Implementing IT to Fulfill PLS (Profit & Loss Sharing) Mechanism

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All divine religions emphasize on usury prohibition. It is concluded that with some IT solutions, it may be possible to fulfill worldly requirement by use of IT systems without any incredulity. Since depositors are shareholders of Non-Usury Bank Corporation (NUBankCo), therefore integrated core banking systems can provide suitable infrastructure for transactions recording and management done by all participants' chains; and the end of process the yields of investment capital of depositors that invest in real economy can be distributed by safe delivery channels such as branches, ATM, WEB, and Meaningful WEB. IT (as BPR, ERP, CRM, SCM, MES, MEX, HRM, WFM) that use single and integrated data warehouses) accompanying with standardization in all processes not only prepare PLS mechanism as main difference between conventional and non-usury banking but also simplify risk management and decline operational risk in comparison with conventional non-usury banking.

Banks as economic firms are active in two markets. On the one hand, they demand financial resources from depositors (in deposit resources market) and on the other side, they supply credit to investors (in credit market). Conventional non-usuric banks do not act as financial intermediaries which receive fraction of investment returns from two parties of contracts as charges. If banks did as intermediaries, then many of usuric juristic problems of conventional banks activities would be eliminated. Conventional non-usuric banks act as economic firms and maximize their profits or minimize their interest and non-interest costs which the same markup price of resources mobilization**.** Conventional bank's profit function shows as follow formula which is different with non-usuric principles:

Max: Profit of bank	=	Revenue of credit supply to investors in different contracts and different loan interest rate	-	Interest payment to deposit holders for all deposit types and different deposits interest rate	+	Revenue of offering banking services to customers	-	Total cost of administrations office, organizational, amortization, tax, personal

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Due to lack of IT penetration in operational and supervisional and even managerial processes of conventional banks, the administration, personnel and overhead costs are less flexible and effective. Therefore, assuming constant total cost of administration [office, organizational, amortization, tax, personal] and revenue [offering banking services to customers] the expression: [Revenue of credit supply to investors *minus* Interest payment to deposit holders] will maximize the profit. Just as shown, there is not simultaneous and systematic relationship between [Interest payments to deposit holders] and [Revenue of credit supply to investors]. In other words, in non-usuric banking, the banks' profit resulting from financial transactions made with depositor's resources should be distributed among depositors after deduction of operational costs[1]. Two major problems are encountered to access this mechanism as follows:

1. In conventional non-usuric banking, depositors are not bank's shareholders. This fundamental problem can be solved by application of a newly defined special banking system named by "Non-Usuric Bank Company (NUBankCo.)". This bank is explained by Bidabad (2005).[2]
2. Profit (interest) distribution to depositors is due to long delay of finalizing auditing processes after the end of financial year. Whereas, it can be shortened by using IT systems. Thus distribution of profit based on PLS mechanism can be done in shorter periods and more rapidly. On the other side, because of heavy overhead cost in conventional banking, endeavor to implement PLS mechanism would not be very successful. Thus IT and ICT systems could initiate new opportunities to implement real PLS mechanism. This also can reduce overhead cost in conventional banking.

In divine books such as Quran, Torah and Bible the prohibition of usury has been explicitly declared. However, there are many differences in definition of usuric financial operations in comparison with non-usuric operations. Bidabad and Harsini (2003) by scrutinizing usury definition and using theosophy principal of jurisprudence defined some criteria to distinguish usuric from non-usuric transactions. It seems that these criteria may be accepted as ending point of usury definition. The criteria are:

1. Loaner must share in profit/loss of the economic activity of loanee.
2. The rate of interest must not be determined and conditioned before.
3. Interest in consumption loans is usury.
4. Foreign currency exchange (without interest) is not usury.

If we accept the above criteria for non-usuric banking operations, then we may use IT systems as important standpoint to optimize efficiency and effectiveness of this

[1] In modern banking of developed countries, by IT implementing based systems has decreased overhead cost. See: Allahyarifard, Mahmoud, "E-banking services and its operational requirement in comparison with operational cost of different banking services", Monetary and Banking Research Academy, Central Bank of Iran, 2005, (Farsi).

[2] Bidabad, Bijan (2005), Non-Usury Bank Corporation (NUBankCo). Proceeding of the 3rd International Islamic Banking and Finance Conference , Monash University, Kuala Lumpur, Malaysia, 16-17 November 2005. http://www.bidabad.com

type of banking. Otherwise, there are operational ambiguities for implementing PLS procedure.

Since in «Non-Usury Bank Corporation» (NUBankCo) depositors are stakeholders, therefore investment return should be distributed among them proportionally based on the amount of their own deposits. The most important factor causing ineffectiveness of conventional non-usuric banking to achieve PLS mechanism is inability to distribute bank's profit at the end of financial period. On the other hand, the incapability of conventional non-usuric banking to achieve PLS mechanism comes from disconnectivity of profit and loss accounting systems and real economic returns of economic activities. Thus, this causes some ambiguities in non-usuric nature of transactions. Generally, the main preventing factors to PLS fulfillment are as follows:

- ✓ There isn't systematic connection among depositors (as supplier of financial resources or as bank's stakeholders) and loaner (as real investors or bank's business partners)
- ✓ Impossibility of creating specific portfolio for each depositor; and precise accounting of her yields by conventional traditional or semi-automatic systems.
- ✓ Existence of different profit (interest) rates for different term deposits based on their progressive time durations returns is a source of fluctuations in financial markets and cause unfair distribution of deposit holders returns. Since, the differential deposit interest rates is not equal to real economy rate of return; thus, it will be contradictory with PLS mechanism.
- ✓ Multiplicity of loan's interest rates and deposit's interest rates and their discrimination from real economy rate of return causes unfair distribution of profit coming from financial activities and is contradictory with PLS mechanism.
- ✓ In order to fulfill of PLS mechanism bank's stakeholders should be bank's depositors and therefore bank instead of maximizing shareholder's profit should maximize depositors' profit.

Core Banking in new non-usuric banking: The Conceptual Architecture Model of new non-usuric banking is organized under broad headings of Foundation, Product-Services and Customers and also External Interfaces. IT systems inside of the core banking (including: BPR, ERP, CRM, SCM, MEX, HRM, WFM), Transformation management (including: Knowledge management, Standardization, Analytics/business intelligent, Risk management, Business rules engine, Fraud management, Process improvement), System security policy inside of core banking (including: Auditing, Network connectivity, Access control, Documentation, Object reuse, Protection domain, Identification & Authentication, Penetration testing) are categorized as Foundations. Customers (including: Government, Enterprises, people), products (including: Investment deposit, Gharz-al-hasaneh deposit), Services (including: Foreign currency exchange, Other services) are categorized in Product-Services and Customers and integrity accounting systems such as real time General Ledger (GL). External interface is one of the most important components of non-usuric core banking which will be vital for new non-usuric banking to access data information resources which produce information in outer-networks and they are very important for fulfillment of PLS mechanism. Data producer and information resources may include: central bank, government, SWIFT,

business partners, investors, stock exchange agencies, insurance company, agricultural products exchange agencies and other exchange markets information generators. Some of main properties of new non-usuric core banking as modern conventional banking capabilities are as follows:

- Straight Through Processing (STP) or END TO END processing.
- Real-time capabilities
- 24×7
- Scalable
- Robust solutions in multi-lingual.
- Multi-currency
- International as well as localized regulatory reporting environment.
- J2EE or .NET platform and standards.
- DB2, Oracle and SQL Server databases.
- C++, XML, SOA.

The conceptual architecture model components are as follows:

Foundations or infrastructures: Executive prosperity of modern non-usury banking depends upon suitable technical, telecommunication, cultural, educational and legal infrastructures. In the case of asymmetric dis-coordination in infrastructural chains, e-banking will fail.

Standardization: Before designing and implementing IT systems, it is necessary to define operational, supervisory and managing standards.

Prohibition of usury principle in non-usuric banking causes international standards and supervising organizations on banking operations such as Basel committee do not cover all of non-usuric banking needs. Therefore, Islamic countries have been planning for establishing new organizations to standardize and codify uniform regulations for supervision on Islamic banking activities. Important organizations in this relation are Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI)[1],

[1] Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) was established in 1991 by Islamic banks and has a board of directors including three central bank governors of Bahrain, Sudan and Jordan and its chairman is Bahrain's commerce deputy minister. The responsibility of AAOIFI is supervising and defining required regulations and standards for Islamic banking. AAOIFI has issued 43 standards and statements, which are mandatory in Bahrain, Sudan and Jordan at the first phase, and at the next phase Qatar and Saudi Arabia also adopted these regulations and majorities of countries also accepted these regulations as bases for their standards and regulations. Organization structure of AAOIFI consists of six parts of General Assembly, Board of Trustees, Accounting and Auditing Standards Board, Sharia Board, Executive Committee and General Secretary. The Accounting and Auditing Standards Board is composed of fifteen part-time members assigned by the Board of Trustees for a four-year term. Members of the Standards Board are representatives of the following categories:

- Regulatory and supervisory authorities
- Islamic financial institutions
- Shari'a jurists
- Accounting and auditing professionals on Islamic financial institutions.
- Users of financial statements of Islamic financial institutions.
- University professors in accounting and financial fields.

Financial Stability Forum (FSF)[1] compendium standards[2], and The Islamic Financial Services Board (IFSB)[3].

IT based systems: IT systems in master plan should be integrated, and inter-network or outer-network separated units should be avoided. New information systems architecture will be based on integration management of IT and ICT and all firm's systems use a unique data warehouse or information database management is integrated and based on automatic interaction and transfer of information among databases. All information resources in inter-network and outer-network will connect together and will create IT master solution for implementing PLS mechanism. In this solution IT subsystems are:

Business Process Reengineering (BPR): BPR looks for strengthening higher value added and eliminating low value added processes. Application of IT and then BPR in production of goods and services causes decrease of overhead cost. Because in traditional business, BPR improve the processes but new generation of BPR in IT-based business causes structural upheaval in processes.

Enterprise Resource Planning (ERP): ERP systems embrace all information resources in inter-network or even in outer-network and therefore information resources link together**.**

Customer Relationship Management (CRM): IT-based businesses are customer oriented as their most important goal. Modern CRM systems is overshadowed new technology of Meaningful WEB which respond to customer automatically and even will assess willingness of customers after delivery of goods or services.

Supply Chain Management (SCM): Since some of transactions occur between banks and suppliers, therefore SCM system covers all connection processes among them.

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[1] Financial Stability Forum (FSF) was convened in April 1999 to promote international financial stability through information exchange and international co-operation in financial supervision and surveillance. The Forum brings together on a regular basis national authorities responsible for financial stability in significant international financial centers, international financial institutions, sector-specific international groupings of regulators and supervisors, and committees of central bank experts. FSF seeks to co-ordinate the efforts of these various bodies in order to promote international financial stability, improve the functioning of markets, and reduce systemic risk.

[2] The Compendium of standards lists the various economic and financial standards that are internationally accepted as important for sound, stable and well functioning financial systems. The compendium highlights 12 key standards which the FSF has designated as deserving of priority implementation, taking account of country circumstances.

Corpus of the compendium standards are organized under three broad headings of: macroeconomic policy and data transparency (including: monetary and financial policy transparency, fiscal transparency, data dissemination, data compilation), institutional and market infrastructure (including: insolvency, corporate governance, accounting, auditing, payment and settlement, market integrity, market functioning) and financial regulation and supervision (including: banking supervision, securities regulation, insurance regulation, financial conglomerate supervision)

3) The first step of defining prudential and supervisory regulations and standards for Islamic banking by Bahrain Monetary Agency (BMA) is the Islamic Financial Services Board (IFSB). This frame is named by 'Prudential Information & Regulatory Framework for Islamic Banks (PIRI) and is based on guidelines of Bahrain AAOIFI and the Basle Committee on Banking Supervision. This committee is in Malaysia and representatives of central banks of Bahrain, Malaysia, Sudan, Jordan, Indonesia, Kuwait, Iran and Saudi Arabia and IMF, IDB and AAOIFI met at the IMF offices in Paris and signed an agreement on a draft for establishment of the IFSB (Islamic Financial Services Board). The objectives of PIRI establishment cover six main areas including capital adequacy, asset quality, management of investment accounts, revenue quality, liquidity and corporate governance. See: "Banking Monetary Agency Issues New Islamic Banking Regulations", Vol.XLV No.5, 4 February 2002.

Manufacture Executive Systems (MES): This system is installed and added as a class or module to ERP systems and interacts between executive layer of producer enterprises as counterpart or investment partner and bank. This system will cover all production processes

Human Resource Management (HRM): This system should contain interactive and online capabilities of economic, training, educational and cultural, favorites and hobby/entertainment needs of employees. Knowledge-based businesses are based on Knowledge-worker and thus determining the quality of organization as Knowledge-mapping and Knowledge-management are possible through HRM.

Workflow Management (WFM): WFM is possible to determine participant's roles and suitable principles for tracing of messages, transactions and information among participants and databases. In new non-usuric banking by WFM system we can trace physical and financial progresses of investment projects based on Mosharekeh and Modarebeh contracs. It is expected that integrating trend of internal WFM systems with external E-commerce systems because of size-reduction of business enterprises and increasing their efficiency will develop.

Implementing and applying integrated IT systems (BPR, ERP, CRM, SCM, MEX, HRM, WFM) lets architectural feasibility for initiating comprehensive integrated system by connecting information resources of bank, depositors, insurance companies, investors, business partners and also capital market specially through establishing NUBankCo.

IT systems accompanying with complement information systems can connect non-usuric banking information resources as rings of a chain, therefore depositors as stakeholders of a company will be investment patron which is an extreme purpose of non-usuric banking. Interaction among non-usuric bank and business partners can be done in different ways.

Products & Services in new non-usuric Bank: Conventional products and services in non-usuric banking may belong to the following categories:

- **Depositories:**
- **Loaning:**

Deposits include Gharz-al-hassaneh or investment accounts. Gharz-al-hasaneh in the jurisprudential terminology is transfer of some properties to a person or leave it without receiving equivalent property. Since governments should fulfill the needs of needy peoples and make provision to access minimum livelihood condition for them, therefore they should collect money resources from tax and duties -or in Islamic countries from tithes (Zakat) for financing peoples' minimum livelihood. Thus attentive to strategic purposes of an economic enterprise which is profit maximization indeed it will be incompatible with generosity of money for free and couldn’t be expected from economic enterprise even non-usuric to accept responsibility of social security affairs.

Loan requirement for fundamental needs could be as marriage expenditures, marriage provisions, therapy of diseases expenditures, building maintenance repayment cost, educational allowances, building establishment allowances for villagers etc.

If new non-usuric banking wants to supply these types of products to customers, then bank could make provision some Islamic framework such as Hebeh contract and collects the necessary resources from following ways:

1. Government can pay money for poors in accomplishing her social security affairs and thus supply her own money resources allotments to consumption loans applicants by delivery channels of banks as Hebeh contracts.
2. Non-usury bank can deliver Gharz-al-hasaneh deposits for fulfillment of consumption loan applicants (if criterion of free loan is removed).

Hebeh contract may be applied as outsourcing, so depositors can give their money resources in trust to the bank and then introduce persons who are needy and eligible to receive consumption loans. So, they use this resources and loaner repay its installments without surpluses. Non-usuric bank can collect commission fees according to contract context from one or two sides of transaction for her intermediary services between depositors and loaner.

New non-usuric banking in relation with investment accounts can do as following ways:

- ✓ **Establishing of stock exchange agency company or other exchange markets and customer portfolio proportional to amount of their deposits:** In this way stock exchange agency companies will invest money resources of customers in financial markets, and portfolio of each customer is specified and encrypted certificate of deposit is send to customer through digital channels. To increase security, digital certificate authorities confirm issued certifications.
- ✓ **Direct investment by investment company belonging to non-usury bank**: Non-usury bank can accomplish direct investment by establishing investment companies. Projects durations and their yields scheduling should be suitable with bank's liquidity risk to cover principle and its return of investment of depositors. The Investment Company of non-usuric bank by evaluating projects makes necessary provisions to invest or participate in investment projects. Therefore, it is necessary that Investment Company forecasts duration of investments and their returns and should manage risks of projects by assistance of insurance companies. Investment Company introduces and proposes her securities and shares to customers and depositors. Customers by investing through purchasing Investment Company's shares can monitor the physical and financial and managerial progresses of projects by CRM system.

Non-usury bank considers and monitors all transactions by Real Time Gross Settlement (RTGS) systems and estimates project progress trend, investment return and expenditures by applying WFM systems. Therefore investment profit or loss will be shared among depositors, business partners by proportion of their shares.

Real Time Gross Settlement (RTGS): Distribution of profit is a complex process in Moshrekeh and Mudarebeh contracts which involve integrated systems supporting multi-currencies and WFM systems in different layers. Interactive and integrated capabilities and existence of standards of information will initiate connectivity capability among other intranet systems as SWIFT, central bank as administrator of Automatic Clearing House (ACH) and RTGS with other internal or external banking interfaces. RTGS system monitors and manages daily liquidity risk both in bank and customer levels. RTGS should possess information resource integrity and as a module of plan should be able to perform End-to-End processing in a way that all payment transactions be managed through delivery channels as SWIFT, fax, E-mail, telephone, telex and mobile devices.

The process will be managed with minimum human interferences, minimum error, high security aspects and confirmation acknowledgments. Integrated information system properties as payment order message processing and tracing capability, transaction auditing will be done by WFM**.**

IT in non-usuric banking in comparison with usuric banking: IT systems accompanying with complement information systems can connect non-usuric banking information resources as rings of a chain, therefore depositors as stakeholders of a company will be investment patron which is an extreme purpose of non-usuric banking. Interaction among non-usuric bank and business partners can be done in different ways. The items have shown in below summarize IT based non-usuric banking in comparison with conventional non-usuric banking in three category. All of details in each category are indicators of high efficiency and effectiveness of IT based non-usuric banking in comparison with conventional non-usuric banking.

- Transparency in PLS mechanism establishment :
  1. Initiate a systemic connectivity and transparent relationship between components.
  2. Eliminate time factor in profit progressive calculation.
  3. Increasing competition for investment in real economy because of existence of WFM capabilities.
  4. Enjoyment all of components from real economy activities.
- Economical, financial, social effectiveness:
- Stability in financial markets and prevailing FSF standards.
- Standardization in operational, supervising and management process.
- Access to international markets.
- Satisfaction and tranquility of customers.
- Decrease of investment cost and increase of productions in the society.
- Dampening money laundering activities.
- Depositors will derive actual investment returns of economic activities.
- Expansion and development of social justice in the society through better allocation of resources.
- Risk management:
- Less operational, liquidity, market and morality risk.
- Continual accounting and auditing process capabilities on Moshrekat or Mudarabah contraction by use of WFM system.
- Transparency of financial sound situation of bank and accessible actual capital adequacy ratio for embracing liabilities and ability for international non-usuric inter-banks financing.
- Attraction of customers and expansion of market because of sound financial stability resulting from enjoyment of customers from real economy yields.

Conclusion:

- ✓ In spite of various attempts of Islamic and non-Islamic countries for executing non-usuric banking, there is no important achievement in general understanding of non-usuric transactions and their standards. One of the important proposals to fulfill non-usuric banking is "NUBankCo".
- ✓ But fulfillment of PLS mechanism and establishment of NUBankCo will be more realistic and more effective by applying IT based systems as BPR, ERP, CRM, SCM, MES, HRM, WFM, K-M. Because all these systems possess integrity characteristics, and use a unique data warehouse and they are components of a unique system and are responsible to handle specific functions.
- ✓ This capability requires external interfacing, gateway and RTGS with security characteristics of integrated information.
- ✓ Standardization in all processes and practices of operational, supervising and managerial aspects should be done by an independent organization to fulfill this type of banking.

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