customer process]. Since the customer process delivers customer outcome/value, it could be inferred that customer outcome influences customer process. As earlier observed, a customer process entails aspects of co-production as well as service encounter and interaction which connote that customer provided inputs are influenced by the expected service outcomes. Edvardsson and Olsson look at "the customer as the recipient and judge of the service in terms of added value and quality—the customer outcome; and the customer as co-producer of the service in his partially unique manner—the customer process" (Edvardsson & Olsson, 1996: p. 146) i.e. services entail two customer perspectives, an argument that portends the view that "processes describe the actions taken to integrate resources ... to produce customer benefit" (Sampson et al., 2010a). This implies, two different organizations with equivalent resources are unlikely to satisfy customers' expectations in exactly the same way because there are vast process step

permutations and as such each arrangement could lead to different outcomes. Goldstein et al. (2002) suggest that organizations that place service concept at the centre of service delivery process are likely to strike the right balance between shareholders' value and customers' expectations. The highlight of the work is a proposed model for service design that adds two new elements to the three phases of traditional input-process-output model; service strategy before the inputs phase, and, performance measures after the outputs phase. Service strategy suggests that organisations should consider market hierarchy and requisite relationships with customers before making input choices. Performance measures allude to the need to evaluate the delivery system upon every production cycle. The model suggests that service concept precedes inputs. Roth and Menor (2003) summarise SOM concepts with the following statement: "Different service concepts and markets require different approaches to the design and management of services (Chase et al., 1998; Schmenner, 1986)" (Roth & Menor, 2003: p. 148). Their proposed paradigm; service strategy triad advocates integration of market requirements, service concepts and the delivery system. Organisations win the service game by addressing concerns such as: who the right customers are, what product bundle is offered to the customers and how service delivery is done. The answers to these questions not only define the service encounter but also explain what happens when service and customer meet and interact. Customers cause variability to the service process during these encounters. Indeed, understanding the encounters is important because they define services. According to Sampson et al. (2010a), a service is "a firm-customer interactive resource-integration process." Bullinger et al. (2003) suggest that engineering methods can be used in new service development. They claim services are characterised by three considerations: i) resource considerations regarding both internal and external productive factors, ii) process considerations related to activities that integrate all the resources, and iii) customer outcome considerations. Activities in each consideration should be documented with the specific interrelationships mapped, a logic akin to the unified service theory. Silvestro and Silvestro (2003) highlight the importance of explicitly congregating the service system design characteristics around the service concept. They observe that "the design of the service delivery system should support the realisation of the service concept ..." (Silvestro & Silvestro, 2003: p. 402). Karwan and Markland (2006) refer to public sector context in testing the applicability of the Goldstein et al. (2002)'s model. They redefine two aspects of the model: the strategy aspect because public sector aims at delivering equitable services more effectively and differs from profit making enterprises (Berman, 1998), and; the delivery process aspect because of uniqueness of public sector FO-BO configurations. Service providers transform customer provided inputs for the benefit of particular customers (Sampson et al., 2010b). This is in line with the unified service theory (UST) that provides a unified definition, using customer inputs, of all services irrespective of context. They argue that customer value is subsequent to service



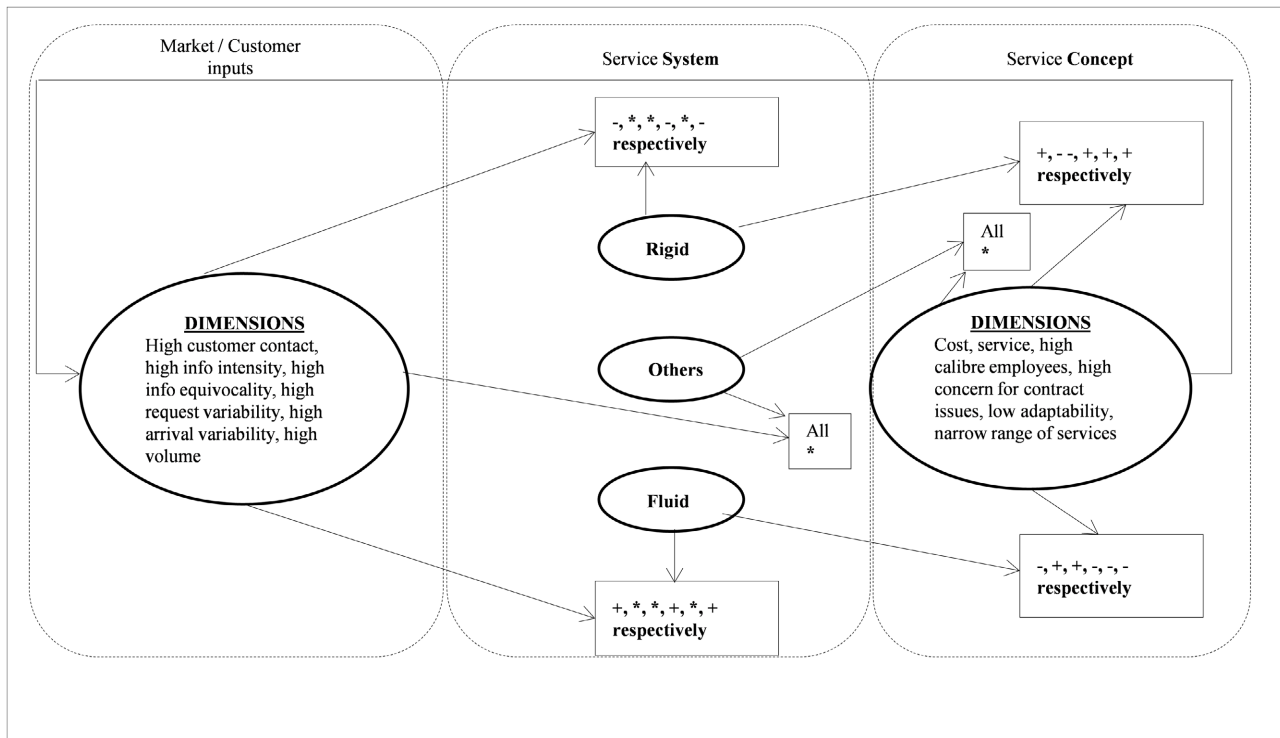
design and that service design is founded on the interaction between the service provider and the customer. Ponsignon et al. (2011) through an empirical study show that service concept influences the design characteristics of the delivery process. This supports Wemmerlöv (1990)'s theoretical observation that highly fluid services require higher employee skills and more employee divergence than rigid ones. Further, they show that design of FO-BO system is influenced by the service concept rather than solely by efficiency goals, suggesting that service design is contingent upon service concept. One of the limitations is that the study takes an 'outside-in' perspective, a market-led view that advocates for continuous development and review of the operations strategy to ensure consistency with changes in the market environment (Hill, 2000; Platts & Gregory, 1990; Porter, 1980). This suggests that service process is influenced by service concept. Ponsignon et al. (2011) recommend an 'inside-out' perspective commonly referred to as operations-led view (Barney, 1991; Mills et al., 2002; Prahalad & Hamel, 1990) involving an audit of operations resources, that drive firm's performance, accumulated over time could provide contrary findings and help formulate a new way forward. They observe that "while the inside-out perspective has not been considered, it is important to recognise that the relationship between service concept and service delivery system design is not always unidirectional" (Ponsignon et al., 2011: p. 344). Indeed, blending of outside-in and inside-out outlooks (Lillis & Lane, 2007) could prove valuable in developing new perspectives of the relationships between the three constructs of study.

The main deduction from these studies is that there is clear relationship amongst the architectural constructs of a service process. However, the present OM literature does not address the transformational process as unit. In the next section this paper provides a summary of these linkages through an emergent theoretical framework.

## 5. Conclusion

In theory building, it is important to have a conceptual framework that shows a priori interdependencies between constructs of interest (Eisenhardt, 1989; Miles & Huberman, 1994). Whetten (1989) highlights four essential elements in theory building: what are the constructs of interest; how do these constructs relate to each other; why were the constructs considered important and what is the justification for the said relationships between them? who, where, when, and in what context do these descriptions and explanations apply? Here below, addressed are what and how elements of theory development.

Based on an analysis of service operations literature, there is evidence to suggest that the three architectural phases of the service transformation process are cyclic and interdependent such that the nature of the service product/package [service concept] influences the resources[inputs] that go into the service process/delivery system [system]. **Figure 3** provides a hypothesised synchronous relationship between the three constructs. A plus sign (+) indicates a



**Figure 3.** Conceptual matching of the architectural elements.

match between an attribute of a service process and a specific aspect of the customer inputs or service concept. A minus sign (–) shows a mismatch. Mark of an asterisk (\*) means the mix is considered a gray area and requires further investigation. For instance, de-coupling of BO from FO operations helps operational costs optimisation decisions (Metters & Vargas, 2000), and there is a good match between improved cost efficiency and rigid service processes (Levitt, 1972; Wemmerlöv, 1990). Rigid service processes, particularly in business-to-business relationships, emphasise delivery of standardised service levels stated in contractual agreements and focus on a narrow breadth of service offerings. On the other hand, fluid service processes involve a high degree of customer participation, lending themselves to service concepts that utilise high calibre employees to deliver non-cost oriented operational efficiencies [such as good quality service], delivering a wide breadth of customised service concepts. The service concept dimensions for other services [lying between the rigidity-fluidity continuum hereby referred to as others] processes are not clearly stated in the literature. However, they could as well be lumped together and be referred to as service shop processes (Silvestro et al., 1992) and or mass services (Schmenner, 1986).

In regard to customer inputs, rigid service delivery processes lend themselves to low levels of customer inputs [such as customer contact (Chase & Tansik, 1983), arrival variability (Buzacott, 2000), and the customer time and effort (De Ruyter & Wetzels, 2000)]. Higher levels of these customer inputs are applicable to fluid service delivery processes. Little is known about the match between the service

shop delivery process and customer inputs. Silvestro et al. (1992) suggest that service shop processes entail medium levels of customer input dimensions. The model consolidates the transformation process for rigid and fluid services as deduced from the literature reviewed and as understood from the aims of this research, suggesting a clear relationship between the service delivery process and the service concept. However, the implication of customer inputs to the relationship, and more so to the 'others' category, remains unclear. In a case study the, "... investigator may not specify the set of independent and dependent variables in advance" (Benbasat et al., 1987: p.). The framework therefore implicitly shows correlation, with no intention to address causation, between the three constructs. Since these 3 constructs address major aspects in the scope of service design in SOM, an understanding of how they relate to each other in different service categories goes a long to answering the main research question.

The main contribution of this paper is the observation that it is clear, from literature, that there are relationships between organisational vision, market needs, service offerings, and design of delivery systems, suggesting interdependency of customer involvement [customer inputs], firm productivity [service delivery process], performance and customer satisfaction [service concept] (Bitner et al., 1997). Sampson (2000) hinted at the bidirectional nature of service supply chains; it requires that the service transformation process be studied as an integrated unit of all inputs, processes, and output. Studies on the interfaces between the constituent elements are scant and this seems to explain the challenges faced by many a service-oriented firm.

The main limitation of this study is that the literature was mainly reviewed from an OM perspective. Perhaps a wider interdisciplinary outlook encompassing the disciplines of service marketing, human resource management (HRM), and management information systems (MIS) would provide additional richer insights. Since the exact nature of the relationships amongst the various attributes of the architectural constructs is yet to be tested empirically, a call is hereby advanced to service management scholars to embrace the challenge.

### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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