Southern African Development Community (SADC)
Payment System Project

Guide to Developing a Strategic Framework for Payment System Modernisation

Prepared by the SADC Payment System Project Team under the auspices of the SADC Committee of Central Bank Governors

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This publication is also available on the SADC Committee of Central Bank Governors' World Wide Web site (http://www.sadcbankers.org).

FOREWORD

This publication, entitled *Guide to Developing a Strategic Framework for Payment System Modernisation* (the Guide), is published by the SADC Payment System Project Team under the auspices of the SADC Committee of Central Bank Governors (CCBG). The SADC Payment System Project was launched in June 1996 to:

- Assist individual SADC countries to define a domestic payment strategy and a development plan.
- Define a coordinated regional approach to cross-border payments, taking into consideration the implications for trade, central bank policy, foreign exchange positions and controls.

During the course of the SADC Payment System Project, it became evident that other developing countries might learn from the efforts and experiences of the SADC region. Like many SADC countries, many developing countries lack the modern communications infrastructure and payment system skills needed to support a successful and sustainable modernisation of their domestic payment systems. The Guide, therefore, aims at guiding any initiatives and developments for modernising a country's national payment system (NPS) and at reducing unnecessary trial and error in the process.

The CCBG recognises the valuable support given to the SADC Payment System Project by the World Bank and the Bank for International Settlements (BIS). The World Bank provided financial support through its IDF Grant and other valuable support in terms of payment system consultants. The BIS assisted with consultation and the printing of our publication entitled *Payment Systems in the Southern African Development Community* (the Green Book) in June 1999.

The Guide was deliberately written in a general manner to increase its usefulness in different countries. It does not represent a blueprint for the modernisation of any individual NPS, but suggests key issues that should be considered in the review of an existing payment system or the design of new one.

We trust that the Guide will be useful to those undertaking the important issue of payment system reform.

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CHAIRPERSON: SADC COMMITTEE OF CENTRAL BANK GOVERNORS

ACKNOWLEDGEMENTS

The Guide to Developing a Strategic Framework For Payment System Modernisation (the Guide) was developed by the SADC Payment System Project Team under the auspices of the SADC Committee of Central Bank Governors (CCBG). The SADC Payment System Project Team, which works full time on SADC payment system issues, collaborates closely with the SADC Payment System Steering Committee, which oversees payment system developments within the SADC region.

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

1.1 Objectives of the Guide

The *Guide to Developing a Strategic Framework for Payment System Modernisation*, henceforth the Guide, has been developed with the following objectives:

- To provide developing countries with a systematic approach to modernising their national payment systems (NPS).
- To serve as a means of enhancing payment system skills in developing countries.

1.2 How to use the Guide

The Guide should not be seen as a prescription for individual developing countries, but rather as a set of broad guidelines on NPS issues that should be considered when modernising a country's NPS. The discussion is kept at a conceptual level and the issues raised should be taken as points for debate by NPS stakeholders.

The Guide does not attempt to address all payment system issues. Consequently, the use of other publications and reference material on payment systems is recommended. For in-depth understanding of various related concepts, a list of relevant reference material is included at the end of the document.

1.3 Structure of the Guide

The Guide follows the three-dimensional model of NPS modernisation shown in Figure 1. The first dimension of this model represents the strategic process that a country is advised to follow. The second dimension represents the NPS knowledge and perspectives that a country should consider when implementing the process. The third dimension represents the structures and skills required to support the strategic process.

1.3.1 Strategic process for NPS modernisation

Any attempt at modernising an NPS should be holistic and comprehensive. The strategic process for NPS modernisation comprises the following phases:

- Project launch
- Sensitisation
- Information gathering and stocktaking
- Vision and strategy formulation
- Conceptual design
- Business specifications
- Technical specifications
- Acquisition
- Development
- Implementation

Each of the above phases is discussed in subsequent chapters of the Guide.

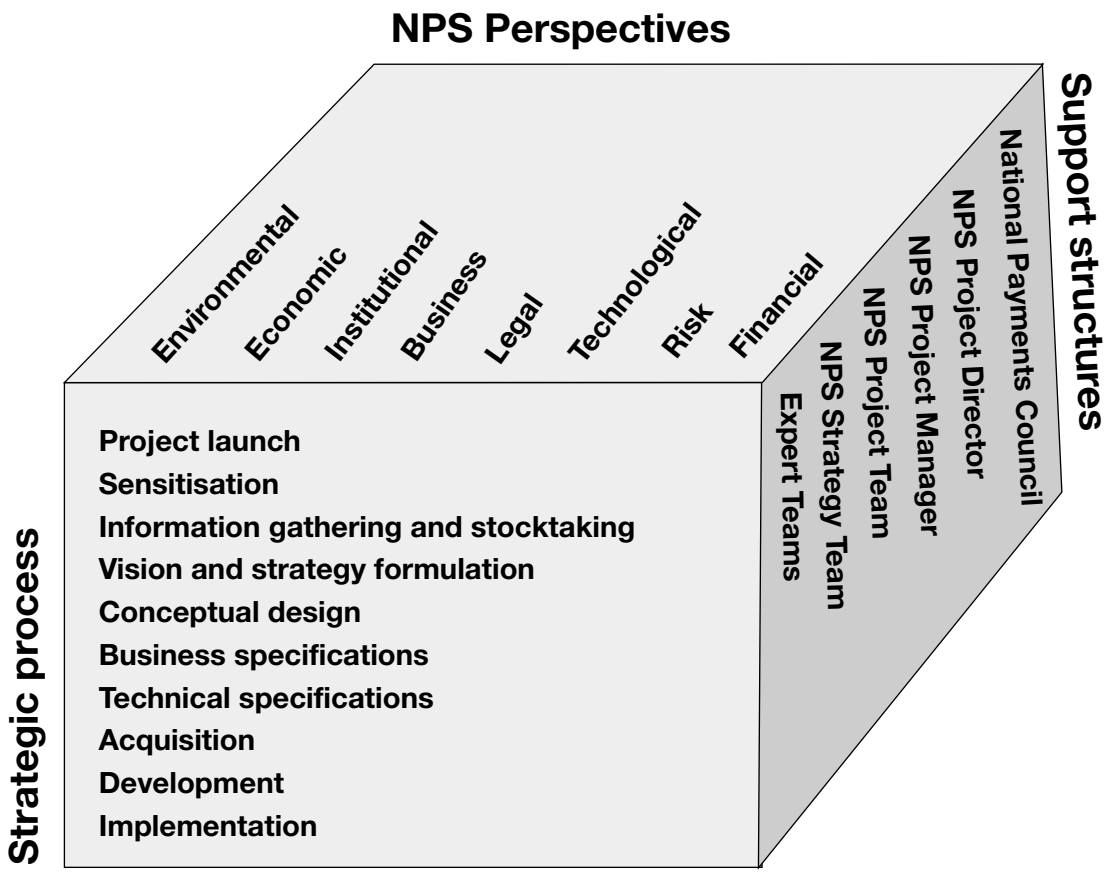

Figure 1: Three-dimensional model of NPS modernisation

1.3.2 NPS perspectives

An NPS can be viewed from many perspectives: legal, economic, business, technological, financial, etc. All the key perspectives should be taken into consideration when analysing an NPS for reform purposes. Chapter 2 provides a detailed analysis of some of the key perspectives.

1.3.3 Support structures and skills

In order to progress from one phase of the strategic process to the next, a country requires specific structures such as an NPS Project Director, NPS Project Manager, NPS Project Team, National Payments Council, NPS Strategy Team and Expert Teams as well as skills such as group facilitation, strategic management, business analysis and project management. Chapter 3 provides details of the support structures and skills.

1.4 Methodology

In formulating a strategic framework for NPS modernisation, three standard methodologies can be used:

- pure strategic approach
- model-based approach
- operational approach

1.4.1 Pure strategic approach

The pure strategic approach focuses on the future by designing the ideal NPS. The approach assumes that everything is possible and that there are no constraints or limitations. Problems in the current NPS are not allowed to influence the design of the ideal system. This approach is often referred to as a “blank paper” or “blue sky” approach. There are no fixed checklists, guidelines or models.

Advantages of the pure strategic approach:
- When implemented successfully, the benefits are often greater than when using other approaches.
- It ensures that the desired NPS addresses the future needs of all key players in the system.
- It takes a holistic view by covering all aspects of the system.

Disadvantages of the pure strategic approach:
- It may take a longer time since all key players have to participate in, agree to and share in the common vision.
- It is not always easy to ignore pressing problems in the current NPS and to focus exclusively on the vision of the future NPS.
- The strategic process is often frustrating for non-strategic thinkers who generally prefer to work from guidelines or existing models.

1.4.2 Model-based approach

The model-based approach investigates the modernisation models adopted by other countries. A fact-finding team will generally visit different countries to learn from their experiences. Models from different countries are collected and studied, demographic features of different countries are analysed, and the most compatible model is adopted and adapted for local circumstances.

Advantages of the model-based approach:
- It may take less time than the pure strategic approach. Valuable time is saved by learning from other countries.
- Non-strategists find the process readily acceptable because they can easily relate to models from other countries.
- It is more practical and makes it possible to design an ideal NPS, while also addressing deficiencies in the current NPS.

Disadvantages of the model-based approach:
- There is a risk of being over-influenced by the solutions of others. What is appropriate in one country may not necessarily be suitable in another country.
- Models may be adopted without sufficient discussion and understanding. This may lead to over-reliance on foreign consultants who may be unfamiliar with local circumstances.
- It may inhibit creative thinking.
- Lack of time and funds may limit the required investigation of foreign models, resulting in the adoption of suboptimal solutions.

1.4.3 Operational approach

The operational approach is driven by the desire to resolve problems that require immediate attention in the current NPS. Funds and effort are expended on enhancing the efficiency of the current system. At worst, this approach may even lead to the automation of a manual system, without first considering users' needs and requirements.

Advantages of the operational approach:
- In the short term it is easier and less costly to maintain and improve an existing NPS than to implement a totally new system.
- Skills are usually available locally to solve operational problems.
- It takes less time to implement than the other two approaches because of its short-term, immediate focus.

Disadvantages of the operational approach:
- It fails to identify future economic and business trends and, therefore, loses sight of potential business opportunities.
- It does not take into account the possible future needs of NPS users.
- It does not identify and provide for future NPS skills requirements. NPS developments lag behind user needs because payment system professionals concentrate on improving the operational efficiency of the current NPS.
- As users become frustrated with the current NPS, they may be tempted to develop their own payment systems. Such systems, if not properly monitored, may increase risks in the overall NPS.
- Although there is a strong perception that this approach takes less time and is less costly, it is actually very expensive in the long-term because money is spent without fully assessing users' needs and requirements.

1.4.4 Recommended approach

The SADC Payment System Project and the World Bank recommend a strategic and holistic approach to the modernisation of a country's NPS. As the three approaches are not mutually exclusive, a country can

- use the strategic approach to address the present and future needs of all NPS users by identifying the characteristics and critical success factors of the ideal NPS;
- use the operational approach to resolve the most serious problems in the current NPS so that the system can meet the minimum user requirements of timeliness, security and reliability;
- use the model-based approach to learn from other countries with systems similar to the envisaged NPS.

Combining these three approaches in this manner ensures that the most pressing problems in the current NPS are resolved timeously and that the envisaged NPS takes into account the unique conditions, circumstances and requirements of the local environment. In this way the envisaged NPS will not be unduly influenced by inappropriate external models. Short-term problems are therefore resolved within a long-term vision of the NPS and the modernisation process is not derailed through short-term expediency.

1.5 Experiences of SADC member states

The SADC region has gained valuable insights and experiences which can assist any country seeking to modernise its NPS. The strategic process has guided the modernisation process within the region and also served as a tool for monitoring and measuring the progress of different member states. Many of these insights and experiences are dealt with in this Guide. See Appendix C for a summary of the experiences of SADC member states.

CHAPTER 2: NPS PERSPECTIVES

2.1 Introduction

This chapter covers the second dimension of the three-dimensional model of the NPS modernisation process shown in Figure 1. It represents the payment system knowledge and the different perspectives a country should consider throughout the process. Each perspective provides a lens for analysing an NPS. An exclusive focus on any one view or perspective will hamper the process of modernisation resulting in a payment system that does not fully satisfy the needs and requirements of its different users.

According to the central banks in the European Economic Community, "a payment system consists of a defined group of institutions, and a set of instruments and procedures, used to ensure the circulation of money in a geographic area, usually a country".

The South African National Payment System - Framework and Strategy document amplifies this definition: "A payment system encompasses all payment-related activities, processes, mechanisms, institutions and users. The term national payment system (NPS) thus refers to payment systems in the widest context and is not restricted to the operational and infrastructural aspects only."

On the surface, "payment system" seems to be a fairly simple and well-understood business concept, but this belies the complexity of the issues involved:

- NPS issues are diverse and multidisciplinary.
- NPS has many perspectives.
- NPS issues contain many levels of detail.
- The perspectives and levels of detail should be customised to reflect the situation at hand.
- The issues are not exclusive, with many interrelationships existing between them.

Figure 2 shows that an NPS can be viewed from at least eight different perspectives, which gives some indication of its diversified nature. All perspectives should be considered to ensure that the

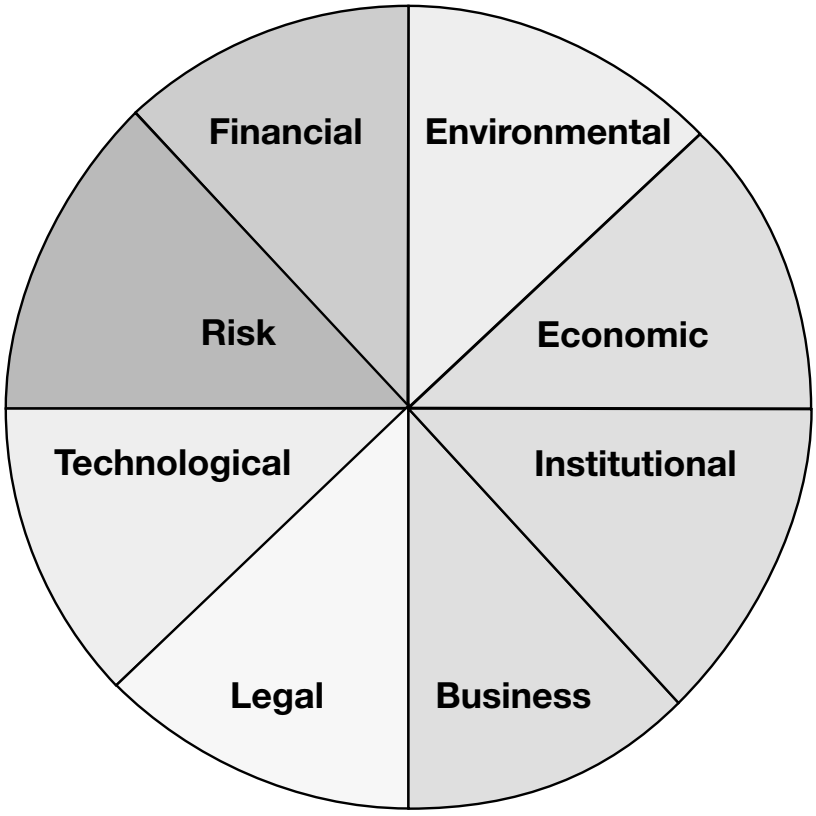

Figure 2: NPS perspectives

modernisation process is holistic and no issues affecting the payment system are ignored. Stakeholders affected by each perspective should be consulted about their needs and requirements.

2.2 Environmental perspective

The environmental perspective contextualises the NPS by describing the environment within which payment services are provided. Environmental aspects of the NPS highlight the needs of the community and the basic constraints within which the NPS functions. The level of education in a country, for instance, may be a constraint or a consideration when introducing modern payment instruments that rely on a community's ability to read and write.

Core components of this perspective:

- **Country demographics**
  This component concerns the size of the country, its population and its level of education, skills availability and political stability. It also has a bearing on the provision of payment services to the whole country, including the rural population.
- **Physical infrastructure**
  This component includes the coverage and reliability of the communication and transport infrastructure, as well as the electricity supply. Modern payment system initiatives often assume the availability of a reliable telecommunication infrastructure.
- **Geographic spread of commerce**
  This component concerns the major commercial centres in the country and the links between them.

2.3 Economic perspective

The envisaged NPS should satisfy the needs of various markets and economic sectors while at the same time enhancing the monetary policy objectives of the central bank.

Core components of this perspective:

- **Economic considerations**
  This component concerns the NPS needs of different sectors in the economy, such as the government sector and the formal and informal sectors. The needs of various markets (foreign exchange market, equities market, export and import markets) are considered.
- **Monetary policy and credit policy considerations**
  This component analyses the interrelationship between the NPS and monetary policy, and also the credit facilities provided to the banking industry by the central bank. Payment and settlement systems are the channels for implementing monetary policy.

2.4 Institutional perspective

The institutional perspective aims at identifying the parties involved in the NPS and their roles and responsibilities.

Core components of this perspective:

- **Stakeholders**
  This component concerns all key stakeholders in the NPS, such as the central bank, commercial banks and the government.
- **Role players**
  This component concerns the roles of different players in the NPS, such as the role of clearing and settlement, provision of payment services, and the role of the central bank as the overseer of the NPS.

2.5 Business perspective

This perspective ensures that the NPS meets business needs and practices, and that NPS reform is in line with current and future business trends.

Core components of this perspective:

- **Payment instruments**
  This component concerns the types, values and volumes of the different payment instruments used in the country. It also seeks to establish current trends in the use of different instruments, while promoting the use of more secure instruments.
- **Business practices and procedures**
  This component concerns the review of different business practices and procedures with the aim of improving them. Procedures and practices for handling issues such as dishonoured cheques and dispute resolution are reviewed.
- **Security**
  The security features of each payment instrument are reviewed and related issues, such as fraud detection and the prevention of money laundering, are considered.

2.6 Legal perspective

The legal perspective interprets the legal context in which the NPS functions.

Core components of this perspective:

- **Legal framework**
  The present legal framework is reviewed to establish the extent to which it supports trends in a modern payment system. If deficiencies are identified, appropriate people are tasked with reforming the legal framework.
- **International agreements**
  All international agreements are analysed, and their effects on the NPS assessed. For example, SADC's aim to achieve free trade by 2004 had a direct bearing on the pace of NPS reform in each member country.

2.7 Technological perspective

The technological perspective defines the technological infrastructure that supports the payment system. Technology is a facilitator of NPS reform. As new and more cost-effective technologies become available, users of the NPS demand greater efficiency, speed and security when making payments.

Core components of this perspective:

- **Communication networks**
  This component concerns the level of sophistication of communication networks and how they support payment services.
- **Applications**
  Current applications and systems are evaluated in order to determine the extent of their support for modern payment mechanisms. Outdated applications and systems are replaced by new ones that can improve the operational efficiency of the NPS.
- **Development and deployment of technology**
  Technological skills in the country are assessed and shortcomings identified. A systematic approach to the development and deployment of technology is agreed to.

2.8 Risk perspective

Risks in the NPS threaten the stability and soundness of the financial system. The central bank, in its role as overseer of the overall financial system, should ensure that payments are made in a secure and safe manner in order to maintain confidence in the system.

Core components of this perspective:

- **Risk identification**
  All the risks in the NPS are identified and quantified. Examples of risks include settlement risk, liquidity risk, credit risk and operational risks. The worst form of risk is the systemic risk that threatens the entire financial system.
- **Risk management**
  Measures to reduce or manage risks are discussed and agreed to by all the stakeholders. Stakeholders are charged with responsibility for monitoring exposures and recommending corrective action. Measures such as collateralisation, prefunding of settlement, loss sharing in netting schemes

and exposure limits are discussed and agreed to.

- **Disturbance handling**
  Procedures and contingency plans to deal with NPS disturbances and disruptions are developed and implemented. The responsibilities of different stakeholders during a disturbance are clarified and agreed to.

2.9 Financial perspective

The financial perspective identifies the financial considerations associated with the NPS.

Core components of this perspective:

- **Cost of risk measures**
  Once risks have been identified and measured, the cost of implementing measures to manage those risks is evaluated and justified. The cost of managing risks in any payment system should be proportional to the value of the payments in that system.
- **Transaction processing costs and pricing**
  The pricing of payment services should reflect the cost incurred in providing the particular services. Pricing can also be used as a means of channelling payments through more secure payment instruments. Pricing can be based on cost recovery, subsided pricing or market based pricing. Transparency in operational and transaction processing costs is important.

2.10 Concluding remarks on NPS perspectives

The above perspectives highlight the multidisciplinary nature of the NPS issues that should be considered at each stage of the strategic process. The perspectives and their core components are not exhaustive and countries may need to investigate other perspectives that may be relevant to their specific circumstances. Therefore the perspectives may not be of equal importance in all the countries but a country should ensure that the designers of the NPS have at least considered each perspective listed above.

CHAPTER 3: NPS SUPPORT STRUCTURES AND SKILLS

3.1 Introduction

This chapter covers the third dimension of the three-dimensional model of the NPS modernisation process shown in Figure 1. It represents the structures and skills needed to support the different stages of the strategic process of NPS modernisation. Particular attention should be paid to these support activities in order to ensure the success of the process.

3.2 Establishment of different support structures

The central bank should play a leadership and facilitating role in all the key aspects of the NPS reform process. For the central bank to play this important role effectively, it may require a legal mandate to oversee the country's NPS. In many countries, such a mandate is secured through the promulgation of an NPS Act that confers on the central bank the right and responsibility to oversee the NPS. The central bank should establish the following structures to support the modernisation efforts.

3.2.1 National Payments Council (NPC)

The NPC consists of the governor of the central bank, the chief executive officers (CEOs) of commercial banks and other key NPS stakeholders, such as the government paymaster and telecommunication infrastructure providers. The responsibility of the NPC is to lead NPS reform, provide funds and personnel for the project and act as a sounding board for the NPS strategy team. The central bank governor should secure commitment from all key stakeholders and also get other members of the NPC to commit personnel to the NPS strategy team.

Issues for discussion by the NPC include the identification of areas for competition and areas where stakeholders should cooperate. The discussions are kept at a strategic and conceptual level, and national interest takes priority over narrow competitive interests. The NPC is a temporary structure that usually dissolves after achieving its reform objectives. Other NPS issues that require the cooperation between banks will be addressed through a body such as the National Payments Association (NPA).

3.2.2 NPS project director

The NPS project director should be part of the executive management team of the central bank. This director initiates and champions the project and ensures that the project receives all the necessary resources, including qualified persons. The project director's major role is to secure support from the executive management of the central bank and to maintain project continuity.

3.2.3 NPS project manager

The project manager assumes full responsibility for the NPS modernisation project. The project director and the project manager may be the same person. They should be able to manage and coordinate all the necessary activities of the project; they should be respected individuals in the banking industry, be at ease when dealing with strategic issues at the executive level and when discussing technical details with experts; they should have good communication, process facilitation and project management skills. Preferably, a central bank official should act as a project manager, since the central bank should take the lead in the project. Nothing, however, prevents the appointment of a project manager from outside the central bank. The neutrality of the central bank is important in gaining the commitment of all key stakeholders, especially the commercial banks.

3.2.4 NPS project team

The project team is composed of central bank staff and, if required, external consultants for additional knowledge and experience. This team works on NPS issues on a full-time basis and guides the development of the NPS modernisation project. The project manager and other central bank officials who serve on the strategy team are also members of the project team. An NPS department in a central bank can also serve the function of a project team.

3.2.5 NPS strategy team

The project director, project manager and other senior, knowledgeable central and commercial bank personnel form the strategy team. Other stakeholders, such as representatives of the financial markets, telecommunication institutions and the post office, may also be included. The major role of the strategy team is to formulate the NPS vision and strategy. The strategy team should be multidisciplinary to ensure that all key perspectives of the NPS are taken into account. The project director should ensure that the spread of skills in the strategy team includes business, treasury, information technology, financial markets, legal, project management, operations and payment system experience. Strategy team members should be empowered to make commitments on behalf of their organisations. Membership of the strategy team is through nomination, or those with the necessary interest and experience may volunteer.

The size of the strategy team is important. A core team of eight to ten members is recommended. It is essential that members of the core strategy team should have the commitment and time required for the project. Members of the strategy team should work from the premise that the NPS is a national asset that should satisfy the needs of all the sectors of the real economy; they should put aside individual organisational focus and competitive issues in the national interest.

The strategy team should hold regular feedback sessions for the larger community of key stakeholders. It should also use the NPC as a sounding board for all key strategic decisions.

3.2.6 Expert teams or focus groups

Expert teams are composed of personnel sourced for their expert knowledge and capacity to address specific issues in the NPS. If there are no such people, focus groups can be formed to build the required expertise within the country. Expert teams give valuable support to the strategy team by providing expert knowledge about specific NPS issues. They meet as often as necessary and undertake investigations and research into specific NPS issues at the request of the strategy team. Each expert team should have a clear mandate and objectives. Several expert teams may be established in the following areas:

- Legal and regulatory issues
- Message standards
- Payment instruments
- Financial markets
- Payment system risk
- Rural payments

3.3 Support skills

Specific skills underpin the success of the NPS modernisation or reform process. The above support structures should embark on capacity-building programmes to train sufficient numbers of commercial and central bank personnel in the following skills:

3.3.1 Business analysis

Business analysts are required to identify and document the business needs and requirements of different stakeholders in the NPS. Failure to accurately specify and document the business drivers for modernisation may lead to the proposal and implementation of incorrect solutions.

3.3.2 Strategic management

Strategic thinkers form ideas at an abstract and conceptual level, and can translate them into concrete tasks. Strategic thinking is critical, especially when developing the vision and strategic framework for a modernised NPS. Members of the strategy team are expected to possess this skill.

3.3.3 Group facilitation

Modernising the NPS is a consensus-building exercise. Getting different stakeholders to cooperate on national issues is often a challenging task. Facilitation skills are therefore critical in building trust among stakeholders and securing their commitment to the project.

Building and maintaining consensus among key stakeholders is often a lengthy process requiring skill and patience, but consensus is vital for the overall success of the modernisation process. Time and effort should be spent on achieving consensus, especially in the vision and strategy formulation phase. Without consensus in this phase, the subsequent phases will be difficult to accomplish. However, it is not always necessary to get the consent of all the stakeholders. National interest should dictate whether the process could safely go ahead without the consent of some stakeholders.

3.3.4 Project management

Sound project management ensures that the objectives of the NPS project are clearly specified, the budget is approved, deliverables are agreed to, resources allocated, and responsibilities clearly defined. Without adequate project management skills, the project would probably exceed the approved budget, be delayed, or fail to meet project objectives.

3.3.5 Financial management

An NPS project requires financial and other resources. Continued stakeholder support for the project will depend largely on whether stakeholders are convinced that the available funds are being utilised effectively. Proper budgeting and financial planning are therefore essential.

3.3.6 Communication and marketing

Ongoing communication between the central bank and other stakeholders is crucial for the success of the project. The project director, through the strategy team, should maintain the momentum of the project by highlighting important achievements and drawing attention to areas of difficulty. The project director should also inform the broader community of stakeholders about developments in the NPS by holding workshops and feedback sessions. The more the stakeholders are informed about pending changes and developments, the more they can prepare themselves for the envisaged NPS.

In order to maintain stakeholder interest in the project, regular progress meetings should be held and project deliverables announced. Other forms of communication such as newsletters, newspapers and television may be explored. After every important phase of the project, formal milestones and reviews should be conveyed to all key stakeholders.

Communication is essential between the NPC, the strategy team and the expert teams. Regular feedback sessions should be arranged to keep all structures informed about the progress of the project.

3.4 Other important support activities

3.4.1 Team selection

Since the NPS is a national asset, the members serving on the various teams should be drawn from all key sectors of the economy. Sound team selection is crucial and members should be screened according to clear and fair criteria to achieve the optimal use of the available human resources in the country.

3.4.2 Continuity

Continuity is critical for the success of the project. Strategy and expert team members should stay in the project from start to finish. A change in team members midway through the process retards the learning experience and often frustrates other team members by drawing them back to issues and questions already addressed and resolved. Those who cannot stay with the project until completion should make arrangements for their replacement. Provision should be made for a transition period of three to six months during which an outgoing team member would bring the new member up to date on all issues.

For more information about roles and structures in an NPS, see Appendix A.

CHAPTER 4: PROJECT LAUNCH, SENSITISATION AND STOCKTAKING

4.1 Introduction

The need to modernise or reform a country's NPS usually arises from pressing problems in the current NPS. Sometimes the need results from the realisation that the current NPS no longer adequately meets user requirements for speed, safety, efficiency and reliability.

The modernisation process of a country's NPS cannot begin in earnest without the full support of the central bank governor and the central bank's executive management team. The central bank's executive management team must therefore be sensitised to the importance of an efficient, secure and reliable NPS for the economy and how it supports the effectiveness of the monetary policy of the central bank. This understanding should motivate the central bank to evaluate the current NPS against international standards and user requirements. If it is found to be inadequate, an NPS reform strategy should be initiated to improve the situation. The central bank should also realise that modern advances in payment system technology require an ongoing assessment and alignment of the NPS with international best practice.

Main objectives of this phase:
- Launch the NPS modernisation project.
- Sensitise NPS stakeholders.
- Conduct stocktaking.

4.2 Launching the NPS modernisation project

A key role of a central bank in the NPS is to ensure financial stability. Payment systems serve as highways for the commercial activity in a country by providing payment mechanisms that facilitate the movement of funds between buyers and sellers of goods and services.

In launching the NPS modernisation project, the central bank governor has to appoint the project director, the project manager and the NPS project team. The launching of the project should also be announced and discussed with the country's Bankers' Association and with the chief executive officers of the commercial banks. Discussions should also be held with other key stakeholders such as banking supervisors (if outside the central bank).

Together with the other stakeholders, the central bank governor should discuss issues relating to the resources required, time frames and the changes sought by the NPS modernisation project. Commercial banks should appoint knowledgeable senior officials to serve on the strategy team and expert teams. Telecommunications authorities should understand their role in supporting the project by supplying a reliable telecommunications infrastructure. Electricity supply authorities should also play a role in the success of the project by providing agreed levels of service.

4.2.1 Securing the support of commercial banks and other stakeholders

At this early stage, stakeholders should realise that NPS modernisation requires cooperative effort and that they are expected to put aside individual competitive issues and concentrate on the national interest.

An adequate budget is needed to enable the project director to manage the project effectively. All the key stakeholders should be prepared to contribute resources, both financial and personnel, to the project.

4.2.2 Establishing the support structures

A dedicated NPS department should be established. If there is no NPS department, a division may be established in existing structures such as Bank Supervision, Information Technology or Banking Operations. The people in the division should possess the skills recommended in Chapter 3.

The central bank, commercial banks and other key stakeholders should set up an NPC to oversee the project. The strategy team should also be established in this phase.

4.3 Sensitisation of NPS stakeholders

After the official launching of the NPS reform process, comes the sensitisation phase which focuses on creating awareness about payment system issues among a wide range of stakeholders. A sensitisation workshop is often used as a tool to create this awareness.

Main objectives of sensitisation of stakeholders:
- Create awareness among a wide range of different stakeholders.
- Promote cooperation and commitment among those banks and other stakeholders actively involved in the NPS reform process.
- Identify knowledgeable individuals who may assist in the modernisation project.

Sensitisation can be achieved through the use of various forms of media, roadshows and workshops. In this Guide the emphasis is on the sensitisation workshop. Such a workshop should run for at least three days to allow sufficient time for discussion and learning.

4.3.1 Preparing for the sensitisation workshop

The project director and his team coordinate the process leading up to the workshop. This includes:
- inviting appropriate attendees
- securing experts (local and international) to make presentations
- securing a suitable venue
- choosing suitable dates
- deciding on a suitable programme
- selecting an experienced workshop facilitator

In order to stress the importance of the event, the central bank governor should deliver an opening address and welcome guests and dignitaries. In his or her address the governor should reflect on issues such as payment system risks, deficiencies in the current NPS, the role of the central bank in the NPS reform process, the need for commitment to the NPS reform process, and the importance of keeping abreast of international payment system developments.

4.3.2 Sensitisation workshop

The workshop can be divided into two sections — the plenary session, and the workshop itself. The chief executive officers of different stakeholders should be invited to the plenary session, which should not last longer than the morning of the first day.
A recognised payment system expert should deliver the keynote address during the plenary session. He or she should highlight the following points:
- importance of NPS to the economy
- international payment system trends
- The importance of payment systems in the monetary policy execution of central banks
- lessons from other countries that had recently modernised their payment systems

The workshop itself should cover the following areas:
- general overview of an NPS
- payment system concepts
- payment system instruments
- NPS perspectives
- strategic process of NPS reform
- payment, clearing and settlement processes
- legal framework governing an NPS
- risks in payment systems
- role of the central bank in payment systems
- core principles for systemically important payment systems

Group discussion should be an important part of the workshop. Delegates may be divided into discussion groups and each group given a topic to discuss. Discussion topics may cover issues such as problems in the current NPS, user requirements, the role the central bank should play in the modernisation project, and the NPS vision for the country.

During the group discussions, the project director and project manager should identify active and knowledgeable participants who could add value to the modernisation project. These are people who have specific skills that can be used in expert or focus teams.

4.3.3 Way forward

Before the end of the workshop, stakeholders and participants should be informed about what is expected of them in terms of the modernisation project. This entails discussing the different phases of the strategic process to NPS reform (first dimension of Figure 1). Stakeholders, commercial banks in particular, should be encouraged to supply the NPS project team with information for stocktaking. The project director should secure commitment and cooperation among stakeholders for the stocktaking process and other subsequent phases of the project.

4.4 Conducting stocktaking

The stocktaking phase involves the gathering of detailed information about the current state of the country's NPS. Information is collected about the country's payment-related infrastructure, the financial system and the existing payment and clearing systems. A detailed analysis is then performed. Information gathering requires a significant cooperative effort by all the stakeholders.

The stocktaking exercise consolidates all the information gathered in a formal and structured manner to facilitate analysis. It is not an end in itself and therefore should not be dragged on unnecessarily, even though some information may be lacking. Stocktaking assists the strategic process by providing an understanding of "where you are coming from".

Objectives of the stocktaking phase:
- Conduct an analysis of the current situation.
- Identify the capabilities and deficiencies of the current NPS.
- Highlight areas of high priority for immediate attention.
- Make preliminary suggestions on the way forward.
- Prepare a report on the current situation.

4.4.1 Information gathering and analysis

Various techniques can be used to gather information. The best way will be determined by the particular country's demographics. Information can be gathered through questionnaires, interviews, observation and visits to the processing sites. Commercial banks, as payment service providers, are the primary suppliers of stocktaking information. The central bank, government and its departments, parastatals, the post office and public transport corporations should also provide stocktaking information. NPS perspectives, as described in Chapter 2, should be considered when gathering the required information.

Once the information has been collected, it is analysed and verified. A diagnosis of the strengths, weaknesses, opportunities and threats (swot analysis) of the current NPS is undertaken. This analysis should result in
- identification of most pressing problems and a plan to resolve them;
- appreciation of the strengths and weaknesses of the current system;
- the desire to develop a long-term vision and strategy for the NPS;
- cooperation among and commitment by all stakeholders to improve the situation.

4.4.2 Stocktaking workshop

A stocktaking workshop (2-3 days) should be held with the following main objectives in mind:
- consolidating and discussing the results of the information-gathering exercise
- ensuring a better understanding of the information gathered
- identifying differences in the information gathered

- Identifying the shortcomings, constraints and opportunities emanating from the analysis of the information gathered
- further reinforcing the team building process
- obtaining proposals from the participants on how to improve the situation

The stocktaking workshop should be attended by the designated NPS project team, institutional project coordinators, the strategy team and representatives from commercial banks, the post office and the government. Follow-up working groups will probably be required to obtain and process further information and prepare the stocktaking report. The workshop should also introduce the next phase of the strategic reform process, which is the formulation of the country's NPS vision and strategy.

4.4.3 Stocktaking report

The stocktaking report is a comprehensive report designed to inform key stakeholders about the state of the current NPS. It forms the basis for the next phase of the NPS reform project — the vision and strategy formulation. A suggested overall structure of the report is as follows:

- *Executive summary:* This section gives a general overview of the NPS in a country. For example, one may want to give some historical background that helps to explain how payment systems evolved in a particular country.
- *Introduction:* This section gives the project rationale, project objectives and project approach, i.e. what the project is all about.
- *Country background and national perspectives:* This section gives the economic, socio-political and cultural background of the country.
- *Infrastructure perspectives:* This section highlights the coverage and reliability of infrastructural factors such as telecommunication, electricity supply, transport (road/rail/air) and mail systems. These factors are assessed according to how they will be able to support the envisaged NPS developments.
- *Legal infrastructure:* This section highlights shortcomings in the current legal structure and identifies key areas that should be improved so that legislation can be supportive of modern NPS trends.
- *Financial system and support institutions:* This section analyses the role that each type of financial institution plays in the NPS. It discusses the nature of the competition, entry barriers, the types of payment services offered and other factors that affect the availability of and access to payment services by the general public.
- *Business environment:* This section describes the general business environment and practices that affect the NPS. It also covers the effect of business rules and procedures on the use and acceptability of different payment instruments.
- *Risks and financial costs:* This section covers risk issues in the NPS as well as the financial cost of providing payment, clearing and settlement services.
- *End-user needs and views on the NPS:* This section covers the user requirements for safety, efficiency, convenience, timeliness and reliability of different payment instruments. It also discusses the extent to which different payment instruments satisfy such user requirements.
- *Concluding remarks and the way forward:* This section gives recommendations on the way forward.
- *Appendices:* More detailed descriptions on specific aspects can be provided in separate appendices.
- *List of contributors:* This sections acknowledges the contribution of all the people and institutions that took part in the information-gathering and stocktaking exercises.
- *Glossary of terms:* This is a list of all the unfamiliar or important payment system terms and their definitions, used in the stocktaking report.

4.4.4 Approval of the report by the NPC

Once the report has been updated from the feedback received from the stocktaking workshop, it should be submitted to the NPC for formal approval. Such approval is important because it signifies the key stakeholders' agreement on the status of the current NPS and on the recommendations for moving forward. Approval also means commitment by the members of the NPC to the next phases of the strategic process, starting with the formulation of the NPS vision and strategy.

CHAPTER 5: VISION AND STRATEGY FORMULATION

5.1 Introduction

Although payment systems may share some common elements and functions, they still differ in terms of their cultural, economic, institutional, legal and political environments. This means that there is no one model or recipe for developing an efficient, safe and reliable NPS in all circumstances and countries. The model chosen should take into consideration the unique circumstances of the local environment and the economic objectives of the particular country.

Early in the vision and strategy formulation phase of the strategic process, consideration should be given to which components of the new NPS would be of systemic importance. Once this has been decided, those components can be designed so as to comply with the Bank for International Settlements (BIS) Core Principles for systemically important payment systems (SIPS). The BIS Core Principles are generally regarded as the *de facto* standards for SIPS.

What constitutes a SIPS? According to the BIS Committee on Payments and Settlement Systems (CPSS): "Any payment system that is capable of triggering disruptions or transmitting shocks across the financial systems domestically or even internationally", is a SIPS. According to the CPSS, a payment system is likely to be of systemic importance if at least one of the following is true:

- It is the only payment system in a country.
- It is the principal system in terms of the aggregate value of payments.
- It handles mainly payments of high individual value.
- It is used for the settlement of financial market transactions or for the settlement of other payment systems.

SIPS should strive to comply fully with the BIS Core Principles, not only when they are first designed, but throughout the operation of the systems. The application of the BIS Core Principles to non-SIPS is optional and will depend on the costs involved and the expected benefits. Appendix B contains checkpoints that can be used when evaluating the compliance of a SIPS with the BIS Core Principles.

5.2 Components of the vision and strategy formulation phase

Typically, a vision and strategic framework for the envisaged NPS will comprise the following components:

- vision and future characteristics
- critical success factors
- fundamental principles
- strategies for aligning the current NPS with the envisaged NPS

5.2.1 Vision and future characteristics of the new NPS

A vision is essentially the desired end state of the envisaged NPS. It is always a long-term view and identifies the results expected over a time horizon of five to ten years. It should incorporate the different aspirations, characteristics and benefits expected by all stakeholders of the NPS.

Those charged with the responsibility of generating the vision of the new NPS should be well informed about payment system issues. Countries that have already gone through the process and have succeeded, may be consulted and their payment systems analysed. International trends in payment systems should also be researched.

Publications by international institutions such as the World Bank, the International Monetary Fund (IMF) and the BIS should be studied. In particular, the BIS Core Principles should be studied and understood by all strategy team members and used as guidelines when formulating the vision and strategy of the new NPS.

The process involves discussion and brainstorming sessions by members of the strategy team. Separate sessions can be held for different stakeholders in the NPS. Different stakeholders should be encouraged to identify the characteristics of their ideal NPS. For example, end users, financiall markets and the government should identify the characteristics and benefits they expect from the new NPS. These expected benefits should be consolidated into a single list of benefits the envisaged NPS should satisfy. This list of benefits is then formally adopted as the vision and future characteristics of the new NPS.

The strategy team should avoid becoming bogged down by problems in the current system and should keep their discussions at the conceptual level. A mindset of "anything is possible" should be adopted.

The future characteristics of the envisaged NPS should broadly address issues according to the categories below. Most of these issues should have been raised during the stocktaking phase:

- envisaged payment instruments
- settlement of payment instructions
- risk management
- regulation and oversight of the NPS
- ownership and participation
- cooperation and competition
- cost recovery and pricing methodologies
- international perspective

5.2.2 Critical success factors

This step entails determining the critical factors against which the success of the modernised NPS can be measured.

The members of the strategy team should have already gained sufficient knowledge to identify the critical success factors. Sources of information for the strategy team are the NPS models of other countries, payment system publications of the BIS, IMF and the World Bank, and local and international payment system workshops.

Each future characteristic should be reviewed. The conditions and circumstances needed for the accomplishment of that future characteristic should then be identified. The strategy team may request the help of expert teams to generate the critical success factors for the future characteristics falling in a particular expert team's area of expertise. For example, the risk expert team may be requested to generate critical success factors relating to all future characteristics dealing with risk issues in the NPS, whereas the legal expert team may be requested to deal with the critical success factors relating to the legal framework of the NPS.

In determining the critical success factors for the NPS, the focus should always be on the most critical of these factors. The idea is to identify those few factors that, when properly implemented, will ensure the greatest success of the NPS. That is, the 20 percent of the critical factors that when implemented, will account for over 80 percent of the success.

5.2.3 Fundamental principles

This step covers the determination of principles guiding the development, deployment and management of the NPS. Once agreed, these principles become non-negotiable and are the basis upon which future disputes and conflicts will be resolved. Fundamental principles are aimed at dispelling any ambiguities about the roles, responsibilities, ownership and participation of different stakeholders in the NPS. They also dispel any confusion about different payment system processes. Fundamental principles should be fair to the present and future NPS stakeholders.

The strategy team should determine the fundamental principles relating to the future characteristics and the critical success factors. If necessary, the strategy team may consult relevant expert teams for their specialised knowledge. For example, the legal expert team may advise the strategy team on matters relating to the legal framework. It is important to realise that the expert teams provide only an advisory service. It is the responsibility of the strategy team to determine and agree on the fundamental principles guiding the development of the NPS.

Examples of questions that will help the strategy team determine the fundamental principles:
- Who is eligible to participate in the provision of payment services, and the clearing and settlement of payments?
- How should the central bank respond to a systemic disruption?
- Who should be responsible for risks in the system?
- When is settlement final and irrevocable?
- What are the roles of different stakeholders in the NPS?

Examples of fundamental principles:
- Clearing and settlement is the exclusive domain of banks.
- The provision of payment services is not the exclusive domain of banks.
- All banks are eligible to have settlement accounts at the central bank.
- Settlement is subject to the availability of funds.
- Participants are liable for the risks that they introduce into the NPS.

Reaching consensus on the fundamental principles takes time and effort. The process should, however, not be hurried for the sake of expediency, since agreement and commitment by all key stakeholders is critical to the success of subsequent phases of the project. It is preferable that sufficient time is provided for the development of the fundamental principles during the vision and strategy formulation phase than in the later phases of the project.

5.2.4 Strategies

This step identifies the main strategies for aligning the current NPS with the envisaged NPS. The strategy team should analyse each future characteristic in order to understand how it can be achieved. Some strategies can be implemented immediately to improve the operational efficiency of some components of the current system. Other strategies may be implemented later during the development of a new system.

In-depth knowledge and understanding of how the present NPS functions are prerequisites for the generation of strategies. Discrepancies between the current system and the envisaged NPS should be identified and analysed. The suggested strategies should then assist in bridging the gaps identified. The members of the strategy team should have familiarised themselves with the current NPS and also with the future characteristics of the envisaged NPS.

It is the responsibility of the strategy team to generate strategies for aligning the current NPS with the envisaged NPS. Strategies become effective only once adopted by the NPC. At the request of the strategy team, different expert teams may research specific payment system issues. For example, the risk expert team may be asked to investigate strategies for reducing risks in the current system to acceptable levels consistent with the future NPS. Similarly, the legal expert team may be asked to review the current legal framework, identify shortcomings and suggest strategies for making the legal system supportive of the requirements of the modern NPS.

For the legal expert team, examples of questions to be discussed include the following:
- Which generally accepted business practices are not supported by the current legislation?
- What is each party's legal recourse in the event of payment default?
- Which Acts or statutes inhibit the NPS reform process (for example the Insolvency Act)?
- How should the present legislation be reformed to support the future characteristics of the new NPS?

For the risk expert team, examples of questions to be discussed include the following:
- Where are the flaws in the present risk management procedures?
- What new risk management measures are needed for the envisaged NPS?
- How should the management of risk be balanced against the cost of implementing risk management measures?
- How should each type of payment system risk be monitored and managed?
- What should be the roles and responsibilities of different participants in systemic crises?

5.3 Signing of the Vision and Strategic Framework document by the NPC

The vision, future characteristics, critical success factors, fundamental principles and strategies as discussed and agreed to by the strategy team should be consolidated into a Vision and Strategic

Framework document. This should be submitted to the NPC for approval. Once approved, it becomes a blueprint for the envisaged NPS. It also serves as a basis for the resolution of conflicts and disputes among different stakeholders.

Once accepted, the vision and strategic framework should be communicated extensively to the broader community of stakeholders. Communication can take the form of workshops, roadshows and briefing sessions. Such communication should focus on

- primary objectives of the envisaged NPS;
- changes brought about by the envisaged NPS;
- expected changes in the roles and responsibilities of stakeholders;
- time frames for the development of the proposed system;
- how stakeholders and participants can prepare for the proposed system.

CHAPTER 6: CONCEPTUAL DESIGN

6.1 Introduction

The conceptual design phase describes the business processes embodied in the different components of the NPS. It aims at defining a high-level design incorporating the vision, future characteristics, critical success factors and strategies of the envisaged NPS. This design shows how the NPS will function and how different components of the system will interact and interface with one another to provide the operational efficiency desired by the end-users. It also clarifies the envisaged role of the central bank and other stakeholders in the NPS. Further analysis of the conceptual design will result in numerous projects based on different design components.

Objectives of the conceptual design phase:
- Provide a high-level design that incorporates the vision and strategic framework of the new NPS.
- Provide an architecture within which every desired component can be identified, prioritised and viewed within the context of the overall NPS.
- Identify short-term operational problems or crises that can be resolved immediately.

A conceptual design workshop may be used to formally launch the conceptual design phase. All relevant stakeholders should be invited. Issues to be discussed at the workshop include:
- progress and success of the project so far
- problems experienced with previous phases
- objectives of the conceptual design phase
- responsibilities of different stakeholders
- requirements for the conceptual design phase (personnel, time and funds)
- deliverables and time frames of the conceptual design phase

Such a workshop also serves as a means of maintaining the commitment and interest of key stakeholders in the project. Different stakeholders should be commended for their commitment and efforts towards ensuring the success of the project.

6.2 Overall payment process

Before the strategy team can develop a conceptual design of the envisaged NPS, members should first understand the overall payment process, as depicted in Figure 3. This will ensure that they understand where payment requests originate, and how they enter the payment system and eventually get settled. The payment process of a typical payment instruction can be divided into the following distinct steps:
- deal agreement, resulting in a payment instruction
- payment initiation
- clearing (incorporating netting)
- settlement (incorporating netting)
- payment finality
- synchronisation of delivery and payment
- synchronisation of information
- deal completion, resulting from a payment confirmation

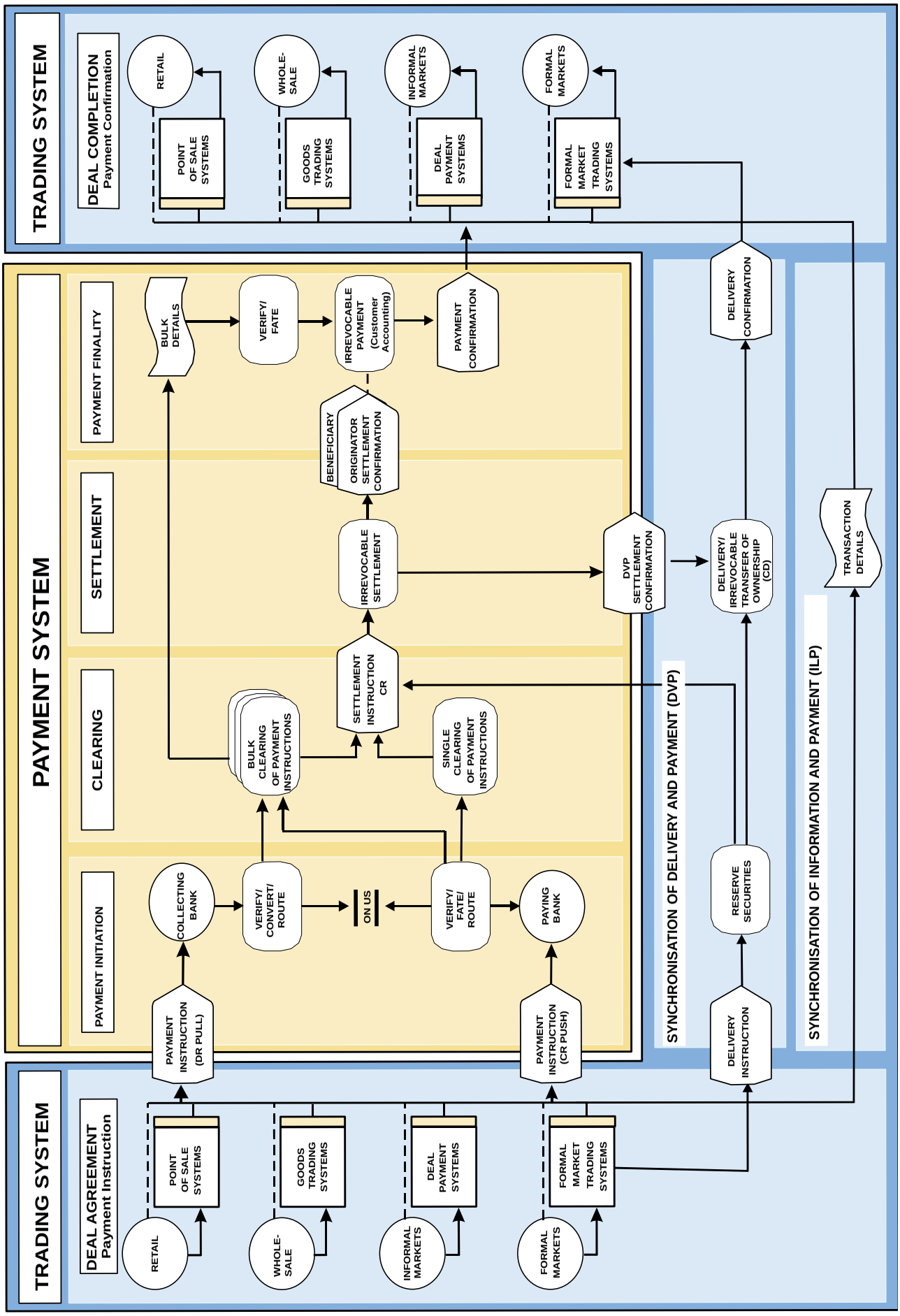

Fig 3: Overall payment process
Source: South African National Payment System - Framework and Strategy (p.41)

6.2.1 Trading system : deal agreement and payment instruction

Payment is the result of trade in various markets, ranging from retail and corporate trade to trade in formal and informal markets. Each of these markets utilises its own market-specific systems. For example, the retail market may utilise point-of-sale (POS) systems, whereas the financial markets may use electronic dealing systems. These systems are developed by the market participants themselves and fall outside the domain of the NPS.

These systems should, however, be able to integrate with the NPS through standardised NPS interfaces, thereby extending the network for the generation of payment instructions that will ensure that electronic payments in particular enter the payment system as quickly and efficiently as possible. This will enhance the trade-related systems and enable customer payment system providers (CPSPs) to provide value-added services from a payment perspective.

6.2.2 Payment system: payment initiation

During this stage of the payment process, the emphasis is on accepting the payment instruction formally into the banking system. Two channels can be distinguished through which a payment can be initiated:

- An electronic credit transfer channel, routing payment instructions from (the bank of) the originator or payer to (the bank of) the receiver or beneficiary.
- A debit collection channel, routing payment instructions from (the bank of) the payee to (the bank of) the payer, resulting in a charge (debit) to the account of the payer.

The bank receiving the payment instruction accepts responsibility for driving the payment to finality. The payment instruction is verified and validated in accordance with the requirements of the specific payment instrument. At this point, the bank has the opportunity to add whatever value-added processing it requires, for example, to tag the payment as a guaranteed payment or to integrate it with other in-house systems.

Banks will be able to schedule the payment instruction either for processing as part of a bulk-clearing process, or for routing directly through a single-payment clearing process.

Processing of a payment instruction could be via the same or different institutions. If both the buyer and the seller are clients of the same bank, the payment instruction is referred to as “on-us” and need not necessarily follow the clearing and settlement processes of the NPS. “On-us” transactions are processed within the same bank, and finality of payment is also achieved within the same bank.

6.2.3 Payment system: clearing

Single payment instructions can be cleared, transformed into a settlement instruction and introduced into the settlement process by the paying bank (credit transfer) or by the collecting bank (debit transfer).

The bulk-clearing process is accomplished through a payment clearing house (PCH) on a bilateral or multilateral basis. Conceptually, there may be various PCHs, each specialising in a specific type of payment and/or payment instrument. The payment instructions are totalled within certain guidelines, and the PCH then issues a set of settlement instructions on behalf of the participating banks. The PCH also makes the details of the payment instructions, bulked together for settlement purposes, available to enable banks to provide payment finality (implicitly or explicitly) once settlement has taken place.

6.2.4 Payment system: settlement

Both processes for handling payment instructions, namely the “bulk clearing of payment instructions” and the “single clearing of payment instructions”, generate standard settlement instructions. These instructions are forwarded to the settlement system at the central bank for final interbank settlement.

Following a successful settlement process, confirmation messages are generated to both the originator and beneficiary banks, and for delivery versus payment (DVP) purposes, where applicable.

6.2.5 Payment system: payment finality

Upon receipt of the confirmation messages, both the originating and the beneficiary banks can do their own in-house and customer accounting and provide payment finality to their customers. The details pertaining to the bulked payments are obtained from the bulk-clearing process (and the associated PCHs) and reconciled with the settlement. Payment finality, therefore, follows settlement finality.

6.2.6 Trading system: synchronisation of delivery and payment

During the trading process, a delivery instruction is generated in parallel with the payment instruction. This delivery instruction confirms that the required securities are available and reserved. Following this reservation, the settlement part of the payment leg can be completed, resulting in a settlement confirmation message. Upon receipt of the settlement confirmation message, the security is delivered and irrevocable transfer of ownership effected. This concept is referred to as delivery versus payment (DVP).

6.2.7 Trading system: synchronisation of information and payment

The NPS facilitates the electronic relay of information related to a payment, in parallel with the payment instruction, from the originating party to the beneficiary. This enables a beneficiary to link the payment confirmation, received from its banker, with customer and other transaction details associated with the payment instruction. This concept is also referred to as information linked to payment (ILP).

6.2.8 Trading system: deal completion

The deal is completed when the originating and the beneficiary banks pass payment confirmations to their clients. Finality of payment is achieved when the beneficiary receives unconditional access to the funds.

6.3 Conceptual design of the envisaged NPS

The NPS refers to the sum of all the payment systems in a country. It includes all the payment instruments used in a country and the payment mechanisms employed to facilitate payment and settlement associated with those payment instruments. The conceptual design of the NPS therefore has to consider the payment and settlement of transactions made through the various payment instruments used in the country. The roles of each stakeholder should be specified with regard to the payment and settlement of different payment instruments.

The role of the central bank in payment systems varies from country to country, depending on the stage of development of the NPS. At the one end, it may be limited to providing settlement services only to the banks. At the other end, the central bank may be involved in processing payment requests, operating and managing clearing houses, owning and operating high-value settlement systems, and regulating and supervising the overall NPS.

Local conditions in each country will determine the extent of the role that the central bank plays in the NPS. The design and the architecture of the envisaged NPS will depend on the role the central bank seeks to play in the NPS. Therefore the central bank should specify its role from the outset. The role and expectations of other NPS participants should also be taken into consideration.

It is the responsibility of the strategy team to develop the conceptual design of the new NPS. The development of the conceptual design may involve the following steps:

- identifying all the payment systems in the NPS
- identifying SIPS in the NPS
- deciding the role of the central bank in SIPS and non-SIPS

6.3.1 Identifying all the payment systems in the NPS

Identification of all the payment systems in the NPS may first require the listing of all the payment instruments used in the NPS. Identifying the available payment instruments may uncover the lack of modern, efficient payment instruments that may be convenient for users. If so, then the central bank

may assist banks and other stakeholders to introduce such modern payment instruments. Issues such as common message and device standards are areas in which the central bank may play a role in achieving agreement and cooperation among service providers. The payment systems identified will include the cash, cheque, card, foreign exchange and electronic (often SWIFT-based) interbank payment systems.

6.3.2 Identifying SIPS in the NPS

Identifying SIPS is important because problems with such systems may affect the stability of the financial system. Central banks normally give first preference to the design of safe and efficient SIPS before attention is given to other systems that are not of systemic importance.

6.3.3 Deciding the role of the central bank in SIPS and non-SIPS

SIPS have the potential of causing systemic disruptions in the financial system. The central bank will consequently be more involved in the design and structure of SIPS to ensure their safety, reliability and efficiency. Conversely, the design and the operation of non-SIPS may be left to the banks and other stakeholders, although the central bank may still remain the overseer.

Once the role of the central bank in SIPS and other systems has been clarified, the central bank may establish conceptual designs for all the SIPS in which it will be involved.

6.4 Settlement systems

Every country will have at least one SIPS and probably several other payment systems within its NPS. Settlement of payment requests flowing through the NPS can be effected either through a gross settlement system or a net settlement system. Modern technology also makes possible hybrid systems that combine the characteristics of both gross and net settlement systems.

6.4.1 Typical example of a real-time gross settlement (RTGS) system

A gross settlement system is a system in which each payment instruction is settled individually, that is, without netting debits against credits. If the settlement process is based on the real-time transfer of central bank money, then payment and settlement take place at the same time provided the paying bank has sufficient funds to cover the transfer. Such a system is generally used for high-value payments, which are time-critical and carry higher risks. In order to reduce the risks associated with high-value payments, many gross settlement systems settle payment instructions on a real-time basis. RTGS systems have the following characteristics:

- Each payment instruction is settled separately at the time it is received in the RTGS system.
- Final settlement is immediate if the payment is covered by sufficient funds.
- Intraday or daylight credit may or may not be extended in the event of funds being insufficient to cover the requested transfer.
- Settlement is continuous throughout the processing day, and there are as many settlements as there are payment instructions.
- Since funds are not netted out, gross settlement systems often need larger amounts of intraday liquidity in order to facilitate prompt final settlement of payments.

Intraday credit is a major consideration in gross settlement systems. Without intraday credit, banks would be required to keep large positive (often non-interest-earning) balances with the central bank. The holding of such large settlement balances with the central bank deprives banks from fully utilising these funds for other purposes. The extension of intraday credit for the smooth functioning of gross settlement systems may be necessary, at least in the initial stages when banks are learning to use the system. This has been the case during the initial implementation stages of the South African Multiple Option Settlement (SAMOS) system in South Africa, where banks have been permitted to use a portion of their cash reserves, in addition to other normally qualifying financial instruments, for intraday credit. However, as banks become more experienced in optimising their intraday liquidity management, and as the interbank money market grows in sophistication, the extension of intraday credit may either fall away or be provided at a marginal charge. Fedwire (USA) extends intraday credit within certain limits; SIC(Switzerland) either rejects or queues payment requests until sufficient funds are available.

RTGS systems can reduce the credit risk (principal risk) inherent in securities market transactions by coordinating the final transfer of funds (payment leg) with the final transfer of assets (delivery leg), so that one takes place only if the other also takes place (delivery versus payment or DVP). Similarly, an RTGS system, when linked to other RTGS systems, can also facilitate payment versus payment (PVP), whereby the payment of one currency is coordinated with the payment of another currency.

A typical RTGS system is illustrated by the following conceptual design:

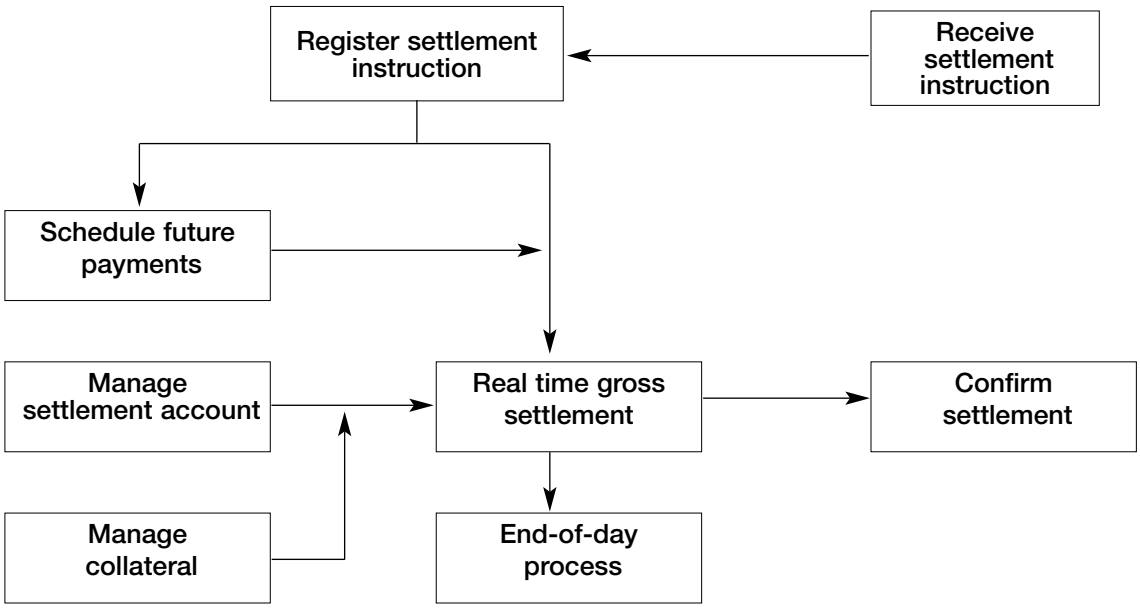

Figure 4: Conceptual design of an RTGS system

Receive settlement instruction: The receive settlement instruction process receives settlement instructions from the participants. Input into the settlement system is through a settlement instruction for a credit transfer across the settlement accounts of the participants held at the central bank. Only authorised participants of the system can issue a settlement instruction.

Register settlement instruction: The process to register the settlement instruction electronically stamps the date and time on a settlement instruction and allocates a unique sequence number to ensure that each settlement instruction is successfully logged and acknowledged. This process validates and authenticates the incoming settlement instruction. A valid settlement instruction is routed either to the real-time gross settlement process for immediate settlement or the schedule future payments process for future settlement.

Schedule future payments: The schedule future payments process provides a facility to schedule settlement instructions for settlement at a future time and/or date, or when a predefined condition is met. When due, these instructions are routed to the real-time gross settlement process for immediate settlement.

Real-time gross settlement: The process for real-time gross settlement provides for immediate settlement on a gross basis. A settlement instruction is settled only if sufficient funds are available in the settlement account. System rules and procedures determine what happens to settlement instructions when there are insufficient funds in the settlement account. Such settlement instructions may be queued to wait until sufficient funds become available, settled against a secured loan or rejected (returned to the sender).

The operator may use processing charges to influence or direct the flow of settlement instructions throughout the processing day. Participants may receive discounts when sending their settlement instructions during specific settlement cycles and some settlement cycles may attract punitive charges.

Manage collateral: The collateral management component of the settlement system forms part of the normal process of intraday and interday accommodation:

- Participants in the settlement process and the central bank should agree beforehand on the terms and conditions of this accommodation process, as well as on the nature of the collateral acceptable to the central bank.
- A depository of collateral facilitates the settlement process. If sufficient securities are available in the collateral depository, they are utilised to advance a loan to fund the settlement account.

As part of the process of managing its collateral, every bank can:

- monitor the utilisation of securities in the collateral depository;
- add suitable securities to the collateral depository;
- prioritise the securities available for collateralisation within the agreed parameters;
- withdraw unutilised securities from the collateral depository.

Manage settlement account: The manage settlement account process allows participants to monitor and manage their own settlement accounts. A participant can view individual account entries in full detail, and the account balance is available at all times. This facility enables each participant to determine its funding requirements and to manage the provision of collateral as well as the release of its settlement instructions to the system.

The funding of the settlement account is the responsibility of the participant. Agreement on the terms and conditions of credit extension is a matter between the participant concerned and the central bank.

Confirm settlement: Messages to confirm that settlement has taken place are generated to the participants and, where applicable, to the system that facilitates DVP.

End-of-day process: The end-of-day process completes the settlement day and closes the system for housekeeping and system administration. All the outstanding settlement instructions are either settled (using interday credit) or rejected. Processing charges are calculated, reports generated and participants are notified about their closing balances. The end-of-day process prepares the system for the next settlement day.

6.4.2 Typical example of a deferred net settlement system

In a net settlement system, payment instructions from two or more banks are netted before they are settled. Participants in the netting arrangement settle only their net positions. Low and high-value payments can both be settled through a net settlement system. Settlement of payments takes place at predetermined intervals or when certain conditions are met. Therefore, there is a time lag between payment and settlement. Net settlement systems have the following characteristics:

- Payments received in the settlement system are accumulated and settled in bulk.
- Only the net position between banks is settled at predetermined cut-off times or when predetermined conditions are met.
- Settlement occurs at one or more discrete, pre-specified settlement times throughout the processing day.
- The benefit of net settlement is that payments can build up in a netting system, thus providing participants with an implicit intraday credit. Net settlement also reduces the need for liquidity.

Risk management measures in net settlement systems may take various forms. Participants may be required to fully collateralise their net debit caps. Some net settlement arrangements may hold participants collectively responsible for settlement failure by sharing the loss among the remaining participants in the event of default. Other arrangements, as is the case with CHIPS (USA), require participants collectively to post sufficient collateral to cover the largest net debit position. Designers, operators and overseers of deferred net settlement systems should aim at complying, at least at a minimum, with the BIS Core Principles.

A conceptual design of a typical deferred net settlement system is illustrated in the diagram below:

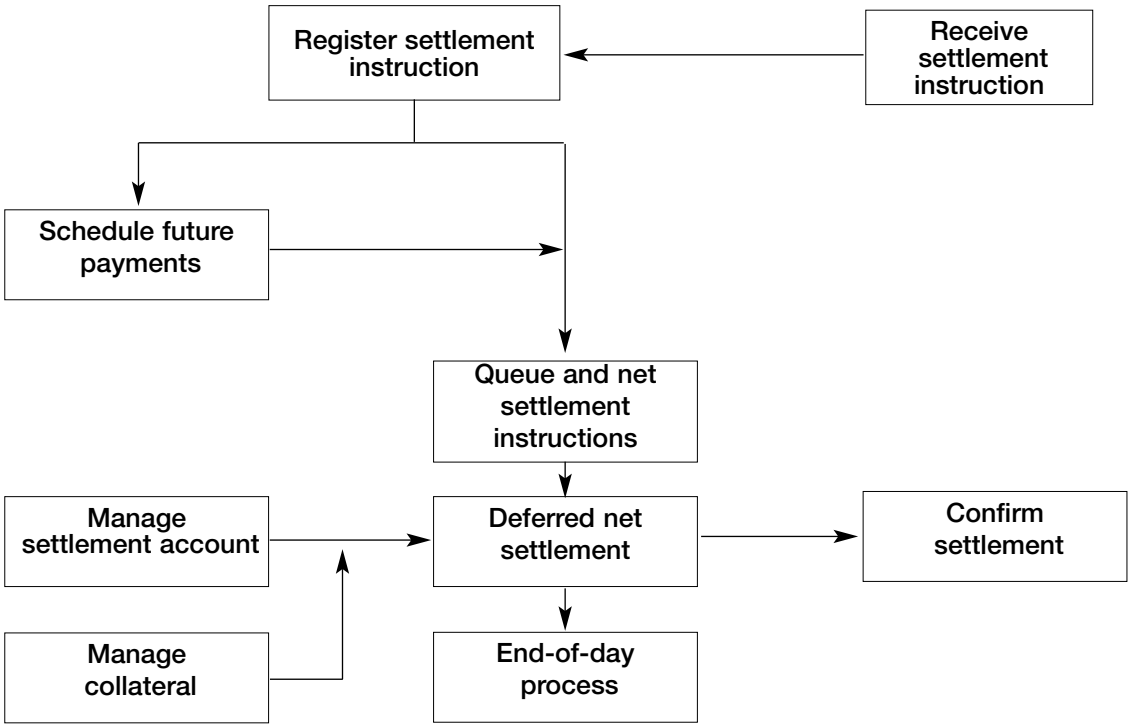

Figure 5: Conceptual design of a deferred net settlement system

The settlement instructions are generated, registered and validated in the same way as in the case of the RTGS system. Those that are to be settled later than the next settlement cycle are routed to the schedule future payments process.

Queue and net settlement instructions: All the valid settlement instructions are placed in the queue until the beginning of the next settlement cycle. At the beginning of the settlement cycle all the queued settlement instructions are netted. The process of netting calculates the net flow of funds between participants. The result of netting is a list showing the debit and credit positions of the participants. At designated times, the settlement obligations are made available to the participants to enable them to fund their settlement accounts before settlement.

Deferred net settlement: At designated times (several times during the day or at end-of-day) the netted settlement instructions are released into the deferred net settlement process. Settlement takes place when there are sufficient funds in the settlement accounts of all the paying banks to cover their net debit positions. System rules and procedures determine what happens to settlement instructions with insufficient funds in the settlement accounts. Such settlement instructions may be queued and wait until sufficient funds become available, placed on hold for settlement during the next settlement cycle, settled against a secured loan, or placed on hold until end-of-day settlement. If the system rules and procedures do not guarantee the final and irrevocable intraday settlement of all netted settlement instructions, then such a system cannot be said to achieve intraday settlement finality, but only end-of-day settlement finality.

The manage collateral, manage settlement account, confirm settlement, and end-of-day process are performed in the same way as for the RTGS system described above.

6.4.3 Typical example of a hybrid settlement system

A hybrid settlement system combines the features of a gross settlement system with those of a deferred net settlement system. It is aimed at achieving prompt final settlement of payment requests without the accompanying liquidity problems that are sometimes found in RTGS systems. A hybrid settlement system has the following characteristics:

- Frequent netting or offsetting of payments takes place in the course of the operating day with immediate settlement.
- Settlement may be either on a net or gross basis.

- Settlement takes place more promptly than in a deferred net settlement system.
- The system requires less liquidity than a gross settlement system.

A conceptual design of a hybrid settlement system is illustrated in the following diagram:

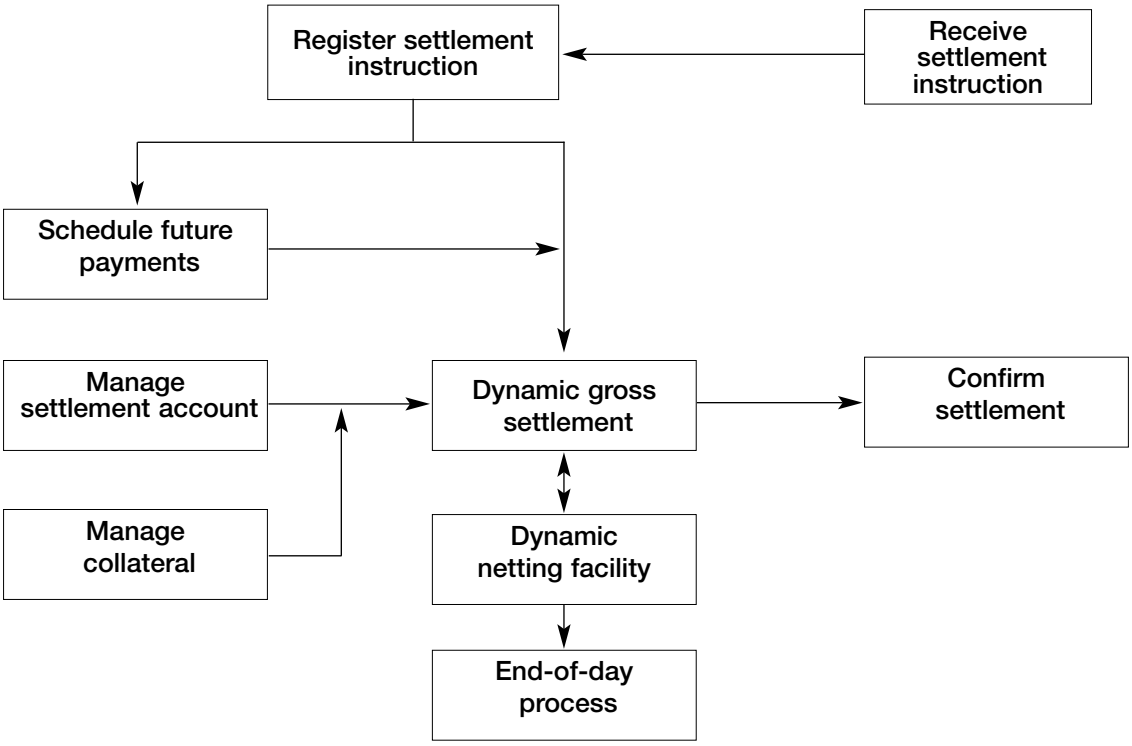

Figure 6: Conceptual design of a hybrid settlement system

The settlement instructions are generated, registered and validated in the same way as in the case of the RTGS system. Settlement instructions that are to be settled at a future date are routed to the schedule future payments process.

Dynamic gross settlement: The dynamic gross settlement process continuously settles, on an individual basis, all the settlement instructions that are covered by sufficient balances in their settlement accounts. Those that cannot be settled individually are released into the dynamic netting facility.

Dynamic netting facility: When a settlement instruction is received into the dynamic netting facility, it is matched with others to see if they can be settled simultaneously, in which case the settlement instructions are grouped and rerouted to the dynamic gross settlement process for settlement. Although settlement is on a gross basis, the resultant flow of funds is equivalent to that of a net settlement. If the settlement instruction cannot be grouped with others for settlement, it is placed in a queue until it can be settled either individually or in another group.

At designated times, usually at the end of day but sometimes at other pre-specified times, the dynamic netting facility commences a settlement cycle that commits all the queued settlement instructions to settlement. It is at these designated times that the manage collateral process is executed to grant secured loans to those settlement instructions that do not have sufficient settlement funds.

The dynamic netting facility uses a sophisticated algorithm that continuously analyses the net effect of settling all or some of the settlement instructions in the queue. System rules and procedures would determine what happens to all the unsettled settlement instructions that are neither covered by sufficient funds nor sufficient collateral.

The manage collateral, manage settlement account, confirm settlement, and end-of-day process are performed in the same way as for the RTGS system described above.

6.5 Management of risk in settlement systems

The management of risk, particularly in large-value payment systems, is critical to the soundness of the whole financial system. Risk management measures are aimed at reducing the risks faced by individual NPS participants, and at minimising systemic risk in the national payment system. These measures can be divided into five types:

- prefunding of all payments
- exposure limits
- collateralisation
- loss-sharing arrangements
- shortening of time lags in settlements

Prefunding of all payments means settlement is subject to the availability of funds in the settlement account. If funds are insufficient, payment requests are either rejected or queued until funds become available. Otherwise, if intraday credit is available, funds can be advanced against collateral.

Exposure limits involve the placing of bilateral and multilateral limits on the values settled between participants in a net settlement system. These limits can also be used to trigger intraday settlement.

Collateralisation requires all participants in a net settlement system to post collateral in order to guarantee settlement. Should any one participant fail to settle, the collateral is used to secure a loan for settlement purposes. Typically, highly liquid assets, such as short-term government securities and central bank bills, are used as collateral.

In a loss-sharing arrangement, participants in a net settlement system agree that, in the event of one or more participants failing to settle their obligations, the surviving participants will share the loss among themselves according to a predetermined contractual arrangement.

Exposure limits, collateralisation and loss-sharing agreements reduce the risk of settlement default and consequently help avoid the risks associated with unwinding. Unwinding occurs when all or some of the payments of a failing participant are excluded from the settlement process. It may lead to the inability of other participants in the netting system to meet their own obligations — a concept known as contagion.

Prompt final settlement can be achieved in net settlement systems by effecting multiple clearing cycles accompanied by multiple intraday settlements. A real-time gross settlement system is the best method of achieving prompt final settlement because settlement is achieved in real time.

6.6 NPS infrastructure

The NPS infrastructure should provide an effective service for the domestic economy and financial markets. There is no single model for a payment infrastructure that is best for all countries. A balance has to be struck between the cost of alternative facilities and their functionality and quality, which will differ from one country to another depending on the current stage and the pattern of development of the domestic economy. The appropriateness and adequacy of the infrastructure and its components will be influenced by the current and projected volumes and values of the payments, as well as the associated level of risk. The infrastructure should, at a minimum, serve current needs and be capable of accommodating foreseeable changes in those needs.

Each SIPS should be designed and operated in a way that suits the needs and resources of its users. For example, there may be a low volume of high-value payments which can be dealt with safely and efficiently, at least initially, by a simple – perhaps even paper-based mechanism. However, a modern NPS infrastructure is critical in facilitating the introduction of many modern and efficient payment instruments. It can be used as a launching pad for credit and debit card point-of-scale (POS) payment systems, smart card and automatic teller machines (ATM) networks, and e-commerce.

6.7 Legal framework

The legal framework affecting payment systems in many developing and some developed countries is often outdated and therefore unable to support modern trends in payment systems. The NPS reform process requires the support of enabling legislation that recognises modern payment and

business practice. The prevailing legislation should consequently be reviewed and analysed. Some of the areas needing particular attention are:

- finality and irrevocability of settlement
- unwinding of multilateral netting and settlement
- collateral pledged as security to support settlement arrangements
- truncation of paper payment instruments
- legal recognition of output from electronic storage media as documentary evidence
- supervision and regulation of the payment system

6.8 Long-term considerations for low-value payments

There are essentially three strategies for modernising low-value payment systems in the long term: substitution of other payment instruments for the use of cash, use of electronic instruments in the place of non-cash paper-based instruments, and a shift from debit transfers to credit transfers.

6.8.1 Replacement of cash payments

For many developing countries, the majority of low-value payments are made in cash. This includes a significant portion of business-to-business transactions. Cash will continue to dominate low-value payments for some time, especially in remote rural areas where it is often the only form of payment other than bartering. Since the level of crime is lower in rural areas than in urban areas, cash is still a safe means of making payments in rural areas.

People in urban areas, however, can benefit from the introduction or improvement of non-cash payment instruments such as cheques, payment cards and other electronic forms of payment. Cheque processing can be improved by the use of truncation and electronic presentment. Payment cards, especially debit cards, are highly efficient in terms of processing speed and transaction cost. Electronic cheque presentment and payment cards, however, require the availability of a reliable communication network between banks and between banks and merchants. The reluctance of merchants to accept cheques from unknown buyers makes payment cards preferable. As long as merchants are reluctant to accept cheques or the majority of merchants do not use POS terminals, cash will continue to be the most convenient mode of payment.

6.8.2 Paper versus electronic processing

The processing of paper is generally more expensive than the processing of electronic instructions. Technological developments always precede legislation. Accordingly, it is advisable to use contract law to implement modern business practices such as paper truncation and the electronic imaging of paper instruments instead of waiting until legislation is updated. Where possible, debit card payments can be substituted for cheque payments. Since debit card payment transactions are prefunded, a payee's exposure to fraud is reduced. Debit cards also eliminate the problem of return items associated with cheque payments. For recurring payments, electronic direct debits and credits are a cost-effective and convenient alternative to cheque or card payments.

6.8.3 Debit payment versus credit payment

The problem of return items associated with a debit payment instrument, such as a cheque, makes a credit payment mechanism preferable. In a credit transfer system, such as a Giro-based system, a payment instruction is validated before it enters the payment system. There are consequently no return items. A Giro system provides greater certainty of payment and has a lower cost per transaction. Another alternative is the development of a debit card system with online authorisation of payment instructions.

6.9 Concluding remarks on conceptual design phase

NPS modernisation should focus on the following key areas:

- process improvement
- technology and standards
- management of change

6.9.1 Process improvement

It is not always necessary to replace an old payment system with a new, modern system. Sometimes constraints, such as a lack of funds and expertise, and crises in the current system, may require process improvements rather than a complete replacement of the old system. Short-term process improvement, however, should be in line with the country's long-term vision and strategy. Inefficiencies and the maintenance cost of the old system should be compared with the cost and expected benefits of the new system. Risk issues should also be considered, since modern technologies tend to enable better risk management procedures than old technologies.

6.9.2 Technology and standards

The development of technology is integral to the development of a modern NPS. In countries where legacy systems persist, the policy choice as regards newer technological advancements ranges between a minimal technological upgrading to a complete replacement of the old technology. Because of their cash-based economies, many developing countries do not have to contend with legacy payment systems. Although they can move directly to employing the latest technology, care should be taken to invest in proven technologies. In this regard, valuable lessons can be learned from countries with modern payment systems.

The temptation to allow technology to be the main driver for change should be resisted. Technology should always follow careful analysis of business needs. Standardisation in the technology platforms used in the NPS is essential. Technology standards are needed to achieve compatibility and interoperability among instruments, applications, systems and procedures.

6.9.3 Management of change

In most activities, work processes and attitudes are strongly entrenched, and resistance to change is inherent. Payment system reform is no exception. What is needed is a definitive statement and a conceptual framework to enable an understanding of the dynamics of change and to bring about concrete proposals for adopting change. Some of the important dimensions of change management are the creation of public awareness through education and training to help the public accept the intended changes.

CHAPTER 7: BUSINESS SPECIFICATIONS

7.1 Introduction

The business specification phase of the strategic process translates the vision, strategy and conceptual design into business requirements and specifications for each of the individual payment systems to be implemented. Up to this point in the modernisation process, the emphasis has been on the high-level requirements of different stakeholders in the NPS. The development of business specifications crystallises these user needs and requirements into a series of tasks and actions that satisfy those needs.

The conceptual design phase revealed several design concepts for different types of payment system in which the central bank could be involved. For example, there could be conceptual designs for the paper-based, card-based, electronic funds transfer (EFT), high-value electronic and other types of payments. These designs, however, were still abstract and did not contain sufficient detail to start building the required systems. They should therefore be broken down into business requirements and processes that can be modelled into business solutions.

Objectives of this phase:
- Prepare a business requirements document that will set out the business specifications to be addressed by the new payment system.
- Develop and publish a business model for the benefit of all NPS stakeholders, which details the functionality of the new payment system.
- Generate a time-phased and prioritised implementation plan.

The level of detail in the business and technical specification phases of the project will be determined by the choice of either buying or building components of the envisaged system. Therefore the strategy team should have made the buy-or-build decision before commencing with the business specifications phase.

7.2 Business requirements

The conceptual design does not incorporate all the business issues involved in the envisaged system. It simply illustrates its functionality and the different high-level business processes that are required to operate it. Business issues such as the relationship between different system participants, system security, data confidentiality and system availability are not covered.

All the critical business requirements should be specified upfront, rather than trying to incorporate them later into an already existing system. This section addresses several business requirements relevant to modern payment systems:
- settlement strategy
- scheduled payments
- funding strategy
- risk management
- audit trail
- support for monetary policy
- access criteria
- international payment system standards
- expected services
- system availability and reliability
- cost implications
- modularity and flexibility
- system operation and oversight
- compliance requirements

This list of business requirements is not exhaustive and may be expanded, depending on the specifics of the system concerned. The strategy team, in consultation with other key stakeholders, should record and discuss these business requirements until consensus is reached.

7.2.1 Settlement strategy

Settlement strategy refers to the particular approach taken to achieve settlement. This can be a choice between real-time gross settlement, deferred net settlement or a hybrid settlement. Business requirements will dictate which option is the most suitable for local circumstances. The availability of securities to serve as collateral, the number of participants and their past experience, technology, risk management considerations and other strategic issues may influence the choice of the settlement strategy.

7.2.2 Scheduled payments

The ability to schedule payments for settlement at a specified future date and time may be important for business reasons. If this is the case, the system should also enable participants to estimate their future requirements in respect of settlement funds.

7.2.3 Funding strategy

Funding strategy refers to the way in which funding for settlement purposes is managed. Some settlement systems use a single settlement account per participant and others use multiple accounts. Some settlement systems allow for intraday credit but others prohibit it and reject any settlement instruction that is not supported by sufficient funds to cover the settlement amount. A collateral management module may be part of the settlement system or it can be a separate system outside the settlement system. An appropriate funding strategy should be discussed with all the participants and perceived by the majority as fair and equitable, and not be used as a way of excluding some participants from the system.

7.2.4 Risk management

The management of various forms of risk is integral to the maintenance of a reliable payment and settlement system. Credit and liquidity risks are the major forms of risk. Operational risk is also important. Participants, the PCHs and the overseer (central bank) should all be empowered with tools to manage the different forms of risk they may be exposed to.

7.2.5 Audit trail

Auditability refers to the ability to prove the existence or absence of an activity in a system, or to trace an activity through the system to establish a pattern of behaviour that could indicate the fraudulent use of the system. A high-value settlement system, for example, requires a sophisticated audit trail so that system administrators can follow a payment request from its origin to the point when it is finally and irrevocably settled.

7.2.6 Support for monetary policy execution

Payment systems are the channels through which monetary policy strategies are executed. They should also provide the statistical data needed for the formulation of monetary policy. The design of the NPS and the settlement systems should therefore facilitate the execution of monetary policy by the central bank.

7.2.7 Access criteria

Access criteria should be fair and equitable and they should not be used as a way of limiting or controlling competition. All those who meet the minimum qualifying criteria should be permitted to participate. The central bank should balance the need to provide an open system with the need to manage risk in the system. Many systems allow for different levels of participation, such as direct and indirect participation.

7.2.8 International payment system standards

Payment systems are affected by advances in technology. Inexpensive and efficient technologies are one of the main enablers of NPS reform. NPS design should therefore incorporate international standards of reliability, safety and efficiency. This does not mean a country has to be at the cutting edge of technology — it merely means a country should take cognisance of the available technology and enhance it for its own business requirements.

7.2.9 Expected services

All key stakeholders should have a clear understanding of what services the new NPS should provide and of their role in the NPS. Some roles will change and new roles may be created — this may create tension among stakeholders. The differences between the current system and the new one should be discussed and clarified. Such discussions should culminate in a list of services the new system should provide and a plan of action for ways that stakeholders and participants can begin preparing for the changes. Some of the following services may be expected:

- enabling secure access to the system
- generating and processing instructions promptly
- integrating the new system with existing back-office systems and infrastructure (e.g. SWIFT)
- achieving delivery versus payment (DVP)
- online management of liquidity requirements
- supporting web-enabled technology

7.2.10 System availability and reliability

A critical system such as an RTGS system should be available 100 percent of the time it is being used. Such availability is often difficult to guarantee. System downtime, maintenance time, length of time needed to transfer processing to the backup facilities, fault tolerance and other availability and reliability-related aspects of the system should be included in the service level agreement negotiated between the suppliers and the users of the system.

The reliability of the software and hardware components of the system refers to the need to use fault-tolerant components that can withstand common, everyday disturbances. It also refers to the need for components to function independently in such a manner that one or more components can be disabled and repaired without bringing down the whole system.

System availability and reliability, once agreed to, should be recorded and incorporated into the service level agreement between the system operator and the participants.

7.2.11 Cost implications

Cost is a major business consideration. This includes the cost of implementing the system, which is influenced by whether the system will be developed in-house or sourced from independent vendors. Once the cost has been estimated, a decision has to be made on how to cover that cost. In order to make the new system attractive to participants, transaction processing costs should be competitive. Participants will not willingly migrate to the new system unless it offers lower costs, greater efficiency, higher security and other value-added services. A system is cost-efficient when it is developed or acquired at the lowest possible cost without compromising user requirements and technical efficiency.

7.2.12 Modularity and flexibility

Modularity refers to the building of the system in modules according to the requirements and priorities of the users. It affords users the opportunity of starting small but having the flexibility to expand the system as business requirements evolve. It also refers to the strategy of creating a basic, robust infrastructure on which other applications and system components are added as and when they are needed.

7.2.13 System operation and oversight

The role, responsibility and authority of the operator and the overseer of the system should be clarified. The relationship between system participants, the operator and the overseer should also be discussed and documented. NPS oversight is the domain of the central bank, but the operation of the system may be left to a private institution. In many developing countries, the central bank may want to operate the system, at least initially, until the system becomes stable and participants gain confidence in its operation. Thereafter it may be outsourced to a private operator.

7.2.14 Compliance requirements

Banks in a country often use specific computer platforms and networks that they want to continue using. The strategy team should therefore consider utilising the existing infrastructure, for example if

several banks are already using the SWIFT network, they may agree that the new system should be compatible with the SWIFT message standards.

Other compliance issues may include the availability of skilled personnel to support specific applications and programming languages.

7.3 Business requirements document

All the business requirements discussed and agreed to are recorded in a business requirements document that supports the conceptual design and the business model. The structure of a typical business requirements document is as follows:

- Executive summary
- Introduction
- Purpose
- Scope
- Business problem definition
- Current situation or environment
- Definition of business requirements
- Solution alternatives
- Business recommendation
- Appendices

7.4 Developing a business model of the new system

After the critical business requirements have been discussed and agreed to, business analysts may begin developing a business model of the new system. The modelling process requires the business analysts to study all the documents generated by the strategy team, including the vision and strategic framework, conceptual designs, all the discussion documents and the business requirements document mentioned earlier in this chapter. Additional work sessions with the strategy team may also be necessary. Without sufficient knowledge and understanding of the thinking of the strategy team, analysts will not be able to model the new system accurately.

These steps should be followed when translating a conceptual design into a business model:

- Understand the conceptual design.
- Convert the conceptual design into business processes.
- Build a model of the business processes.
- Discuss the model with the strategy team for approval.

7.4.1 Understanding the conceptual design

Before the conceptual design can be translated into business processes, it first has to be properly understood. Complete understanding of the conceptual design can be gained from the vision and strategy framework document, the minutes of the strategy team meetings, and from discussions with members of the strategy and relevant expert teams.

The primary responsibility for translating the vision and conceptual design into business specifications rests on the business analysts. A team of business analysts should therefore be constituted to perform this task. This team should consist of a team leader with one or more additional members. The team leader liaises between the business analysis team and the project director.

Members of the business analysis team should possess the skills to construct business processes from the vision and the conceptual design. They should be able to understand and communicate abstract concepts at a strategic level, facilitate work sessions and meetings, and utilise computer technology and business modelling tools to generate comprehensive designs such as process flowcharts, dataflow diagrams and entity relationship diagrams.

7.4.2 Converting the conceptual design into business processes

Once the business analysis team has gained complete understanding of the conceptual design, it can begin identifying the business processes that need to be performed in order to achieve the

conceptual design. The business analysis team needs structured business analysis and business modelling tools to draw up business models. High-level business processes such as payment initiation, clearing, netting, collateralisation and settlement should be decomposed into lower-level processes. Decomposition continues until all processes are at their lowest possible level. At this level, specific activities or tasks, which will serve as the building blocks of the intended system, are identified. Each task or activity should be fully analysed, given a unique name and documented in a way that is meaningful to system analysts.

In essence, business processes define how work is done and how work is coordinated. A process is incomplete without defining both of these aspects.

There are basically four types of business processes:
- *Core processes:* These processes focus on satisfying external customers. They are vital because if they do not work as expected, they signal the failure of other business processes. In other words, a business is not sustainable without effective core processes. Without proper implementation of the core processes, the new system would be unable to provide an optimal level of service to its users.
- *Management processes:* These processes coordinate, plan and schedule. They ensure that the core processes work effectively. Problems with management processes could make the business unable to satisfy external customers.
- *Support processes:* These processes enable all the other processes to function effectively. Examples of support processes include human resources management and information services management which focus on internal customers.
- *Change processes:* These project-based processes are aimed at improving, upgrading and radically redesigning the other three processes, which are ongoing.

7.4.3 Building a model of the business process

A model can be defined as a simplified representation of reality. A process model can be defined as a set of carefully coordinated descriptions, starting from a high-level description of the entire process and ending with a detailed description of process activities. Business process modelling is therefore the “act of developing an accurate representation of a business process”. A diagram is the basic building block of a model.

Why build models before building the system itself? Models are important because they can be constructed in such a way that they highlight or emphasise certain critical features of the system. This enables focussed communication with the user without being distracted by irrelevant issues and system features. If we learn that our understanding of the user requirements was incomplete (or that user requirements have changed), the model can be changed or a new model built.

A business analyst uses modelling tools to
- focus on important system features;
- discuss changes and corrections to the user’s requirements at low cost and minimal risk to the user;
- verify that the system analyst correctly understands the user’s environment and has documented it in such a way that the systems designers and programmers can build the system correctly.

A model is a means to an end, and not an end in itself. Therefore a model should
- contain only the level of detail required by the system designers and programmers;
- highlight the most important features of the system;
- never cost more to build than building the system itself;
- verify the system analyst’s understanding of the user’s true requirements.

Benefits of modelling processes:
- Understanding — modelling helps uncover the nature of the business processes being modelled, that is, what is being done in the business.
- Communication — once understanding has been gained, the nature of the business process can be documented and communicated.
- Enlightenment — modelling helps uncover anomalies, redundancies and deficiencies in the existing conceptual design.
- Improvement — a model allows one to select deficient areas of the process and improve them.
- Redesign — a model provides a tangible basis for redesigning the business process, performing tests on the redesigned process and measuring the outcome.

Some key questions to ask when developing a business model:

- What is the purpose of the model?
- From whose point of view should the model be developed?
- Which processes should be included or excluded (scope)?
- What are the inputs into the processes?
- Who are the customers of the processes?
- What are the outputs of the processes?
- What are the activities of the people and machines in the processes?
- How do physical materials, paperwork and data flow through the processes?
- What events trigger the processes?
- What events constrain the processes?

At this point of the modernisation process, the information gathered should be about what the envisaged system should accomplish rather than how it should accomplish it. Care should be taken not to be unduly influenced by what seem to be quick technological fixes.

7.4.4 Approval of the business model by the strategy team

Throughout the modelling of the business processes, the business analysis team should maintain close contact with the project director to check the validity of the business model. This should continue until the project director is satisfied with the model and believes it can be tested against the whole strategy team. This ensures that the project director fully understands the model and can answer questions from the strategy team.

The strategy team should approve the model only if it accurately reflects the vision and the conceptual design already agreed to. Discussion of the business model may highlight some areas requiring further analysis and discussion by the strategy team. When this is the case, the strategy team should discuss these new areas and reach agreement. The discussion of the business model often leads to a review of the conceptual design.

The process of getting the business model approved by the strategy team may be long and sometimes frustrating. The business analysis team should not lose heart as every revision tends to improve understanding of the business and improves the quality of the design of the system. Each revision of the business model fine-tunes the system design in relation to user requirements. It is usually advisable to include treasury officials of commercial banks and other domain experts at such meetings because members of the strategy team are not always directly involved in all the actual payment operations.

All the members of the strategy team should approve the business model by attaching their signatures to the model. Once approved, the model should be published and made available to all interested parties. The published business model will serve as input into the technical specifications phase.

Once the business model has been approved, the business analysis team should conduct work sessions with the systems analysis team to explain and clarify the business model. Before disbanding, the business analysis team leader officially hands over the task and all the documentation to the leader of the systems analysis team. The systems analysis team is responsible for translating the business specifications into system and technical specifications.

7.5 Guiding principles for developing a business model

The business analysis team should remember the following guiding principles when developing a process model.

7.5.1 A business model is a communication tool

Effective communication always conveys specific information to a specific intended receiver. This means deciding at the outset what specific information should be communicated and who the intended audience is. The information should also be at the required level of detail.

The business process model is the driver for all the other modelling and specification activities.

Dataflow diagrams and entity-relationship diagrams are based on the business process model. If the model is incorrect in some important aspect of the business, the dataflow and entity-relationship diagrams will also be flawed. This will lead to incorrect system specifications and eventually to a system that does not fully meet user requirements. In-depth discussion and debate should be held about the business process model.

7.5.2 Revision is critical and repetition is unavoidable

It is unlikely that the first business process model will be the final one. As models are developed, hidden aspects of the business are uncovered, inconsistencies emerge and previously agreed principles may require fresh analysis. When this happens, one should not lose heart because this is the benefit of modelling — it helps uncover the nature of the business process. With every revision, a deeper understanding of the business is achieved. This process usually continues until a common understanding of the business is achieved among all the key stakeholders. This common understanding and agreement on how the business will be conducted is critical for the ultimate success of the business. The required time should therefore be invested in order to gain consensus and common understanding.

7.5.3 Guarding against self-interest at the expense of national interest

It is often difficult to balance cooperation with competition or place national interest above self-interest. Some stakeholders may want to claim some business processes as their domain; others may want to erect entry barriers to keep out new competitors. The project director should emphasise that the process is not about allocating responsibilities, but about achieving a common understanding of how the business is supposed to work. Of importance at this stage is what should be done and not who should do it. The envisaged system should also be seen to be equitable and fair to all stakeholders, both present and future.

CHAPTER 8: TECHNICAL SPECIFICATIONS

8.1 Introduction

This phase of the strategic process of NPS reform looks at all the technical specifications that should be discussed and agreed to before the new system is developed or bought. The objectives of this phase are to

- establish technical specifications for the new system,
- feed technical specifications into the procurement phase.

This phase emphasises the technical specifications that will help support all the major business requirements of the new system. Specific business requirements such as processing speed, making use of existing systems, risk monitoring and measurement, system availability and disaster recovery require technical solutions. All the technical considerations that are critical in meeting the minimum business requirements should be established, discussed and agreed to. The temptation to use state-of-the-art technology when mature technology will meet the essential business requirements should be resisted. This often serves only to inflate costs and risk unnecessarily.

Technical specifications are an important input into the procurement phase. When solution providers are invited to bid for the provision of the new system, those who do not incorporate technical specifications are excluded. Valuable time can be spent on studying a few relevant tenders, rather than wasting time on numerous irrelevant tenders. Technical specifications should apply mainly to critical issues involving the functionality and reliability of the system.

8.2 Establishing technical specifications

The following technical specifications are among those that should be considered before the new system is developed or bought:

- system architecture
- system platform
- system capacity
- security
- disaster recovery
- communications network
- system maintenance
- databases

8.2.1 System architecture

The system architecture should match the business design features and required functionality of the system. Although a client/server can offer processing capabilities similar to those offered by a mainframe, some differences may necessitate the choice of one architecture over another.

System architecture includes the system software. The most suitable system software for the primary and secondary (backup) sites, as well as for workstations accessing the system, should be investigated. A similar investigation should be conducted into database management systems.

8.2.2 System platform

Many NPS applications are designed to run on one or more computer platforms but some applications are restricted to only one platform. Different platforms offer different capabilities, some of which are more suitable for small applications though others are designed for very large applications. Technical specialists should evaluate different platforms and choose the one that is most appropriate for the size of the application, number of participants, volume of transactions, speed of response, cost, safety and other strategic business considerations.

8.2.3 System capacity

System capacity refers to the need for the system to process certain transaction volumes at specific speeds, store certain amounts of data, service a certain number of users and maintain sophisticated algorithms for efficiency. Some solutions are suitable for a small number of users with limited transaction volumes. Though such solutions may be adequate at present, they may fail to accommodate future growth in the volumes or users of the system. Technical specifications for system capacity should take into account both the present and the future requirements of the system.

8.2.4 Security

From a business point of view, the system should be totally secure and perceived as such by all the intended users. Security can be addressed at different levels, including;

- *Security at point of entry:* There should be security checks at the point of entry into the system. Security features such as user identification numbers, signatures and passwords (with a limited life-span) may be used. For very sensitive areas of the system, state-of-the-art security features may be implemented. Security at the point of entry ensures that only authorised personnel can gain access to the system. Access to the system should be limited to those with a valid reason for access, and limited to the functions that are relevant to the particular individual.

- *Network security:* Security at the network level refers to the security arrangements aimed at securing the network from external security threats. These security threats include hackers, network downtime, reliability of the physical network infrastructure, and the resilience of the network in handling high volumes of messages.

  It should be possible to temporarily suspend processing in the course of the business day and to resume system operation without the loss or duplication of messages. The system should be restartable within a short period of time to enable the completion of the day's processing.

- *Information security:* Payment information flowing through clearing, payment and settlement systems is highly confidential. The new system should therefore ensure the maintenance of this confidentiality throughout the life cycle of a payment instruction.

  Information security ensures that only those authorised by management to operate the system can gain access to the information. It enables management to enforce confidentiality and distribute information only to those people who are meant to get it. Information security features such as data encryption are used to secure information against hackers.

  The system should be able to trace a payment instruction automatically from the point of entry into the system to the final destination, with full information about the time the payment instruction was received and delivered at each location. This tracing and audit trail should also include all the security identities of the people involved in the transaction. At the close of the business day, the system should be capable of performing periodic archiving of the past day's data. It should also be able to restore data from archives to online storage for enquiry or reporting purposes.

8.2.5 Disaster recovery

Any payment system, especially SIPS, requires backup and disaster recovery facilities to ensure business continuity and system availability even in the event of extreme disasters and emergencies. Periodic testing of such facilities is critical. Issues for discussion under this topic include the location of the facilities, disaster recovery procedures, the roles and responsibilities of different key personnel, and other operational matters aimed at ensuring minimum business interruption. Technical issues for discussion include whether to use the same hardware/software combination used at the primary site, the process of switching from the primary processing site to the backup site, the length of time required to switch, and other technical considerations that affect users. For instance, for a real-time gross settlement system, it may be necessary to maintain the secondary site in "hot standby" mode with the continuous transfer of data from the primary site so that processing can resume at the secondary site in a matter of minutes. For an off-line batch-processing system, longer recovery time may be acceptable. The cost of the disaster recovery arrangements should be weighed against the potential benefits of service continuity.

8.2.6 Communications network

Communications network refers to the communication links between participants and the system. In most instances, SWIFT will be a major component of this network. SWIFT is already being used as a financial message carrier in many countries. If a different network is proposed, it should support SWIFT message standards in order to facilitate interface with SWIFT for those participants already using SWIFT. The security of the communications network is a major consideration and any alternative networks should be able to provide a high level of security. Other communications network considerations include the number of users who will connect to the system, the investment each user has to make in software and hardware, how the user connects to the main system, security features built into the network, who is responsible for the network, licensing and other ongoing costs of the network, and network speed.

Using SWIFT, for example has many advantages:
- proven network and security system with fully proven recovery facilities
- low risk
- quick to implement
- owned by banks
- compatible with international standards

8.2.7 System maintenance

Every system will need maintenance and upgrades on an ongoing basis. Maintenance ensures that the system continues delivering the same level of service, and upgrades enhance the functionality of the system so that it can be kept in tune with users' evolving requirements.

Technical issues for discussion under system maintenance include the programming language used to develop the system, availability of technical skills to maintain and upgrade the system, the availability of parts to service the hardware, length of time it will take experts to arrive at the processing site to deal with emergencies and the future cost of maintenance. As a rule, the system should be simple to maintain and its upgrades should involve minimal business interruption.

8.2.8 Databases

Different databases offer different flexibility and functionality. Some databases support only a specific computer language whereas others support multiple languages. Some databases are more suitable for very large applications and others are designed for smaller volumes of records. The choice of a database is central to the speed and safety with which settlement instructions will be processed by the system.

8.3 Concluding remarks on technical specifications

Agreed technical specifications will be included as an attachment to the business requirements document. Detailed technical specifications may not be necessary for acquiring a packaged solution. In such a case, there may be a few mandatory specifications to serve as minimum criteria for considering proposals from vendors. The evaluation of proposals will also be based on the extent to which a proposal's technical specifications satisfy business requirements.

The next step in the strategic process is to acquire or develop the required system. In some cases the service can be outsourced to an external operator who will charge participants fees based on their usage of the system.

CHAPTER 9: ACQUISITION, OUTSOURCING AND DEVELOPMENT

9.1 Introduction

Different approaches can be followed in translating the business and technical specifications into systems and applications. These approaches include:
- acquisition
- outsourcing
- development

9.2 Acquisition

Acquisition is the act of acquiring or purchasing solutions from a vendor. The process of acquiring the necessary hardware, software, applications and other services should encompass the following steps:
- selecting the most suitable vendor
- purchasing the most appropriate solution that meets all the critical business and technical requirements
- maintaining the solution following the implementation
- accomplishing all the above in an efficient manner

Acquisition has several advantages:
- saves time
- is usually more cost-effective than development
- provides a proven solution

There are some risks, though. If the proposed package is not thoroughly evaluated and tested before purchase, the following may result:
- incompatibility between the package and organisational culture
- package may not fully meet user requirements
- incompatibility with other organisational systems
- non-realisation of exaggerated promises

9.2.1 Those involved in the acquisition process

The project director, as the project owner, is responsible for setting up and coordinating the different activities involved in acquiring the appropriate cost-efficient package. This may involve setting up teams of experts to assist with the acquisition process.

Members of a typical project team include:
- project manager — to manage the project,
- business representative — to coordinate business-related activities between participants,
- IT representative — to co-ordinate IT-related activities between participants,
- acquisition specialist — involved during contract negotiation with the vendor,
- participant banks' representatives — to represent the interests of system users.

Whether the project manager and the business and IT representatives are involved on a full or part-time basis will depend on the complexity of the project as well as their experience with similar projects.

The vendor may also appoint a team to work on the acquisition process:
- account manager — high-level manager involved part time
- full-time project manager
- business analysts
- IT specialists
- trainers

9.2.2 Acquisition process

Prior to the process of acquisition, the business and technical specifications should have spelled out what is needed to achieve the desired solution. The following steps serve as broad guidelines for the acquisition process:

- Plan the acquisition, using the request for information (RFI) where appropriate.
- Prepare and issue the request for proposal (RFP).
- Prepare for proposal evaluation.
- Business and technical evaluation.
- Financial evaluation.
- Verify vendor proposals.
- Negotiate the contract.
- Sign the contract.
- Manage the contract relationship.

Planning the acquisition, using the RFI where appropriate: An RFI may be used to obtain information on prospective vendors' experience, the nature of their solutions, financial strength and their ability to meet the business and technical specifications of the new system. The main purpose of the RFI is to identify the vendors for possible invitation to the bidding process. A notice in various media (newspapers, journals, magazines) inviting prospective vendors to respond to the RFI would typically contain information such as:

- purpose of the tender (e.g. procurement of an interbank settlement package),
- scope of the required solutions,
- contact details of the project director and the procurement team,
- qualification criteria for the prospective vendors, including experience of similar projects, financial position, resource capability and other pertinent information,
- closing date and venue for collecting the RFI documents.

The RFI is not a substitute for the RFP and it should typically not be expected of a vendor to provide a price when responding to an RFI. It would normally be unfair to request a proposal or pricing without providing the vendor with detailed information.

Preparing and issuing the RFP: All the vendors' responses to the RFI should be evaluated and ranked according to their expected ability to meet the business and technical specifications. Tender documents should be in a standardised format to facilitate the evaluation and selection process. Standardisation is required for a tender document to meet certain government/ legal/sponsor (e.g. World Bank) criteria.

The tender process should be fair and ethical, for example, information supplied to one vendor should be shared with all. If necessary, an RFP conference could be held to clarify any uncertainties relating to the RFP. The conference should be open to all vendors. After the closing date all the proposals should be opened at the same time in the presence of some strategy team members. This ensures the fairness of the process and that all vendors are treated equally. The RFP should include at least the following:

- *Information to vendors:* Information to vendors should cover the phases of the project, contact details, the use of subcontractors and the period the tender will remain open.

- *Terms of reference:* Terms of reference include core functions, processing requirements, information management requirements, interfaces, standards of compliance, access criteria, performance of systems, reports and help facilities.

- *Project milestones:* Project milestones are the steps the project follows from the moment a solution is chosen to the point when that solution is implemented. Milestones are a good control tool leading toward the implementation phase.

- *Training requirements:* Training requirements refer to the operators, supervisors, managers, system administrators and system support personnel who are expected to be trained in the use of the new system.

- *Contract:* Since some vendors may supply their solutions with standard terms and conditions for purchase it has to be established to what extent these terms and conditions are negotiable. The contract should be specific in terms of the product that is acquired, its functionality and price, the

roles and responsibilities of the acquirer and the vendor, the contract period, rules to be applied in the event of disputes and other relevant aspects of the purchase.

- *Requirements specification:* The requirements specification (business and technical) forms part of the RFP document and provides sufficient information about the requirements of the system to give vendors a clear understanding of what is expected.

The RFP document provides precise details and refers vendors to the requirements specification for further details. The RFP should not simply define the functions to be performed — it should highlight how such functions would be performed and cases where a specific method would be preferred.

RFP documents should be sent to the vendors identified from the responses to the RFI. It would save time to deal only with the vendors who most likely could supply the required solutions. The number of potential vendors should typically be four to six (taking into consideration that some who were issued with an RFP might not respond).

The RFP should be clear about what should be included in the costing of the proposal. It is advisable to provide a cost breakdown schedule and vendors should clearly specify what is not included in their pricing. Vendors should also be invited to provide alternative pricing strategies or pricing options that may make their offering more attractive, e.g. pricing per module rather than paying for functionality that will be used only at a future date.

See Appendix D for an example of a table of contents of the RFP document.

Preparing for proposal evaluating: Proposal evaluation is an important step in short-listing suitable vendors. Evaluation is undertaken once the deadline for the submission of proposals has passed. It should be undertaken in two separate phases: the business and technical proposal evaluation followed by the financial proposal evaluation.

Before finalising the RFP document, consideration should be given to the manner in which the responses will be evaluated. The requirements may be classified into several categories such as business, technical and financial, to make comparison simpler and more objective. The requirements should be weighted in a top-down manner. The weighting indicates the relative importance of the criteria whereas the rating (for example on a scale of 0 - 4 with 4 indicating full compliance) reflects the vendor's degree of compliance with the requirements. The product of the weight and the rating gives a weighted fit. The vendor with the highest weighted fit should be the most appropriate. It is advisable not to communicate the weighting and the evaluation method of the bids to the vendors prior to the receipt of their proposals, otherwise vendors may structure their responses in a manner that interferes with the objective analysis and evaluation of their bids.

A cross-functional team of IT specialists and business and legal experts should weight the criteria and rate the proposals. Members of the strategy team should also be involved in the evaluation process.

Business and technical evaluation: A business and technical proposal evaluation is undertaken and scored against agreed business and technical criteria. A minimum score is required before a vendor can be considered for a short list. With four to six proposals, each proposal should be considered on merit giving due consideration to

- whether the solution meets business requirements (referred to as the business fit);
- the suitability of the supplier as a business partner (bigger is not always better. The supplier should be able to provide the best service consistently in the foreseeable future);
- whether the solution meets technical requirements in terms of reliability and maintainability;
- the cost (does the solution provide value for money and is it justifiable for the amount of risk being managed).

Other criteria:

- *Ability of the vendor to deliver within the required time frame:* This refers to the vendor's ability to commit sufficient personnel and other resources to ensure the completion of the project within the required time frame. The vendor's experience and size are critical in assessing whether the deadlines will be met.
- *Vendor experience:* Length of time in similar businesses, experience in the banking and associated environment, examples of installations that may be used as references, and proof of project management acumen, are all indicators of vendor experience.

- *Resource capability:* Vendors should be able to demonstrate the amount and quality of resources at their disposal, and their ability to subcontract or to use parent company resources.
- *Support capability:* This includes service level agreements, standby facilities and support facilities.
- *After-sales support:* This includes a suitable after-sales service, local support arrangements, location of support resources, cost of support arrangements within working hours and outside working hours, as well as the escalation procedures for dispute resolution.
- *Customisation required:* It is unlikely that the acquired solution will satisfy all the business and technical requirements. Customisation is usually needed to make the acquired product meet the specific needs of the customer. The amount of customisation required, the cost and the time needed for customising should consequently also be incorporated into the technical evaluation. A product requiring limited customisation is obviously preferable. The responsibility for customising should also be made clear from the outset.

Financial evaluation: After the technical proposal evaluation has been completed, the financial proposal evaluation is undertaken. The financial proposals should remain unopened until the technical proposal evaluation has been done. The financial proposals for evaluation should be those of prospective vendors who have already met the minimum qualifying criteria in the business and technical proposal evaluation.

A financial proposal should include itemised billing for all the solution elements, including hardware, operating system, customised application software, training, project management and other services.

Verifying vendor proposals: The information that vendors provide in their proposals is often not clear enough to make a selection. Verification is required to confirm the validity of their claims and to eliminate any vague or ambiguous statements.

It is advisable to verify the claims and reputation of the vendor with existing customers by visiting their current installations and attending demonstrations of their products.

A bid clarification meeting can be set up with each vendor individually to discuss their proposal. The questions that arose during the evaluation process should now be put to the vendor and the evaluations amended accordingly.

Following the verification process, the vendors can be ranked and the successful vendor approached to negotiate the contract. Appointment should be subject to a successful negotiation process.

Negotiating the contract: Contract negotiation is an important step which includes the management of the contract relationship. Other important aspects of the agreement are:
- product or service requirements
- development and delivery milestones
- acceptance conditions
- exception and dispute handling procedures
- payment schedules
- penalty clauses
- maintenance and upgrades
- rights and restrictions regarding technical data, copyrights and patents

Since contract negotiation is a specialist skill, people with the relevant commercial and legal experience should be involved in the process.

Signing the contract: Successful conclusion of the contract negotiation will result in the signing of the contract and the commencement of the contract relationship. The vendor's project manager and the NPS project director should establish their working relationship and how they intend to measure and monitor progress with implementing the new system.

Managing the contract relationship: Vendor performance in terms of the negotiated contractual agreement should be monitored on an ongoing basis throughout the contract. The vendor should be provided with all the necessary information, infrastructure and resources in time so that the contract can be executed unhindered. The management of the contract relationship is a delicate matter and can adversely affect the success of the contract if not handled properly. The contract negotiation should therefore be as thorough as possible and all uncertainties and ambiguities resolved before the contract is signed. Once signed, the contract becomes the primary standard for measuring the success of the acquired solution.

9.3 Outsourcing the service

SIPS, because of their strategic and national importance, are usually owned and operated by central banks. However, in some cases it may be preferable to outsource the operation of such a system to a qualified external private operator. Outsourcing may be preferable for several reasons:

- It is possibly the least expensive option.
- It takes a short implementation period because there is no system development.
- Does not usually involve a large initial capital outlay because participants are charged on the basis of their volume of transactions.
- Competitive pricing — the operator will be motivated to offer competitive prices in order not to lose the business to competitors.
- Participants may expect the operator to keep abreast of international trends.
- Switching costs are low — participants may switch to other operators at low cost.

Outsourcing may also have some risks:

- Operational risk for the central bank because it now relies on another party to operate the system.
- Inability to enforce service levels.
- Market risk — any unfavourable market perception of the operator may reflect badly on the central bank.
- Strategic risk — it may be difficult to justify outsourcing a mission-critical service.
- Escalation of charges — the operator may escalate processing charges to a level that makes this option no longer cost-effective or efficient.

Circumstances where outsourcing may be preferable:

- The outsourced task it is not a core business function.
- Private operators can perform the task more efficiently than the central bank.
- Image of the central bank will not be tarnished by any unfavourable market perception of the operator.
- The central bank can switch to other operators at low costs.

Payment systems such as the cheque, card-based and electronic low-value payment systems are usually not of systemic importance and therefore qualify as candidates for outsourcing or may simply be left to the banks or other private operators to own and operate. Country-specific circumstances determine whether a system is a SIPS and consequently whether it can be outsourced.

9.4 Development

Development is a process of building systems from scratch. It results from system analysts taking information from the business and technical requirements and translating this information into system specifications that system developers can use to develop a new system. Development requires more in-depth analysis than does buying an off-the-shelf package.

Solutions bought off-the-shelf may sometimes not adequately satisfy the required business and technical specifications. It may then be more appropriate to develop the system from scratch rather than acquire and customise a system from a vendor. The rationale for development rather than acquisition includes the following considerations:

- The system is mission-critical and forms the core of the central bank's functions.
- There are no off-the-shelf packages that adequately satisfy the required functionality of the envisaged system.
- The central bank wants to be self-reliant in terms of the NPS.

Development does not necessarily mean the central bank develops the system on its own without any external assistance. Unless the central bank has adequate experience in developing systems and managing projects of this nature and size, it may be appropriate for an external firm with the required experience to be contracted to partner the central bank in developing the system. In such a case, a contract outlining the relationship between the firm and the central bank may be signed. Both the contracted firm and the central bank should appoint project managers to lead the development and report to the project director. The two project managers should agree with the project director on the members of the development team, milestones and deliverables, the budget and other resources that would promote the success of the project. Issues of how the system would be maintained once it has been implemented should also be discussed. The development team should comprise system analysts, designers, programmers, testing staff, data analysts and system integrators. The

contractual agreement should specifically address the ownership of intellectual property relating to the development of the system.

Should the central bank decide not to use external assistance, then a project manager and a development team should be appointed. The project manager should reach agreement with the project director on milestones and deliverables, the budget and other resources that would promote the success of the project.

9.5 Involving stakeholders

Key stakeholders should be kept informed about the progress of the project. They should be notified when a major project milestone has been accomplished and should be given sufficient time to adapt their systems and procedures to the new system. User group or stakeholder meetings should form an important part of the progress of the project.

9.6 System testing

System testing involves the creation of a test environment to carry out integration testing, user training and user acceptance testing. System testing is required irrespective of whether the solution was bought, developed or outsourced.

A test environment is created to test the system functionality. The test environment is identical to the production environment, enabling the testing of the system as if it were running live. It allows the system to be tested for volume handling, speed, user-friendliness and robustness.

The following technical tests should be conducted:

- Module testing — to test whether the individual modules or programs produce the desired results.
- Integration testing — to test whether all the developed or customised modules can be integrated to achieve the overall expected application functionality.
- Functionality testing — to test whether the system requirements have been met.
- Stress testing — to test the system's robustness, speed and volume handling.

9.7 User acceptance testing

User acceptance testing occurs when the intended users of the system formally test the system before it is transferred into the live or production environment. Users should be satisfied that the system performs the expected tasks at a satisfactory speed, that reports are in the desired format, that there is data integrity and that system security is at the expected level, and that the system is friendly and easy to operate. User acceptance testing should be conducted separately from other types of testing. The project director and stakeholders should be involved in evaluating the results of the acceptance test. Their involvement leads to the decision whether to have the system installed or returned for further upgrading.

CHAPTER 10: IMPLEMENTATION

10.1 Introduction

The acceptance of the system by the user groups (banks and other stakeholders) moves the project into the implementation phase. User acceptance means the system delivers the expected user-friendliness and satisfies the business and technical specifications demanded by the users. It also means that the users have assessed the impact of the new system on their business practice and procedures, and that they are willing to migrate to the new system.

The objective of implementation is to ensure the proper installation, testing, operation, management and maintenance of the new system.

Information technology (IT) and business relationships are essential for a successful implementation. IT specialists and users play critical roles in implementation, which includes converting relevant data from the old to the new system and verifying the accuracy of the data.

Another crucial activity is the training of the system's end-users and other users affected by the new system. User training should be planned and carefully scheduled so that users are prepared to use the system when it is implemented. If user resistance is anticipated, this possibility should be addressed during training or earlier. The users should be trained not only on how to use the system, but also on the importance of the new system for risk management and the achievement of the NPS vision specified in the NPS Strategy and Framework document. Even if the system is technically sound, it will probably be a failure if users resist it or believe it lowers the status of their jobs. Proper documentation in the form of system and user manuals is indispensable for effective training.

10.2 Implementation strategies

Various strategies, such as pilot, parallel, immediate replacement and phased implementation, may be used to implement the new system. A choice of implementation strategy is influenced by many factors. Each strategy has strengths and weaknesses and the strategy team should discuss them and recommend the most appropriate strategy.

10.2.1 Pilot implementation strategy

This is an attractive option where the new system can be introduced and tested in one section of the organisation. The objective is to solve as many problems as possible before the system is implemented throughout the organisation. If many problems are encountered in the pilot site, general implementation can be delayed until all the major problems have been resolved.

10.2.2 Parallel implementation strategy

Parallel implementation strategy operates the "old" and the new systems simultaneously until certain predetermined criteria are met; thereafter the switch-over to the new system is made. This may be the case where banks, for example, are allowed to use both the cheque and the RTGS systems for large-value payments for a limited time while they are still gaining experience in using the RTGS system. After the given time, an item limit is placed on cheque payments to channel all large-value payments through the RTGS system.

10.2.3 Immediate replacement strategy

This strategy is used where the existing or "old"system is stopped and an immediate switch-over to the new system is made. This can be accomplished over a holiday weekend to allow for a third day for returning to the old system in the event of a major failure. Although the strategy has greater inherent risks, it is attractive in cases where it is difficult to operate the old and the new system simultaneously.

10.2.4 Phased implementation strategy

This strategy is appropriate where implementation can be done in phases. For example, if the system is developed in modules, the core module may be implemented first and other modules implemented once the users have grown accustomed to using the core module. The downside to this strategy is that it results in a lengthy implementation period.

Any strategy selected depends on the nature of the system being implemented, the time available for implementation, and the support of all the key stakeholders. Implementation of an RTGS system may be more difficult because it may also involve implementing a front-end system in all the participating banks. Some of these banks may deliberately delay the process if they are still attached to the old system or if they perceive a loss of competitive advantage after converting to the new system.

The above implementation strategies are not mutually exclusive. A combination of strategies can be selected.

10.3 Pitfalls in implementing packaged applications software

According to Richard K Lynch (*Nine Pitfalls in Implementing Packaged Applications Software*), implementers of off-the-shelf systems should be aware of the following pitfalls:

- inadequate specification of requirements by end-users
- inadequate examination of prospective packages
- need for package modification
- inadequate vendor support

10.3.1 Inadequate specification of requirements by end-users

The central bank and other users of the acquired application should clearly define their requirements, the functions to be performed and how these functions are to be carried out.

Inadequate specification of requirements may lead to the acquisition of poor solutions and the frustration of trying to modify the application to meet user requirements. It also makes it difficult to evaluate and select the most appropriate package.

10.3.2 Inadequate examination of prospective packages

Once a detailed requirements document has been drawn up, certain packages can be eliminated merely by looking at the documentation or the marketing materials. Some can be eliminated for technical reasons (e.g. they do not support the required database or operating system), others for functional reasons (e.g. they do not have essential features).

After these initial eliminations, potential vendors may be invited to demonstrate their packages. These demonstrations should be augmented by as much outside verification as possible. This can be done by visiting organisations suggested by the vendors and evaluating the package in a live operation.

Inadequate examination of prospective packages may lead to the acquisition of packages that do not suit the size of the organisation or the nature of business.

10.3.3 Need for package modification

If the pitfalls already mentioned are encountered during implementation, the package may need modification to perform a function it was not designed to support. Changing the vendor's code may have legal implications; vendor approval should be sought beforehand, otherwise the vendor may withdraw package support. Loss of vendor support may have a substantial impact on the benefits of using the package.

10.3.4 Inadequate vendor support

Inadequate vendor support usually arises from unqualified and inaccessible support staff or inadequate documentation. Given IT support staff turnover rates, the support representative who visits the user's site may be relatively new to the vendor's organisation and may know the package only marginally better than the user does.

Writing good documentation is difficult, especially when the software is continually being changed or enhanced. Proper documentation, however, is the key link to the system.

The quality of vendor support is not evident until implementation takes place. It is usually more effective to designate one person to liaise with the vendor rather than have many people calling on the vendor with the same questions.

10.4 Potential barriers to the effective implementation of the new system

Drawing conceptual designs on paper and speculating how they will work is usually easier than implementing such designs in a business environment and ensuring their effectiveness. Several changes generally need to be made before the new system is fully implemented and functional. Sometimes there may be actual barriers to the effective implementation of the new business processes.

10.4.1 Policies and business practices

All policies and business practices in conflict with the new way of processing payments should be identified and analysed, and then amended to reflect the new procedures. If they are totally outdated, they should be discarded.

10.4.2 Legal framework

The current legal framework should be analysed with a view to updating and making it more supportive of the new payment arrangements. Those who resist the intended changes because of their entrenched interest in the present system should be prevented from holding the reform process to ransom by clinging to the current legal system.

Changing the legal framework affecting the NPS is usually a slow process that may take several years. In the meantime, legal certainty can be achieved through contract law and legally binding bilateral and multilateral agreements. Particular attention should be paid to laws and regulations such as insolvency, bills of exchange and zero-hour rules. New NPS legislation should be promulgated to take precedence in the regulation of all matters related to the payment system.

10.4.3 Environmental factors

Unfavourable environmental factors can stall or totally disrupt the NPS reform process. These factors include all the social, economic and political factors that affect the environment within which payment, clearing and settlement arrangements take place. Social factors such as a country's disposition towards favouring some payment instruments over others, economic factors such as the concentration of business activity in only a few areas, and political factors such as the possibility of the central bank governor changing with every political change in the ruling party, should be identified and their impact analysed. Once their impact has been assessed and measured, steps should be taken to minimise the negative consequences.

10.4.4 Organisational culture

An audit of the organisational culture should be conducted. If factors that may inhibit the successful implementation of the new system are identified, corrective action should be taken to align the organisational culture with the requirements of the new system. The implementation of a new system may upset established roles and structures and some people may feel marginalised or threatened by the changes. A change management process is usually required and this may involve changes to communication and reporting relationships as well as changes in skills requirements. Other changes may include restructuring, moving away from a hierarchical to a flatter organisational structure, the devolution of decision-making power to lower levels of the organisation, and using cross-functional teams to improve customer service.

10.5 System maintenance

Every system requires maintenance and upgrading to keep it in tune with user requirements. For a packaged application, maintenance and upgrades should have been discussed with the vendor during the contract negotiation. For a system developed in-house, the development team (usually the

IT department) is responsible for maintenance and upgrades. In both cases, clear rules and procedures should be developed and adhered to, otherwise major disruptions may occur with every maintenance or upgrade.

New applications are typically not moved into production unless adequate documentation has been provided to the users. Implementing a complex system without accurate documentation is highly risky. Documentation simplifies maintenance and makes it easier to fall back on an earlier version of the system should the new changes present major problems.

10.6 Implementation scheduling

The time frame for modernising a country's NPS should be defined carefully; account should be taken of the lead time for system implementation and the extent of the customisation required. An implementation schedule should be developed showing the roles and responsibilities of each stakeholder in the implementation and the dates and activities that should be carried out.

10.7 Concluding remarks on implementation

Implementing packaged applications can be faster and easier than designing and developing customised applications. However, implementing packaged applications does present special challenges and whenever possible, implementers should avoid the pitfalls alluded to earlier. Vendors save users' time by coding applications, but the users must tailor these generalised products to their organisation's needs. The success of a packaged solution should be evaluated on the basis of how adequately it satisfies the stated business and technical specifications, and whether it saves the organisation time and money.

It is therefore important to choose a product or develop a system with a long-term view, and to choose a vendor with whom a long-term relationship can be established. Knowledge transfer and change management are essential for the overall success of the project. The vendor's role in supporting the solution following implementation should be clearly defined in a maintenance and support contract. A "hand-hold" period as part of the implementation contract should also be considered.

CHAPTER 11: CONCLUSION

11.1 Strategic framework for NPS modernisation

In recent years NPS issues have moved from the back office to the boardroom. In many countries, central banks have become increasingly concerned about the financial stability of their economies and the containment of financial shocks that may be triggered either from within their own NPS or from other countries' NPS. This concern has led many central banks to test their NPS vigorously for reliability and safety. Many of them have realised the need to reform or modernise their NPS to bring them in line with international best practice.

For those countries that find themselves in this situation, the Guide suggests a practical strategic framework. This framework has proved useful for the SADC region and it has helped the SADC Payment System Project Team to coordinate various tasks and activities on behalf of the region. The framework, in particular the strategic process, has also been used as a powerful tool to measure the progress of individual SADC member states.

11.2 NPS perspectives

As people gain more insight into payment system issues, they gradually begin to realise that the NPS has many perspectives. These perspectives suggest that a country should take a broad and holistic view when modernising its NPS. Although such modernisation efforts should be driven by economic and business considerations, the environmental, institutional and legal considerations, among others, should also be borne in mind.

11.3 Support structures and skills

The lack of payment system skills in many developing countries is still a major obstacle to successful modernisation. The different NPS stakeholders should build payment system capacity that can drive the modernisation process. Different structures such as the strategy team and the NPS project team should be established to support the process.

11.4 Strategic process

The strategic process is a step-by-step process which a country can follow to modernise its NPS. Each step or phase is important and should be given careful consideration.

The Guide recommends the sequential implementation of the phases of the strategic process. For example, the vision and strategy formulation phase precedes the conceptual design phase. Each phase builds on the preceding phase until the envisaged system is implemented. Each phase highlights specific issues that the project director and his/her team should carefully consider.

11.5 Concluding remarks

The Guide should not be read once only and put aside. It should be referred to throughout the process of modernising a country's NPS.

The Guide can be used as a manual for payment system skills training as it deals with practical issues that trainees can easily research and confirm. New people joining the NPS project team, the strategy team or any grouping of people working on NPS issues, may be given a copy of the Guide to improve their basic understanding of payment systems. It can also be used as support material during the sensitisation workshop and to stimulate debate on NPS issues. For example, the role of the central bank in non-SIPS, access criteria for participation, and the management of risk, are important issues that can be discussed by NPS participants. Interesting debate can also arise when a country appraises the compliance of its SIPS with the BIS Core Principles. It is also recommended that other payment system reference material be used to complement the Guide (see references at the end of the Guide).

The process of modernising a country's NPS never actually ends. As soon as a new payment, clearing or settlement system is implemented, users increase their requirements and demands for greater convenience, reliability and safety. Aided by newer technologies, the whole process starts all over again with the designers of payment systems eager to make their systems comparable with the best in the world. When this happens, we hope that the Guide will still offer valuable and relevant guidelines that can make the process easier and simpler the second time around.

APPENDIX A: ROLES AND STRUCTURES IN THE NPS

A.1 Introduction

The NPS comprises several independent but interrelated components. These components may be owned and managed by different organisations. The domain, role and functions of each organisation should be defined unambiguously.

In is necessary to distinguish and separate various aspects that have become entangled and vested in institutions over the years. This involves issues such as responsibility, accountability, access, privileges and ownership.

Participants can use NPS infrastructure, regardless of its ownership, provided that specified criteria are met. Ownership of the physical equipment and systems is therefore not relevant in determining participation.

Responsibility for the provision of NPS infrastructure is formally delegated, through the granting of a licence, to a private operator.

A.2 Roles in the NPS

The management and operation of the NPS requires a clear definition of the roles and specific responsibilities of all key NPS players. It is also essential to identify and, if necessary, create structures to provide for the requirements of the NPS.

Every country is unique in the way its NPS is organised. The roles discussed in the Guide are, therefore, mere suggestions but it is recommended that a country seeking to modernise its NPS should evaluate the applicability of these roles and responsibilities to the specific requirements of its NPS.

A.2.1 Role of the central bank

The central bank is responsible for ensuring that a country's monetary and banking system as a whole is sound, meets the requirements of the community and keeps abreast of developments in international finance.

The central bank fulfils a number of roles:
- monetary policy-maker
- banker to banks and government
- settlement institution
- issuer of financial securities
- financial market participant
- lender of last resort
- overseer of the NPS

Within the context of the NPS, the central bank is responsible for
- ensuring that the interests of all stakeholders are served by the NPS;
- guiding the evolution of the NPS, focussing primarily on the overall soundness and effectiveness of the system;
- ensuring that a sound legal framework exists;
- overseeing the application of NPS risk management measures;
- ensuring the smooth functioning and conclusion of the settlement process;
- defining the nature of acceptable collateral and negotiating the extent of collateral to be held by banks as sufficient collateral in support of NPS settlement arrangements;
- ensuring that NPS roles are defined unambiguously and that responsibilities are properly delegated to appropriate organisations;
- ensuring that appropriate systems and the necessary interfaces are in place to support the NPS;
- facilitating the handling of specific occurrences of systemic crisis and promoting the resolution of disputes, without in any way prejudicing the ability of the NPS to continue functioning;

- overseeing the creation of national standards and ensuring that NPS standards are in keeping with international standards;
- enforcing the agreed NPS principles, policies and practices;
- liaising with other central banks and banks to promote the use of the country's financial system;
- ensuring that infrastructure relating to the settlement process is in place.

The central bank is ultimately responsible for ensuring the overall soundness of an effective NPS. The central bank accomplishes this objective in conjunction with the banking industry, which places an obligation on the central bank and the banking industry to accept joint responsibility and accountability for the smooth functioning of the NPS.

A.2.2 Role of a bank

For the purposes of the NPS, a bank is an institution registered or authorised as a bank and subject to the supervision of the country's bank supervisory authority.

Banks are the gateway to the NPS clearing and settlement facilities and are eligible to

- have a settlement account at the central bank;
- participate in interbank clearing and settlement;
- act as the principal and/or intermediary in payment transactions.

A bank can fulfil one or more of the following roles in the NPS:

- Settlement bank, settling its own interbank payment obligations and effecting real-time payments. A settlement bank can also sponsor another clearing bank for settlement.
- Clearing bank, clearing payment instructions by joining one or more payment clearing houses (PCHs).
- Customer payment service provider (CPSP), providing payment-related services to its customers. In this role, a bank acts as an agent, similar to any other CPSP.
- CPSP, developing payment instruments to enable end-users to select an instrument appropriate for a particular situation, from a convenience, cost and risk perspective.
- NPS operator, providing payment-processing infrastructures and rendering processing services to the NPS, similar to any other NPS operator.
- Service provider, making its infrastructure available, on a bureau basis, to other banks, although such arrangements do not necessarily imply financial guarantees.
- End-user, issuing payment instructions on its own behalf, or as the beneficiary of a payment issued by someone else.

Within the context of the NPS, banks are responsible for

- managing the risks that they introduce or accept into the NPS and for ensuring that their institutions have a clear understanding of these. They have to ensure that aggregated exposures remain within acceptable limits and that all limits set for other banks are communicated to the central bank;
- ensuring that they have sufficient liquidity for their own interbank settlement;
- providing access to the interbank clearing and settlement processes;
- ensuring that the payment processing cycle is completed in accordance with the customer's requirements;
- making their customers aware of the features of, and the risks involved in, accepting and using payment instruments, and educating them in the alternatives available.

A.2.3 Role of a customer payment service provider (CPSP)

All payment instructions enter the core of the NPS through banks, which will at that point accept responsibility for the processing of a payment instruction. Banks do not accept responsibility for payments lodged with unauthorised payment collectors. Restricting the management of payment systems to banks does not imply that the NPS is the exclusive domain of the banking industry. Technology overcomes time, geographic and cost constraints, and various organisations in the economy may be technologically well positioned to provide payment-related services. These factors should be exploited optimally in the context of the NPS, to the benefit of the whole economy and the public. Individual business enterprises and/or markets collectively should be enabled and encouraged to interface with the NPS. In principle, the NPS should be accessible to whomever wishes to issue a payment instruction.

For the purpose of the NPS, a CPSP is defined as a registered organisation/business that provides one or more of the following services to its customers:

- collection of payment instructions
- preprocessing of payments in a variety of value-added processes before entry into the NPS
- provision of links to deliver payment instructions to banks
- receipt of confirmation of payment finality from banks, and communication of completion of transactions to its customers, either by explicit advice or, de facto, in terms of industry procedures
- acceptance of accountability for the integrity of its customers' interests at the point of entry into the NPS

The purpose of a CPSP is to make the NPS as open and accessible as possible. To this end, healthy competition among CPSPs should be encouraged and at the same time, predetermined levels of security and risk controls should be maintained. The NPS requires an extended network of CPSPs to enable the public to effect payments. Such a network should evolve to include banks, retailers and entities external to the NPS (e.g. financial exchanges).
This is accomplished by separating the role of agent and principal. An institution acting as a principal in the NPS must be a bank. A CPSP, on the other hand, provides payment services to its customers by acting as an agent for one or more banks in the NPS. Subject to the criteria applicable to the various payment systems, CPSPs in their capacity as agents are authorised by the National Payments Association (NPA), and have access to the necessary interfaces for incorporation into their own trading systems. A CPSP forwards the payment instruction to the appropriate bank without changing the nature of the instruction. This should happen immediately, but if not, at least on a same-day basis. In principle, a CPSP, in its capacity as an agent, may not hold back payment instructions overnight.

A CPSP is required to

- adhere to legally enforceable rules and regulations and a code of conduct applicable to all participants;
- qualify in terms of equitable risk-based entry criteria;
- adhere to the applicable risk reduction/prevention measures;
- obtain appointment as an agent of one or more banks.

A CPSP fulfils the following roles in the NPS:

- Acts as an agent for the banks.
- Provides an extended payment collection network in order to transport payment instructions and confirmations between customers and banks.
- Channels payment instructions to banks.

A.2.4 Role of the National Payments Association (NPA)

The NPA is an association of the central bank and banks that provide payment instruments. Membership of the NPA is thus restricted to banks. The NPA determines and enforces the policy agreed to with the central bank.

The NPA is responsible for managing the NPS. This involves, inter alia,

- granting membership to banks to participate in particular payment systems in terms of applicable entry criteria;
- authorising and enabling a CPSP to act as an agent for banks in a particular system;
- selecting NPS operators to render payment processing services;
- granting official status to PCHs to function in a particular system;
- retracting the authorisation of a CPSP and/or cancelling the membership of a bank, where required.

The NPA ensures that

- all key players are appointed in terms of applicable criteria;
- the necessary infrastructure and operational procedures are in place to ensure a smooth processing operation;
- adherence to set standards, participation rules and entry criteria is enforced.

The NPA is established by the participating banks and the central bank. In a particular payment system, the NPA will be responsible for

- ensuring the privacy, confidentiality and authenticity of all payment transactions processed in the payment system;

- ensuring that NPS mechanisms comply with the agreed national and international standards and practices for an NPS;
- ensuring that membership agreements are in place and that all participants compete on an equal footing;
- ensuring that a code of conduct applicable to all participants is drafted, published, implemented and enforced;
- facilitating the prevention of fraud and money laundering in the NPS, and ensuring that all payment instruments and products, made available to customers and processed through the NPS adhere to a set of minimum fraud prevention and anti-money-laundering standards;
- preventing cross-subsidisation, and ensuring fair pricing;
- introducing appropriate risk reduction measures, and managing the establishment and maintenance of limits and settlement arrangements;
- ensuring that the payment service infrastructure provides the desired service level;
- ensuring that no unacceptable practices, which may result in the long-term deterioration of the efficiency, credibility and integrity of the NPS, are permitted.

With regard to member banks, it should be noted that membership of one payment system does not imply membership of all payment systems or any other payment system, since each payment system is subject to independent management and entry criteria. For example, membership to a cheque payment system does not imply automatic membership to a card payment system because different entry criteria may apply.

A.2.5 Role of a payment clearing house (PCH)

Bulk (or batch) clearing of payment instructions between banks takes place in a PCH. A PCH sorts payment instructions and calculates values for the subsequent discharge of financial obligations (settlement) between its member banks.

A PCH is defined as any formal arrangement whereby participants exchange payment instructions. It may entail a manual clearing process or an electronic switch. A PCH operates under the authority of the NPA, which introduces appropriate risk-reduction measures in PCH operations, such as a cap (limit) on the item value of a payment instruction that can be processed by a particular PCH. Although risk-reduction measures are applicable to all PCHs, that is, any clearing arrangement between participants, every PCH enforces its own customised set of risk-reduction measures. It follows that membership of one PCH does not imply membership of all PCHs.

Payment instructions are cleared and monitored within each PCH. The banks manage their net exposures within each PCH and across all applicable PCHs. The fact that PCHs operate independently in the different types of payment does not necessarily imply a duplication of operating infrastructures.

The outcome of all PCH clearing processes is transmitted to the central bank and consolidated to contribute towards a holistic view of exposures in the NPS.

It is important to distinguish between the roles and responsibilities of a PCH and an NPS operator. Only banks can participate in a PCH, that is, transmit payment instructions to the PCH for clearing. Banks, as principals, therefore accept responsibility for the results of the clearing process. By contrast, an NPS operator is sanctioned by the NPA to provide processing services to the PCH. An NPS operator accepts operational responsibility only according to the agreed service level and is not held responsible for the financial risk associated with the clearing process.

A.2.6 Role of payment-processing infrastructure operators (NPS operators)

To enable effective and open participation by all banks on equal terms, the ownership of the infrastructural components has to be separated from the utilisation of the components.

NPS infrastructural components can be provided by any institution, not necessarily banks or bank-owned companies, and can include the development, deployment and day-to-day operation of services, for example, systems, networks and other facilities.

The NPA licenses NPS operators to render NPS services, subject to predetermined criteria.

The processing services provided by a licensed NPS operator are available on an equal basis to all qualifying participants in a particular payment system.

An NPS operator has to ensure that
- the necessary infrastructure is available and operational;
- the agreed service level is maintained;
- the required operational information is available;
- prescribed controls and security measures are enforced.

A.2.7 Role of a bankers' association

A bankers' association is a collective body that represents the banking industry in a particular country. The role of the bankers' association in the NPS is primarily to represent the interests of the banking industry as a whole.

A.2.8 Role of a securities depository

A securities depository, although not part of the payment clearing and settlement domain of the NPS, performs the role of custodian for immobilised/dematerialised securities. In an effort to synchronise delivery with payment, it is the responsibility of the securities depository to
- reserve the securities at the request of a securities clearing house prior to confirming a payment instruction;
- transfer the ownership of securities once confirmation of payment has been received;
- enable the pledging of immobilised and/or dematerialised securities.

To facilitate a collateral management system for payment settlement purposes, the securities depository should be extended to financial instruments acceptable for accommodation, such as treasury bills.

It is envisaged that a securities depository should in the longer term make provision not only for immobilisation, but also for dematerialisation. Reference to a "depository" therefore includes both these concepts in a central depository (CD) and an electronic scrip registry (ESR).

A.3 NPS operational and management functions

The NPS requires the execution of the following operational and management functions:
- **Management of various payment systems**
  Participation in every payment system has to be controlled, and its evolution managed.
- **Running of the payment-operating infrastructure**
  All the mechanisms to initiate, process and complete the payment process have to be established, maintained (including DVP) and/or enhanced. All processes must perform to defined service level requirements.
- **Processing of payments**
  Each payment instruction has to be channelled through appropriate processes, from initiation, through clearing and settlement, to finality. Every instruction has to complete the cycle and, where applicable, the end-user has to be advised of the outcome.
- **Management of payment-related risks**
  The monitoring of its risk profile by a particular bank, as well as of the system as a whole by the central bank, and the application of proper risk-reduction measures have to be ensured.
- **Analysis of payment trends**
  Trends have to be monitored, future developments projected, and problem areas identified.
- **Handling of crises in terms of documented procedures**
  Corrective actions in the event of a settlement crisis have to be directed, coordinated and harmonised with the bank supervisory authority, the financial market regulators and other parties involved.
- **Overseeing of the NPS**
  The evolution of the NPS has to be facilitated, the necessary regulatory framework administered, surveillance applied, and NPS developments have to be synchronised with other financial system components.

The NPS operates within the context of the broader financial system, alongside functions such as the supervision of banks and the development of financial markets.

The following table depicts possible roles and responsibilities pertaining to the various functions:

Summary of management responsibilities in the NPS

FUNCTION		PRIMARY RESPONSIBILITY	SECONDARY RESPONSIBILITY
1.	**MANAGE PAYMENT SYSTEMS**		
1.1	Determine overall policy, including entry criteria principles	NPA	central bank
1.2	Manage member banks' participation in a payment system	NPA	central bank
1.2.1	Determine bank membership rules for payment system participation	NPA	
1.2.2	Grant bank membership	NPA	central bank
1.2.3	Monitor compliance with rules, regulations and code of conduct	NPA	
1.2.4	Remove membership in case of default	NPA	central bank
1.3	Manage CPSP participation in a payment system	bank	NPA
1.3.1	Determine regulations, rules and code of conduct for CPSPs	NPA	central bank
1.3.2	Grant CPSP membership	NPA	central bank
1.3.3	Monitor compliance with rules, regulations and code of conduct	NPA	central bank
1.4	Manage PCH participation in a payment system	NPA	central bank
1.4.1	Formally constitute/recognise a PCH	NPA	central bank
1.4.2	Determine operational PCH procedures	NPA	central bank
1.4.3	Implement risk-reduction measures per PCH	NPA	central bank
1.4.4	Monitor compliance with rules and regulations	NPA; bank	central bank
1.5	Manage NPS operators	NPA	central bank
1.5.1	Define and publish criteria for NPS operators	NPA	central bank
1.5.2	Select NPS operators to render payment services	NPA	central bank
1.5.3	Grant licences to NPS operators	NPA	central bank
1.5.4	Monitor NPS operators' service levels	NPA	
1.6	Administer bulk-clearing environment	NPA	PCH
1.6.1	Set caps and limits, for example cap on the item value of a payment instruction, PCH cap and bilateral limits	bank	central bank
1.6.2	Administer measures to secure settlement	NPA	PCH
1.6.3	Administer cut-off schedule	NPA	PCH
1.7	Monitor evolution of a system (this includes the monitoring of fraudulent activities prevalent in that particular payment system)	NPA	central bank
2.	**ESTABLISH PAYMENT SYSTEM INFRASTRUCTURE**		
2.1	Provide NPS interface	bank	NPA
2.2	Provide payment instruction/confirmation mechanisms	CPSP	NPA
2.3	Provide payment initiation/finality mechanisms	bank	NPA
2.4	Provide bulk-clearing mechanisms	PCH	NPA
2.5	Provide national payment system	bank	NPA
2.6	Provide national settlement system	central bank	
2.7	Provide settlement mechanisms	central bank	
2.8	Provide DVP and PVP interface	NPA	central bank
3.	**PROCESS PAYMENTS**		
3.1	Issue payment Instruction	end-user	CPSP
3.1.1	Accept payment instruction from end-user	CPSP	bank
3.1.2	Issue standardised payment instruction to a bank	CPSP	bank
3.2	Initiate payment	bank	
3.2.1	Receive/Collect payment instruction from CPSP	bank	
3.2.2	Verify payment instruction details	bank	
3.2.3	Validate payment instruction	bank	
3.2.4	Route for clearing (single/bulk)	bank	
3.3	Perform bulk clearing of payment instructions	PCH	
3.3.1	Register receipt of payment instructions	PCH	bank
3.3.2	Convert to electronic format	PCH	bank
3.3.3	Bulk payment instructions	PCH	bank
3.3.4	Instruct settlement	PCH	bank
3.3.5	Provide bulk-clearing details	PCH	bank
3.4	Perform single clearing of payment instructions	PCH	
3.4.1	Issue settlement instruction	bank	

Summary of management responsibilities in the NPS - *continued*

FUNCTION		PRIMARY RESPONSIBILITY	SECONDARY RESPONSIBILITY
3.5	Perform settlement	central bank	bank
3.5.1	Register settlement instruction	central bank	bank
3.5.2	Manage settlement queues	bank	central bank
3.5.3	Manage collateral	bank	central bank
3.5.4	Manage settlement account	bank	central bank
3.5.5	Effect final intraday settlement	central bank	bank
3.5.6	Effect final end-of-day settlement	central bank	bank
3.6	Finalise payments	bank	
3.6.1	Receive bulk details from PCH	bank	PCH
3.6.2	Verify/Fate bulk-cleared payment instructions	bank	PCH
3.6.3	Receive settlement confirmation message	bank	PCH
3.6.4	Provide irrevocable payment (finality) - accounting	bank	PCH
3.7	Confirm payment	CPSP	
3.7.1	Receive payment confirmation from bank	CPSP	bank
3.7.2	Receive delivery confirmation and match with payment confirmation where applicable	CPSP	bank
3.7.3	Communicate payment completion to customer where applicable	CPSP	
3.8	Facilitate payment-related services	NPA	
3.8.1	Synchronise delivery of securities with payment	bank	Securities Depository
3.8.2	Relay detailed customer information to beneficiary	CPSP	bank
4.	**MANAGE PAYMENT-RELATED RISKS**		
4.1	Administer a payment risk profile per bank	bank	
4.1.1	Identify banks' risks and exposures per payment system, instrument and market	bank	NPA
4.1.2	Monitor banks' risks and exposures	bank	central bank
4.2	Administer an NPS risk profile for the system as a whole	central bank	
4.2.1	Derive NPS total risk and exposure per payment system and per instrument	central bank	NPA
4.2.2	Monitor bank and industry exposures, volumes and value distribution per payment system	central bank	central bank
4.3	Implement risk-reduction measures	bank	central bank
5.	**ANALYSE PAYMENT TRENDS**		
5.1	Determine trends	central bank	bank
5.2	Project future developments	central bank	bank
5.3	Determine problem areas	central bank	bank
6.	**HANDLE CRISES**		
6.1	Coordinate, direct and take corrective action	central bank	bank
6.2	Harmonise corrective action with bank supervision authorities and others	central bank	bank
7.	**OVERSEE PAYMENT SYSTEM**		
7.1	Facilitate evolution of the NPS	central bank	
7.1.1	Provide strategic guidance	central bank	
7.1.2	Coordinate national efforts	central bank	
7.1.3	Facilitate introduction of new payment systems, instruments and technologies	central bank	
7.2	Administer regulatory framework	central bank	
7.2.1	Enhance, maintain and administer legal framework and standard agreements	central bank	
7.2.2	Establish, enhance, maintain and administer rules, regulations and procedures	central bank	NPA
7.2.3	Harmonise regulatory framework with other regulatory frameworks	central bank	
7.3	Oversee NPAs	central bank	
7.3.1	Ensure fair competition and participation	central bank	
7.3.2	Provide guidelines for NPS entry criteria	NPA	central bank
7.3.3	Enforce regulatory framework	central bank	
7.4	Surveillance of payment systems	central bank	
7.4.1	Monitor interbank payments	central bank	NPA
7.4.2	Identify growth and problem areas	central bank	NPA
7.5	Synchronise NPS developments with other financial system components	central bank	
7.5.1	Synchronise developments with bank supervision authorities	central bank	
7.5.2	Synchronise developments with financial market regulators	central bank	
7.5.3	Synchronise developments with financial market clearing and settlement houses	central bank	

APPENDIX B: BIS CORE PRINCIPLES FOR SYSTEMICALLY IMPORTANT PAYMENT SYSTEMS

B.1 Introduction

The reliability and security of a payment system will be judged on the basis of the extent to which it complies with the BIS Core Principles for Systemically Important Payment Systems (BIS Core Principles). The design of the new NPS should therefore make provision for compliance with the BIS Core Principles.

The following discussion briefly describes the BIS Core Principles and suggests checkpoints for use in their implementation. These checkpoints are not exhaustive and do not cover all the different circumstances that may prevail in different countries. Nevertheless they offer a quick but valuable means of assessing a system's compliance with the BIS Core Principles. The statements are worded positively and responses in the affirmative suggest compliance, whereas responses in the negative suggest lack of compliance. A response of "Not Applicable" (N/A) may be used for all statements that are not applicable or that are irrelevant. For example, for an RTGS system, all statements relating to the netting of payments may not be applicable.

All the payment systems in a country should be assessed against the BIS Core Principles. Payment systems that are not of systemic importance can still use the BIS Core Principles to improve their reliability and security, but the cost of compliance should be measured against the expected benefits to the participants and users of such systems. The central bank, if itself not the operator, should ensure that any privately owned or operated systemically important payment systems comply with the BIS Core Principles. Where the central bank also operates a systemically important payment system, it should take conscious and deliberate steps to achieve compliance.

B.2 BIS Core Principles for Systemically Important Payment Systems

I The system should have a well-founded legal basis under all relevant jurisdictions.

II The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

III The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

IV.* The system should provide prompt final settlement on the day of value preferably during the day and at a minimum at the end of the day.

V.* A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

VIII. The system should provide a means of making payment which is practical for its users and efficient for the economy.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

X. The system's governance arrangements should be effective, accountable and transparent.

* Systems should seek to exceed the minima included in these two BIS Core Principles.

Responsibilities of the central bank in applying the BIS Core Principles

A. The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.

B. The central bank should ensure that the systems it operates comply with the Core Principles.

C. The central bank should oversee compliance with the Core Principles by systems it does not operate and it should have the ability to carry out this oversight.

D. The central bank, in promoting payment system safety and efficiency through the Core Principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.

Core Principle I: The system should have a well founded legal basis under all relevant jurisdiction.

QUALIFYING STATEMENT	**YES/NO**
Legislation supports modern payment system developments.	
The rights and obligations of participants under insolvency are clear and unambiguous.	
The exact timing of final settlement has been defined by law and communicated to all participants.	
All clearing house agreements are legally binding.	
All netting agreements are legally binding.	
All agreements relating to collateral and credit facilities for settlement purposes are legally binding.	
The law supports development of modern payment system instruments and mechanisms.	
The legal basis and system procedures do not permit unwinding of the netting process.	

Core Principle II: The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

QUALIFYING STATEMENT	YES/NO
Every payment system and clearing house has clear rules and procedures relating to the clearing of payment instructions.	
These rules and procedures are easily available to all participants in the payment system or the clearing house.	
The rules and procedures clearly describe all the financial risks that participants may be exposed to by their participation in the payment system or clearing house.	
The rules and procedures clearly describe how the various financial risks are monitored and managed in each payment system or clearing house.	
The rules and procedures clearly describe the responsibility of participants in the management of the various financial risks.	
The rules and procedures clearly describe how the operator of the payment system or clearing house monitors and manages the various financial risks.	
The rules and procedures clearly specify different circumstances under which the operator of the payment system or clearing house has discretion to deviate from those rules and procedures.	
The rules and procedures clearly describe the roles of various parties under the normal operation of the system.	
The rules and procedures clearly describe the roles of various parties and the procedures that will be followed under abnormal circumstances or system disruption.	
The rules and procedures are up to date.	
New participants receive the rules and procedures when they become members.	
The operator provides training to participants, especially new participants.	

Core Principle III: The system should have clearly defined procedures for the management of credit and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

QUALIFYING STATEMENT	YES/NO
Limits are placed on the maximum level of credit risk that can be created by any participant.	
Individual participants have bilateral limits on credit exposure towards each other.	
The system has multilateral limits on credit exposures that apply to all participants.	
There are risk management systems that monitor credit and liquidity risks on a real-time basis.	
Clear, full and timely financial information is provided to participants and the central bank.	
Payment queues are managed in such a way that financial risks are minimised.	
The procedures include guidelines on throughput in order to minimise financial risks.	
The procedures clearly allocate participants' responsibility to cover losses that could result within the system from participant failure.	
The procedures provide participants with clear incentives to manage the risks they introduce into the system.	

Core Principle IV: The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

QUALIFYING STATEMENT	YES/NO
There is a clearly defined and legally effective moment of final settlement.	
Operating hours and settlement processes are strictly enforced.	
Payment accepted for settlement cannot be removed from the settlement process.	
The interval between the system's acceptance of payment and the payment's final settlement does not extend overnight under normal circumstances.	
The system provides final settlement at the end of day.	
The system provides real-time settlement.	
Although the final settlement is not on the day of value, the central bank guarantees that final settlement will occur under any circumstances.	

Core Principle V: A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single obligation.

QUALIFYING STATEMENT	YES/NO
There are legally committed lines of credit to ensure settlement in adverse circumstances.	
The committed lines of credit are supported by a pool of collateral sufficient to ensure settlement under adverse circumstances.	
Providers of legally committed lines of credit are clearly able, in practice, to deliver the contracted-for funds within the time periods specified by payment system rules and the relevant loan commitments.	
There are limits on participants' net debit positions to ensure that exposures never exceed the pool of collateral.	
The collateral is sufficiently liquid and quickly available to enable settlement to take place as expected.	
The collateral is revalued frequently to record its true market value.	
The pool of collateral is under the control of the payment system operator or the central bank.	

Core Principle VI: Assets used for settlement should be a claim on the central bank: where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

QUALIFYING STATEMENT	YES/NO
Settlement takes place across the books of a central bank.	
The settlement asset is the account balance at the central bank.	
The central bank is the issuer of the settlement medium used in the payment system.	
If the claim is on a private sector institution, the payment system operator and the central bank conduct regular assessments of such an institution, examining factors such as capital levels, access to liquidity, external credit ratings and any other obligations that may limit its ability to satisfy claims on it.	
If the claim is on a private sector institution, the settlement asset is readily convertible into a claim on the central bank.	

Core Principle VII: The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

QUALIFYING STATEMENT	YES/NO
The objectives, policies and service levels regarding security and operational reliability are set by the senior management of the central bank or by the NPA and are well documented.	
Agreed service levels are met even in the event of the failure of one or more components of the payment system.	
In the event of serious system failure, there are alternative arrangements for making payments.	
There is regular assessment by independent internal and external auditors of whether the system meets the defined objectives, policies and service levels relating to security and operational reliability.	
The system is subject to a regular security risk assessment, using a recognised and structured methodology.	
There are alternative arrangements for infrastructure services such as telecommunications, power supply and transportation.	
The system is operationally reliable, even in the event of disasters such as fire, earthquake or flood.	
The system has sufficient capacity to process the expected volumes of payments with the required speed, especially at peak times.	
All changes to the system are well documented, authorised, controlled and tested in accordance with quality assurance procedures.	
There are on-site repair supplies of hardware and telecommunications components.	
There is a multiskilled crisis management team.	
There are clear and well-documented disaster recovery procedures.	

Core Principle VIII: The system should provide a means of making payments which is practical for its users and efficient for the economy.

QUALIFYING STATEMENT	YES/NO
Participants and users were involved in the design and implementation of the payment system.	
The payments are processed at the lowest possible cost to the user.	
The system is designed such that participants hold the minimum possible liquidity for settlement purposes.	
The system's services, performance, costs and charges compare favourably with those of systems in comparable economies.	

Core Principle IX: The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

QUALIFYING STATEMENT	YES/NO
The system's access criteria encourage competition among participants.	
The system's access criteria do not compromise the safety of the system.	
The system's criteria acknowledge that no participant is "too big to fail".	
The system's risk management relies mainly on risk-related controls rather than on access criteria.	
Access criteria are applied continuously, not only when an institution makes an initial application.	
There are exit criteria for those members who fail to comply with the risk-related controls of the system.	
The access and the exit criteria are reviewed regularly to ensure they remain fair and objective.	
The access and the exit criteria are specified in the rules and procedures of the system and are readily available.	

Core Principle X: The system's governance arrangements should be effective, accountable and transparent.

QUALIFYING STATEMENT	YES/NO
The system has clearly defined strategic objectives.	
Clear reporting arrangements monitor the actions of senior management against the strategic objectives.	
There are clear lines of responsibility and accountability.	
The system is managed by a qualified and competent management team.	
Information about governance, senior management and organisational structures is publicly disclosed.	
Reports on the performance of the system are regularly published and distributed.	
The operator and overseer hold regular user-group meetings.	
The system is audited on a regular basis.	
Major decisions are made after consultation with all interested parties and due deliberation.	
The high-level decision-making process is prompt and communicated clearly to the system users.	
The system consistently attains projected financial results.	
The system delivers payment services that satisfy customer needs.	

Having completed the checkpoints, the following table can be used to give an overall evaluation of a system's compliance with the BIS Core Principles:

Key: F = Full compliance, C = Compliance in progress, E = Enacted, A = Adopted, N = No compliance

Principle	Rating	Commentary
I. The system should have a well-founded legal basis under all relevant jurisdictions.		
II. The system's rules and procedures should enable participants to have a clear understanding of the systems impact on each of the financial risks they incur through participation in it.		
III. The system should have clearly defined procedures for the management of credit and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.		
IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.		
V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single obligation.		
VI. Assets used for settlement should be a claim on the central bank: where other assets are used, they should carry little or no credit risk and little or no liquidity risk.		
VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.		
VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.		
IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.		
X. The system's governance arrangements should be effective, accountable and transparent.		

APPENDIX C: A SUMMARY OF SADC EXPERIENCES IN NPS MODERNISATION

C.1 Introduction

The reform and modernisation of a country's NPS presents many challenges. The SADC region has also had to grapple with many challenges but the experience has taught valuable lessons that can be useful to any country seeking to modernise its NPS.

C.2 Support from the central bank governor

The support and commitment of the central bank governor is crucial to the overall success of the modernisation process. The involvement of the central bank governor is essential in canvassing support and commitment from all the key stakeholders, especially the CEOs of commercial banks and the Ministry of Finance. The central bank governor also plays a key role in allocating financial and human resources to the modernisation process.

It is a formidable challenge to get three or four CEOs of a country's largest commercial banks around a table to discuss cooperation on NPS issues. This is one area in which the central bank governor needs to be firm and clearly distinguish competitive issues from those that require cooperation in the national interest. Although central bank governors may be tempted to use their authority to enforce cooperation, in the long run it pays to win the trust and confidence of the commercial banks by demonstrating effective leadership.

C.3 Support and commitment from commercial banks' CEOs

Commercial banks are the primary intermediaries in the NPS because they provide the channels through which a country's payments are mobilised. Any attempts to modernise a country's NPS without their support, would be futile.

The CEOs of commercial banks should pledge their support and commitment to the modernisation process at a meeting of the NPC. Such support and commitment should be interpreted and understood in terms of the resources, both financial and human, they are expected to make available for the modernisation process. This includes appointing senior officials to serve on the strategy team for the duration of the modernisation process.

C.4 Process of building consensus

The NPS modernisation process requires all payment system stakeholders to act collectively to improve the access to and availability of payment services in a country. This process requires the building of consensus among the key stakeholders. It takes time and many meetings and workshops to build such consensus, especially among banks that have grown to perceive one another as adversaries. This process is also very costly and many stakeholders may expect the central bank to carry all the costs.

There is no short cut to building trusting relationships among different stakeholders. Building confidence in the central bank as a neutral party also takes effort and time. Failure to do so may result in some stakeholders regarding the central bank as a dictator or biassed in favour of other participants.

C.5 Need for financial support from the central bank

Modernising a country's NPS is a costly exercise. SADC member states soon realised that the central bank should take the lead not only in coordinating the process, but also in providing financial resources. Without the willingness and ability of the central bank to absorb a large portion of the

costs, the process would definitely fail. Various cost recovery models should be investigated so that all participants can share in the costs of modernisation. A country's domestic circumstances will influence the choice of a suitable cost recovery model.

C.6 Continuity in the strategy team and other committees

Changes in the strategy team's composition adversely affect the progress of the modernisation process. It takes effort and time to build capacity among the members of the team and any withdrawal of members reduces the effectiveness of the team. Ideally, the members should stay with the strategy team throughout the process. If it is unavoidable to release members from the strategy team, it should be arranged that the new members are introduced into the team at least a few months before they replace the outgoing members. The same arrangements should be made in other payment system teams and committees.

Continuity ensures that valuable time is not wasted in trying to get new members up to speed in the workings and progress already achieved by the strategy team. Strategy team members should be made aware of the time commitments expected of them.

C.7 Skills shortage

Due to limited payment system knowledge in the SADC region, considerable resources had to be expended on capacity building. The building of payment system skills is vital and should not end with the sensitisation workshop — it should be continued throughout the modernisation process. After the envisaged system has been implemented, a country should continue equipping its payment system personnel with complementary skills such as project management, business analysis, business process modelling and facilitation skills.

Capacity building is expensive. In many developing countries, it may be necessary to send trainees to workshops and conferences outside the country. Budgetary constraints may limit the number of trainees or the number of training courses a given number of trainees can attend.

C.8 Use of external consultants

The lack of payment system skills in many developing countries may necessitate the use of external consultants. Some consultants do not devote the required time and effort to understanding the local environment. As a consequence, they offer solutions that are out of tune with the local circumstances of the host country. Besides wasting time and scarce resources, this adversely affects the confidence of stakeholders in their attempts to improve the situation. Those who prefer the *status quo* may use such a situation to frustrate any attempts at modernising the NPS.

The use of external consultants should be carefully considered and it should be ensured that skills are imparted to those individuals who will continue the process long after the consultants have left. The skills should be spread as widely as possible. The capacity to source skills such as IT and legal skills from other departments in the central bank and the commercial banks is also very important.

C.9 Establishment of a dedicated NPS team in the central bank

It may be difficult to justify that a central bank should establish a dedicated team of people to work full time on NPS issues. This is often the case, especially during the initial stages of the strategic process when most of the people involved still have a narrow view of the NPS. The lack of resources, both financial and skilled personnel, in many developing countries may also adversely affect the pace of modernisation. But as a country begins to appreciate the critical role that payment systems play in facilitating economic activity, the country may slowly begin to appreciate the value of having a dedicated team to focus on NPS modernisation. The size of the team will be influenced by the stage of the strategic process in which a country finds itself. The latter stages demand cooperation among people with different skills and may necessitate increasing the size of the NPS team.

C.10 Shortcomings in communications and power supply infrastructure

In many developing countries, the lack of a reliable communications infrastructure poses a major challenge to NPS modernisation. Modernising a country's NPS requires a reliable communications infrastructure and power supply. This is why it is important to involve the telecommunications and electricity supply authorities early in the process so that they can also initiate projects to improve their services to the banking industry. These authorities should be made aware of the key role that reliable communications and electricity infrastructures play in ensuring safe and efficient payment services.

C.11 Dominance of the banking system by a few large banks

Some SADC countries are still in the process of liberalising their economies from strong government control to a free market environment which fosters greater competition among market participants. This process sometimes involves breaking down large state-owned banks into several private banks that have limited or no state ownership. Such privatisation may take time and may affect the progress of modernisation, as it may be necessary to wait until a more level playing field has been achieved; otherwise one or two large state-owned banks may dictate the terms or hold the whole modernisation process to ransom.

In other countries, where there are few large private banks, other problems may be encountered. Very large banks that enjoy monopoly benefits may not see the need to modernise their operating systems. This may frustrate any attempts at getting them together to cooperate within the framework of the modernisation process. The leadership of the central bank governor will be crucial in getting such banks to set aside their differences and cooperate in the national interest.

C.12 Effect of inflation on costs

Many developing countries still experience inflation as an enemy of economic growth and financial stability. In an environment of increasing inflation and unstable exchange rates, containing the costs of NPS modernisation may be a formidable challenge. In most cases, software and hardware components will be purchased from outside the country and prices will change with any marked deterioration in exchange rates.

C.13 Great disparity among technologies used by banks in the country

In some countries, banks use widely differing technologies. This poses a serious challenge when deciding on the technical specifications to support a new payment system. Banks may use this issue to test their relative strengths and compete on whose technology will eventually be adopted. This may be complicated further when the different technologies use different standards and are difficult to interface.

In other countries some banks may use modern technologies and others may use old technologies. In such a case, the banks may insist on the adoption of their technologies even though they may not adequately satisfy user requirements. Conversely, banks with old technologies may see an opportunity to upgrade to newer technologies and so become more competitive with other banks. Such differences should be carefully managed and the solution adopted should incorporate, as far as possible, the investment that banks have already made in their operating technologies.

C.14 Temptation to be at the cutting edge of technology

It is sometimes tempting to embrace state-of-the-art technology, even though the tried-and-tested "old" technology may have satisfied the business and technical requirements. Other than unduly increasing costs, this temptation, if not controlled, may also lead to the over-supply of system capacity. Cost recovery may then be difficult and that payment system may fail to offer competitive processing charges to its participants. This may discourage participants from using the new system, making it even more difficult to justify the continued use of the system.

C.15 Legal framework

Many SADC member states do not have specific legislation to govern their payment systems. Those that have already put new NPS legislation in place have learned that the refinement of the NPS legal environment is dynamic. Soon after new NPS legislation has been promulgated, fresh issues come to the fore, requiring a review of the legislation. However, this does not mean that NPS legislation should be amended every time new issues are encountered. What is required is a broad legal framework that accommodates new technological advances but is still specific enough and addresses the rights and obligations of the different NPS participants. The legislation should always be appropriate and in the interest of the whole industry, rather than individual stakeholders.

The legal framework and the new NPS legislation should be in harmony with other pieces of legislation such as the Insolvency Act.

C.16 Involvement of financial markets

In the early phases of the strategic process, countries may overlook the importance of involving financial markets especially in the vision and strategic framework formulation phase. The SADC region has learned that neglecting the financial markets makes incorporating their requirements later in the process more difficult. The financial markets should be represented on the strategy team.

C.17 Pressures to deliver within a short time

The modernisation of a country's NPS is not a short-term process. It usually extends over several years. Those charged with this task, especially the project director, may be under undue pressure to show progress. Such pressure, especially if it emanates from the central bank itself, may lead to premature solutions that fail to satisfy user needs. All stakeholders, especially the central bank governor, should understand the nature of payment systems and appreciate the time needed to envision, define, model and implement a new payment system.

APPENDIX D: AN EXAMPLE OF A TABLE OF CONTENTS OF AN RFP DOCUMENT

The following items/components should be contained in the RFP document.

1. SUMMARY/ EXECUTIVE SUMMARY
   - 1.1 Purpose of the tender
   - 1.2 Standardisation of responses

2. INTRODUCTION
   - 2.1 Local environment
   - 2.2 Acquirer
   - 2.3 Overview of products and services to be supported
   - 2.4 Overview of functions to be provided
   - 2.5 Overview of local market
   - 2.6 Acquirer organisation/structure

3. INSTRUCTIONS TO TENDERER
   - 3.1 Introduction
   - 3.2 Who can tender
   - 3.3 Timetable
   - 3.4 Format of responses
   - 3.5 Compliance instructions
   - 3.6 General requirements
   - 3.7 Contractual/ Legal issues
   - 3.8 RFP: contractual relationship
   - 3.9 Requirements clarification - “Requirements Review Meetings”

4. MANAGEMENT SUMMARY
   - 4.1 Organisational structure
   - 4.2 Proposed approach
   - 4.3 Costs

5. DESCRIPTION OF TENDERER
   - 5.1 Your company information
   - 5.2 Resources and allocation
   - 5.3 Local factors
   - 5.4 Product development strategy
   - 5.5 User group association/forum

6. DESCRIPTION OF PROPOSAL/ PRODUCTS
   - 6.1 Your proposed product(s)
   - 6.2 Proposed integration
   - 6.3 External interfaces
   - 6.4 Data migration
   - 6.5 Implementation
   - 6.6 Capacity issues
   - 6.7 Suitability for volumes and applications
   - 6.8 Reference sites
   - 6.9 Software licences
   - 6.10 Reference manuals
   - 6.11 Sample outputs/ Layout
   - 6.12 Maintenance and support

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LINKS TO WEB SITES OF SADC CENTRAL BANKS

COUNTRY	CENTRAL BANK	WEB SITE
Angola	Banco Nacional de Angola	www.ebonet.net/bna
Botswana	Bank of Botswana	www.bankofbotswana.bw
Democratic Republic of Congo	Baque Centrale du Congo	www.bcc.cd
Lesotho	Central Bank of Lesotho	www.centralbank.org.ls
Malawi	Reserve Bank of Malawi	www.resbank.malawi.net
Mauritius	Bank of Mauritius	bom.intnet.mu
Mozambique	Banco de Moçambique	www.bancomoc.mz
Namibia	Bank of Namibia	www.bon.com.na
Seychelles	Central Bank of Seychelles	www.cbs.sc
South Africa	South African Reserve Bank	www.resbank.co.za
Swaziland	Central Bank of Swaziland	www.centralbank.sz
Tanzania	Bank of Tanzania	www.bot-tz.org
Zambia	Bank of Zambia	www.boz.zm
Zimbabwe	Reserve Bank of Zimbabwe	www.rbz.co.zw
SADC Central Banks		www.sadcbankers.org