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## Fuzzy effectiveness of self-service innovative systems in the lean retail banking sector

### Abstract

Technology gives retail banks an advantage over their competitors and enables them to exploit new opportunities. Current branch-based distribution models are no longer sustainable in most banks, and are unable to meet rapidly-evolving customer needs and provide easy access to simplified banking services. This study examines the impact of the streamlining of internal lean practices on service operations processes at South African banks. Structured questionnaires were distributed to 15 selected South African bank branches in Gauteng province (with an average of 10 participants per branch) that have instituted new lean oriented systems. A sampling technique was used to collect data from employees in order to determine their perceptions of internal processes and the effects of technological self-service systems aimed at improving customer service. The study used factor analysis on 150 responses to develop the internal processes models. The findings illustrate that self-service systems at retail bank branches do not simplify banking services. They reveal the relationship between self-service systems, such as cash accepting ATMs, and the speed of service provision, the simplicity of using banking services, and consistency in customer service. The findings suggest that, in order to streamline processes, retail banks need to invest time in educating customers on technological self-service systems. Furthermore, customers should initiate the value chain process; banks need to adopt a pull-approach by offering catalogues of services for customers to choose from.

**Keywords:** lean, lean principles, adoption theory, value stream.

**JEL Classification:** G21, L86.

### Introduction

South Africa's retail banks need to embrace a customer-centric approach in order to preserve and augment their customer base. Accentus, cited by Tyrer, observes that, "local banks offer the same financial products so customer service becomes the key differentiator which could give them the competitive advantage" (Tyrer, 2010, p. 5). Although systems like lean production were originally designed for the manufacturing sector, this study considers lean practices and the degree of retail banking agility. An empirical study by Narasimhan (2008, pp. 440-457) found that lean and agile strategies address competitive priorities such as cost, superiority, service and liveness, although each emphasizes different essentials and distinctions can therefore be made among these strategies (Gunakaran, 2008, pp. 549-564). Christopher and Towill (2008) consider cost to be the focus of lean practices while speed is regarded as the focus of agility, and liveness and receptiveness are associated with changes in service (Zhang and Sharifi, 2007). This study seeks to ascertain the effects of internal lean service processes and the influence of self-service systems on streamlining retail banking value-adding operations. A recent survey by Lebides (2012) revealed that South African banks do not measure and promote behavior that is associated with good customer service; rather, they measure employee performance in terms of sales and revenue. Consequently, rather than focusing on customers' needs, employees

push products in order to deliver on performance targets. The study further revealed that customers are frustrated by errors that occur when they visit their banks; this is caused by the fact that bank employees service products rather than the customer (Lebides, 2012). Demand failure is defined by Seddon and Caulkin (2007, pp. 9-24) as "demand caused by a failure to do something or do something right for the customer; it is the consequence of poor service design". Seth (2005) adds that service quality directly impacts customers and their experiences of an organization's offering; high impact is manifested in improved business performance, customer satisfaction, customer loyalty and profitability. In the process of transformation, financial institutions have significantly changed their business paradigm from servicing the product to servicing the customer.

### 1. Problem statement and objectives

Financial institutions have evolved significantly in streamlining value-added services in response to customer demand for better service, lower transaction costs and convenient delivery channels, such as mobile and internet banking (Ernest and Young, 2012). Both business and customer needs have evolved over time, despite the customer-centric approach that is necessary to ascertain and grow the customer base. Improved efficiencies accompanied by quality service are the main challenge facing financial institutions (PriceWaterhouseCoopers, 2012). This study's principal objective is to investigate the impact of the streamlining of internal lean practices on service operations processes.

The objectives of the study are:

- ◆ To establish the contribution of the value-added processes introduced by lean retail banking prac-

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tices business operations in the shift from servicing the product to servicing the customer.

- ◆ To explore the correlation between the value-stream system and serving customers and the influence of self-service systems on delivery channels.
- ◆ To evaluate the extent to which internal lean-principle service operation processes influence continuous retail banking performance outcomes in terms of increased business performance velocity.

## 2. Theoretical framework

The adoption of electronic systems in a supply chain has significant effects on business process change, collaborative relationships among trading partners and even business transformation (Gimenez and Lourenco, 2008; Wu and Chang, 2012). It entails the use of information technology (IT) to adopt new methods, processes, or production systems. The purpose of IT adoption is to sustain or improve firm performance and to respond to changes in the external environment while utilizing broad features such as information exchange capabilities, and business process integration, to conduct value chain activities (Liu, Ke, We, Gu and Chen, 2010; Ke, Liu, Wei, Gu and Chen, 2009). In relation to lean theory Figueiredo (2005) points out that many innovations do not achieve the expected results and fail to satisfy the requirements of potential adopters. This study therefore assesses potential value-adding processes in relation to lean retail banking practices and the influence of the introduction of innovative electronic banking initiatives. According to Rogers (2003), adoption refers to a person or organization's decision to use an innovation while diffusion is the process by which an innovation is communicated over time through certain channels among members of a social system. Oliveira, Dutra, Correia, Neto and Guerra (2012, p. 786) recommend "the method of interaction between research and behavior theory that involves assessing the individual preferences of users and their behavior according to choice models, examining the combination of attributes and their variability, and becoming possible to envision various situations and closely examine the interests of users to these situations".

## 3. Literature review

### 3.1. Lean systems in supply chain management.

In today's competitive world, organizations are aware that they must deliver quality services that satisfy rising customer expectations. This requires that they develop strategies to improve their understanding of customer needs. Increased customer expectations have pressurised banks to review their operations and become more efficient in order to

remain competitive (Cronje, 2007, p. 11). This study elucidates the lean principles that banks can embrace in order to improve customer service and efficiencies. Lean is "the systematic removal of waste by all members of the organization from all areas of the values stream" where the value stream is used to document and analyze the phases in each process (Womack and Jones, 1996, p. 6). Organizations that have embraced lean management have experienced improved performance in the form of cost reductions, improved service, and faster turnaround times (Emiliani, 2006, p. 167). Lean is expected to remove all waste in the value stream chain in order to improve an organization's operations (Abdulmalek and Rajgopal, 2007, pp. 223-236). Unlike analysts who view lean and agile practices as mutually exclusive (Richard, 1996; Goldsby, 2006; Vazquez-Bustelo and Avella, 2007; Krishnamurthy and Yauch, 2007; Naylor, 1990) this study does not adopt a one-dimensional perspective where lean and agile are considered conjoint competitive priorities. Like production companies, financial services companies have operational processes and products, all of which exhibit some degree of inefficiency. Lean manufacturing has been shown to improve efficiency (Worley and Doolen, 2006, pp. 228-245). However, Achanga (2005, pp. 460-471) adopts a cautious attitude to the use of lean manufacturing as an approach to quality management, as its success or failure depends on the organization's ability to implement all the identified initiatives. According to lean principles, resource utilization with no customer value outcome must be changed or eliminated (Womack and Jones, 2003).

**3.2. Principles of lean management.** Womack, Jones and Roos (1996) present five principles of lean production that an organization should focus on in adopting waste elimination and service quality improvement systems in order to pass on value to customers. These principles are guidelines for lean practices that ensure that processes are aligned with customers' value creation. In terms of the first principle of value, Womack and Jones (2003, p. 310) state that, "value can only be defined by the ultimate customer. It's only meaningful when expressed in terms of a specific product (a good or service, and often both at once), which meets the customer's needs at a specific price at a specific time". Customer value entails mutual commitment and information sharing that, enable the organization to satisfy customers' needs. The authors define value as the "capability provided to the customer at the right time at an appropriate price, as defined in each case by the customer" (Womack and Jones, 2003, p. 311). For an organization to deliver value, only services that the customer has asked for should be delivered (Hicks, 2007, pp. 233-249). The second principle of value stream focuses on the

identification of the value; mapping out how value will be delivered is essential, while non-value adding steps are eliminated. The value stream map is a high-level, visual representation of a specific set of processes. It provides a common perspective through which everyone is able to identify areas of waste (Tapping and Dunn, 2006, p. 320). The third principle of flow is defined by Womack and Jones (2003, p. 306) as the “progressive achievement of tasks along the value stream so that a product proceeds from design to launch with no stoppages”.

Waste elimination requires more simple and organized processes so that the service moves through value adding steps. This includes reducing turn-around time and smaller lot sizes, and guarantees a visible and smooth production process that eliminates backlogs. Liker (2009) advocates that the flow is created by ensuring that the value-creating steps occur in a tight and integrated sequence so the service flows towards the customer. The fourth lean principle of pull is defined by the authors as a “system of cascading production and delivery instructions from downstream to upstream in which nothing is produced by the upstream supplier until the downstream customer signals a need for it” (Womack and Jones, 2003, p. 309). By understanding customer demand, processes can be designed to meet that demand and the organization is able to deliver what its customers need, when they need it, to where they need it. The fifth principle of continuous improvement was pioneered by equality guru, Juran. He defined quality control, quality advancement and quality planning (Juran, 1986, p. 19). Superiority is an important element of lean practice. Businesses and customers change frequently and organizational practices must accommodate new expectations and needs using principles such as Value, Value Stream, Flow, Pull, and Perfection/Continuous Improvement (Ahlstrom, 2004; Goldenbaum-Gaber and Rizenbanch, 2013; and Babczenko and Garvey, 2012). Organizations should focus on these principles in order to promote waste elimination, improve service quality and pass on value to customers.

**3.3. Lean service.** There are no apparent findings that lean implementation improves performance at an organizational level unless the improvements are measured at the local level and subjective perspectives are included to support improvements (Burgess, 2012, p. 288). The application of lean methods to services enables managers to take action that improves their performance in terms of operations knowledge (Seddon and O’Donovan, 2010, pp. 34-37). These authors stress that organizations are trained to address predictable and unpredictable value demand as efficiently as possible guided by the application of lean principles (Brophy, 2013) to the internal service system. This study focuses on

the extent to which internal lean principle service operations processes influence and manage systems and values in continuous retail banking performance outcomes in terms of increased business performance velocity. Arfmann and Barbe (2014, pp. 18-24) note that lean production practice “minimizes waste along entire value streams and creates more value for customers”, although lean service practice from the usefulness and usability point of view improves internal service systems and manages value streamline service operations. Lean service creates process speed in service provision by reducing cycle time and improving value adding efficiency by reducing costs. George (2003) describes value adding as work that adds value in the customer’s eyes. Fitzsimmons, Fitzsimmons and Bordoloi (2014, p. 196) assert that the lean service process is “a continuous rapid flow of value-adding activities to satisfy customer needs through achieving perfect process with the right purpose as value, the best method as process and the highest sense of accomplishment as people”. Lean’s core competency is to remove all the links to non-value added activities in the enterprise with less manpower and less equipment. In the short-term and at a smaller site, this performance-based lean system creates value in meeting customer expectations of the product and service (Zhou, He and Gao, 2006). It emphasizes waste reduction and an improved service value chain and therefore cost reduction (Russell and Taylor, 2009). It underpins growth by improving productivity and quality, reducing lead times and freeing up significant amounts of resources (ITC, 2004).

**3.4. Lean in the services sector.** Levitt (1976, pp. 63-74) advocated the adoption of lean in the service sector in his article on the “production line approach to service”. Kanakana (2013, pp. 2-3) supported this position. Over the years, more service organizations have become interested in implementing lean principles. Bowen and Youngdahl’s (1998, pp. 207-225) study on lean adoption by two companies, McDonalds and Taco Bell found that lean can be successfully implemented in the food sector. McDonalds and Taco Bell were amongst the first service organizations to successfully adopt lean principles (Kanakana, 2013, pp. 5-6). Zarei, Fakhrzad and Paghaleh (2011, pp. 25-33) found that lean manufacturing principles could improve processes while reducing costs and improving customer value (Noorwali, 2013, p. 2). The majority of studies on lean principles in the service sector have focused on the health industry; most support the implementation of lean techniques in this sector (Vlachos and Bogdanovic, 2013, p. 4).

Cookson and Colin (2011) applied value stream mapping in the Emergency Department of a UK hospital and identified more than 300 instances with

potential for waste elimination and process improvements. Bortolotti, Romano, and Nicoletti (2010, pp. 579-583) developed a methodology to streamline and automate processes with the aim of eliminating waste in service organizations. The authors found that the automation of a non-streamlined process could generate problems that slow down the flow and increase errors (Vlachos and Bogdanovic, 2013, p. 6). Therefore, lean principles are not applicable to all industries; while the service sector can implement lean principles that are useful and usable, not all organizations in this sector can adopt lean methodology. Psychogios (2012, p. 125) observed that Taco Bell was a perfect example of the introduction of lean in the service sector (Noorwali, 2013). This scholarly endorsement offers some level of confidence that lean methodology is applicable to a banking environment. While lean manufacturing principles are not applicable to all service organizations, studies by Vlachos and Bogdanovic (2011), Cookson (2011), Goldenbaum-Gaber and Rizenbanch (2013), Babzenko and Garvey (2012), Ahlstrom (2004), Noorwali (2013), Bowen and Youngdahl (1998), Kundu and Monohar (2012), and Bonneau (2011) outline the core lean principles which can be applied to any sector, although service organizations can adopt lean principle tools such as the 5Ss of housekeeping (Sort; Straighten; Shine; Standardized; and Sustain) methodology and 7 wastes of Lean (Piercy and Rich, 2009, p. 54). It is clear that lean principles can be implemented at South African banks in order to improve internal processes and enhance customer service.

**3.5. Lean in the financial sector.** Traditionally, the financial sector has been known as being service-centred, with services pushed towards the branches rather than requested or pulled by customers. In recent times, banks have adopted a more customer-centric approach where internal processes that customers value, such as credit applications, are managed in an end-to-end manner. Ahlstrom (2004), Goldenbaum-Gaber and Rizenbanch (2013), and Babzenko and Garvey (2012) investigated how successful the financial sector has been in adopting and implementing lean principles. These studies revealed that banks can reap substantial benefits from implementing lean principles, including improved efficiency and cost reductions (Kanakana, 2013, p. 6). Maleyeff (2006, p. 674) observes that lean can be adopted to improve internal banking processes. Wilson (2010) notes that the fundamental goal of lean is to pragmatically identify waste at each level of the process and eliminate it completely. One of the easiest ways to locate waste is to observe material or product flow from the process perspective. Lean methodology aims to streamline processes and workflow to enhance an organization's productivity while satisfying the customer and eliminating waste (Chibaira and Hattingh, 2013, p. 6). Lean

focuses on eliminating waste and reducing lead times between customer demand and service delivery in order to satisfy this demand; this is achieved by focusing on and addressing non-value-adding activities (Goldenbaum-Gaber and Rizenbanch, 2013, pp. 3-7). Applying lean properly in a service context often means regarding customer satisfaction as "the product" and investigating ways to improve service (Kanakana, 2013, pp. 6-9). A recent survey by Lebides (2012, p. 18) revealed that South African banks do not measure and promote behavior that is associated with good customer service; rather, they measure employee performance in terms of sales and revenue. Consequently, rather than focusing on customers' needs, employees push products in order to deliver on performance targets. The study further revealed that customers are frustrated by errors that occur when they visit their banks. These often emanate from bank employees servicing products instead of servicing the customer (Lebides, 2012, pp. 18-28). These concerns reflect the reality of what is happening at branches; hence this study investigates the adoption of lean principles in banking processes.

**3.6. South African banks.** PriceWaterhouseCoopers (2012) states, that, there is great potential for financial institutions to embrace lean principles to improve day-to-day efficiency. It is very important for lean-based institutions to focus on the eradication of non-value-added activities. This will lead to visible and sustainable improvement as customers are becoming less loyal to their banks (Ernst & Young, 2012). A study conducted by PriceWaterhouseCoopers (2012) found that all the mainstream South African banks had a formal strategy in place to switch customers to electronic banking. However, this has not been very successful and has not had a significant effect on profitability. Customers are taking greater control of their banking relationships. They are prepared to switch banks and are demanding improvements and new products. Banks need to rapidly adapt to these changes and re-evaluate the ways they interact with customers. They need to embrace change by adopting new approaches that give customers greater flexibility. Giving more power to customers may feel uncomfortable, but it assures the future of the bank (Ernst & Young, 2012).

The mainstream South African retail banks have recognised that ever-changing demands in the banking industry call for simple and innovative ways of doing business (Dayan, AL-Tamimi and Elhadji, 2008, pp. 320-330). Not surprisingly, customers want better value and improved services. Customer advocacy and word of mouth are rapidly gaining power. Research shows that customers are more likely to seek financial advice from friends and family (Ernest & Young, 2012). Van Belle (2012) observes that the majority of customers are dissatisfied with their banks. Asked why they stay with their banks, responses in-

cluded that it is “too much effort to change”. Other reasons were good service (17%), loyalty (10%) and competitive rates (5%). This emphasizes perceptions that banks tend to invest more in attracting new customers than in retaining their current customers. It signals that banks need to change their approaches and adopt lean principles to attract and retain customers in order to remain competitive.

**4. Research methodology**

**4.1. Target population and sample size.** This study employed a non-probability sampling method defined by Schiffman (2010) as one where the population under study is predetermined in a non-random fashion on the basis of the researcher’s judgment or a decision to select a given number of respondents from a particular group. The study used convenience sampling in order to obtain quick information, and judgemental sampling to enable the researcher to gain access to individuals with the requisite information. The estimated sample size for 15 bank branches was approximately 225 potential participants, although the actual sample size was an average of 10 participants per branch multiplied by 15 branches = 150 returned questionnaires. The response rate was 66.67% (=150/225x100). Given the high levels of confidentiality in the banking sector, it was expected that gaining access would be a prob-

lem. Furthermore, the response rate was expected to be low due to busy schedules.

**4.2. Data collection instrument.** A closed-ended questionnaire designed by the researcher was used to collect data. The questions were designed to establish how strongly a subject agreed or disagreed with statements using dichotomous questions, a five-point Likert scale, and ranking. In evaluating self-service systems, respondents were asked to rank their experience of the effectiveness of self-service systems at branches. The ranking scale varied from “1 = least important”, to “2 = not important”, “3 = important”, and “4 = most important”. In the Likert scale, the rating scale varied from “1= strongly disagree” to “5 = strongly agree”. Overall, 68 questionnaires were distributed and collected electronically, while 82 were distributed and collected manually, with a total of 150 responses. Of the 150 respondents, 67 are male and 83 are female.

**4.3. Descriptive statistics.** According to Burns and Grove (1993, p. 29), a descriptive study provides an accurate portrayal of characteristics, such as the beliefs, knowledge, abilities, and opinions of particular individuals. This design was used to achieve the objectives of this study, namely, to determine the views of retail bank branch staff members on internal lean-principled service operations. Reliability tests were conducted on all variables.

Table 1. Descriptive statistics

	N	Mean	Std. deviation	Med	Mode
Customer education	150	4.23	.984	4.000	4
Catalogued product	150	4.18	.795	4.000	5
Value adding process	150	4.09	.897	4.000	5
Customer experience	150	4.06	.971	4.000	4
Customer specifications	150	4.05	1.048	4.500	5
Lean & agile	148	3.97	1.017	4.000	4
Cycle time	150	3.94	.892	4.000	4
Internal process	150	3.85	.915	4.000	4
Value stream system	150	3.77	1.124	4.000	4
Valid N (listwise)	148	Cronbach's Alpha = 0.860			

Table 1 provides the descriptive statistics for the sample of respondents for nine dimensions of a value stream. The results show that the average scores for the variables are high, with customer education in particular scoring a large mean of 4.23. As a variable of a value stream, catalogued products or services, and value adding processes also scored a high mean of 4.18 and 4.09, respectively. The total number of respondents who answered questions on the specified variables was 150. The mean for customer education, which measures the central tendency and is the arithmetic mean across the observations is 4.23 and is

slightly greater than the mode 4. This indicates that on average more than 50% of the sample believes that educating a customer about self-service systems reduce queues at the branches.

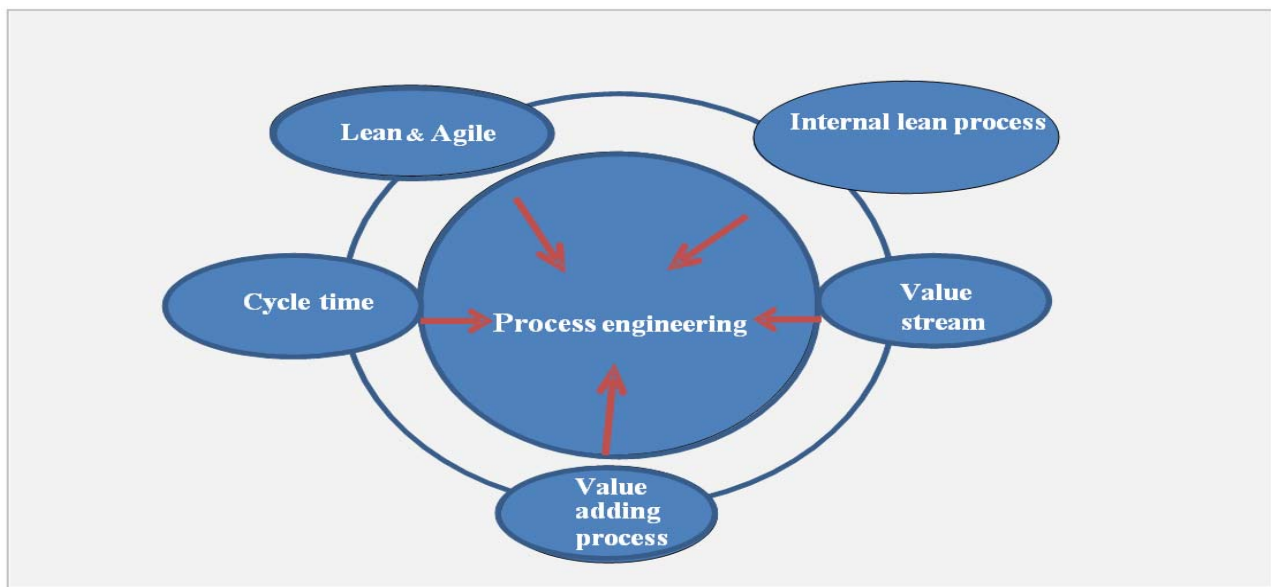
**4.4. Factor analysis.** The score of 0.819 presented by Kaiser-Meyer-Olkin (KMO) depicts the strength of the other variables in explaining the correlation between potential factors; thus the KMO values are good. Pallant (2010) states that, the data set is considered suitable if it is above .60. In this factor analysis, the KMO (.819) and Bartlett’s test of sphericity (564.68) scores are suitable at degree of freedom (36).

Table 2. Factor analysis

Kaiser-Meyer-Olkin measure of sampling adequacy				.819	
Bartlett's test of sphericity	Approx.	Df	564.684		
			Sig	36	
Rotated component matrix					
	1	2	% of variance	Mean	Std. deviation
Factor 1: Internal lean process engineering					
Internal process	.802		47.830	3.85	.921
Value stream system	.792			3.76	1.127
Lean & agile	.755			3.97	1.017
Value adding process	.746			4.08	.900
Cycle time	.580*			3.93	.893
Factor 2: Customer centricity					
Customer experience		.855	15.843	4.05	.974
Customer specification		.854		4.05	1.052
Catalogue product		.766		4.18	.797
Customer education		.571*		4.22	.989
* = rounded off to .60; total variance explained = 63.673					

According to Costello and Osborne (2005, p. 3), the intention of rotation is to simplify and explain the data structure. This study employed factor loadings as the basis for imputing a label to the different factors wherein the researcher examined the most

highly or heavily loaded indicators in each column and assigned a factor label. The factor interpretations and labels are confined to the assumption of face valid imputation of factor label (face validity) that is rooted in theory.

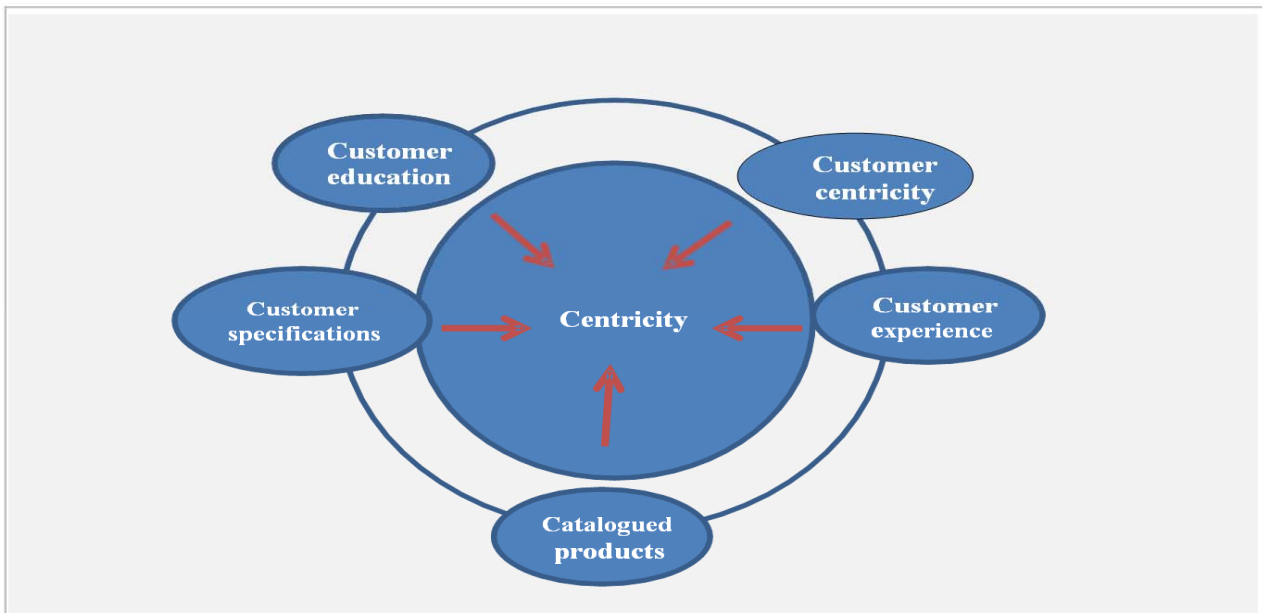


Source: designed by the researcher from empirical findings.

**Fig. 2. Process engineering**

Factor 1 demonstrates the greatest variable loadings of the five extracted factors. Therefore, the loadings of five out of nine variables have the highest variance figure of 47.830%. This critical factor encompasses internal processes, the value stream process, lean and agile and value adding processes. These five items encourage an organization to reduce waste by instituting process engineering based on value stream, meaning that lean processes will enhance flexibility through agile. Thus they are appropriately interpreted as process engineering.

When processes are engineered and optimized to deliver customer demands, it will be easier for bank staff to respond quickly to customers. The bank needs to simplify its internal processes in order to allow flexibility in terms of staff functions and duties. To put it simply, optimized processes will lead to consistency, simplicity, and reliability in customer service provision. The overall performance of the business will be directly affected by process engineering; hence the bank needs to review and optimize its processes.



Source: designed by the researcher from empirical findings.

**Fig. 3. Centricity**

The loadings of five out of nine variables have the highest variance figure of 15.843%. These factors are related to customer-centric, and are hence interpreted as *centricity*. If customers are educated about banking services and products, they can specify the services that add value to them; hence customer experience will be improved. In simple terms, centricity focuses on prioritizing customers in every decision that the bank makes. This will give customers a sense of belonging and involvement. To afford customers some flexibility, customer education initiatives must be undertaken in order to enable them to choose specific services from the products or services catalogue, hence customer experience will be improved. The study revealed that, in discussing lean at a bank, there are two important sets of elements, namely, process engineering and centricity. Process engineering encompasses cycle time, the value stream process, lean and agile and value adding processes. The second element, centricity, includes customer experience, customer centricity, customer specifications, customer education and catalogued products.

### 5. Managerial implications

The study revealed that the application of lean tools to a bank can generate positive outcomes. However, a bank does not produce and keep commodities; therefore, it is important to pay attention to capacity management and high volumes of service demand (Johnston and Clark, 2008). This implies that managers need to actively manage resources by ensuring that all customer demands are accommodated and timeously delivered. Banks have already applied some of the principles of “pull” such as self-service banking systems. However, the lean philosophy also considers

customer education in order to support efficient and reliable value creation. This study revealed that this is a gap at banks, as customers are not educated about self-service banking systems and are hence reluctant to use these services. There are instances where value stream mapping has exposed areas of improvement (Arbos, 2002) and lean practices have facilitated waste elimination in financial organizations (Goldenbaum-Gaber and Rizenbanch, 2013; Babczenko and Garvey, 2012; Ahlstrom, 2014). Future research should seek to apply these proven models and practices (Harre, 2008). Inseparability is one of the key factors of service. This factor focuses on simultaneous delivery and consumption of services (Donnelly, 1976; Grönroos, 1978; Zeithaml, 1981; Carmen and Langard, 1980; and Onkvisit and Shaw, 1991). This study’s results revealed that self-service systems do not facilitate simplicity and efficient delivery to customers. This implies that turnaround times in service provision are still an issue. Future research should seek to determine whether self-service systems can be designed in such a way that they benefit both the bank and its customers.

### Concluding remarks

The findings of the study indicate that positive benefits are associated with the application of lean methods to service organizations. There is strong conviction that a principle derived from TPS works in a service context (Bowen and Younghal, 1998). The study revealed that self-service systems do not afford customers simple, reliable and fast banking service. Thus the principal objective of this study to determine the impact of streamlining of internal lean practices on service operations processes at different branches was achieved. While

banks invest heavily in technological systems to enable customers to access services conveniently, the study revealed that customers are reluctant to use these systems due to lack of understanding. On the other hand, cycle times are relatively longer at bank branches; hence customers find themselves queuing for a long time.

The findings of the literature review indicate that internal banking processes are only explained by two elements, internal process engineering and customer centricity. Value stream systems and custom

er experience were found to have a positive correlation, which indicates that customers derive utility from such systems. Customer education appears to be an important variable. Efficient internal processes are considered to be the most important factor in ensuring that fast, efficient and consistent service is provided to customers. This study analyzed the practicality of improving internal processes at retail banks and the influence of waste reduction on processes and the bank's performance. The findings demonstrate bank staff's initial understanding of retail banking internal processes.

## References

1. Abdulmalek, F.A. and Rajgopal, J. (2007). Analysing the benefits of lean manufacturing and value stream mapping via simulation: A process sector case study, *International Journal of Production Economics*, pp. 223-236. USA. Available at: [http://www.leanconstruction.org/media/docs/lcj/2012/LCJ\\_10\\_034.pdf](http://www.leanconstruction.org/media/docs/lcj/2012/LCJ_10_034.pdf) [Accessed: October, 04, 2013].
2. Achanga, P. (2005). Critical success factors for lean implementation within SMEs, *Emerald*, 17.
3. Ahlstrom, P. (2004). Lean Service operations: translating lean production principles to service operations', *International Journal of Services Technology and Management*, 5 (5/6), pp. 545-564.
4. Arbos, L.S.C. (2002). Design of a rapid response and high efficiency service by lean production principles: Methodology and evaluation of variability of performance, *International Journal of Production Economics*, 80, pp. 169-183.
5. Arfmann, D. and Barbe, F.G.T. (2014). The value of lean in the Service Sector: A Critique of Theory and Practice, *International Journal of Business and Social Science*, 5 (2), pp. 18-24.
6. Babcozenko, K., and Garvey, J. (2012). *Projects Without Borders: It's All About the Execution*. Available at: <http://www.pwc.com/us/en/financial-services/publications/viewpoints> [Accessed September 15, 2013].
7. Bonneau, M. (2011). *Compared development of intermuscular and subcutaneous fat in carcass and primal cuts of growing pigs*.
8. Bortolotti, T., Romano, P., and Nicoletti, B. (2009). *Lean first, then automate: an integrated model for process improvement in pure service-providing companies*. Bordeaux, France: Advances in Production Management Systems.
9. Bowen, D.E. and W.E. Youngdahl (1998). Lean service: in defense of a production-line approach, *International Journal of Service Industry Management*, 9 (3), pp. 207-225.
10. Brophy, A. (2013). *FT Guide to Lean: How to streamline your organisation, engage employees and create a competitive edge*. London: FT Publishing International.
11. Burgess, N.J. (2012). *Evaluating Lean in Healthcare*. (Doctor of Philosophy in Business), University of Warwick, Warwick.
12. Burns, N. and Grove, S.K. (1993). *The practice of nursing research conduct, critique and utilisation* (2<sup>nd</sup> Ed.), Philadelphia: W.B. Saunders.
13. Carmen, J.M. and Langeard, E. (1980). Growth strategies of Service Firms, *Strategic Management Journal*, 1, pp. 7-22.
14. Chibaira, B. and Hattingh, T. (2013). Applying lean principles in a school environment to reduce lead times and improve quality. SAIIIE25 Proceedings. Available at: <http://conferences.sun.ac.za> [Accessed August 17, 2013].
15. Christopher, M. and Towil, D.R. (2008). An integrated Model for the Design of Agile SupplyChains', available at: <http://www.scmforum.org>, [Accessed on: January 20, 2014].
16. Cookson, D. and Colin, R. (2011). Improving the quality of Emergency Department care by improving waste using Lean Value Stream mapping, *International Journal of Clinical Leadership*, 17 (1), pp. 25-30.
17. Costello, A.B. and Osborne, J.W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis, *Practical Assessment, Research and Evaluation*, 10 (7), pp. 1-9.
18. Cronje, J.J. (2007). Assessing the Relative Efficiency Management of South African Banks, *Management Dynamics Journal*, 16 (4), pp. 11-23.
19. Dayan, M., Al-Tmimi, H., and Elhadji, A. (2008). Perceived justice and customer loyalty in the retail banking sector in the UAE, *Journal of Financial Services Marketing*, 12 (4), pp. 320-330.
20. Emiliani, M. (2006). Origins of Lean Management in America, *Journal of Management History*, pp. 167-184.
21. Ernst & Young/Knowledge@Wharton (2012). Global Banking 2020: foresights and insights. Available at: <http://kw.wharton.upenn.edu/ey-global-banking/global-banking-2020/> [Accessed, October 04, 2013].
22. Figueiredo, L.A. (2005). *A industria de prestacao de servicos logísticos e o mdelo de negocio ASP: Perspectivas elendencias no mercado brasileiro*, Doctoral thesis, UFSC, Florianopolis.
23. Fitzsimmons, J.A., Fitzsimmons, M.J. and Bordoloi, S.K. (2014). *Service Management: Operations, Strategy, Information Technology*. (8<sup>th</sup> ed.), New York: McGraw-Hill.
24. George, M.L. (2003). *Lean Six Sigma for Service*. New York: McGraw-Hill.



25. Gimenez, C. and Lourenco, H.R. (2008). E-SCM: Internet's impact on supply chain processes, *International Journal of Logistics*, 19 (3), pp. 309-343.
26. Goldenbaum-Gaber, D. and Rizenbach, R. (2013). Implementing the Lean Approach in a financial Organisation. Available at: <http://www.tefen.com/fileadmin/editorial> [Accessed: July 20, 2013]
27. Goldsby, T. (2006). *Lean Six Sigma Logistics: Strategic Development to Operational Success*, Boca Raton. Ross Publishing.
28. Gronroos, C. (1978). A service Oriented Approach to Marketing of Services, *European Journal of Marketing*, 12 (8), pp. 588-601.
29. Gunakaran, A. (2008). Responsive supply chain: A competitive strategy in a networked economy, *Omega*, 36, pp. 549-564.
30. Harre, R. (2008). Thinking with models, *Self-Care, Dependent-Care & Nursing*, 16 (1), pp. 22-27.
31. Hicks, B., J. (2007). Lean information management: Understanding and eliminating waste, *International Journal of Information Management*, 27 (4), pp. 233-249.
32. ITC (2004). *Textiles and Apparel: Assessment of the competitiveness of certain foreign suppliers to the U.S. Market*. USITC Publication 3671, Washington, United States International Trade Commission.
33. Juran, J.M. (1986). *Quality Control Handbook*, New York, McGraw Hill.
34. Kanakana, M.G. (2013). Lean is service industry. SAIIIE24 proceedings. Available at: <http://conferences.sun.ac.za/index.php/saie25/SAIE25/paper/viewFile/574/253> [Accessed August 26, 2013].
35. Ke, W., Liu, H., Wei, K.K., Gu, J. and Chen, H. (2009). How do mediated and non-mediated power affect electronic supply chain management system adoption? The mediating effects of trust and institutional pressures, *Decision Support Systems*, 46 (4), pp. 839-851.
36. Krishnamurthy, R. and Yauch, C.A. (2007). Leagile manufacturing: a proposed corporate infrastructure, *International Journal of Operations & Production Management*, 27, pp. 588-604.
37. Kundu, G.K., and Manohar, B.M. (2012). Incident Management Process Capability – a simulation study, *Communications in Computer and Information Science*, 270, pp. 243-255.
38. Lebedes, M. (2012). *Can we depend on the service delivery of a South African Financial Institution*. University of Cape Town: Graduate School of Business.
39. Levitt, T. (1976). The industrialisation of service. *Harvard Business Review*, 54 (5), pp. 63-74.
40. Liker, J.K. (2004). *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. Tata. New Delhi: McGraw-Hill.
41. Liu, H., Ke, W., We, K.K., Gu, J. and Chen, H. (2010). The role of institutional pressures and organisational culture in the firm's intention to adopt Internet-enabled supply chain management systems, *Journal of Operations Management*, 28 (5), pp. 375-384.
42. Maleyeff, J. (2006). Exploration of internal service systems using lean principles, *Management Decision*, 44 (5), pp. 674-689.
43. Narasimhan, R. (2008). Disentangling leanness and agility: An empirical investigation, *Journal of Operations Management*, 24 (5), pp. 440-457.
44. Naylor, J. (1990). Developing Lean and Agile supply chains in the UK housebuilding industry, *International Journal of Service Industry Management*, 62, pp. 70-118.
45. Noorwali, A. (2013). *Apply lean and Taguchi in different level variability of food processing system*. De Montfort University, The Gate way, Leicester. Proceedings of the 5th Manufacturing Engineering Society International Conference – Zaragoza – June 2013.
46. Oliveira, D.E.L.K., Dutra, N.G. DA S., Correia, V.A., Neto, W.A.P. and Guerra, A.L. (2012). Adoption assessment by carriers and retailers to use an urban consolidation center – A case study in Brazil, *Social and Behavioural Sciences*, 39, pp. 783-795.
47. Onkvisit, S. and Shaw, J.J. (1991). Is Services Marketing “Really” Different, *Journal of Professional Services Marketing*, 7 (2), pp. 3-17.
48. Pallant, J. (2010). *SPSS Survival Guide: A Step By Step Guide to Data Analysis Using the SPSS Program*. England: McGraw-Hill.
49. Piercy, N. and N. Rich (2009). Lean transformation in the pure service environment: the case of the call service centre, *International Journal of Operations & Production Management*, 29 (1), pp. 54-76.
50. PriceWaterCoopers (2013). *Shaping the Bank of the future. South African Banking Survey*. Available at: [http://www.pwc.co.za/en\\_ZA/za/assets/pdf/south-african-banking-survey-2013.pdf](http://www.pwc.co.za/en_ZA/za/assets/pdf/south-african-banking-survey-2013.pdf) [Accessed: September 05, 2013].
51. Psychogios, A.G., J. Atanasovski, and Tsironis, L.K. (2012). Lean Six Sigma in a service context a multi-factor application approach in the telecommunications industry, *International Journal of Quality and Reliability Management*, 1, pp. 122-139.
52. Richard, C.W. (1996). Agile manufacturing: Beyond lean? *Production Inventory Management Journal*, 2nd Quarter, pp. 60-64.
53. Rogers, E.M. (2003). *Diffusion of Innovation*. (5<sup>th</sup> ed.) New York: Free Press.
54. Russell, R.S., and Taylor, B.W. (2009). *Operations Management along the Supply Chain*. 6<sup>th</sup> Ed., Chichester: John Wiley and Sons Ltd.
55. Schiffman, L.G. (2010). *Consumer behavior*. (10<sup>th</sup> ed.). New Jersey: Pearson Education Inc.

56. Seddon, J. and Caulkin, S. (2007). Systems thinking, lean production and action learning, *Action Learning: Research and Practice*, 4 (1), pp. 9-24.
57. Seddon, J. and O'Donovan, B. (2010). Rethinking Lean Service, *Management Services*, 54 (1), pp. 34-37.
58. Seth, N.S. (2005). Service quality models: a review, *International Journal of Quality and Reliability Management*, 22 (9), pp. 913-949.
59. Tapping, D. and Dunn, A. (2006). *Lean office demystified: Using the power of the Toyota production system in your administration area*. Chelsea: MCS Media.
60. Tyrer, N. (2010). "Banks must improve customer service". Accenture. Available at: <http://www.southafrica.info/news/business/285836.htm>. [Accessed January 22, 2014].
61. Van Belle, S. (2012). How to develop theory driven evaluation design? *BMC Public Health*.
62. Vazquez-Bustela and Avella, L. (2006). Agile manufacturing: Industrial case studies in Spain, *Technovation*, (26), pp. 1147-1161.
63. Vlachos, I. and Bogdanovic, A. (2013). Lean thinking in the European hotel industry, *Tourism Management*, 36, pp. 354-363.
64. Wilson, L. (2010). *How To Implement Lean Manufacturing*. New York: McGraw-Hill.
65. Womack, J., and Jones, D.T. (1996). *Lean Thinking: Banish Waste and Create Wealth for Your Corporation*, New York: Simon and Schuster.
66. Womack, J.P. and Jones, T. (2003). *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*, New York: Free Press.
67. Worley, J.M. and Doolen, T.L. (2006). The role of communication and management support in a lean manufacturing implementation, *Management Decision*, 44, pp. 228-245.
68. Wu, I.L. and Chang, C.H. (2012). Using the balanced scorecard in assessing the performance of e-SCM diffusion: Multi-stage perspective, *Decision Support Systems*, 52 (2), pp. 474-485.
69. Zarei, M., Fakhrzad, M.B., and Jamali, P.M. (2011). Food supply chain leanness using a developed QFD model, *Journal of Food Engineering*, 102, pp. 25-33.
70. Zeithaml, V.A. (1981). *How Consumer Evaluation Process Differ between Goods and Services?* 2<sup>nd</sup> Edition, Upper Saddle River, New Jersey: Prentice Hall.
71. Zhang, Z. and Sharifi, H. (2007). A methodology for achieving agility in manufacturing organisations: an introduction, *International Journal of Production Economics*, 62 (1), pp. 7-22.
72. Zhou, H., He, Z. and Gao, X. (2006). The contrast and integration of Lean Six Sigma management, *Industrial engineering*, 6, pp. 1-4.