STRAIGHT THROUGH PROCSSING (STP) TECHNOLOGY AND GLOBAL FINANCIAL MARKETS: ITS CURRENT STUTUS AND FUTURE DEVELOPMENT

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ABSTRACT

The financial services sector has been undergoing rapid change on a global basis. The number of global securities trades is doubling every three years. Cross border trades account for approximately 20% trades in USA, the largest financial market of the world. However, everyday, under the current T+3 settlement cycle in US Stock Exchange, approximately US$1.8 trillion worth of trades remain outstanding globally, which is the daily exposure to dangerous operational risks. Facing these new challenges in world's financial industry, a new technology, Straight Through Processing (STP), seems a viable solution.

As an emerging new technology, STP has been a new concept to many financial institutions in the world as well as some IS researchers. This research paper intends to give an introduction to this new technology in terms of its brief history of the development, its definition, and benefits of implementing STP in global financial markets. Further, based upon the successful experience of implementing STP in global financial institutions by KPMG Consulting, some specific STP implementation approaches are discussed and a brief case study is provided. Finally, future studies on STP are presented.

1. INTRODUCTION

The financial services sector has been undergoing rapid change on a global basis. Based on data from NASDAQ of USA, the value of equity transactions has increased dramatically from US$27 million daily in 1980 to US$27 million every 3½ minutes in 2001. The New York Stock Exchange (NYSE), USA reported an increase from US$382 billion (13,015,000 trades per year) in 1980 to US$11.2 trillion (221,040,000 trades per year) in 2000. The world's total equity market capitalization is US$40 trillion in 2000. The number of transactions in the global equity markets is US$1.8 trillion in 2000 (1.2 trillion in 1999). The number of global securities trades is doubling every three years. Cross border trades account for approximately 20% trades in the largest financial market (USA).

However, everyday, under the current T+3 settlement cycle in US Stock Exchange, approximately US$1.8 trillion worth of trades remain outstanding globally[1]. According to the Securities Industry Association (SIA), a reduction in processing time would reduce the daily exposure to operational risks by US$250 billion currently in the US to in excess of US$760 billion by 2004[2]. Further, 25% of all cross-border trades fail or need serious intervention, and over one-third (37%) of the cross-border trade failures can be attributed to late or no specific instruction for the cross-border trades, mismatches of stock amount/cash amount, and invalid cross-border trading instructions[3]. In the US, only 4% of domestic trade, and 8% of cross-border trades, are completed without errors. Since about 20% of US trades are cross-border trade, this implies that 60% of the US cross border trades are prone to errors.

Facing these new challenges in world's financial industry, a new technology, called Straight Through Processing (STP), seems a viable solution. EDS, USA estimates that

[1] Securities Industry Association, "T+1 Business Case Study," www.sia.com/T+1
[2] Ibid
[3] Mercator, (July 3, 2001), Executive Briefing-KPMG.

changing from T+3 to T+1 in NYSE, USA can remove US$760 billion and US$1.8 trillion of pending operations risk[4].

The US Securities Industry is scheduled to move from T+3 to T+1 in mid 2006. This will compresses the settlement time in the financial industry. The enormous size of the global financial industry, its complex credit exposures, and the globalized structure of its technology and business processes, are leading to increased complexity of implementing STP in global financial institutions.

Various segments of the financial industry, such as asset management, capital markets, insurance and wholesale/retail banking are interconnected and interrelated (Figure 1).

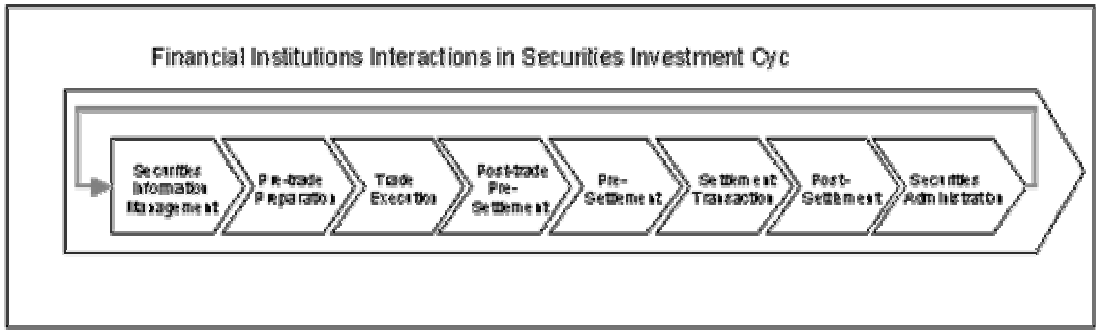

Figure 1. The Financial Markets Are Interrelated

Financial markets in the world are interrelated as well – a major change in one market will have significant impact on other markets. A change in one market will cause adjustments in other markets. After US Stock Exchange decided to change T+3 to T+1, the world's other major financial centers such as London Stock Exchange, Tokyo Stock Exchange, and Hong Kong Stock Exchange have already been working on specific plans for STP implementations, which will in turn influence smaller financial markets in Europe and Asia to follow up in the near future.

As an emerging new technology, STP has been a new concept to many financial institutions in the world as well as some IS researchers. This research paper intends to give an introduction to this new technology in terms of its brief history of the

[4] Kumar V., and David G. (2000), Global straight through processing: The evolution continues, EDS

development, its definition, and benefits of implementing STP in global financial markets. Further, based upon the successful experience of implementing STP in global financial institutions by KPMG Consulting, some specific STP implementation approaches are discussed and a case study is provided. Finally, future studies on STP are presented.

2. A BRIEF HISTORY OF STP DEVELOPMENT

The Industry Standardization for Institutional Trade Communications (ISITC) was set up in 1992, focusing on standardizing the links and format of trade settlement instructions and other messages among fund managers and custodians in global financial markets.

The Financial Information Exchange (FIX) was also formed in 1992 to deal with pre-trade and trade communications among counterparties. FIX's objective is *"to improve the global trading process by defining, managing, and promoting an open protocol for real-time, electronic communication between industry participants, while complementing industry standards"*[5].

In 1999, a key new standard to facilitate STP implementation became available. The ISO 15022 standard permits migration of the securities industry to a standardised use of XML, guaranteeing interoperability across the industry and others. As they move to their universal standards, each country or region will need to adapt their current message formats to suit.

One of the first initiatives taken by Fidelity Investment, USA (the largest fund management corporation in the world) in establishing the Electronic Trade Confirmation (ETC) facility was to provide electronic post-trade communications among fund managers and brokers. The availability of industry message standards such as ISITC, FIX, and ISO 15022, has enabled this seamless automated trade processing.

[5] Greensted R, (2001), "It's About Time: The coming Revolution in Trade Processing", OMGEO

Currently, the two major central matching approaches to STP are the GSTPA and OMGEO models. Both entities have significant market presence and are important in the move toward T+1, and both also support the emerging STP standards.

OMGEO was a joint venture between TradeSuite of the Depository Trust & Clearing Corporation (DTCC) and Thomson Financial ESG, a division of Thomson Financial in 2000. Its objective is to create the leading global trade processing platform and bring the securities industry closer to shortened settlement cycles.

The core component of STP solution in OMGEO model is the Intelligent Trade Management (ITM): a centralized matching service platform for trade processing, trade confirmation, matching and reporting. ITM is to replace the sequential exchange of trade information. The model enables financial firms to build on existing services and infrastructures and migrate towards STP in pace with internal timelines.

GSTPA was founded in August 1998, and is an industry association opening to all Investment Managers, Brokers/Dealers and Global Custodians involved in the processing of cross-border trades. Current members comprise of 89 industry leading Investment Managers, Brokers/Dealers, and Global Custodians. Its objective is to accelerate the flow of cross-border trading information, to reduce the number of failed cross-border trades and to reduce the risks and the costs of cross-border trade settlements. KPMG Consulting plays an important role in this model.

The backbone of GSTPA model is multilateral interconnectivity designed to enable investment managers, brokers/dealers and global custodians to inter-operate in the process of trade enrichment and matching. The core component of the solution is the Transaction Flow Manager (TFM), which uses industry standards (ISO 15022, ISIN, BIC). The interface between participant clients and TFM is via a concentrator. Three banks (Chase, Bank of New York and State Street Corp.), one brokerage (Merrill Lynch) and three vendors (SunGard, ADP and Canada's Financial Models) have agreed to function as concentrators.

So far, STP is still at its early stage of development. More challenges as well as exciting development exists ahead.

3. THE BENEFITS OF STP

3.1 Efficient and Faster Response Times

By making trade information available at the right time, STP allows for "just-in-time" processing of cross-border securities trades. For example, the implementation of STP by Colonial First State Bank (CFS) of Australia has enabled it to update its cash and stock positions four hours earlier than previously possible and shortened the transaction process from 20 minutes to 5 minutes[6].

3.2 Cost Reduction

STP eliminates unnecessary processes and replication of work, and automates many processes involved in cross-border securities trading. Cost reduction is therefore achieved through the elimination of manual processing of paper-based transactions, and the consequent re-deployment of employees.

3.3 Risk minimization – reducing the incidence of trade failures

According to SWIFT, 25% of all cross-border trades fail or need serious manual intervention, and over one-third (37%) of trade failures can be attributed to a lack of STP[7]. A significant decrease in trade failures could substantially reduce the risk exposure of a financial firm. With the introduction of STP, it is expected that the failure rates could fall to as low as the 5-10% range[8], representing a major improvement in the reduction of trade failures over the pre-STP environment.

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[6] Mercator, 'Mercator Technology Speeds Cash and Stock Information Updates for Colonial First State', *Mercator*, <http://www.mercator.com/news/pr/colonial.html>, 19 June 2001, (19 July 2001).

[7] Mercator, (July 3, 2001), Executive Briefing-KPMG.

[8] Cap Gemini Ernst & Young, The Human Consequences of Global Straight Through Processing.

3.4 Increased Customer Satisfaction

STP can help organizations to improve customer satisfaction in a number of ways. For instance, in the FOREX environment, STP allows customers to have easier access to research and analysis; quicker and more comprehensive price discovery; and more transparency and efficient processing[9].

4. THE DEFINITION AND CONCEPTUAL FRAMEWORK OF STP

STP is at its early stage of development. There have existed different views and understanding of STP conceptually. So it is important to have a comprehensive definition and conceptual framework of STP to guide the further implementation of STP in global financial markets.

STP is a strategic operating principle focussing on optimising process design and technology to improve customer service, and significantly reduce operational costs. It involves moving electronically through a trading process from initiation through post-execution and final settlement without manual intervention[10].

The series of uninterrupted electronic processes of STP has the following characteristics:

- Securing an initial transaction as an electronic message (a transaction encompasses any activity, not just orders, associated with trading currency and/or securities);
- The core processes of STP can include order processing (from indication of interest to order routing, order execution, and order confirmation); the internal link between traditional front, middle and back office; external links to clearing and settlement, custody and safekeeping; and to all customers and suppliers at every stage of the processing cycle; and,

[9] 'Forex ventures beyond the phone', *Euromoney*, May, 2001.

[10] KPMG, (2000), " Preparing For Straight Through Processing"

- According to Levi and Blackman[11], STP provides a means of pulling back together disparate components of a securities trade, which are separated by technology, systems, and processes, to achieve a seamless trade.

Financial firms are moving to integrated connections for direct interactions/transactions with customers, partners and suppliers. All concerned parties need to work with the same data and information standards.

The Internet is an open system which allows interconnectivity and collaboration across all sectors of industry. Such a global system utilizes standards that are universally deployable.

Taking into consideration the distinction between internal processes (within a firm and its subsidiaries) and external processes (with other trading partners or customers' processes), and the integration level as well as connectivity between the two types of processes, we can propose a conceptual framework for STP as illustrated in Figure 2 (adopted from Hee, Chen and Huang, 2003).

[11] Levi, J., and Blackman, A. (1997), The quest for a global STP backbone, Global Investor, London

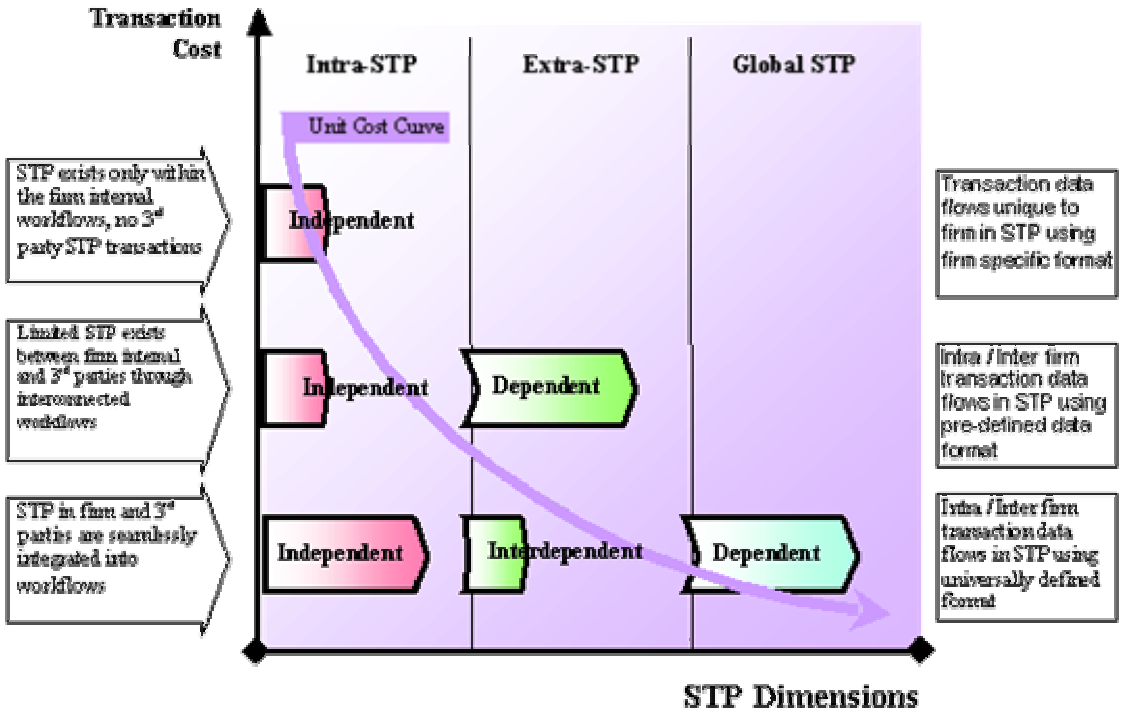

Figure 2. Conceptual STP Framework

The proposed conceptual framework includes "intra-STP", "extra-STP", and "global-STP". Intra-STP refers to STP implementation inside an organization and all of its branches. Extra-STP refers to STP between financial firms which allows direct access into other companies' internal processes, and facilitates an industry-wide integrated straight through process. Global-STP refers to a set of interconnected extra-STPs that covers worldwide boundaries. It represents the level of integration of core processes, systems and information interchange within firms, between firms, and between industries. It is the largest and most complicated integration of STP.

5. STP IMPLEMENTATION IN GLOBAL FINANCIAL MARKETS

The STP automation of the processes of financial trading to eliminate manual intervention represents a significant change in business process management in global financial markets.

Due to the complexity of global financial markets, STP implementation is a huge complicated project. It would be very difficult to succeed if not a suitable STP implementation approach is adopted. Therefore, a systematic implementation is needed to realize the full benefits of STP, and improve operational success rate.

There are two main approaches to implementation: Process re-engineering approach, focussing primarily on process redesign; and Technology re-structure approach, primarily driven by technology.

5.1 The Process Re-Engineering Approach

In the practical world of business, every organization has its own version of process – not only for the needs of that business but also to differentiate products and gain a competitive advantage.

But, traditionally, the business processes of large organizations have a significant number of repetitive and non-value added tasks. In the traditional financial trading process, data is passed manually in different structure, style and formats through different channels.

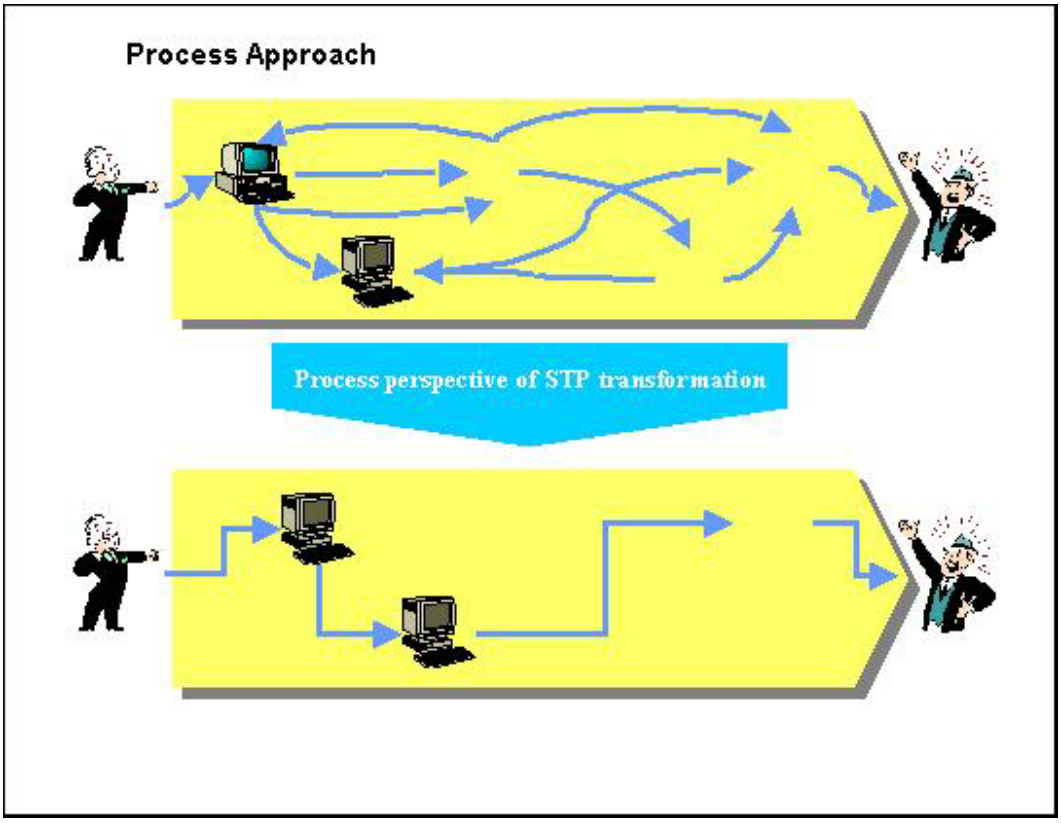

Figure 3. A process re-engineering approach

In order to reduce the cost and risk of manual processing and failed trades, and to create competitive advantage and trade opportunities, a compressed business process is desired. Furthermore, according to Gemini SA Consulting, the major sources of inefficiency of traditional processes are at the boundaries of organizations and functions[12], hence if they are properly re-engineered, significant benefits can be realized. Figure 3 above shows this approach.

The result of the re-engineering exercise will greatly reduce the time for the "end-to-end" process whilst reducing the operational costs.

This approach is exemplified in the "One date roundtrip, T+1" settlement proposal by Jill Considine, Chairman and CEO of Depository Trust and Clearing Corporation (DTCC)[13].

[12] 1999 Cap Gemini SA - Proprietary and Confidential
[13] http:// www.swift.com, 19/07/2001

His proposal is to implement "industrial liposuction" that removes the unnecessary "fat - redundancy process" in the trade settlement activities to shorten the trade cycles and reduce the manual processes.

Process re-engineering involves a radical redesign of business processes to achieve improvement in performance. The complete re-engineering approach has a significant impact on an organization and its people, which could lead to reluctance to embrace full re-engineering of the process.

Without a long-term plan, good project management, and senior management commitment, it is likely that this approach will fail, or at least not realize the full potential benefit.

Nevertheless, the process re-engineering approach can bring about several benefits, such as cost reduction, expansion of trading boundaries, reduced turnaround time, and the potential for improved profit figures.

5.2 Technology Restructuring Approach

The technology re-structuring approah focuses on the application of technology to enable disparate systems to communicate with each other through the use of interfaces (applications).

For example, as shown in Figure 4 below, within an organization, data entered in terminal A can be sent to terminal B, D or E directly for the transaction to be processed. However, as there is no direct data sharing among the terminals, if terminal C requires the data from terminal A, the shortest route for data transmission will be either from terminal A, to B and then to C or terminal A, E to C. This process flow is cumbersome and frequently leads to delay.

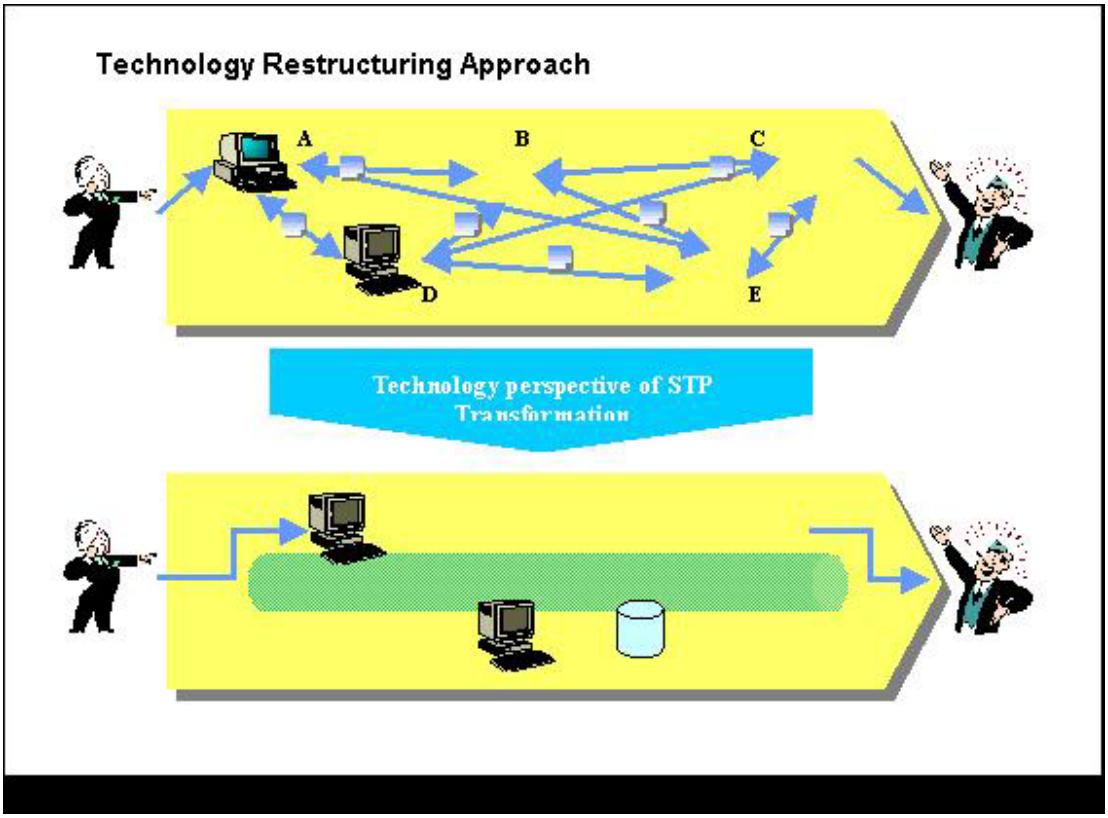

Figure 4. Technology Restructuring Approach

The technology restructuring approach builds a layer across the terminals to enable data to flow in line with the workflow. This approach reduces the need for maintaining multiple applications in the systems, and enables data to be shared across all processes.

All terminals are directly linked through network infrastructure like the bus infrastructure for PCs, so that the terminal C can directly acquire data from A without going through B. As this approach focuses heavily on the technology, the process or workflow is often not given sufficient attention, and opportunities to streamline the workflow are often not fully realized.

One of the predictable disadvantages of the technology restructuring approach is the idleness of the communication system. Duplicated data also occupies hard disk memories and increases the possibility of data violation and provide threats to data integrity. This scenario may extend to cross companies, industries and worldwide business process.

Further, by only integrating computer systems without changing business processes and related workflows, long term business benefits may not be realized.

On the other hand, technological systems integration would ultimately change business processes and workflow, which would result in political conflicts as well as human resistance. Due to the proprietary nature of some system development, a number of middleware applications lack a common platform.

6. A CASE STUDY OF STP IMPLEMENTATION

The following case study was conducted by KPMG consulting, one of the biggest consulting groups in the world.

Case Study– STP Implementation in a Medium Size Australian Bank

A medium size Australian bank asked KPMG Consulting to help its use of STP to integrate various functions, operations, and services into a single system in order to achieve common customer contact center. This is aimed to provide customers with better services where all the customers can get what they need. They also received the same services across all channels each time they use the services. For instance, they would be able to get a loan from any of the channels, whether it be Internet, telephone or bank personnel. As all the information of the customer is integrated and stored in common repository. Also, the transaction processing is captured in near real time. The benefits achieved are as follow:

Benfits

20% reduction in operations cost footprint
60-80% FTE savings within operations
Increased revenue (associated 10%)
Customer satisfaction and retention
Reduced staff turnover

The case demonstrates the benefits for a STP project with a focus on the firm's operations, does not apply only to a large financial firm. It is only the beginning of the process of realizing additional cost savings when synergies between firms are extracted. This project is clearly a step forward for the firm in its learning process for STP implementation.

7. FUTURE STUDIES

The move towards global-STP capability involves major changes in a company. There are many significant research issues to be considered for future studies.

(1) Technology Issues

STP implementation requires extensive technology reform at the enterprise level, working hand-in-hand with process re-engineering. Research has shown that 50% of the firms [14] undertaking STP implementation to achieve T+1 will need high levels of technology support.

A number of technology issues such as STP system architecture and systems integration are important for future studies.

(2) Compatibility

Compatibility of technology and systems among several participants in the industry is critical for 'global-STP' interoperability. But simply making diverse computer systems communicate with each other is not enough. Each system needs to understand the nature

[14] KPMG Institutional Survey, 2000

of the information it is handling; the content of a transaction; and how the transaction is to be manipulated. It also requires compatible platform for exchange of information.

(3) Reusability

The reusability of technology infrastructure is critical given the pace of change. This implies that STP technology needs to be consistent with the technology architecture developed by the firm.

To achieve a high level of technology and process synergy, the "technology architect" needs to have a good understanding of the business processes of the firm, as well as the future direction in the development of STP technology, to ensure that the technology resources and infrastructure are reusable, scalable and extensible to avoid layering costs[15].

(4) Management Information

STP solutions are complex. They bring processing capability together with wider concepts that aim to integrate and disseminate information within and outside a given institution[16].

Management information and reporting aspects of STP solutions will be needed to ensure that management is able to monitor and manage the business, internally as well as across its various channels, and to deliver real-time information to corporate and regulatory counterparts. Hence, how to effectively generate diversified and different management reports from different management levels and cross different financial institutions in different countries, is an important research issue for future studies.

8. ACKNOWLEDGEMENT

[15] KPMG Consulting – Financial Services, (2000), 'Best Bank'.
[16] Schmerken, I, (1998), 'Just-in-time STP,' *Wall Street & Technology*, New York.

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