CHAPTER 9

THE ROLE OF INFORMATION TECHNOLOGY IN BUSINESS PROCESS REENGINEERING

9.1. INTRODUCTION

In the preceding chapters, all the elements and aspects from the planning to the implementation of the BPR process were discussed. The only aspect not discussed was the role of IT in the BPR process. Due to the importance of IT, it will be canvassed in this chapter.

The chapter will mainly focus on two aspects:

- The role of IT in the BPR process; and
- The reengineering of the IT function to fulfil this role.

The role of IT in the BPR process will further discuss whether IT should be the driver of the BPR process or rather fulfil the role of the enabler. The chapter will also focus on the unique characteristics of IT that can be utilised during the BPR process.

The following aspects will be addressed when discussing the reengineering of the IT function to fulfil its role in the BPR process:

- The alignment of IT strategies with business strategies;
- The planning stage in the project of changing IT systems;
- The pre-study stage, which include the assessment of requirements for a new IT system as well as the assessment of the current IT systems; and
The execution stage, which include redesigning alternative IT solutions to support the BPR process, testing of the redesigned alternatives and the implementation of the new IT system.

9.2. THE ROLE OF IT AS THE DRIVER OF THE BPR PROCESS

9.2.1. Introduction

There are essentially two schools of thought with regards to the role of IT during the BPR process. The first school is of the opinion that IT drives the reengineering of business processes and the second school is of the opinion that business perceptions should drive BPR, but IT is the most important enabler of BPR. Both schools of thought will be discussed below.

9.2.2. IT drives the reengineering of business processes

The first school of thought is based on the fact that software developers did extensive research on what “best practice” is for business processes within different industries. They use examples of major players in the Enterprise Resource Planning (ERP) systems such as SAP, JD Edwards, BaaN, PeopleSoft and Oracle. According to this school, software developers develop information systems that provide best practices and enable companies to fit their processes according to the IT system. Accordingly, it is not necessary to reinvent the wheel in terms of the designing of processes. When the software package has been implemented, an extensive degree of reengineering has already taken place. This school believes that when IT drives
BPR, technology will most probably be used to its full potential (Rand Afrikaans University, 2001:7-9).

To summarise, the first school of thought believes that business processes should be adjusted to fit the selected package due to the amount of research performed by the software developers. The IT system will therefore drive the BPR process in total.

9.2.3. *It does not drive the reengineering of business processes, but enables it*

9.2.3.1. *It does not drive the reengineering of business processes*

Very often, the implementation of new IT systems and BPR is seen as two sides of the same coin. However, according to the second school of thought, this is the biggest misconception in BPR. The main reasons for this misconception are:

- The majority of people who initially introduced BPR were mostly from an IT background; and
- The media tend to focus on the spectacular improvements as a result of implementing new computer systems, but neglect to mention the other organisational changes that were implemented (Ballé, 1995:146).

Although IT plays an important role before and during the BPR process, it should never drive changes without a clear business case for such changes.
“Even if the IT potential drives the initial thinking about change, it is necessary to step back from the technology, understand the current process, and reengineer it before automating it or before adding or enhancing present information systems” (Carr & Johansson, 1995:29).

Buzz Adams, president of Peak Value Consulting Inc. agrees and adds:

“There is a belief that the new system will automatically reengineer your processes. Most people put in new systems with the hope that they will improve productivity and cut costs…Sometimes the simplest non-technology solution is the easiest and most efficient way to go” (Bartholomew, 2001a).

Bartholomew brought to attention the savings Caterpillar Inc., Peoria, IL realised by firstly improving processes and then implementing software to automate certain processes. Very often, companies do not realise that organisational issues are the root cause of inefficiencies and as a result, tend to first change the software. However, it is critical that companies first improve the processes and then implement software to support and automate the redesigned processes (Bartholomew, 2001a). Morris & Brandon agree with Bartholomew when stating that technology itself does not give any sustained competitive advantage, but it originated from the process capability within an organisation. Although BPR is often linked to information systems due to its importance in improving certain capabilities within the operation, it is not a computer activity. IT should be used to support the reengineering process (Morris & Brandon, 1994:189).
9.2.3.2. IT enables the reengineering of business processes

Before discussing why IT enables the BPR process, it is important to understand the concept “enables”. The Concise Oxford dictionary describes “enable” as “provide with the ability or means to do something” or “make possible” (Oxford, 1999).

According to Hammer (1990) and St. Clair (1999), it is generally accepted that IT is the key enabler of BPR, meaning IT is the key tool that makes it possible to reengineer the business processes. This means that when designing alternative processes, the new design should be driven from a business perspective (e.g. customer satisfaction), but IT should be used as a tool to obtain the required results (e.g. reduce lead time).

St. Clair (1999) referred to Benjamin (1993) who also pointed out that, although IT is most often seen as a key enabler of BPR, it is not necessarily true. IT can also be a potential constraint or inhibitor, particularly when the organisation’s IT infrastructure is inappropriate or inflexible.

Marchand also emphasise the importance of IT during the BPR process. According to him, one of the major reasons for failure of reengineering projects arise when a company wants to implement its new business processes, but the IT systems are not ready to support these processes. He gave two reasons for this:
- Business executives recognise the need for IT in their organisation, but is unwilling to provide the necessary budgets for the developments; or
- Business executives underestimate the capabilities their companies will need in IT as they progress from the planning stages of the reengineering process to the implementation (Marchand, 1995:14).

The unique characteristics of IT that enables (“make possible”) the BPR process will be discussed in paragraph 9.3.

### 9.2.3.3. Summary

To summarise, the second school of thought based their view on the fact that an organisation has three building blocks, which are of equal importance, namely:
- Business processes;
- Organisational structure (human dimension); and
- Information technology.

![Figure 9.1. RELATIONSHIPS WITHIN AN ORGANISATION (Du Plessis, 1994:42)](image-url)
During the BPR process, which was defined in par. 2.4 as the radical redesign of business processes, it is important that the other two building blocks (organisational structure and information systems) be realigned in such a way that they support each other to deliver optimal results. IT should not drive the redesigning of business processes, but should support it. Changing any of these building blocks in the organisation should be driven from a business perspective, but “to design processes independently of IT or other enablers is to ignore valuable tools for reshaping processes” (Swanepoel, 1995:18).

### 9.2.4. Criticism on the two schools of thought

Disadvantages of the first approach are:

- Implementing the total ERP systems is very expensive (Rand Afrikaans University, 2001:9);
- Very often during the implementation of these ERP systems, organisations plan inadequately. As a result, extensive customisation takes place, which increases costs further (Rand Afrikaans University, 2001:7-9);
- The best practises that are built into these ERP systems may be industry standards, but not necessarily aligned to all BPR principals;
- Package selection is normally based on cost, available support, capabilities of systems to fulfil current requirements, etc. and not necessarily based on BPR principals built into them; and
- Assuming that implementing an ERP package solution will automatically ensure that BPR principals are implemented, the company will have no competitive advantage over competitors in terms of BPR as competitors may be using the
same systems. That means that the company’s competitive advantage is based on its IT system and not necessarily on business perspectives, e.g. customer satisfaction.

Disadvantages of the second approach are:

- To drive the reengineering processes from a business perspective and to realign its IT systems accordingly could be a lengthy and in depth process;
- Based on the lengthiness and comprehensiveness of the process, it could be costly;
- IT departments often deliver systems late and as a result of limited time spent on the testing process and users may be unsatisfied (Peppard & Rowland, 1995:146); and
- In order to realign software to BPR principals, it is often necessary to re-write existing systems (legacy systems). These adjusted systems can become very large and difficult to administrate and manage. The potential risks for IT bottlenecks increase (Heygate, 1993; as quoted by Peppard & Rowland, 1995:147).

9.2.5. Conclusion

Based on the disadvantages of the two schools of thought, a company should not base its competitive advantage only on IT systems. Although an IT system can be part of the competitive advantage, it is important that the competitive advantage is based on business perceptions.

“BPR projects often fail due to the fact that technology is viewed as the solution rather than a component of the solution….IT plays an absolutely
critical role, but as an enabler of the BPR project and not the driver thereof” (Mayer, 1998:43).

BPR should be driven by business perceptions.

9.3. THE UNIQUE CHARACTERISTICS OF IT THAT ENABLES BPR

9.3.1. Introduction

The reason why IT is seen as the most important enabler of BPR is due to its unique characteristics that can support the objectives of BPR. During the development of the IT system or the selection of a package solution, it is important that the BPR objectives be identified and the opportunities that IT provides are matched to the objectives. Some of these unique characteristics of IT systems include the ability to:

- Automation of tasks;
- Store and retrieve data;
- Communicate data;
- Support decision making;
- Control tasks; and
- Monitor and measure performance.

9.3.2. Automation

The main advantages of automation are:

- Eliminating human labour (Jacobson, 1995:291), which is a reduction in overhead costs;
- Improving efficiency;
- Increasing speed;
- Controlling of tasks; and
- Improving quality (Morris & Brandon, 1994:191,192);

Automation can support BPR principles by reducing costs and dramatically improve performance. This can be obtained by either eliminating non-value adding tasks or automating certain non-value adding tasks, which creates no value for customers, but are required in order to get the value adding work done. An example of such tasks is quality control (e.g. check the completeness of information provided in a new policy application document). Automation can dramatically improve performance by increasing the speed in which tasks are performed.

### 9.3.3. Store and retrieve data

The ability to quickly and easily store and retrieve enormous amounts of information increases an organisation’s search abilities (Morris & Brandon, 1994:191,192). The advantages of this characteristic are enormous, including:

- Distribute the organisation by making it possible to access information from geographically different places with the help of telecommunication (Jacobson, 1995:291); and
- Data analysis can be done easily by combining different types of information and history (Swanepoel, 1995:19).

This ability supports BPR principles in that employees can be empowered and assisted in decision making by providing sufficient information to them (e.g. new developments on fraud in the industry) as well as by providing quality customer
services. The ability to easily store and retrieve data from the system will assist brokers in providing potential customers with information on new products, obtaining on-line quotations, performing on-line claim tracking, etc. By supporting this with the latest communication abilities such as mobile technology, quality customer service can virtually be provided at any geographical area.

9.3.4. Communicate data

As explained in the preceding paragraph, the ability of IT to easily communicate data can play a significant role in enabling BPR.

Communication is probably the fastest developing characteristic of IT together with the developments in telecommunication and satellite communication. The ability to communicate data has increased the advantages of IT during the last couple of years significantly. Some of these advantages include:

- Distribute the organisation by making it possible to access information from geographically different places (Jacobson, 1995:291);
- Certain processes can be moved outside the organisation by giving customers and suppliers online access to certain activities and information on the system (Jacobson, 1995:291); and
- Easier communication by using electronic mail and computer conferences (Swanepoel, 1995:19).

The use of the internet by operations to increase the communication abilities provides unlimited opportunities. The use of the internet and its role during the BPR process will be discussed in paragraph 9.4.
9.3.5. **Support decision making**

Computer systems have the ability to gather, analyse and either support interpretation of information or in certain instances, automatically interpret information (Morris & Brandon, 1994:192). This ability supports the BPR process by helping staff to perform complex jobs (Jacobson, 1995:291), e.g. where assessment of claims and the underwriting of policies are performed by the IT system and certain exceptions in terms of the programmed rules are referred for manual intervention.

9.3.6. **Controlling tasks**

IT can be used to directly control tasks in a process. It is also possible to parallelise workflow and control the sequences of activities by coordinating the information exchange (Jacobson, 1995:291). According to Morris & Brandon (1994:191), it is likely that the quality of the output will increase due to the elimination of human error.

The ability of IT systems to control tasks can support BPR principles in many ways, of which the scheduling of standard procedures (e.g. printing of standard letters, preparing the monthly premium run, annual premium increases, etc.) is used frequently.

9.3.7. **Monitoring and performance measurement**

IT can be developed in such a way that standards are included and activities are monitored against these standards. The advantage of this ability is to immediately report errors and measure performance (Morris & Brandon, 1994:191).
The ability to monitor and measure performance supports the BPR principle that performance should be measured and staff be remunerated in terms of their performance.

9.4. THE ROLE OF THE INTERNET DURING BPR

“E-business draws on an increasing array of new technologies, which have already demonstrated the ability to create dramatic breaks from past business models. These are ‘disruptive technologies’, not in any negative sense but owing to their power to create rapid, fundamental change in strategy and operations” (PricewaterhouseCoopers, 1999b:8)

In a survey performed by PricewaterhouseCoopers, Chief Executive Officers (CEOs) of companies increasingly indicated that electronic business will increase in the near future and that it is likely that non-traditional competitors will enter the market via electronic business. In the same survey performed for the European region, British chief executives are apparently the strongest believers in the future of electronic business while French and German CEOs tend to be more sceptical. The following graph indicates the motives for expanding electronic business capabilities.
Improving customer service does not only mean that current services must be performed in a better way. Although this is crucial, new demands have developed over the past years. The Oracle Magazine (Anon., 1998:11) referred to a book published by McGraw-Hill, “Growing Up Digital”, that indicates the next generation is the “Net-generation”. Children who are currently between the ages of ten and twenty will be tomorrow’s customers. They were born in the era of the Internet, which means that they will join the economy with different demands, different kinds of services and work environments, which demands are based on the comfort of a digital world.

Figure 9.2. MOTIVES FOR E-BUSINESS (PricewaterhouseCoopers, 1999b:9)

The mystery of the unknown era remains the biggest challenge for today’s companies. The question is what will these children like as employees and customers, as they are used to very different ways of working and reject many basic assumptions of today’s companies. Markets have very little comprehension of how this new generation will make and influence purchases of goods and services. However, it is not only companies who should change their old ways of doing things, but parents, teachers, policy makers, marketers, business leaders and social activists as well as Governments, who in particular are lagging behind in considering the implication of the new generation on their services (Anon., 1998:11).
In 1998 James Champy replied to a question whether the age of reengineering was nearly over, that he believed it has hardly begun. His reason for this was that companies still have to experience the full effect of the ubiquity of information technology on the way companies operate. That includes the highly portable computing and telecommunication devices in the workplace and at home, combined with the increase in computer literacy and comfort in which adults operate computers as well as the internet phenomenon (Champy, 1998:26).

How the internet could be used when reengineering a short-term insurance industry will be discussed in the paragraph 9.5.5.

9.5. BUILDING THE SUPPORTING IT SYSTEMS DURING THE BPR PROCESS

9.5.1. Introduction

As discussed in the preceding paragraphs, IT enables the BPR processes, which means that IT makes it possible to reengineer processes according to customer requirements. Davenport & Short (1990:11) describe IT and BPR as natural partners.

It is important that the IT environment also be reengineered during the BPR process to support the business processes. Davenport & Short describe the relationship between IT & the BPR process as “each is the key to think about the other.” This principal is illustrated in the following figure:
To ensure the IT systems support the business processes, it is important that the IT systems be envisioned as early as possible during the BPR process (Jacobson, 1995:237). However, it will be difficult to identify the requirements of an information system before the current system has been analysed and weaknesses have been identified. The process of reengineering the IT systems should start when the process of redesigning the business processes commence. This is illustrated in the following figure (partly constructed by Oberholzer (1995:57) developed through the course of this study:

Figure 9.3. *RELATIONSHIP BETWEEN IT & BPR* (Davenport & Short, 1990:12)
Although designing IT systems is a complex and lengthy process that is not included in the scope of this study, Jacobson summarises these steps as follows:

- Requirement capturing and analysis;
- Ideal design;
- Real design;
- Testing; and
The following aspects of designing IT systems that are directly affected by BPR principals will be discussed in some detail:

- Aligning IT strategies to business strategies,
- The planning stage;
- Assessing the current IT systems;
- Redesign IT systems to support the reengineered processes, with specific reference to:
  - Risk management and internal controls within the system;
  - Process architecture;
  - Data architecture;
  - Data storage;
  - Communication systems; and
  - Electronic-business capabilities; and
- Implementation of new IT systems.

9.5.2. **Align IT strategies with business strategies**

9.5.2.1. **Introduction**

As discussed in paragraph 6.2 the objectives of the BPR process should be in line with and support the strategies of the company. To compete in the current, highly competitive markets, “alignment between the business strategy and IT is not a luxury, but a cost of entry” (Cheong-Tsair Ho, 2001:4).

However, according to Armistead & Rowland, IT strategies can also influence the existing corporate strategies and the direction of business itself (Armistead & Rowland, 1996:194). This approach is very much supported
by Ciborra’s view on strategic alignment. Her approach will be discussed in more detail by par. 9.5.2.3.

9.5.2.2. The Henderson and Venkatraman’s model

During the past years, the alignment of IT strategies with the business plan has been the subject of much research. Several strategic alignment models were developed of which the Henderson and Venkatraman’s model (1993) was the first. This model focused on the interrelationship between business and IT and was based on two distinct linkages, namely the strategic fit and functional integration. According to Henderson and Venkatraman, the alignment of IT strategies and business strategies should specifically focus on:

(a) The strategic fit, which relates to:
   - The integration of the external environment in which the firm competes. This includes:
     • Business scope;
     • Partnerships;
     • Alliances; and
     • Core competencies and
   - The internal environment in which the firm performs, e.g.
     • Organisational structure;
     • Human resources; and
     • Business processes;

(b) The functional integration, which is the corresponding horizontal link between business and IT (Cheong-Tsair Ho, 2001:6-8).
When aligning IT and business strategies by applying the Henderson and Venkatraman’s model, the adjustment of current IT strategies as well as the implementation of new IT strategies should be considered in terms of each of the areas mentioned above. It is important that on each of these areas, the IT strategies support the BPR principles included in the business strategy.

That also implies that, in accordance with BPR principles, IT has the ability to deliver solutions that extend to third parties (customers) and that add value (Ulrich, 2000).

9.5.2.3. Ciborra’s cultivation theory

During 1997/1998, Ciborra strongly disagreed with the Henderson and Venkatraman strategic alignment model. According to Ciborra, IT is autonomous and that the strategic balance is questionable in an uncertain and flexible environment. According to her, the Henderson and Venkatraman model lost its representation when the internet usage started gaining momentum. According to her, there is a dynamic interaction between current strategies and future technology and a structured approach to align business and IT strategies is impractical (Cheong-Tsair Ho, 2001:10,11).

According to Armistead & Rowland, BPR requires a new approach to IT planning. The IT function should add value by influencing the future and shaping organisations to exploit opportunities (Armistead & Rowland, 1996:199).
9.5.2.4. Conclusion

There are several arguments for and against each of the strategy alignment models. However, it is important that the IT strategies support the BPR principles on each level of business, and that these strategies are also flexible to support the fast-moving environment.

It is also interesting to notice that IT strategies appear to be very similar to each other, e.g. most organisations use a client-server architecture, object orientation, etc. The reason for this is mostly that IT strategies are greatly influenced and dependent on the general trends and developments in the IT industry, which determine the availability of technology (Armistead & Rowland, 1996:199). However, in research performed by Forrester during April 2001, it was clear that although IT strategies appear to be very similar, the biggest challenge was to move beyond traditional IT best practices and turn outward to focus on customers and suppliers (Ross & Doyle, 2001).

To conclude on the different approaches how to align IT strategies with business and BPR strategies, it is important to refer to the relationship between BPR and IT as illustrated in figure 9.3. IT strategies should be aligned with BPR strategies, but it should also influence the BPR and business strategies in a flexible and fast moving environment.

Once management is confident that the IT strategies support the business strategies, the reengineering team should continue to assess the current IT systems, which will be discussed in the next paragraph.
9.5.3.  **The planning stage**

As for any other project, it is important that sufficient planning is performed before commencing the process of changing the IT systems.

Although discussions of the full process for designing new IT systems, which includes the planning process, is specifically excluded from the scope of this dissertation, it is important to note that co-operation between the IT and BPR teams is critical when IT systems are changed during the implementation of BPR.

During the planning stage, the roles and responsibilities of each team member as well as interaction and co-operation between the IT team and the BPR team (which forms a combined BPR team) should be specified.

9.5.4.  **Pre-study stage: Assess requirements in terms of a new IT systems**

During this step, the combined BPR and IT team should gather all suggestions, ideas and requirements from customers on how the IT system should be developed or changed. Customers do not only include customers who purchase goods or services from the organisation, but include all parties dealing directly or indirectly with the IT systems, e.g. users of the system, suppliers who have access to the system, etc. This information, which can be gathered by making use of the same methods as discussed in paragraph 7.3.5, can be combined as a wish list. The wish list should be further developed into a list of requirements, which is based on highest priorities (Jacobson, 1995:243).
A requirement analysis should be prepared to review the specifications of the requirements and to ensure they are consistent and in accordance with the strategies (Jacobson, 1995:244). Morris and Brandon warned about having too much on the requirement list. That can easily result in huge backlogs on the maintenance and development aspects of an IT system.

“The assumption is often made that backlogs are made up of ideas that would not give value for money.”

It is important to base the requirement list on the high impact, low cost principal (Morris & Brandon, 1994:202). Very often, both the IT team and the BPR team should compromise in terms of their objectives to secure the best business solution.

9.5.5. Pre-study stage: Assess the current IT systems

To analyse the current systems, Morris and Brandon recommend that the following documentation be used:

- Functional descriptions;
- Descriptions of data definitions;
- File record layouts;
- Process charts;
- Data relationship diagrams;
- User documentation; and
- Program design charts & programs.

Computer-aided systems engineering (CASE) tools may also be used, which can provide direct input into any automated reengineering tool (Morris & Brandon, 1994:197,198).
Assessing the data, data relationships and program designs is not sufficient in itself. Assessing the hardware requirements is an extremely important aspect. This aspect should be performed by an expert to fully utilise existing technology available in the market. Communication and data sharing is one of the most important aspects when aligning the IT systems to support the reengineered business processes (Morris & Brandon, 1994:199,200).

A last aspect that should be analysed is the quality of data. The quality of the data is not only dependent on the accuracy, but more on the timing and organisation of it. Due to the growing importance of information to an organisation, data quality is an extremely important aspect, which should receive attention during the BPR process (Morris & Brandon, 1994:200,201).

9.5.6. Redesign IT systems to support reengineered business processes

9.5.6.1. Introduction

An organisation has two options in order to implement IT systems that support reengineered business processes:

- A package solution can be purchased and customised; or
- A new system can be developed. The development of the new system can either be performed in-house or it can be outsourced.

Redesigning the IT systems is a lengthy and complex process. Should the organisation decide to rather purchase a package solution, the complexity of the process is substantially reduced. However, it is very likely that some customisations will still be required.
Redesigning the IT systems should take place simultaneously with redesigning of the business processes (Morris & Brandon, 1994:202).

The following paragraphs will not cover the designing and development process in depth, but will focus on areas that are important in both a package solution and in-house developed system to support BPR principals. When the combined IT & BPR team selects a package solution or develops the information system in-house, it is important that the team carefully considers the following areas in terms of how they support BPR principles:

- Risks and internal controls within the system;
- Process and database architecture;
- The data storage capacity;
- Communication capabilities; and
- The ability to facilitate electronic business.

Each of these aspects will be discussed below.

### 9.5.6.2. Risk and internal controls within the system

One of the BPR principals is to work in teams and to ensure employees are involved in a process rather than one task. This principal eliminates to an extent the internal control of segregation of duties on which management relies to ensure validity and accuracy of information. Thus, it is important that the new information system includes alternative controls to validate information.
These internal controls should provide reasonable assurance that the following objectives are achieved:

- Effectiveness and efficiency of operations;
- Reliability of financial reporting; and
- Compliance with applicable laws and regulations.

However, internal controls should still be cost effective and promote the achievement of business and BPR objectives, e.g. reduce lead time, etc (Daly, n.d.:22, 23).

Before the combined BPR & IT team can evaluate the internal controls in a package solution or develop internal controls in the new in-house developed system, a risk assessment should be performed. The risk assessment should highlight the risks as well as what type of internal controls will be required to reduce the risk to an acceptable level. The risk assessment should be properly documented and evaluated (Daly, n.d.:24).

Computer controls that can reduce risks to an acceptable level include:

- General controls; and
- Application controls.

General controls are those normally concerned with the programming, data files, communication functions, etc (Jenkins, Cooke & Quest, 1992:28). Although these controls do not have a direct impact on the validity, completeness and accuracy of data, they do have an important indirect impact. The indirect impact and importance of general controls are illustrated in the following:
- Access/security controls to the networks and platforms will prevent unauthorised access and ensure valid data input;
- Firewalls will protect networks and databases from unauthorised access through communication systems and ensure valid data input and complete data files;
- Proper backup procedures will ensure complete data recovery in case of any disasters; etc.

It is, therefore, critical that the combined BPR & IT team ensure proper general controls are in place when the IT function is redesigned.

It is also extremely important that proper internal controls (general controls) be in place during the development phase. A certain level of segregation of duties should always be in place. One of the most important segregation of duties is that the development function of the new system and the operating function be segregated. That means programmers should not be able to process data and vice versa. Proper procedures should be in place for developing, maintaining, documenting, testing and approving systems and changes should be formalised in procedure manuals (Daly, n.d.:24).

Application controls on the other hand, are controls built in the package solution or the in-house developed system, that are closely related to the data. These controls should be carefully evaluated to ensure they reduce the risks to acceptable levels as defined in the risk assessment.

Application controls are categorised into:
- File controls; and
- Transaction controls;
File controls should ensure file continuity (once data is updated to a file, the data remains correct and current on the file) and that assets are protected (prevent unauthorised access to data files) (Jenkins, et al., 1992:25,26).

Transaction controls should ensure that all transactions are captured and processed completely, accurately and that transactions are valid (authorised) (Jenkins, et al., 1992:26).

When evaluating a package solution or in-house developed IT system, it is important that the team carefully considers both general and application controls. These controls should reduce risks to acceptable levels without impeding the achievement of business and BPR objectives.

9.5.6.3. Process architecture

When selecting an appropriate package solution or developing a new IT system in-house, it is important that the architecture of the system supports BPR principals. These principals can be supported by the following:

9.5.6.3.1. Capture data once, at its source

Many short-term insurance companies have a number of separate information systems, such as an underwriting and claims subsystem, an accounting system, a system to record reinsurance and a system
to analyse data for new product development and risk management. Very often, the last two systems are maintained on spreadsheets.

Each of these systems collects, enters and processes information. It is recommended that either one IT system is used or that all systems are automatically interfaced and that data is captured once and at its source. By giving all authorised staff access to databases and providing them with proper reporting tools, data analysis can be performed directly from the database. That will eliminate the process of exporting information from the different databases into spreadsheets for analyses (Romney, 1995:26).

9.5.6.3.2. Information producers process information

Information producers should process the information into the system and not other staff members who are very often data capturers who are not conversant with the detail and background of the data. This will eliminate errors as well as ensure completeness of information. Very often, data capturers do not understand the importance of certain data fields and either do not capture the information or capture it incorrectly.

In a short-term insurance industry, it is important that staff who capture new business, is also conversant with the underwriting process. This is also applicable to staff capturing information on claims, who should be conversant with the claims assessment process (Romney, 1995:26).
9.5.6.3.3. Real-time management of information

Another important aspect of information systems is that it provides real-time management information that should assist management to analyse and compare the complete organisation and its components with budgets, results from other periods, results from competitors, market trends, etc. When redesigning management information, it is extremely important that profitability of individual products and customers are also measured (Davies, 1994:50).

Davies also emphasises the importance of “end-user definability.” All the report writing and inquiry functions should be defined by the end-user and it should be easy to change these reports.

9.5.6.4. Database architecture

9.5.6.4.1. The importance and relevance of database architecture during the implementation of BPR

“Information is always in demand. However, access to accurate and timely information that may have been merely desirable in the past has become vital in today’s global marketplace. Businesses are requiring broader access to information as a means of supporting decision-making processes and to facilitate extended relationships with customers, suppliers, and partners. This information must be gathered from various systems and sources, and stored and organised so it is
easily accessible to those who need it, when they need it” (PricewaterhouseCoopers, 1999c:427).

It is important that the combined BPR and IT team understands the relevance and importance of establishing the correct database architecture when implementing BPR principles. The relevance of the database architecture during the implementation of BPR is explained with reference to the following principles:

- When implementing BPR, employees no longer only participate in a single task, but participate in the full process. That will improve customer service, but also require that employees be empowered to make decisions. It is critical that sufficient information is centralised and dispersed to employees assisting them in making informed decision and providing them with knowledge regarding the process in total; and

- When implementing BPR, the objective is to significantly improve customer service levels. Customer service levels in the short-term insurance industry can be improved by:
  - Reducing the underwriting time;
  - Reducing the claims assessment time;
  - Reducing fraudulent claims; etc.

The role of database architecture in this requirement is significant to ensure all the information that is required in these complex analyses are obtained as fast as possible from various sources, which also include third parties (e.g.
Although the focus of this dissertation is on motor and household insurance products, it is worth mentioning the important role that data mining, which is defined as “the process of discovering previously unknown information from the data in data warehouses” (PricewaterhouseCoopers, 1999c:448), can play in the medical insurance business. Mechanic (2001) reported that predictive data analysis engines identify high-risk patients before costly medical events occur. However, insurance companies still lack the tools to preemptively intervene. Insurance companies offering other insurance products can also benefit from using data warehouses more effectively.

To ensure that information is available when and to those who need it, it is extremely important that data is easily and timeously accessible. These requirements can be fulfilled by:

- Centralising and dispersing data; and
- Providing a flexible data architecture by using data marts and/or data warehouses.

These two aspects will briefly be discussed in the following paragraphs in order to understand the different concepts.
9.5.6.4.2. **Centralise and disperse data**

Very often, operations centralise activities to achieve economies of scale, while others decentralise activities to provide better customer service. Romney recommends that by centralising and dispersing data, it is possible to have the advantages of both approaches (Romney, 1995:26).

In the short-term insurance industry, it is particularly important that information be centralised to analyse group risk on a daily basis and re-insure risks that the company is not willing to carry. However, it is also important to disperse data to ensure brokers and customer contacts have updated information on regions to improve customer service (Romney, 1995:26).

9.5.6.4.3. **The difference between a data mart and a data warehouse**

Before discussing the difference between a data mart and a data warehouse, the development of databases will briefly be discussed as background.

Early IT systems incorporated both the data and the processing engine within the one software system. Developments in database technology made it possible to decouple the data from the processing engines. With the development of data warehouses and data marts, it become possible to define the data requirements for an individual process and then extend the definition of the data to include
new attributes that are required for subsequent processes (Armistead, Rowland, 1996:211). Data warehouses make it possible to centralise data, but also cater for additional data definitions as applications are added to the system. The following diagram indicates the development of databases:

![Diagram of database development]

Figure 9.5. DEVELOPMENT OF DATABASES

The concept of data warehouses is further explained by the following diagrams:
Figure 9.6. DATAWAREHOUSE TECHNOLOGIES

(PricewaterhouseCoopers, 1999c:434)
Figure 9.7. CREATING THE DATAWAREHOUSE

(PricewaterhouseCoopers, 1999c:435)

Data from operational systems and/or other external systems, of which the latest developments are to link the internet and
corporate intranets as a means of sourcing and delivering
data, is extracted, cleansed and summarised. Data
warehouse generation tools are used to cleanse and
summarise the data from where it is loaded into a data
warehouse. Generally, an estimated 60 to 80 percent of the
data warehouse activities occur in the warehouse generation
process (PricewaterhouseCoopers, 1999c:403-435).

Database gateways that access different database and
formats are used to access data that resides in operational
systems. Data extraction routines then interpret the
operational system data formats, identify the changed records,
and copy them to an intermediate file. Utilities (transformation
programs) are run from the intermediate file to prepare the
data for the data warehouse. The transformation process
includes:

- Consolidating the data from multiple sources;
- Filtering the data to eliminate unnecessary details or
  fields;
- Cleansing the data to repair or eliminate incorrect or
duplicate data;
- Converting and translating the extracted operational
data into the data warehouse format; and
- Aggregating the data (PricewaterhouseCoopers,

Another aspect that should be considered during the
evaluation of the data architecture is whether a data
warehouse or a data mart should be used. This will depend on
the following aspects:

<table>
<thead>
<tr>
<th>TYPICAL CHARACTERISTICS</th>
<th>DATA MART</th>
<th>DATA WAREHOUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EFFORT</td>
<td></td>
</tr>
<tr>
<td>Scope</td>
<td>A single subject area</td>
<td>Many subject areas</td>
</tr>
<tr>
<td>Time to build</td>
<td>Months</td>
<td>Years</td>
</tr>
<tr>
<td>Cost to build</td>
<td>$ Hundreds of thousands</td>
<td>$ Millions</td>
</tr>
<tr>
<td>Complexity to build</td>
<td>Low to medium</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>DATA</td>
<td></td>
</tr>
<tr>
<td>Requirements for sharing</td>
<td>Shared within a business area</td>
<td>Shared across the company</td>
</tr>
<tr>
<td>Sources</td>
<td>Few operational and external systems; a data warehouse</td>
<td>Multiple operational and external systems</td>
</tr>
<tr>
<td>Size</td>
<td>Megabytes to low gigabytes</td>
<td>Gigabytes to terabytes</td>
</tr>
<tr>
<td>Time horizon</td>
<td>Near-current and historical data</td>
<td>Historical data</td>
</tr>
<tr>
<td>Frequency of update</td>
<td>Optimised for frequent updates (daily &amp; weekly)</td>
<td>Optimised for less frequent updates (weekly &amp; monthly)</td>
</tr>
<tr>
<td>Number of instances</td>
<td>Multiple data marts distributed across the company</td>
<td>Single data warehouse</td>
</tr>
<tr>
<td></td>
<td>TECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>Hardware</td>
<td>Small to medium sized PC or RISC servers</td>
<td>Medium sized PC or RISC servers, mainframes</td>
</tr>
<tr>
<td>Typical operating system</td>
<td>Windows NT, UNIX, OS/400</td>
<td>UNIX, MVS, OS/2</td>
</tr>
<tr>
<td>Database</td>
<td>Work-group database</td>
<td>Large database</td>
</tr>
<tr>
<td></td>
<td>USAGE</td>
<td></td>
</tr>
<tr>
<td>Number of concurrent users</td>
<td>Tens</td>
<td>Hundreds or thousands</td>
</tr>
<tr>
<td>Type of user</td>
<td>Business area analysts, business unit managers</td>
<td>Knowledge workers, corporate analysts and executives</td>
</tr>
<tr>
<td>Business focus</td>
<td>Optimising activities within the business area</td>
<td>Cross-functional optimisation and decision making</td>
</tr>
</tbody>
</table>

Table 9.1. **DIFFERENCES BETWEEN A DATA WAREHOUSE & DATA MART** (PricewaterhouseCoopers, 1999c:432,433)
9.5.6.5. Data storage

Besides transaction information that should be stored by the organisation, companies are legally obliged to store certain documentation for certain periods. Very often, such documents are also used during certain processes. In the short-term insurance industry, it is important that where documentation such as policy applications are received in paper format, the original document is kept as a legal agreement between the customer and the company.

Documentation can be stored by using image processing, which refers to two different types of imaging technology:

- Micro-graphics, which uses an analog photographic process to create microfiche under computer control. This is the oldest method of image processing; and
- Electronic image processing, which is an all-digital process that scans an image into a digitised form to be stored and manipulated electronically. Although electronic image processing provides greater flexibility and productivity, it is much more expensive (Gehling & Gibson, 1995:55).

Although micro-graphics/microfilm storage has significant advantages comparing with storing paper documents, it has the following disadvantages:

- Documents can only be viewed by one user at a time;
- Searches for specific information contained within a group of documents are extremely slow and labour intensive as each document has to be reviewed manually;
- Processing the film can cause delays between the time the
document is filmed and when it is available for access; and
- Access to microfilmed documents is limited to very few locations
within the organisation (Gehling & Gibson, 1995:56).

One of the biggest potential advantages of using electronic imaging is the
ability to integrate the images with the organisation's current information
technology (Gehling & Gibson, 1995:57). The potential for the short-term
insurance industry is that all documentation received from customers can
be scanned and transformed into electronic format within the new
business and claims subsystems. Data capturing can be eliminated
largely.

Imaging technology also allows users at different locations to work with
the same documents and information at the same time (Romney,
1995:25). This ability supports BPR principals to ensure information is
available to any user who should require information in its decision
making process.

A further advantage of using electronic imaging processing is that these
systems also control the movement of documents and images through the
organisation by using a set of pre-established routing rules. These
routing rules are parameters that dictate what should be done with an
image file and where the task should be performed. Gehling & Gibson
explained this concept by using the example that the routing rules can
specify that a document should be held until other related documents
enter the system, or it could specify that any document in excess of a
certain amount be routed to a specific person (Gehling & Gibson, 1995:58).

Dames & Moore Group, a Los Angeles-based engineering firm, used imaging technology to circulate invoices for approval before payment. Before reengineering their systems, this function was performed manually and was extremely time consuming (Bartholomew, 2001b).

The United Services Automobile Association (USAA), an insurance company, used image technology to significantly improve their workflow and convert to a paperless office in 1982. All incoming mail is scanned and stored and the paper is destroyed. This enabled the USAA to track every document and know its location at any time. Besides the costs of saving office space of 38,900 square feet, the company improved customer service by providing faster and more reliable service (Gehling & Gibson, 1995:58).

9.5.6.6. Communication

Communication is one of the fastest developing areas. An incredible amount of new technology is currently available in the market and it is increasing on a daily basis. Due to the importance of information sharing and customer communication in a reengineered environment, effective communication technologies are critical to support the reengineered environment.

Local area and wide area networks (LAN & WAN respectively) can connect users and provide online access to all information. Mobile
computing is also available to ensure employees are in constant communication with their organisation (Romney, 1995:25). Computerweek reports that the expected growth in LANs & WANs will be 26% and 17% respectively from 2001 to 2005. This report also identifies four markets that will show significant growth in upgrading their LAN & WAN networks. One of these sectors is the financial services sector, which includes the insurance industry (Anon., 2001). Integrated services digital network (hereafter referred to as ISDN) increased the speed of transmitting data tremendously as it provides a continuous digital transmission path for the duration of calls. It is suitable for applications such as voice transmission, video conferencing, remote access to office networks, internet access and fax and image transmission. Although ISDN was a tremendous improvement in the communication technology, digital data continues to grow much more rapidly than voice traffic. One of the later developments is SMDS (switched multi-megabit data services), which is a connectionless packet service that offers speeds up to 45Mbps. This technology is already available in most of Europe and parts of the US (PricewaterhouseCoopers, 1999c:47-51).

Wireless mobile services continue to grow at astonishing rates across the world. The projected growth rates are doubling as the prices continue to drop. Wireless traffic grew from 5% in 1997 to a projected 18% by 2002. The number of wireless networks is expected to expand from 687 in 1997 to 1,144 by 2002. Satellite services have a window of opportunity to provide data services to the small office / home office (SOHO) market. These facilities are developing extremely fast (PricewaterhouseCoopers, 1999c:76-78).
The Gartner Group estimates that during 2003, at least 60% of Fortune 1000 companies will deploy a wireless application gateway (WAG), and by 2004, companies will have to support a minimum of 50 different mobile device profiles and 10 different wireless network interfaces at once. A WAG is the only way to ensure all these interfaces glue together to support the mobile strategy. WAGs are the only practical solution to reduce the risk of immature devices, inconsistent content and application types and conflicting network capabilities (Papanicolaou, 2001).

While cost versus benefits will influence the decision on the type of communication technology that will be installed, it is important that the company is aware of new developments in the market as well as what is available. The selected communication technology should have the ability to support the operation in its BPR objectives.

These BPR objectives can be supported in a short-term insurance business by providing brokers and direct salespeople with the latest communication technology in order to access networks virtually from any destination. Not only should brokers and salespeople have access to the networks by using the technology as discussed above, the customers (including potential customers, current policyholders, third party insurance companies, reinsurers, etc.) should also be allowed to access networks. The developments in communication technology can be applied with great success where companies specifically decide to expand business into Africa.
9.5.6.7. **The ability to facilitate electronic business**

Electronic business is one aspect that cannot be ignored by any company that wants to survive the new economy. Electronic business, together with communication technology, is one of the most current and important developments in businesses. Web-based process automation tools allow business and IT analysts to create Internet front ends that allow users to trigger or authorise a manual or an automated process (Ulrich, 2000).

When the combined BPR and IT team consider the implementation of a IT system to support the business processes, it is important that the selected software supports electronic business as well as provide proper security for internet business. These two aspects will be discussed in the following paragraphs.

9.5.6.7.1. **Software should support electronic business**

Normally, the starting point for e-business in a retail organisation is business-to-business. However, this is not necessarily true for insurance companies as products offered to individuals are very often simpler and the underwriting process can be automated easier than special products provided to commercial customers.

According to PricewaterhouseCoopers, before selling over the internet, business to consumer models only included walk-in centres, direct sales and mail or phone order (PricewaterhouseCoopers, 1999c:199,200). In the short-term insurance industry, this represented walk-in centres (office of the short-term insurance
company or the broker), direct sales via brokers where brokers do
door-to-door sales at customer's residence and sales via mail or
phone. Auto&General is a South African insurance company that is
using telephone systems extremely efficiently. This will be discussed
in more detail in paragraph 9.5.6.7 and chapter 10.

The use of e-business allows walk-in centres to become virtual offices
that are always open and lightly staffed (or even not staffed at all).
The Web as a medium of sales offers very different possibilities from
the physical world. Some of these possibilities are highlighted by
PricewaterhouseCoopers as:

- The advantages of a worldwide audience, assuming that
  through branding or advertisement (also by using the Web) the
  company will invite visitors to its web site;
- An extremely wide range of information is available from a
database in contrast to information that is made available
through floor space, catalogues or air time when advertising
through radio or television;
- On-line quotations are available without the involvement of
  staff; and
- Highly targeted marketing that presents each customer with a
timely and appropriate offer (PricewaterhouseCoopers,
1999c:200,201).

Depending on the company's strategy, resources and objectives, the
electronic services available to customers as well as the cost of
developing and maintaining a web site will vary. During 1999
PricewaterhouseCoopers referred to a matrix prepared by the Gartner
Group of different strategies and the costs to implement these strategies:

Figure 9.8. BUSINESS-TO-CONSUMER WEB SITE FEATURES & COSTS (PricewaterhouseCoopers, 1999c:201)

While operations previously made use of value-added networks (VANs) to support electronic data interchange (EDI) between companies and their suppliers and/or customers, new technology developments for the internet, such as XML, make it possible to
transfer data between suppliers/customers and the company via the internet.

9.5.6.7.2. Security in the electronic business environment

Another extremely important aspect that the combined IT & BPR team should consider with regards to electronic business is security. Clive Handley of Velocit-e, an IT security and cashless solution specialist, agreed with this and added:

“No matter how alluring, an e-commerce site will not be used if it does not offer the necessary security. Users will only disclose financial details if they are confident transactions are secure. This means ensuring authentication, availability and integrity. The primary requirements when it comes to e-business are the need for privacy, failsafe authentication and non repudiation.”

Handley based his comments on statistics that were released from a major company that indicate more than 50% of all repudiated transactions come from less than 2% of their business, being their online business. He foresees that this figure will rise meteorically (Language, 2000).

In research performed by KPMG regarding e-commerce security and fraud, the results showed that knowledge of e-commerce in SA was lower than expected. Only 30% of companies responded that they know exactly what e-commerce and the related security risks involve, while 53% responded that they have a vague idea. According to KPMG, this illustrates senior executives ignorance of the importance of security. Companies are failing to implement policies that could
prevent and detect e-commerce fraud. Less than 35% of the participants in SA perform security checks on a regular basis, while only 43% of participants have no incident response procedures in place when they do discover a breach (Etzman, 2001).

Several vendors and other organisations have been working together to establish a number of products and procedures that will ensure secure web sites and reduce fraudulent transactions. These products include:

- Digital cash, where the customer possesses tokens that can be exchanged for goods or services. In many instances, the tokens are used anonymously in the same manner ordinary cash is used;
- Smart cards, which carry a certain amount of virtual cash stored directly on the chip and do not require on-line verification;
- Secure electronic transactions (SET), which is a combined effort of leading credit-card associations and software vendors that created standards for accepting credit cards over the internet. Software that passes SET’s testing will receive a SET stamp. One of the latest developments from SET is to include debit cards, smart cards and other methods of internet payment;
- Bank internet payment system (BIPS), which is an initiative by the Financial Services Technology Consortium as a cooperative effort among several US banks, technology firms and government agencies to increase system security. BIPS will enable payers and payees to agree on payment terms and
mechanisms and to access multiple bank payments systems; and

- Open trading protocol (OTP), which was created by a global consortium of more than 30 vendors, financial institutions and payment system organisations. OTP is aimed at facilitating business-to-customer transactions. OTP is vendor-neutral standards that are designed to ensure the EC transactions take place securely and efficiently, regardless of the method of payment (PricewaterhouseCoopers, 1999c:213-225).

9.5.7. Implement electronic business in the short-term insurance industry

This paragraph will discuss an example of how an e-business application (business-to-customer) can be implemented. It is important that the company provides the customer with a one-stop service that is fast and secure.

As the short-term insurance products that are discussed in this study are mainly based on inherent risks that relate to the geographical area, short-term insurance web sites should specifically indicate that products are only available to customers in specific areas. E.g. Should a short-term insurance company be registered in South Africa, Namibia, Botswana, Zimbabwe, Swaziland & Lesotho, it is important that this information already be disclosed on the first page to prevent a potential customer who does not insure assets situated in any of these countries, from requiring a quotation. It is also important that where products are available in more than one geographical area, customers indicate in which area they require cover. E.g. South Africa can be divided into regions (Guateng, Northern Province, etc) and each region can be divided into
cities (Johannesburg, Pietersburg, etc) and rural areas or districts. Risk profiles for each of these will differ and it is important that this be identified.

It is also important that the web site provides all possible services as well as links to related sites and services. Services that can be provided should include:

- New policy and quotation application;
- Policy maintenance and changes to personal details;
- Lodging claims;
- Claim tracking; and
- General and company information.

The web pages may be a method to collect information, which is similar to the paper based application forms. Therefore, the content of the web pages should be similar to the paper based application forms. The advantages of the web application are the reduction of infrastructure (reduce data capturers) and a direct interface to the databases, which reduce lead time substantially.

The quotation and new policy application page should list the different products and depending on the select product(s), the specific information required for underwriting to determine the risk. Examples of the specific information on house content & motor vehicle insurance should include:
<table>
<thead>
<tr>
<th>House Content</th>
<th>Motor vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of building that should be insured, e.g. main residence, barns, etc.</td>
<td>Vehicle year</td>
</tr>
<tr>
<td>Roof construction, e.g. standard, thatched, etc.</td>
<td>Vehicle make &amp; model</td>
</tr>
<tr>
<td>Wall construction, e.g. brick, wood, etc.</td>
<td>Registration number</td>
</tr>
<tr>
<td>Burglar bars &amp; alarm systems</td>
<td>Usage, e.g. private, business, etc.</td>
</tr>
<tr>
<td>Security gates &amp; electric fence</td>
<td>Type of cover required, e.g. comprehensive</td>
</tr>
<tr>
<td></td>
<td>Immobiliser, gear-lock</td>
</tr>
<tr>
<td></td>
<td>Alarm &amp; tracking device</td>
</tr>
<tr>
<td></td>
<td>Locked garage</td>
</tr>
</tbody>
</table>

Table 9.2. INFORMATION ON HOUSE CONTENT & MOTOR VEHICLE INSURANCE

Other information that should be required can include:

- Insured amount;
- No claim bonuses history; and
- Voluntary excess amount.

It is important to use drop-down boxes and compulsory fields to ensure accurate and complete information is provided. Before the customer submits his/her application, it is important that a confirmation page, which lists all the information on application, be
reviewed. Underwriting of these type of products should be relatively easy and should all be automated. Therefore, customers must receive immediate quotations on-line.

Brokers can use the same web pages should they complete a quotation or new application on behalf of a customer by completing a broker code field. The system can also perform an on-line validation check on the broker code to ensure the correct code is captured.

Should the quotation be confirmed by a formal policy application, method of payment should be provided, e.g. a debit order form should be completed and bank details should be provided. On-line validation checks on bank details can be implemented should the insurance company have agreements with banking institutions to access their systems directly.

The policy maintenance page should start with the policy number. However, for security reasons, it is recommended that customer details are not reflected automatically on the screen when only the policy number is submitted. The customer should provide other personal information as well, e.g. ID number, surname, first names, initials, etc. The page should then provide for possible changes, which can, depending on the current policy, include any of the following:

*Information that does not affect the premium:*
- Change in personal detail, e.g. surname (married woman);
- Contact details, e.g. e-mail address, telephone numbers, etc;

*Information that does affect the premium:*
- Change in residential address;
- Additions to insured content;
- Cancellation of certain insured items or the full policy;
- Increases or decreases to the insured amount or voluntary excess amount;
- Changes to conditions, e.g. alarm system added to residence, gear lock added to motor vehicle, etc.

Similar to the paper based claim process where different claim forms exist depending on the type of claim, the web site should also provide the customer with different web pages depending on the type of claim. Examples of these types of claim forms are:

- General claim form for house content;
- Motor vehicle claim form; and
- Windscreen claim form.

Again, it is important that when these forms are completed, that not only the policy or claim number is provided by the policyholder, but also other personal information to validate the claim.

The most detailed claim form will probably be the motor vehicle claim. Information that should be included this form can include:

- Personal and policy information to validate the policy holder;
- Detail with regards to the accident, which can include:
  - Date of the accident;
  - Police / traffic department where the accident was reported;
  - The police / traffic department case reference number;
  - A short description of the accident;
  - The purpose with which the vehicle was being used at the time of the accident;
- Details with regard to the driver (name, relationship with policyholder, ID number, driver’s license code);
- Detail of the insured vehicle to validate the information with the detail of the insured vehicle as per the policy;
- An estimation of the costs to repair the vehicle or names and contact details of companies who provided quotations to repair the damaged vehicle;
- Details of third parties whose property was damaged by the accident, including the make and registration number of the other vehicle; and
- A declaration by the person submitting the claim. A substitute for a signature is to ask the claimant to mark a click box should he/she agree with the declaration that all information provided is true and accurate.

After submitting a claim, the customer should immediately receive a claim reference number, which can be used in claim tracking. The claim tracking system should indicate to the customer the stages of completion, and where applicable, the time it will take before final completion.

The same entry pages as on the web application should be available to brokers and the call centre personnel. That will enable customers to use any of the following entry points:
When the customer prefers to rather telephone the insurance company, personnel at the call centre can use the same entry pages to ensure all information is obtained to perform a quotation, maintain policy information, lodge and track claims. When business is performed by means of telephone, it is important that all calls are recorded.
It is important that short-term insurance companies ensure that their full service is available to customers in as many as possible mediums and as cost effective as possible. Advantages of offering web and voice services to customers are:

- The reduction of paper and postage costs;
- The reduction of personnel costs (reduction in data capturers and back office staff); and
- The reduction in overhead expenses, e.g. office space and related expenses due to the reduction in personnel.

By offering services to customers in as many as possible mediums and as cost effective as possible supports BPR principles to improve customer service and reduce costs. The internet provide excellent opportunities to support BPR principles.

### 9.5.8. Testing and implementation of the new designed IT system

After redesigning and developing or customisation of the new IT system, the system should be tested. The testing of the IT systems is part of the full testing of the reengineered processes. It is important that the testing is performed properly and in accordance with a detailed test plan (Morris & Brandon, 1994:209, 210).

Testing of in-house development systems should be carried out in three distinct stages:

- Program testing, which consists checking the logic of individual programs against the specifications. This testing should be performed during the development phase as soon as a section of a program has been completed;
- System testing, which consists of checking the logic of the various individual program links that together form the system. This is an extremely important part of the testing to ensure all interfaces are working properly; and

- Live testing, which consists the testing of the system under operational conditions. The purpose of this testing is to ensure the system can cope with workloads and volumes. Live testing can be performed by:
  - Parallel running; or

Parallel running can be a costly exercise and can have difficulty in comparing results when the new system and the old system are not identical. Nevertheless, parallel running constitutes the best method of testing a system thoroughly (Jenkins, et al., 1992:216).

Pilot running is to implement the system at a small portion of the business or to capture a portion of the relevant records, e.g. to implement the system at a branch. The results of the new system are examined in detail to ensure that it is reliable and accurate. If the system proves to be reliable, it is implemented in the rest of the operation (Jenkins, et al., 1992:217).

Testing packages will only differ from the in-house developed systems in that the program testing will not necessarily be performed, except where extensive customisation has been performed.

Following the testing of the IT systems and reengineered processes, the systems should be implemented. There should be a detailed conversion plan as well as the implementation procedures (Morris & Brandon, 1994:209, 210).
9.5.9. **Conclusion**

Redesigning the IT system to support the reengineered business processes is critical to the success of the BPR process. It is extremely important that the IT development team and the BPR team work together to meet the business objectives. Very often, both the IT team and the BPR team should compromise in terms of their objectives to secure the best business solution.

The combined BPR and IT team should consider whether it is more appropriate to develop a new IT system in-house or to purchase a package solution, which can be customised. However, notwithstanding which option is selected, it is important that:

- The IT strategies be aligned with business (and BPR) strategies;
- The project is planned properly;
- The requirements and current system is properly analysed;
- IT systems are designed to support the newly designed business systems;
- The IT system is tested properly; and
- The IT system is implemented.

There are different approaches on how the IT strategies be aligned to business strategies. However, it is important that IT strategies be aligned to support business processes in all aspects, but that the strategies are also flexible in an extremely fast developing environment. The relationship between IT and business strategies should be that they are interdependent and influence each other.

Like any other project, the planning stage is critical. It is important to clearly define the roles and responsibilities of the team members, as the BPR and IT development teams should work closely together.
During the pre-study stage, both the current IT system should be analysed and requirements for the new system should be identified.

When redesigning a new IT system or when selecting a package solution, it is important that the teams consider following aspects in terms of BPR principles:

- Risks and internal controls;
- Process architecture;
- Database architecture;
- Data storage capabilities;
- Communication capabilities; and
- The ability to facilitate electronic business.

It is of extremely importance that the solution is tested properly. Testing of the IT systems should be part of the BPR process testing to ensure a complete solution.

9.6. CONCLUSION

Chapter 6 discussed the planning stage of the BPR project, chapter 7 the pre-study stage and chapter 8 certain aspects of the execution stage. This chapter completes the discussion on the execution stage by referring to the role and certain aspects of IT that should be considered during the execution stage.

As discussed by paragraph 9.2, the role of IT is extremely important during the BPR process. Although the BPR process should never be driven by IT, but by business objectives, IT plays the role of enabler during the BPR process. Being the enabler of the BPR process means that IT “makes it possible” to reengineer the processes by providing technology as part of the
solutions. However, it is important to know that IT on its own will never provide the full solution to the business problems.

IT is seen as the enabler of the BPR process due to specific characteristics, which include:

- The ability to automate tasks;
- The ability to easily store and retrieve massive volumes of data;
- To improve communication and transmission of data;
- To support decision making processes;
- To control tasks; and
- To monitor and measure performance.

An extremely important aspect of IT during the BPR process is the role of the internet. This, together with developments in telecommunication, is currently one of the most important developments in business. No business that would like to have a competitive advantage can afford to ignore these developments.

When a new system is developed or a package solution is selected, it is important that the BPR and IT teams work together to the best possible solution to support the reengineered processes. The process of developing, testing and implementing the IT system should be integrated with the process of developing, testing and implementing the reengineered processes. Only if the IT and BPR teams work closely in all aspects, can this important phase of the BPR process be successful.
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