# BUSINESS PROCESS REENGINEERING IN INTEGRATING ENTERPRISE RESSOURCE PLANNING (ERP) AND BANK SYSTEMS IN CONSULTING COMPANIES: A CASE STUDY OF PARITY SOFTWARE IN SOUTH AFRICA

By

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## Abstract

One of the aspect of the greener future is about reengineering information technology (IT) through system integration. The thesis challenges the concept of Business Process Reengineering (BPR) in integrating enterprise resource planning (ERP) and bank systems in consulting companies. This thesis is based on the research carried out at Parity software, as the biggest consulting company in South Africa that uses business systems and develop additional management systems to meet customer's expectations. The four big South African banks namely First National Bank, Absa, Standardbank and Nedbank are already offering online business banking applications that can be easily integrated with other payment software through cloud computing. However, point-to-point integration between financial ERP and bank systems remain a huge challenge. The thesis aims at designing a business integration model that will be the backbone of new software development in the field of automatic and direct payment transactions between corporate and bank systems. Using model-driven architecture, the designed model intends to present benefits of direct integration that will reduce long payment process and end import and export of bank files. Following theoretical, conceptual and empirical approaches, the literature review shows the gap between standard business process reengineering and business process reengineering applied to system integration and thus define survey items. The research methodology used is a combination of quantitative and qualitative research methods. The thesis uses qualitative research design to develop reengineering model using cross-functional flowchart design process from Microsoft Visio professional. Quantitative research design is used to analyse data collected from the likert scale questionnaire and to interpret descriptive statistics and correlational method to test hypothesis. Research findings showed that there is a positive and statistical significant relationship between dependent variables namely business factors, financial ERP system and IT architecture and the BPR Integration (BPRI) model known as independent variables. Additionally, interviews regarding customer's expectations showed that 85% of customers are looking forward for a direct and automated payment solution that will reduce payment cycle and increase their profitability. Extensive research should be done to redesign the proposed integration model using computer and data language to facilitate execution by IT people.

**Key words:** BPR (Business Process Reengineering), ERP (Enterprise Resource Planning), IT (Information and Technology), Software, SARB (South African Reserve Bank), BPRI (BPR integration) model, Model-driven architecture (MDA), Internet as a service (IaaS), Bank payment system, Financial ERP payment system.

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## List of Acronyms

The below abbreviations have been used in the document:

| Abbreviations | Description |
|---|---|
| BPR | Business process reengineering |
| ERP | Enterprise Resource Planning |
| IT | Information and Technology |
| SARB | South African Reserve Bank |
| CRM | Customer Relationship Management |
| B2C | Business-to-companies |
| B2B | Business-to-business |
| GDP | Growth Domestic Product |
| SWOT | Strength, Weakness, Opportunities and Threats |
| ICT | Information, communication and technology |
| BPRI | BPR integration |
| ONG | Organisation new goals |
| AP | As-Is Processes |
| CFD | Cross-functional Flowchart Design |
| MD | Master data management |
| CB | Cloud-based |
| WM | Workflow monitor |
| INF | System Infrastructure |
| OBB | Online business Banking |
| SEC | Integration Security |
| PRO | Business Profitability |
| PP | New Application |
| PPC | Payment Process Cycle |
| MDA | Model-Driven Architecture |
| EAI | Enterprise Application Integration |
| IaaS | Internet as a Service |
| TB | To-Be Processes |

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# CHAPTER 1: INTRODUCTION AND BACKGROUND

## 1.1 INTRODUCTION

Regarding the continuous changes occurring in the current dynamic world, it is important for organisations to develop efficient strategies to remain sustainable. Emerging market, dynamic environment, increase in technology and the globalisation itself bring organisations to become realistic about changing their traditional way of running business in order to face future challenges by using agile ERP (Enterprise Resource Planning) solutions. Based on system modelling, integration between two or several systems is a bottom line of business efficiency, productivity and sustainability for company growth. Integrated management systems bring all departments and functional units together as well as all other management systems pieces of a company in a single solution. Integrated solution also enables interface with external management systems to improve customer services. Integrated solutions by means of software development is based on company policies, management and core processes as well as corporate governance in order to stay align with the organisation goals and objectives.

Globalisation has been mostly driven by Information and Technology (IT) systems improvement. The overall economy system has been predominated by IT transformation from small business to multinational organisations as well as banking systems. Such innovation goes in hand with organisational change and business process improvement through reengineering of management, core and support processes. On the Information and Technology (IT) sector, continuous software development allows to face the new challenge of constantly improving current and future customer needs and satisfaction. This permanent change need to fit in an agile IT system that makes a difference compare to a traditional one.

Based on the pivotal role that financial institutions play in the economic sector, companies need to keep their financial system up-to-date in order to easily manage transactions with the bank. At the same time, banks have an obligation to improve quality and availability of financial services to satisfy all customers' needs as prescribed by the financial inclusion principles (SARB, 2017).

**Intention of the thesis**

Few researches have been done on the field of business system integration around the world. Authors such as Gericke (2010) and Muhlen (2004) came out with controversial opinion regarding success factors enablers that promote enterprise application integration. However, besides standards critical factors, each business environment and industry have specific key points to consider while dealing with systems' integration whether internally or externally. The present study covers the topic in South Africa using a consulting company that is at the beginning and at the end of IT system upgrade in many businesses. Summary of literature review through theoretical framework will bring a critical analysis on the previous researches before focusing on the conceptual framework as part of the current study contribution. In addition, the author uses empirical framework to emphasise on the empirical evidence of system integration applicable on banking industry as well as on any economic sector.

The current thesis intends to design a business process model as a bedrock of a software development that can allow straight connectivity between corporate and bank systems. System modelling by means of software development through computer performance promote business upgrade and innovation spirit in order to seek for business optimisation in the organisation as well as improving environmental strategic approach. It is all about conceiving a financial system model to be linked to a specific banking model for direct integration. The solution will be an integrated business process model to setup a business interface between a company and a bank for payment transactions. This link will eliminate repetitive capturing of information by automating financial transactions. Using IT innovation, change and competition boost any organisation today to develop up-to-date activities that fulfil customer needs and improve performance. Ongoing customer needs lead companies to perpetual change. Hence, the importance of having an agile IT systems to support implementation of BPR integration in an organisation compared to traditional computer technology approaches.

## 1.2 BACKGROUND

Some companies still grow and prosper without foreseeing customer needs in this ongoing environmental change as great source of opportunities, innovation and market positioning. But, such companies cannot be sustainable overtime because observations show that many organisations will become obsolete if they don't adjust their business approach from now. Globalisation comes with new technologies that also comes with changes and innovation challenges (Aldrich and Martinez, 2001). Organisations and financial institutions can accept the change but don't always know the right approach to deal with it. Hence, failure and resistance to the change. To shine a spotlight on this, evidence shows that companies don't consider the importance of first materialising their existing business process named As-is processes and to define their future processes named To-be processes as building block of the change management. Following the SWOT analysis (Strength, Weakness, Opportunities and Threats) in the strategic field, it is a prerogative for any organisation to foresee and be aware of any potential change occurring in his environment. Identifying threats helps in preventing sudden negative impact on the business while looking for new opportunities allow companies to develop new product to meet customer expectations and gain place in the market.



**Software Development Approach**

Banks of today have a traditional way of running business which does not suit the global evolution full of perpetual change. So, results from traditional banks methodology are not significant in fulfilling customer' needs. Regarding constraints facing by business as well as individual in completing their banking transactions, it appears that the customer is not satisfy because payment process is still done in a traditional way using import and export of bank payment files. In so doing, the bank of the future will be looking for straight connectivity with his customer' system in order to move from the "actual business" to the "global business". All banking functions such as payments, deposits and lending, capital raising and so forth and functionalities such as online banking are reviewed through business model update to meet long-term growth. Corporate structures as well face business process upgrade and implementation of new strategy regarding payments, financial management, human resources, and supply chain to fit into the new global environment. This new business approach forced organisation to develop environmental-orientated strategy in order to be more competitive. Environmental adaptation come with process automation and digital investment that require to

be continuously amended and improved. What is the trigger button of all these events? The answer being customer satisfaction and long-term vitality. Customers always have new dreams of how they want their life to be easy by following smartness and not hardness approaches. This suggests increasing needs and requirements from the customer that bring companies to be more customer-orientated than ever and develop up-to-date business strategy accordingly. Organisations then create and offer new products to attract the customer and to remain competitive on the market sphere.

Fitting in the global environment today required business and system change for company instead of sticking to the existing way of running business as legacy systems. Nowadays, each and every business domain uses specific modern solution able to improve business efficiency and reduce costs. As such, straight integration between corporate system and bank system will definitely increase productivity, alleviate work conditions and reduce costs. In South Africa, bank chose to invest in new technology to improve their efficiency and to transform strategic approach on the financial vitality with corporates as future trends for business to business (PWC, 2017). This implies that business activity needs to be aligned with workflow monitors in and across departments. This particular aspect of the BPR needs to be done in an incremental process instead of a radical process as proposed by Schumpeter (1934) in order to consider contribution of all parties namely functional people, IT people (Technicians, networkers and developers) and business analyst people both from the customer and the integrator side as well as from the bank side.



**The History of Business Process Reengineering**

Processes need to be reengineered because old practices are no more effective. Business process reengineering (BPR) enables performance improvement through changes on re-design processes, retooling of networks and architectures and re-orchestration of functional units also called the 3R of re-engineering as stipulated by Sotiris (2000). According to him, BPR is also based on customer service oriented, innovation, flexibility, quality and speed. Although business process improvement causes roles changes, focus must be made on reducing costs and increasing competitive advantage that promotes performance of the organisation

Improvement of institutions' performance requires new business process model in line with the ongoing environmental change on the current global world. As confirmed by Aslam et al.

(2016) and Kaisha (2017), business process modelling is a tool for better productivity of an organisation while business process re-engineering is the process of thinking, conceiving, innovating and deploying accurate business process that take into account exact business constraints, environmental requirements and internal enterprise resources. Business to business integration requires changes at every functional level in the organisation. Hence new strategic planning to be put into place. Integration of business process and knowledge management as a strategic approach is recommended in order to efficiently control process implementation as confirmed by Vesna (2006)

A business process summarises understanding of process flow from input to output between all related business functions and roles per department within the company. An efficient and suitable business process is built so that all resources of the organisation are well-used in fulfilling company' goals. Ruth (2004) defined business process modelling as a setup of activities in a company describing their logical order and interconnexion for better business analysis and business integration. She also highlighted the fact that business process model constitute building blocks for new software development and for existing business process restructuration.

**Business Process Integration**

Business integration requires information exchange between systems. This can be done only through E-business (Business-business, business-customer, business administration) using network and worldwide telecommunications technologies as explained by Sara et al. (1999). In the process of business integration between organisation and his stakeholders, company has a choice between vertical, horizontal integration or both types at the same time (Soritis, 2000). He confirmed that ERP systems are the vehicle of business re-engineering applied to horizontal organisational structure. Although data transmission between systems expose parties to some risks that can compromise internal and multi-level system securities, globalisation brought everyone to the notion of integration whereby all systems communicate through direct interface to improve productivity. Direct link and direct exchange between organisations and corporates reduce time consuming and dependence from a specific banker to release uploaded payments as currently observed. Leyer and Hollmann (2013) showed that business process has been used to simulate effect of the introduction of electronic documents on financial services compared to using paper documents. Other studies used business process to show integration between many applications using the same company and business process among functional units of the

same organisation (Johannesson and Perjons, 2001). Regarding the success of using BPR in many industries such as banking (Karibu et al., 2013), telecom and foods (Rungporn et al., 2014), it is possible that implementation of BPR will promote new process of straight integration between ERP systems and banks.

Corporates dream for automation with banks while banks are careful of risk associated with straight integration. However, the on-going modern world full of changes and needs of adaptation and market positioning bring business stakeholders to compromise and look for best practices that promote safety integration and business opportunities. Despite people or company mind set holding back business process reengineering that comes with disruptions, there is no way to escape from the change because if the company don't get aligned, competition will take over and the business will close down. Today, changing and moving forward is part of the company living process that promote overall country economy. From the traditional way of running business to the future way of fitting into to the environment, companies need to follow best practices in terms of business process reengineering to continuously improve the business. Process design needs to be done at high level for the macro view of the overall company business process and at lower level in order to facilitate micro understanding of the step by step tasks to be executed. Design of business process before BPR whether from high or low level allows to define change management that comes with the new process implementation. IT systems are one of the reinforcement external factors that promote and sustain the change at the individual and company level.



## 1.3 PROBLEM STATEMENT

Improving management system is about reengineering existing business processes named as "AS-IS" processes while keeping alignment with the new company objectives. However, many companies and institutions don't always know their current business processes because they have not been using processes to describe their activities. Existing business processes are building blocks for process improvement using gap analysis between the current stages and where the organisation want to be in the future (Albany, 2006). Therefore, reengineering process out of nowhere becomes a huge challenge. In such case, business process can be redesigned based on organisational structure and business transactions. But, as a result, implementation of those processes failed to addresses many business requirements that cannot be easily identify through business analysis. Integrating solutions also failed to provide a valid

business process of what the system intend to solve in the company (Output). It also happens that entities to be integrated don't have management system and/or don't use processes approach to represent their business.

Any process reengineering needs to follow company' policies, new goals and vision to be sustainable (Hamme and Champy, 2001). For companies that meet the above, they don't properly identify and include relevant elements and participants that structured a suitable business process. Moreover, process documentation remains the big weakness point. Corporates failed to design process while following a logical sequence that meet company' new strategies. Business processes should show process purpose, process scope, process steps, participants (Departments, units, stakeholders…), resources and relevant detailed symbols (Sage, 2017). Following end-to-end business sequence, the end point of one process should be the starting point of the following process. Corporates hide themselves behind high level business processes to not represent hierarchy process that shows split of process in the organisation. This is how business processes don't show business interaction that indeed helps to understand how the company operates.

Globalisation promotes constant change of market conditions and continuous upgrade on information, communication and technology (ICT) infrastructures. Such realities are supposed to be a wake-up signal for banks to develop a preventive approach in adapting to the change. But it appears that banks are not always well managed in aligning their architecture and operating business process to meet all customer' needs. The overall economic survival depends on the ability of the bank in managing payment transactions between people, between organisations and between organisation and people (Deloitte, 2017). It appears that there is not always straight communication between bank and organisation systems that causes delays and shortcoming for companies. This is a huge challenge because at this era of digital take over, integrated systems should be the best practices. Company always experience delays and mistakes on payment transactions due to manual steps.

Payment transactions between organisation and banks face the challenge of unmatchable payment solution used in both structures. Application used at company level are not always compatible with the one used at bank level as set by bank regulation on integration point of view. Observations showed that many big companies use ERP as an integrated management software to run their businesses (Parity, 2017). But the process stopped at entering Business partner payments transactions in a specific module in the used system. Then start a manual and

complex process of exporting and importing big data from banks for reconciliation. Furthermore, companies need to wait for a specific banker at the bank to release the transactions. Such long process is stressful, time consuming and not efficient neither for the company nor for the bank.

Some softwares are neither compatible nor efficient for payment transactions integration because of inappropriate IT infrastructures. They then require additional applications as a bridge to interface with banking system through upload of EFT file. This causes issues like time consuming, EFT file license authorisation and dependences. That is why it is imperative to find an appropriate solution through effective business processing model as a channel that can easily match with bank payment interface. It is important to develop a one window connectivity software that is aligned with the requirements from both corporate and banking business.

As a developing country, South Africa has a market dominated by big companies with several branches all over the country and multinationals spread in the world. Those companies need to transact with banks every day to meet employees and other stakeholders payments in order to grow their business. But, South African banks offer specific business management software such as instant payroll (FNB, 2017), Sage one accounting (Standardbank, 2017), Nedbank Accounting, Nedbank cash online and Neddbank payroll (Nedbank, 2017), all relevant for only small and medium businesses and not big organisations. Business need to connect to those management software provided by the bank on their website to proceed with their daily transactions. This comes with license fees and limited number of companies to be loaded. Besides the above-mentioned, business do no need to be always connected to the bank website or system to run their activities. Moreover, the bank said that "We are not responsible for any loss that results from: any technical or other problem (including interruption, malfunction, downtime or other failure) that affects our website, system or any online service or any database for any reason; …" (Standardbank, 2017). In the case of integrated systems, each system still follow his internal rules besides integration rules without impacting the other system.

## 1.4 RESEARCH OBJECTIVES

### 1.4.1 Primary aim of the study

The major objective of the study is to assess the effectiveness of business process reengineering in integrating Enterprise Resource Planning (ERP) and banks systems at Parity Software Company in South Africa. The BPR model output will be used as foundation of a new software development that will promote straight payment integration between any financial ERP system and any bank in South Africa without human dependencies.

### 1.4.2 Secondary aim of the study

The secondary objectives are as follow:

- To determine business factors that significantly affect BPR integration model in both corporate and bank systems in South Africa.
- To determine whether financial ERP system will have statistical significant impact on the efficiency of BPR integration model between corporate and bank systems in South Africa
- To determine whether IT Architecture will have statistical significant impact on the efficiency of BPR integration model between corporate and bank systems in South Africa



### 1.4.3 Research Questions

The following research questions will guide our assessment:

- Which business factors can significantly affect BPR integration model in both corporate and bank systems in South Africa?
- How can financial ERP software contribute to evaluate efficiency of BPR integration model between corporate and bank systems in South Africa?
- How can IT Architecture help to evaluate efficiency of BPR integration model between corporate and bank systems in South Africa?

### 1.4.4 Research Hypothesis

Below are 3(three) relevant research hypotheses based on the problem statement to determine relationship between variables (Salkind, 2012:94)

**Hypothesis 1:** Business factors can be relevant or not on the BPRI model in defining BPR integration model between corporate and bank systems.

**Hypothesis 2:** Relevant financial ERP system can efficiently have or not an impact on the BPR integration model between corporate and bank systems.

**Hypothesis 3:** IT Architecture platform can efficiently have or not an impact on the BPR integration model between corporate and bank systems.

The average of variables determine in 2017 will allow to criteria as if P-value < B, reject the null hypothesis; if P-value > B, accept the null hypothesis. B defined as being level of significance.

**Description of variables**

| **Dependent Variables** | **Independent Variables** |
|---|---|
| Business Factors | BPR integration (BPRI) model |
| Financial ERP system | BPR integration (BPRI) model |
| IT Architecture | BPR integration (BPRI) model |



## 1.5 LIMITATIONS OF THE STUDY

The validity of the study is questionable because it only comprised 20 companies out of many that Parity software has as customers in South Africa as well in the Middle East. The results will not be applicable to other companies using different management software for their banks transactions. The validity of the study is questionable because the results will not be easily generalised in other 14% of South African banks which are small. The sample size only comprised South African big banks instead of both large and small banks. Furthermore, a comparative analysis with another statistical method could increase the value of findings.

## 1.6 SUMMARY

The present proposal aim to explore the implementation of business process reengineering model to facilitate automate integration of enterprise software with bank system. The purpose is to find out efficient business integration model that will be used as foundation of the software development that will promote straight communication interface for data exchange between stakeholders and banks without human dependencies.

## 1.7 CHAPTER OUTLINE

The study will be organised into 5 major chapters. The first chapter will include introduction and background as well as problem statement. This chapter also includes presentation of research main and secondary objectives, research questions with the related hypothesis and the limitations of the study. In chapter two, Literature Review will be outlined around theoretical and conceptual framework as well as empirical framework including the following points:

- BPR and BPRI framework
- BPR and BPRI methodologies
- BPR and BPRI process modelling
- BPR and BPRI IT enablers
- Challenges of BPRI implementation
- Customer satisfaction
- Contribution of the study

The research methodology used is discussed on chapter three. It will talk about research design, population and sampling, data collection and data analysis with an emphasis on the reliability and validity of the research as well as ethical considerations. The fourth chapter will be about analysis and discussion of results. Lastly, recommendations and conclusion will be presented in chapter five. References used in the study as well as appendixes such as letter of consent, permission letter and research questionnaire will be listed.

# CHAPTER 2: LITERATURE REVIEW

In this chapter the relevant literature regarding business process reengineering on system integration which constitutes the main theme of the current thesis is reviewed. The selection of the literature is based on the research objectives outlined on chapter 1-Introduction and background. The literature review elaborates on the theoretical framework around BPR and emphasised on the conceptual framework to provide link with the major objectives of the thesis. Although theoretical framework and conceptual framework are used interchangeably, this study pointed out a clear demonstration of the two concepts. In addition to the empirical framework, the current study uses theoretical and conceptual models to easily make research findings meaningful and generalisable. These two frameworks are used to establish connections between observations and facts developed by the author. An overview of key concepts are first highlighted in the following unit.



## 2.1 Overview

### 2.1.1 A Concept of Business Process Reengineering

Business process reengineering (BPR) has been identified by Hammer and Standton (1995) as a successful approach to continuously upgrade business activities through optimisation. Overtime business improvement allows organisations to meet customer satisfaction and improve market positioning and thus develop long term survival. BPR is defined as "The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, service and speed" (Hammer and Champy 1993). BPR is still characterised by core process design that is a new method of working smarter or a new industrial engineering and uses IT platform for deployment (Chen, 2011). In the case of this study, financial transactions in the company will be using ERP system as IT platform. Aguilar (2004) argued that it is important to know the purpose and the technique of the model or process to be redesigned in order to be effective. In light of this, financial process design will be matching will banking business model. He emphasised on flow chart technique, data flow diagram (Yourdon's diagram), role activity diagrams, and workflow technique as examples of process design techniques. Usually it is about amending the As-is (Existing) processes by fixing the issues and developing an optimised To-be (New) processes to be implemented in accordance with company new goals.

### 2.1.2 BPR theory

Business process reengineering represents the organisational structure of the company at management, core business and support level. BPR theories are based on process management that reflects companies' objectives in meeting long term survival. BPR theories are built around the below:

- Software development
- IT Architecture
- Strategic innovation
- Customer satisfaction
- Resource improvement
- Productivity and profitability

Redefining business process model in an organisation through innovation allows to continuously meet organisational business strategies.

### 2.1.3 Consulting Companies

#### *2.1.3.1 Parity Software*

Parity software is a consulting company that uses Microsoft operating system and Sage ERP solution products to efficiently deliver in the South African market. ERP system is an integrated solution that covers financial modules such as accounting, account payables, accounts receivables and payment/receipts. It also puts all management module existing in a company altogether compared to standalone application. This consists of implementing new ERP management solutions to improve customers business. In so doing, "Parity is a modern business management solutions provider catering for clients from across industries ranging from manufacturing, warehousing, logistics and mining" (Parity, 2017) as well as finance, distribution, retail and wholesale.

Regarding the powerful impact of PARITY software in promoting business upgrade throughout South Africa, it has been awarded by SAGE South Africa as a Platinum Reseller in 2016. Parity software is also owner of the below award from Sage South Africa (Parity, 2017):

- ❖ Top business partner for sage X3/X3 people
- ❖ Sage National Partner of the year 2016
- ❖ Sage X3 people partner of the year 2016
- ❖ Sage X3 SADC partner of the year 2016