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### **Oman's National Payment Systems and their Compliance with International Standards and Practices**

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## **Abstract**

Payment systems play a major part in the conduct of a country's monetary policy, financial sector and economic development. These systems are key tools for the economy in general and the banking and financial sectors in particular. The central bank plays a leading role, in investing, developing, enhancing and managing these systems. This research gives an overview of payment systems in Oman and their compliance to international standards and practices. Also illustrates the experience of payment systems approaches in developed countries (USA, UK and Australia) and regional Gulf Cooperation Council (GCC) countries. It shows that there are some gaps in Oman's payment systems with international standards and practices. Central bank of Oman (CBO) has to give the attention to these gaps to make payment systems more safe and effective and to comply with best practices. The financial crisis and technology changes have exposed how important the interconnections are among the banking system and payment systems. That suggests the need to strengthen the fundamental parts of a financial infrastructure, particularly in payment systems. The current issues in the Oman's payment systems may be an obstacle and against best practices. Therefore, they need to be highlighted for resolution.

**Keywords: banking; National Payment Systems; Payment Systems; E-Commerce; Oman**

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## **INTRODUCTION**

Payment systems are a core group of strategic information systems, which contribute towards economic development, especially in emerging economies, and form the foundation for financial sector and national information infrastructure developments (Khiaonarong, 2000). This has become a key concern for central banks in developing countries seeking to improve national financial infrastructures and to increase their potential of becoming major financial centers. The payment systems developed by the central bank are known as national payment systems (NPS).

Payment systems are fundamental to economic and financial activity both at a national and international level. Their orderly functioning is crucial, since most transactions of an economy are executed and settled through them. They are also a key infrastructure for the management of monetary policy, the implementation of which requires the efficient processing and settlement operations.

Payment systems are necessary for the sound functioning of financial markets. Financial stability mostly depends on the capacity and effectiveness of payment systems to control the systemic credit risk that might affect institutions. This risk materializes when the failure of one participant to fulfill its obligations in a payment system causes the failure of others, generating a chain that can ultimately collapse the settlement of transactions and the national financial systems. Such a series of events may be exacerbated if there is a

high degree of interrelation between different payment systems and countries, which could cause the swift spread of any potential failure.

A NPS can be described as a system and associated processes to facilitate interbank transaction, clearing and settlement, resulting from various economic transactions within a country or between countries and ensures the circulation of money within a country (BIS, 2001). For that reason a NPS is composed of participants, mainly but not exclusively, the financial institutions, a set of payment instruments, such as credit cards, checks, and systems and procedures that enable participant to move funds and make and settle payments. The NPS supports the full spectrum of financial activity both within the country and from businesses transacting globally in the international markets.

The payments system is the infrastructure (comprised of institutions, instruments, rules, procedures, standards, and technical means) established to enable the transfer of monetary value between parties discharging mutual obligations. Its technical efficiency helps to determine the efficiency with which transaction money is used in the economy, and assist with the management of the risk associated with its use. An efficient payments system reduces the cost of exchanging goods and services, and is indispensable to the functioning of the interbank, money, and capital markets.

A weak payments system may severely drag on the stability and developmental capacity of an economy. Its failures can result in inefficient use of financial resources, inequitable risk-sharing among agents, actual losses for participants and loss of confidence in the financial system and in the very use of money (World Bank, 2008).

Historically, payment systems have lain at the heart of banking. In the mid of 20<sup>th</sup> century, payment technology considered to be stabilized and improving. Payment systems issues were still considered less important than other aspects of the financial systems. Payment systems seen mostly as technical matters to be dealt with by subunits of information technology (IT) departments in both central as well as commercial banks (Word Bank, 2008).

To maintain financial stability by strengthening national financial infrastructures there are a number of international initiatives under way. The committee on payment and settlement systems (CPSS) of the central banks of the group of ten countries has developed core principles for payment systems. These core principles are considered as international standards for use as universal guidelines to encourage the design and operation of safer and more efficient payment systems worldwide (BIS, 2001).

The real-time gross settlement system (RTGS), automated clearing house (ACH), electronic check clearing (ECC) and ATM/POS (Automated Teller Machine/Point of Sale) switch are the four components of the national payment system in Oman set out by the central bank of Oman (CBO) payment system strategy established in 2003. As per CBO 2006 annual report, the best international standards have been adopted as a minimum benchmark for setting up and operating the payment systems (CBO Annual Report, 2006). All transactions in all systems are settled in participant's central bank accounts.

This report will give an overview of national payment systems in Oman and their compliance with international standards. Moreover, it will discuss some issues of the

payment systems in Oman. This section introduces the payment systems and NPS in general. The rest of this paper is arranged to cover four more sections. Section two presents a review literature of payment systems in general, an overview of payment systems in developed countries (USA, UK and Australia), an overview of GCC country's payment systems and an overview of payment systems in Oman. Section three provides An comparative analysis of the core principles deployed in Oman. In addition, payment systems standards, legal and regulatory framework, risk management in payment systems, payment systems oversight, opportunities, challenges and current issues in payment systems are discussed in the same section. Finally, section four provides recommendations, conclusion and outlines area for future work.

## **BACKGROUND**

### **Payment Systems**

Payment systems are potentially very important for the operation of the whole economy in general and for the country's financial system in particular. They assist with building a robust financial system and improving the economy as a whole. They also improve the functioning of the economic system and enhance sustainable economic development. Moreover, they help to open the international markets for the country's economy. From this perspective they become mandatory to be established in the country.

Significant change that occurs in technology, global financial systems and financial crises are the challenges that must be observed and studied effectively. Dealing with them may require the enactment laws, legislation and international standards for payment systems to allow them to respond to these changes in the future to ensure business continuity of these systems effectively. From this point view, controlling payment systems and focusing on the updates that must be entered in these systems will help to address changes that may occur in the future.

The Bank for International Settlements (BIS) is an international organization which fosters international monetary and financial cooperation and serves as a bank for central banks. BIS has therefore recommended the adoption of RTGS systems for large-value transfers, ACH for low-value payments (retail payments) and ECC based on check images for check clearing. In an RTGS system, interbank payments are settled, as they are sent, by their gross amount. In other words, no bank can be illiquid at any given moment. This clearly reduces the time lag between delivery of payment messages and final settlement, hence reducing systemic risk (BIS, General guidance for payment system development, 2005).

The development of a national payment system has relevance to both the financial stability and the monetary policy interests of a central bank. By linking financial institutions together for the purpose of transferring monetary claims and settling payment obligations, a payment system becomes a channel through which financial risks can be transmitted across financial institutions and markets. In promoting a safe and efficient national payment system, central banks limit the prospect of financial contagion through this channel (BIS, 2005)

David Sheppard, (Bank of England, 1998) emphasized the fact that payment and

settlement arrangements impinge directly on a central bank's key objectives of maintaining monetary and financial stability. Well-designed payment systems will both help in supporting the economy (in particular enabling monetary policy to be implemented effectively) and also contain the transmission of financial shocks and disturbances through the economy. Poorly designed systems could have the opposite effects, undermining economic efficiency and transmitting or even amplifying economic shocks.

Although central banks share underlying interests in how payment and settlement systems operate, the extent of individual central bank involvement in their operation will differ. The role of the settlement agent to the payment system is a universal one from which historically the central bank's functions as ultimate provider of overnight liquidity and as lender of last resort have developed. The two main objectives of central banks in promoting and developing a country's payment and settlement systems are risk reduction and promoting efficiency (David Sheppard, 1998).

Although much emphasis is rightly placed on the reduction of risk, especially systemic risk, the promotion of efficient payment systems is important both in its own right and also because there is a need to secure a balance between efficiency and risk reduction that is acceptable to those who use the systems.

Safe and efficient payment systems are also critical to the effective implementation of monetary policy. In particular, an efficient and stable payment system is a precondition for interbank money markets and other short-term credit markets used in monetary policy market transactions. Both payment systems and money markets enhance the short-term influence of monetary policy actions on overall financial and economic activity (BIS, 2005).

In addition, developments in the payment system that affect the speed and predictability of the turnover of monetary balances for a given value and volume of transactions can influence the overall demand for money in the economy. Central banks monitor developments in the payment system to assess their impact on the demand for money and adjust their monetary policy strategy accordingly.

The International Monetary Fund (IMF) and World Bank have developed an observation program known as the financial sector assessment program (FSAP). The FSAP intends to assess countries' financial systems, focusing particularly on the adequacy of their regulatory frameworks for promoting financial system stability and assessing potential sources of vulnerability.

For payment system assessment, the main focus is on assessing the level of national observance with the CPSS standards and using the findings to make an overall assessment of the risks and vulnerabilities of the country's payment infrastructure, identifying and recommending areas of reform (Allison & Michael, 2003).

## **Overview of payment systems in developed countries (USA, UK and Australia)**

### **Payment Systems in USA**

The development of the payment system in the United States has been influenced by many diverse factors. Firstly, there are numerous financial intermediaries that provide payment, clearing and settlement services. Secondly, the legal framework governing payment activity as well as the regulatory structure for financial institutions that provide payment services in the United States is complex. Thirdly, a variety of payment instruments and settlement mechanisms are available to discharge payment obligations between and among financial institutions and their customers. These payment instruments vary considerably in their characteristics, such as cost, technology, convenience, funds availability and finality, as well as in orientation towards consumer, commercial and interbank transactions (BIS, 2003).

In the U.S., there are three large value payment systems: the Fedwire Funds Service (Fedwire) is a RTGS system operated by the Federal Reserve System (the Fed); the Clearing House Interbank Payment Systems (CHIPS), a privately owned payment system combining net and gross real time settlement, and the Continuous Linked Settlement (CLS) system operated by the CLS Bank and regulated by the Fed. Fedwire begins at 9:00 PM and ends at 6:30 PM next day; the system operates for 20 hours and a half. Alternatively, the ACH system provided by Federal Reserve Banks (FRBs) is a nationwide network through which depository institutions send each other batches of electronic credit and debit transfers. The direct deposit of payroll, social security benefits, and tax refunds are typical examples of ACH credit transfers. The direct debiting of mortgages and utility bills are typical examples of ACH debit transfers. Today ACH is used to process one-time debit transfers, such as converted check payments and payments made over the telephone and Internet. The FRBs electronic check collection services is the primary system for check clearing; most of the checks presented for clearing are settled within same day of presentment. (Federal Reserve Banks of US, 2010).

The FRB had the most recent self-assessments conducted in 2009, which concluded that they observe all applicable core principles for systemically important payment systems (CPSIPS) as stipulated by BIS. Nonetheless, the IMF published two technical notes under the 2010 financial sector assessment program (FSAP) elucidating the Fed's oversight of the payment systems in the country and liquidity risk management of the systems. The reports conclude that the Fed's oversight powers over systems that do not hold bank charters need to be broadened and risk management of systems need strengthening (Cirasino and Garcia, 2008). The IMF acknowledges efforts at the federal level to address these concerns through a new payment system risk policy and a 2009 legislative proposal to increase Fed's authority in relevant matters (IMF, 2010).

### **Payment System in UK**

As per the Bank of England (The UK's central bank) website the Bank's role as settlement agent providing the ultimate, risk-free means of discharging payment obligations between parties with the provision of settlement accounts for the banking sector. These accounts have been held within the Bank's RTGS, which provides for real-time posting with finality and irrevocability of debit and credit entries to participants' accounts (BoE, 2011).

The RTGS system settles for all the major sterling interbank payment systems or schemes in the UK. By values settled the two most important systems which are clearing house automatic payments system (CHAPS) and UK securities settlement system (CREST) payments.

CHAPS is the same-day electronic funds transfer system, operated by the bank-owned CHAPS clearing company, that is used for high-value/wholesale payments but also for other time-critical lower value payments. The bank supports the timely settlement of CHAPS payments through its provision of additional intraday liquidity to the settlement banks; this is provided via same-day repos of eligible securities between the CHAPS and the banks (CHAPS, 2010). The BoE 2009 report notes that CHAPS is a high-value payment system providing RTGS. CHAPS has two components, CHAPS sterling and CHAPS euro.

There are two retail-oriented payment clearing arrangements in the United Kingdom. The BACS system offers an ACH service handling electronic payment orders i.e. direct debits and direct credits, whilst the check and credit clearing company (C&CCC) processes paper items such as checks and credit vouchers. For both these clearings there is a two-tier access structure with direct settlement members and "indirect" participants. Settlement between direct members occurs across accounts held at the Bank of England (CPSS Red Book, 2003).

RTGS also settles, on a multilateral net basis, the interbank obligations arising in the following payment schemes:

- BACS: The UK's ACH System
- Faster Payments Service: The same-day settlement service for standing orders, internet and telephone banking payments
- The check and credit clearing company (C&CCC) is a non-profit making industry body, which has managed the check clearing system in England and Wales since 1985 and in all of Great Britain since 1996
- LINK, the UK's ATM network

A 2009 Bank of England (BoE) report describes the results of a self-assessment of the CHAPS, observes the core principles of payment systems. A 2003 assessment of CHAPS by the IMF had indicated that CHAPS observed all CPSIPS and the BoE observed all four central bank responsibilities in applying core principles as prescribed by the BIS (IMF, 2003). However, as the BoE's 2009 self-assessment report incorporates the most recent changes in the payment system structure in the UK, it provides a more updated assessment of the UK's compliance with CPSIPS. The 2009 BoE report also notes that in addition to CHAPS, the other main U.K. payment systems operate with a great degree of compliance and in accordance with international standards. As per BoE website, three important developments in recent years include the enactment of the 2009 banking act that grants statutory oversight of the payment systems to the BoE; the launch of the faster payments service in May 2008 as an automated clearing system for electronic retail credit transactions settling on a near RTGS basis to divert low value payments from CHAPS to itself; and the decommissioning of CHAPS euro in May 2008, since the U.K. opted to stay out of the european union's trans-european automated real-time gross settlement express transfer

known as (TARGET2).

### **Payment System in Australia**

Banks, building societies and credit unions are the principal providers of payments services in Australia (RBA, 2009). The Australian payments clearing association (APCA), an industry body, has responsibility for the day-to-day management of the major payments clearing systems. The payments system in Australia has changed significantly in recent years. This has been a response to technological change, but it has also been the result of a comprehensive program of reform. The key objective of the reform process to date has been to enhance the safety and integrity of the system. The introduction of Australia's real-time gross settlement (RTGS) system in June 1998 has been integral to that reform (BIS, 1999).

According to reserve bank of Australia (RBA) website, the reserve bank information and transfer system (RITS) is Australia's high-value payments system which is used by banks and other approved institutions to settle their payment obligations on RTGS basis. The payments are final and irrevocable settlement is achieved by the simultaneous crediting and debiting of exchange settlement accounts held at the reserve bank of Australia. Payments are entered into RITS directly. Some netted payment obligations are also settled in RITS as part of a batch. Payments processed through low-value clearing systems are currently settled in RITS on a net deferred basis once a day. However RBA is in the process of providing infrastructure that will allow more timely settlement of these payments (RBA, 2009).

The range of consumer payments available may be seen from the clearing arrangements operated by APCA. There are three consumer payment systems:

- The Australian paper clearing system for checks and other paper-based payment instructions
- BECS, the bulk electronic clearing system, for direct entry debit and credit payment instructions
- CECS, the consumer electronic clearing system, for ATM and EFTPOS interchanges

Based on the findings of IMF 2006 financial system stability assessment (FSSA), Australia's payment systems are sound and efficient and comply with all the relevant core principles developed by BIS. The RBA assessment in 2009 indicates the same conclusion. The report states that RITS is in compliance with all core principles. Both assessments state that the RBA also fulfils all four central bank responsibilities in applying the core principles. The IMF FSSA further comments that the legal basis for the system's operation is solid, its functionality is well-developed, its risk management to mitigate credit and liquidity risks is appropriate and its governance structure is effective and transparent. The IMF forwarded recommendations pertaining to some CPs only in order to further enhance the operations of RITS and its regulatory environment. A 2009 report by the payments system board (PSB) of the RBA concludes that some changes to the RITS have been implemented and have made RITS more efficient, cost effective and user friendly. Meanwhile, the 2008 World Bank survey of payment systems worldwide provides an appendix summarizing the characteristics of countries' payment systems as they relate to international best practices.



### **Overview of payment systems in regional countries (GCC)**

In GCC region, the first country that implemented the payment systems was Saudi Arabia. The name of the system is The Saudi Arabian Riyal Interbank Express (SARIE) system that commenced live operation in May 1997. It provides the mechanism for all Saudi commercial banks to make and settle payments in Saudi riyals (SAR). SARIE provides the basis for improved banking products and services and is the foundation for the payments system strategy of the Kingdom. SARIE is a state-of-the-art payment and settlement system that links all the banks in the Kingdom. It provides the mechanism for those banks to safely and efficiently exchange funds transfer and direct debit messages on behalf of their customers as well as for their own trading purposes (Homidan, 2006).

The Saudi Arabian monetary agency (SAMA), the central bank of the Kingdom of Saudi Arabia, has a strong interest in promoting safety and improving efficiency in payment systems as part of its overall concern with financial stability. SAMA plays a major role in the development and operation of payment systems in the Kingdom. Properly functioning payment systems enhance the stability of the national financial system, reduce transaction costs in the economy, promote the efficient use of financial resources, improve market liquidity and facilitate the conduct of monetary policy (SAMA payment systems 2009).

The SARIE system, designed on the concept of real time gross settlement (RTGS), has revolutionized electronic banking and commerce in the kingdom of Saudi Arabia by providing the backbone for a number of advanced and sophisticated payment and settlement systems currently in place. These include automated clearing houses (ACH), an electronic check clearing system; the Saudi payments network (SPAN), which links all ATM and EFTPOS terminals, the electronic securities system (TADAWUL); and also the electronic bill presentment and payment (EBPP- SADAD) (SAMA payment systems 2009).

Whereas in the Kingdom of Bahrain, the central bank of Bahrain (CBB) operates a real time gross settlement (RTGS) system where all inter-bank payments are processed and settled in real time on-line mode. The global S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication) payment network is used as the communication backbone for the transmission of the payment instructions. The RTGS system provides for payment and settlement of customer transactions as a value addition. The RTGS system is a systemically important payment system (SIPS) and CCB's objective is to ensure that the banks use the RTGS platform for the payment and settlement of all large value inter-bank payments to minimize settlement and systemic risks. The RTGS system enables the banks to have real time information on, for example, account balances, used and available intra-day credit, queue status, transaction status etc. The RTGS system is multi-currency capable and based on straight through processing (STP) (CBB payment and settlement systems 2007).

While the above illustrates two examples of the payment systems in the region, table (1) summarizes the current payment systems components in the GCC.

**Table 1: Overview of Payment Systems in GCC**

GCC Countries	Payment Systems Contents	
	Brief description of options available	Observations and Features
<b>Bahrain</b>	<ul style="list-style-type: none"> <li>✓ RTGS</li> <li>✓ Check Clearing: Paper based clearing system</li> </ul>	<ul style="list-style-type: none"> <li>✓ RTGS operates in local, USD and EUR currencies</li> <li>✓ CBB currently in the implementation electronic check clearing.</li> <li>✓ Payment Systems oversight is not available.</li> </ul>
<b>Kuwait</b>	<ul style="list-style-type: none"> <li>✓ KASSIP Kuwait's Automated Settlement System for Inter-participant Payments (RTGS)</li> <li>✓ KNET (Kuwait's switch) ATM and POS</li> <li>✓ Check Clearing System</li> </ul>	<ul style="list-style-type: none"> <li>✓ RTGS support local and other currencies</li> <li>✓ RTGS support low value payments</li> <li>✓ Connection via SWIFT and the Central Bank's private WAN network -CBK-Net.</li> <li>✓ Payment Systems oversight is not available.</li> </ul>
<b>Qatar</b>	<ul style="list-style-type: none"> <li>✓ QPS: Qatar Payment Systems (RTGS)</li> <li>✓ ECC : Electronic Check Clearing</li> <li>✓ NAPS :National ATM and POS Switch</li> </ul>	<ul style="list-style-type: none"> <li>✓ QPS use SWIFT Network for connection</li> <li>✓ QPS allows sending E-mails, SMS and WAP messages</li> <li>✓ Payment Systems oversight is available.</li> </ul>
<b>Saudi Arabia</b>	<ul style="list-style-type: none"> <li>✓ SARIE: Saudi Arabian Riyal Interbank Express (RTGS)</li> <li>✓ Paper-based Check Clearing System</li> <li>✓ SADAD: Retail Payment System</li> <li>✓ SPAN (ATM/POS)</li> </ul>	<ul style="list-style-type: none"> <li>✓ SARIE operates 24 Hours</li> <li>✓ SARIE capable of settling payroll and periodic payments such as billing invoices of utilities services.</li> <li>✓ The core mandate for SADAD is to facilitate and streamline bill payment transactions of end consumers through all channels of the Kingdom's Banks.</li> <li>✓ Payment Systems oversight is available.</li> </ul>
<b>United Arab Emirates</b>	<ul style="list-style-type: none"> <li>✓ UAEFTS: UAE Fund Transfer System (RTGS)</li> <li>✓ ICCS: Image Check Clearing System</li> <li>✓ UAESWITCH: National ATM-sharing scheme</li> <li>✓ WPS: Wages Protection System</li> </ul>	<ul style="list-style-type: none"> <li>✓ In RTGS participants also includes 21 Government Ministries and 5 money exchanges and 2 non-banking financial institutions.</li> <li>✓ WPS provides a safe, efficient and robust mechanism to allow the timely payment of employees' wages</li> <li>✓ Payment Systems oversight is available.</li> </ul>

**Payment Systems in Saudi Arabia (KSA)**

The IMF 2006 FSSA on SARIE system states that SARIE observes the applicable core principles for payment systems as circulated BIS. In addition, the FSSA concludes that all four responsibilities of the central bank are observed. The BIS 2003 red book notes that the risk management strategy designed by SAMA for SARIE provides a rigorous and comprehensive mechanism for controlling risks. Meanwhile, the World Bank 2008

report on payment systems development describes the legal and regulatory of KSA's payment systems as having a medium-high level of development.

#### **Payment Systems in Qatar**

Based on the World Bank 2008 survey, Qatar complies with four components which are broadly based on BIS core principles for payment systems. The report also points-out that Qatar achieves a "medium-high level of development" for the legal and regulatory framework component. The same report indicates that Qatar achieves a medium-low level of development for payment systems oversight. The World Bank assisted Qatar in assessing the new systems as well as the related legal and regulatory framework, and made some recommendations on further improvements.

#### **Payment Systems in Bahrain**

According to a 2008 CBB financial stability report, the launch of RTGS system has reduced significantly the risks associated with payments and settlement transactions. The report also notes that the CBB is finalizing a payment system roadmap to further strengthen the system and improve compliance with the CPSIPS. The CBB has advocated for a payments systems act to provide a statutory legal foundation and further reduce legal risks. The IMF FSSA recommended that the independence and powers of the central bank be strengthened, gaps in legal framework be closed, and provisions on payments and settlements are refined. Based on the IMF recommendations the central bank of Bahrain and financial institutions law was ratified in September 2006, enhancing the central bank of Bahrain's (CBB) enforcement powers and operational independence.

#### **Payment Systems in Kuwait**

The central bank of Kuwait (CBK) operates and supervises the KASSIP RTGS system and considers the system in compliance with the core principles of BIS. However, World Bank report (2008) does not come to the same conclusion. The report does not give favorable marks to the legal and regulatory framework for payment systems in the country. According to the same report, Kuwait's compliance with four components which are broadly based on the core principles of the payment systems. Kuwait achieves a medium low level of development for the legal and regulatory framework component. As per the World Bank (2008) report, Kuwait is reforming its payment systems and relevant legal framework to reduce systemic risk, improve overall efficiency, and provide better services for users. The report also indicates the payment systems oversight has currently achieved a low level of development.

#### **Payment Systems in United Arab Emirates (UAE)**

Currently there is no publically available assessment for payment systems in the UAE against the core principles developed by BIS. However, the central bank of the UAE established its internal payment systems oversight unit in 2009 which is responsible in providing annual assessments of the country's payment systems against the core principles (UAE CB, 2010). Furthermore, two reports by the World Bank in 2008 provide some general analysis of the legal framework, security features, and oversight of the UAE's payment systems. These measures are deemed to range from a "medium-low" to "medium-high" level of development.

### **Overview of Payment Systems in Oman**

As in most economies, cash remains the most accepted payment medium for retail transactions in Oman but forms a very small value of total payments. The currency with the public has steadily declined from 10.7% in 2003 to 9.2% in 2007 in Oman, exhibiting a falling share of currency use for payments and an increasing reliance on other non-cash modes of payment. This is sign of a maturing payment system. ATMs in Oman dispense cash against value held in the form of deposits or under credit arrangements with banks operating the ATMs (CBO, 2009).

### **Non-Cash**

Checks and payment cards like debit/ATM cards, credit cards, or standing arrangements with the banks for direct credit transfers etc. are other modes of payment operating in Oman. The introduction of electronic funds transfer mediums like real time gross settlement (RTGS) system, Automated clearing house (ACH) and electronic check clearing (ECC) have modernized the payments systems in Oman.

### **History**

The check clearing system and special funds transfer service of CBO represented two organized payment and settlement systems till first half of the year 2005. CBO operated the check clearing houses at the head office (HO) and its two branches, though only that in the HO was automated as to the reading and recording of MICR encoded information and generating settlement. The inter-bank settlement across the banks' accounts with the CBO would take place on the day of exchange in the Clearing House and in respect of checks that dishonored, the settlement reversed the following day.

The special transfer Service was a telex and S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication) message-based manual facility offered by the CBO to banks, for high-value inter-bank payments, including payments by banks to the CBO itself and transfers between the banks' accounts at the CBO head office and at its two branches. It also handled transfers to and from the ministry of finance and the state general reserve fund.

### **Payment System Reforms**

The central bank of Oman formalized payment system strategy for the national payment systems (NPS) in the year 2003. The strategy brings out the CBO vision of the NPS and lays down a clear roadmap. Treating the NPS as integral part of CBO's financial stability objectives, the best international standards have been adopted as a benchmark for setting up and operating the payment systems. The operational efficiency, robustness, credit and operational risks minimization and business continuity set-ups are the quintessential ingredients in the design of every component of the NPS. The CBO has already operated the following modules of NPS real time gross settlement (RTGS), automated clearing house (ACH), electronic check clearing (ECC) and ATM & POS national switch (OmanNet) is the latest offering and the one which will directly & positively impact wider society members including banks, customers and merchants. All these systems have been taken up for development under the umbrella of national payment systems with the following vision: "To be a partner in the economic development and growth of the Oman by creating an efficient Payment and Settlement System as a key component of the financial system as also to be a leader and earn a

strong visibility in Payment and Settlement Systems in the GCC region and beyond” (CBO, 2010).

### **Organizational and Institutional Infrastructure**

In order to achieve the stated objectives of strategy, CBO has formed an EFT project committee composed of nominees from the CBO, banks, ministry of finance, state government reserve fund, Muscat security market and capital market authority. For focused attention for development and operations of the various payment systems identified in the payment systems strategy, the central bank of Oman established the payment systems department (PSD) in 2006.

### **Legal Reforms**

Though banking law 2000 (Royal decree 114 of 2000) CBO was empowered to carry on clearing functions, implicitly authorizing to set up electronic payment and clearing channels. In order to impart clear and extensive powers to CBO, amendments to the banking law have been proposed and are under consideration by the government.

### **Electronic Funds Transfer Systems**

In implementation of the payment system strategy 2003, the CBO has set up the following payment systems and are operational:

#### **Real Time Gross Settlement (RTGS) System**

RTGS is a payment mechanism whereby interbank and other time-critical payments are entered into the system and settled item by item across the banks’ settlement accounts held with the central bank by debiting the remitting bank and crediting the receiving bank. Such payments, once settled, are final and irrevocable. RTGS was introduced in 2005 and has probably reduced systemic risks in Oman financial system. It settles high value payments in real time, as well as facilitates deferred net settlement system (DNSS) for ACH, ECC and ATM/POS transactions. In 2009 almost 375,716 transactions were settled in RTGS, amounted more than OMR 67 billion (CBO, 2010). The design of the RTGS incorporates the latest process components available in the payment systems environment, has latest liquidity and operational risk management tools.

#### **Automated Clearing House (ACH) System**

ACH is a payment clearing system for low value and high volume payments and provides an electronic platform for interbank retail payments transaction, for deferred net settlement. Payroll, utility bills and dividends are examples of ACH payments. The ACH was launched in 2006. ACH clearing balances are settled through the RTGS settlement accounts of the members maintained with CBO. More than 937,764 transactions settled in 2009 with a value exceeding OMR 569 million (CBO, 2010).

#### **Electronic Check Clearing (ECC) System**

The ECC, the third component of the NPS, started its phase one operation on January 29, 2009 and replaced the paper-based check clearing system with electronic image based clearing. ECC provides all inter-bank check clearing by check image via online web-based application end-to-end functions in A straight through processing (STP) form directly from the teller/branch level passing to CBO clearing for settlement of T+0 (check settlement done in the same day of presentment). The system brings in efficiency and security to the presentment, payment, clearing and settlement process by reducing the

check clearing cycle substantially to the beneficiary's advantage, and reducing the probability of fraud, error, check loss or theft, etc. The system architecture is based on web-based Application Service Provider model. In 2009 2.5 million checks were settled through the system with a total amount of almost OMR 8.9 billion (CBO, 2010).

### **ATM/POS Switch**

The automated teller machine (ATM) & point of sale (POS) national switch is called OmanNet. OmanNet replaces and consolidates two earlier switches in Oman (Al-Shamel and Al-Watani) into one central solution under the management of CBO. It enables migration of all financial institutions onto the common state-of-art technology platform with the highest international security standards. Apart from facilitating greater speed, efficiency and cost-effectiveness, OmanNet provides two additional services: Mini statements and account to account transfer at all the ATMs and for those banks who support this functionality. The POS service is also recently introduced in Oman.

### **Systems Participants**

Operating rules of the payment systems stated that all licensed commercial banks operating in Oman are compulsorily required to be members of NPS. Ministry of finance, ministry of civil service, Muscat depositories and securities registration company and state general reserve funds are also members in RTGS and ACH. For being admitted as members, besides being in the above categories, the participants are also required to comply with prescribed technical requirements.

### **Communication Infrastructure**

A closed user network called BankNet is the backbone for all communication for the payment systems. The network is maintained and operated by OmanTel, a telecom company but admission to network is controlled by CBO. The S.W.I.F.T. network stands as back up to the BankNet.

### **Payment Systems Risk Management in Oman**

All payment systems typically would be subject to two major risks – financial risk pertaining to settlement and operational risk from business continuity context. Due to settlement being completed through participant accounts in central bank or in 'central-bank money' the settlement bank risk is totally eliminated. To manage counterparty/liquidity risk, the intra-day liquidity support from CBO, queue management and grid lock resolutions have been put in place.

Operational risk is contained at various levels. The systems have been built using "no-single point" failure designs. These include cluster technology at processing servers, disk mirroring at data storage level, load balancing and redundancy at gateway level and in the LAN (local area network). The risk control is further strengthened through periodic data backup as per standard procedures and availability of a disaster recovery site which is tested from time to time.

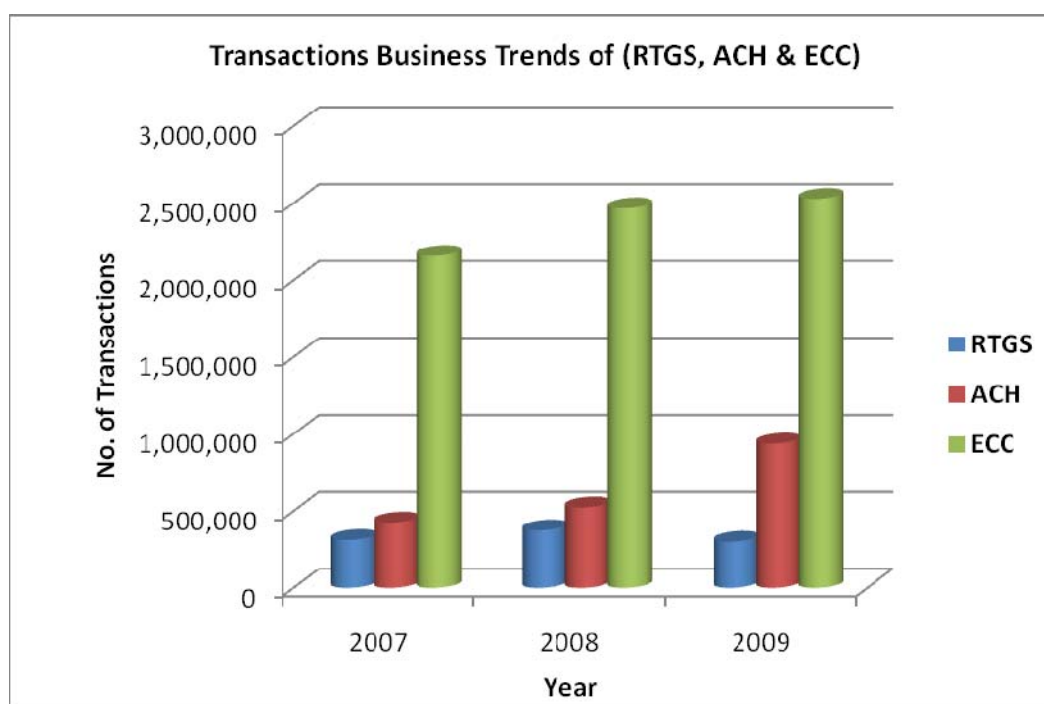
### **Payment Systems Business Trends**

The following table and figure shows payment systems trends from 2007 to 2009.

**Table 2:** Business trends of RTGS, ACH & ECC

Payment Systems						
Year	RTGS		ACH		ECC	
	No. of Transactions	Value in (RO Millions)	No. of Transactions	Value in (RO Millions)	No. of Transactions	Value in (RO Millions)
2007	311,839	69,069	425,576	180	2,158,189	3,611
2008	374,886	93,333	523,506	282	2,467,857	4,898
2009	300,716	67,133	937,764	569	2,529,465	8,880

Source: CBO annual report 2009



**Figure 1:** Transactions business trends of (RTGS, ACH & ECC)

Source: CBO annual report 2009

### Analysis

This section is a comparative analysis of Oman's NPS against the core principles for payment systems. The core principles were agreed by the G10 group of countries and published by the BIS in January, 2001. The core principles are summarized by the BIS as follows:

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

There is no explicit legislation for payment systems in Oman currently. However, the legal basis for payment systems is defined by the banking law. The World Bank 2008 report observes that Oman illustrates a medium-low level of development for legal and regulatory framework component for payment systems. The report also mentioned that legal provisions in Oman cover clarity of timing of final settlement especially when there is an insolvency, legal recognition of (bilateral and multilateral) netting arrangements, enforceability of security interests provided under collateral arrangements and of any relevant repo agreements, and protection from third-party claims of securities and other collateral pledged in a payment system. However, these provisions do not cover other important issues such as the non-existence of any zero hour or similar rules; and recognition of electronic processing of payments. Moreover the World Bank indicates that Oman is reforming its legal framework for payment systems and at the time of the report the requirements of law have been defined.

**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.**

The operating rules of all payment systems identify the obligations and rights of the participants and the system operator. It also sets out the features and the operations of the system, including arrangements for settlement, queuing mechanism, provision of intraday liquidity, operating time. It also details procedures for handling abnormal situations. Furthermore, CBO provides training to all new participants and training is also available on request. New members are given access to the test environment from their own offices prior to going live to enable them to perform more testing and familiarization with the systems. CBO make sure that all the participants in the payment systems are familiar with operating rules and apply them while they use the payment systems. CBO keeps updating the operating rules to the market needs. A detailed document on operating rules for all systems participants is available on the CBO's website.

**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.**

The sources of liquidity in the RTGS system are provided by: opening balances and funds received from other participants during the day, participants' entire reserve requirements balance during the day, lines of credit between banks, and credit granted by the central bank either in the form of a loan or a repo. To control credit risk exposure in the system, the CBO requires high quality collateral in all cases. In case intraday liquidity is not repaid at the end of the operational day, the central bank will transform the intraday credit into overnight credit at market rates or penalty rates. If a participant does not have enough balance in its current account to process new payments, the payment order will go into a queue for later processing. The World Bank (2008) observes that Oman illustrates medium-high level of development in the evaluation of RTGS.

**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.**

The RTGS system provides real time immediate and final settlement. Once a payment is



settled there is a simultaneous debit and credit of the paying and receiving participants' settlement account at the CBO. It is irrevocable, unconditional and cannot be reversed by the sender or a third party. In addition, ACH system offers a net clearing position at the end of the day to be settled in RTGS system.

**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.**

The RTGS system settles high value payments in real time, as well as facilitates deferred net settlement system like ACH, ECC and ATM/POS Switch transactions. Oman exhibits medium high level of development as per the World Bank 2008 assessments.

**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.**

The CBO's 2008 annual report notes that all participants in the RTGS system settle through their central bank accounts. The 2008 World Bank report notes that to control credit risk exposure in the system, the central bank of Oman requires high quality collateral in all cases. It can be said this applies in principle.

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

The World Bank 2008 publication on payment systems worldwide indicates that for Oman's payment systems, routine procedures are in place for periodical data back-ups. Data storage media is kept in sites other than the main processing site and back-up servers have been deployed at the main processing site. Meanwhile, a fully equipped alternate processing site exists. The report also notes that the CBO has documented a formal business continuity plan, which includes procedures for information dissemination and for crisis management, and the business continuity arrangements are regularly tested. Moreover, CBO conducts at least two testing for disaster recovery in a year for all payment systems to ensure business continuity plan is implemented. The best standards have been adopted for security infrastructure in regards of network and authentication. For example, PKI has been adopted and it is due for certification every six months.

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

Payment systems were developed in order to reduce counterparty risk and enhance electronic payments in Oman. The main objective of CBO is to offer efficient and secure infrastructure to the financial sector, RTGS for time critical payment and ACH for retail and not urgent payments. All systems are connected through BankNet as a primary channel for all participant and S.W.F.T Network as backup.

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

According to the World Bank 2008 publication on payment systems worldwide, there is an explicit exclusion policy for payment systems in Oman; access is granted on the basis of institutional standing and the fulfillment of a set of objective criteria; and formal rules exist to allow the operator to exclude a participant in a timely manner.

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

NPS are owned and operated by the CBO. Payment systems department (PSD) manages the day-to-day operations. System enhancement is carried out by the PSD. However, there are few publications or assessments published by CBO to ensure that the payment systems governance arrangements are effective, accountable and transparent.

**Responsibilities of the central bank in applying the core principles:**

The BIS set-out responsibilities for all the central banks to apply the core principles:

**Principle: 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.**

The World Bank 2008 report notes that the CBO's payment system oversight powers are provided by the central bank law. The report also states that the CBO's payment system oversight function is not performed in regular basis. There is no specific unit or department within CBO responsible for payment system oversight. The payment systems oversight should be distinguished from payment system operational tasks through organizational means or independent reporting lines.

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

As the payment systems oversight is not performed in regular basis and there is no payment system oversight policy within CBO it is difficult to ensure that the payment systems are fully comply with core principles.

**Principle: 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.**

Same as principles A and B

**Principle: 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.**

According to the World Bank 2008 publication, CBO cooperates with other relevant authorities through regular meetings, exchange of opinions and views, regular information exchanges, prior notice of regulatory action, joint inspections, or in an informal ad-hoc basis.

**Payment Systems Standards**

From technical perspectives the payments system is evolving as a businesses and consumers seek the convenience and efficiency of electronic payment instruments. The development and adoption of standards are key to achieve widespread use of electronic payments as well as other goals such as payments system safety and accessibility. A common standard can enable the straight-through processing of electronic payments files from the originator of the transfer to the receiver. According to that open standards such as eXtensible Markup Language (XML) can further promote interoperability by enabling systems based on different standards to communicate more readily. However,

lack of a common standard for a payments system and its participants at various levels can increase the cost of participating in the system and introduce inefficiencies such as format translation and manual processing (Board of governors of the Federal Reserve System, 2002). According to CBO annual report (2006) the best international standards have been adopted in the implementation of the national payment systems.

As the standards are concerned with well-functioning payment systems, the integration with core banking systems seems to be the most important issue that facing the commercial banks in Oman. The banks legacy systems are outdated and the cost of integration and migration is high for all participants. Some of the bank's vendors provided solutions and adoption of digital technology that enabled banks to provide more diversified and convenient financial services. However, CBO sets the flexibility options for the participants to be fully or partly integrated with payment systems.

For operational and supervisory perspectives as mentioned in the background section for the general guidance for payment system development set out by the committee on payment and settlement systems at bank of international settlement (BIS) are considered the international standards and practices for the development of the payment systems. Most of the central banks and monetary authorities are following these standards including CBO.

Heller and Hollanders (2010) emphasize that with many payment systems being introduced all over the world, the need to prepare international standards that would be universally applicable became clear. They also highlights the core principles developed by BIS are widely used as guidelines to encourage the design and operation of safe and more efficient payment systems.

### **Legal and Regulatory Framework**

The World Bank (2008) highlighted that a sound and appropriate legal framework is generally considered the basis for a sound and efficient payments system. A sound legal environment includes the following considerations:

- Laws and regulations of broad applicability that address issues such as insolvency and contractual relations between parties
- Laws and regulations that have specific applicability to payment systems (such as legislation on electronic signature and settlement finality, and the responsibilities of the central bank or other regulatory bodies, such as the oversight of payment systems) and consumer protection
- The rules, standards, and procedures agreed by the participants of a payment system

Other relevant pieces of legislation that have an impact on the soundness of the legal framework on the payments system include laws on transparency and security of payment instruments, terms, and conditions; antitrust legislation for the supply of payment services, and legislation on privacy.

While laws are normally the appropriate means to enforce a general objective in the payments field, in some cases regulation by the overseers might be an efficient way to

react to a rapidly changing environment. In other cases, specific agreements among participants might be adequate; in this case, an appropriate professional assessment of the enforceability of these arrangements is usually required. As per the World Bank survey in 2008 the legal and regulatory component is medium-low level of development in Oman. Furthermore, as mentioned earlier Oman is reforming its legal and regulatory framework and a comprehensive legal framework has been submitted to the government for approval.

### **Payment systems oversight**

The oversight role of the central bank is currently at the heart of international debate, and this function is emerging as key in central bank activity to ensure proper monitoring of the reliability and efficiency of domestic payment systems on an on-going basis (World Bank, 2008). The deployment of an effective payment system oversight function calls for a careful consideration of at least three key issues. First, it is necessary to evaluate the adequacy of the legal powers of the central bank in this area. Second, the internal organization of the central bank with respect to payment system activities may also be worth evaluating. Third, effective cooperation must be in place between the overseer and market players, and among domestic regulators and increasingly among international overseers.

A central bank should accept primary responsibility for a system's oversight on the basis of its powers and capacity and the relevance of the system to its oversight responsibilities, with a presumption that this central bank will be the one where the system is located (BIS, 2005). Based on the World Bank survey in 2008 the payment systems oversight is medium low level in Oman. Without the oversight function it is difficult to evaluate payment system accordance to the responsibilities of the central bank in applying the core principles.

### **Risk Management in Payment Systems**

The possible risks to which a payment system is exposed can be of a financial, operational or legal nature. The financial risk may be liquidity or a credit risk. Liquidity risk arises when one or several participants cannot meet their payment obligations at the moment of settlement. Credit risk occurs when this obligation cannot even be fulfilled at a future date. Operational risk takes place when technical failures, human errors or malicious interventions cause deficiencies in the system's functioning. Finally, legal risk consists of the existence of legal gaps that may affect the legal safety of transactions. Depending on the magnitude of the problem originated by any of the previous risks and, mainly, of its capacity to spread, systemic risk might materialize (Jochen Schanz, 2009). As discussed in the background and comparative analysis of Oman's NPS, the BIS core principles for payment systems are the minimum benchmarks which CBO follows for managing the risks. The payment systems are also subjected to assessment from time to time by International Monetary Fund (IMF) under its financial sector assessment program and World Bank evaluations.

### **Opportunities and Challenges**

A study by staff of board of governors of the Federal Reserve System in 2002 found out that over time, payment systems will be redesigned in fundamental ways to accommodate new technologies and new business processes. The payment systems will be advanced systems that give end users options in such areas as timing, finality,

information capability, and fees. Those systems might incorporate tools for managing the risk of originating and receiving payments, including tools for authenticating and authorizing end users in real time this from the perspectives of some stakeholders of the payment systems. Others may look to a future in which end users have direct and easy access to payment systems, change that would increase end users control and options and lower their costs, but also would likely add risk to those systems and alter traditional banking practices. Still others foresee more-limited, but nevertheless challenging, possibilities (Board of governors of the Federal Reserve System, 2002).

The same study also emphasizes that the payment systems will change over time. Existing systems will be redesigned, or perhaps replaced altogether, and established business relationships may be altered. The ways in which these changes will be worked out in the marketplace cannot be readily predicted.

The redesign or replacement of existing payments systems opens opportunities; there will also be a need to develop safeguards to ensure a balance between safety and efficiency. Market developments and business practices, including those in the credit card industry, are responding to consumer and business needs related to authentication and authorization techniques for on-line payments.

The existing payment systems may also require participants and their customers to make changes to their own systems and processes (Andrew, 2008). Making such changes may not come easily or cheaply. Currently, incomplete integration of technology widely affects the ability of banks, corporations, and consumers to develop and use new payments and information services. This incompatibility problem has hindered developments in the past and is likely to do so in the future.

Andrew *et al.* (2008) discuss how a new technology is adopted over time for payment systems and how technology itself evolves over time. Technology innovations tend to occur in bursts and typically limitations of the previous technology become binding. Therefore, advanced technology might emerge before the previous one has been fully adopted in the payment systems. Globalization and financial integration that have contributed to recent development are likely to important drives for years to come.

#### **Other issues in payment systems in Oman:**

With respect to the utilization of payment systems in Oman, many of systems members are not utilizing all the services offered by ACH system. For example, salary transfers, utility payments and dividend distribution. Many of government ministries and institutions employee's salaries are still transferred using the manual process. In this case the ACH system is not utilized to handle such salaries payments.

Direct debit instrument (DDI) is part of ACH payments operations which enables the participant banks to pay and collect their monthly utility bills, installments of loans and standing orders etc. on behave of their customers. However, DDI is not available in Oman's ACH system because the legal framework does not existed for such payments. CBO should make the necessary initiatives to pave the way to facilitate this type in for payment. This will enhance the efficiency of ACH system.

As a concept and best practice ACH should cover 90% of the total volume and 10% of total value, while RTGS covering the rest. Based on the figures of RTGS and ACH illustrated earlier indicates or can be treated as an evidence of lack use of the systems. As it is clear from table (2) that ACH is only covering almost 60 % of total volume and only 0.3 % of total value (Figures might be even different if there is an effective oversight procedure).

It is observed that Omani society is more confident and comfortable when using old ways of making payments such as cash, checks etc. due to their cultural barriers. As ECC system is for checks clearing, it is very clear from table (2) and figure (1) that there are huge differences in number of transactions between ECC & ACH systems. This behavior may cause a delay in recognizing the ultimate objectives introducing new payment systems.

## **RECOMMENDATIONS**

Analysis of the BIS core principles of Oman's payment systems shows that Oman is not fully compliance with them. Some components partially comply with the principles. There are some issues with the legal and regulatory framework as there is no special law or act for the payment systems. In this case CBO should update the current banking law or establish a payment systems law. Furthermore, risk management should be taken in considerations to overcome the risk that might occur within payment systems.

Oversight practice is important for the central banks in all over the world to supervise the payments system. It is highly recommended by BIS. Therefore CBO should deploy many efforts and initiatives to implement an oversight unit for payment systems. Moreover, the payment systems oversight should be distinguished from payment system operational tasks through organizational means or independent reporting lines to be more practical.

After the oversight is being implemented CBO should conduct self-assessment for payment systems compliance with core principals. Such assessment will help in identifying Oman's payment systems position accordance to the international standards.

CBO might study to implement new component in the payment systems to accept other currencies like USD and EURO. That will help to make the payment systems more capable for settling international payment in the country. This approach is already implemented in developed countries as well as in some of GCC countries.

Private sector plays a major role in the payment system like in USA, Australia and UK, as some of the payment systems are privatized. Private sector takes precedence in promoting payment systems efficiency. To follow the success experience from those countries, CBO should study the feasibility in privatizing some of the payment systems in the country to give the opportunity for the private sector to play its role in promoting the payment systems.

Banks should strive for business excellence with optimum use of technology. By doing Business Process Re-engineering and implementing straight through processing (STP) to deal with the issue integration, banks can enhance operational efficiencies and

increase productivity in the payment systems. The banks can innovate and offer value added services and earn significant non-interest income through various fees and other charges.

To address cultural issue, banks may adopt an awareness campaign strategy to continue influencing the public behavior to adopt new methods of payments such as direct debit instead of issuing check and direct credit instead of cash handover.

The technical infrastructure, risk management framework and legal and regulatory framework issues should be worked upon so that they are ready when the awareness campaigns are introduced by the government and banks.

CBO, commercial banks, government and private sector must work together to fully utilize NPS services offered by CBO especially for transferring all government and private sector institution employees' salaries via the RTGS and ACH systems.

The technology changing very fast, the payment systems will be redesigned in the future to be more safety and efficient. CBO have to be ready for those changes in the payment systems by studying the current and future market needs of the payment systems.

## **CONCLUSION**

The central bank of Oman has played an important role, over the years, in creating an institutional framework under the NPS for the development of a safe, sound, secure and efficient payment and settlement systems in the country. The rapid advancements in the field of information technology have facilitated the advancements in the payments systems. However, Oman's payment systems are still not fully compliance with the core principles developed by BIS as international standards. The important gaps to be addressed are in the legal and regulatory framework, risk management and payment systems oversight. The assessments of USA, UK and Australian payment systems confirm that they fully observe the core principles. Meanwhile, some of GCC countries to some extent comply with core principles, while others have to modify their payment systems to fulfill the requirement of the core principles.

In Oman, the creation of modern electronic payment systems has helped facilitating the turnover of funds in the economy. The use of information technology in current payment arrangements helped reduce human intervention and has also helped strengthen the country's capabilities and competitiveness in providing financial services. Each country has its own approaches and implementation strategy to accommodate payment systems for its economy in general and for the banking sector in particular. It is recommended for Oman to pursue the experiences from other countries in the payment systems filed specially developed countries. That will help to enhance the current payment systems status to be more flexible and practical.

It is clear that there is a need to manage change in payment systems. Whether the change may be in developed or emerging countries, technological changes, together with unexpected and undesired financial status have led to subsequent changes in related laws regulations, system requirements, and existing payment arrangements.

Recent financial crises which affected global economies, suggest the need to strengthen the fundamental parts of a financial infrastructure, particularly in payment systems. This implies that there is a need to balance between payment systems efficiency and risks.

The current issues and barriers in the NPS need to be considered for the improvement of the systems in near future and for smooth implementation of future payment systems. A feasibility study on the privatization of payment systems in Oman will be a future work.

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