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Hee, Jarrad;Chen, Yining;Huang, Wayne
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Straight Through Processing Technology in Global Financial Market: Readiness Assessment and Implementation

Jarrad Hee, BearingPoint Australia Pty. Ltd. (formerly KPMG Consulting), Australia
Yining Chen, Ohio University, USA
Wayne Huang, Ohio University, USA

ABSTRACT

With rising trading volumes in domestic and cross-border security transactions, risks faced by global financial firms and markets are increasing. To manage settlement risks and maintain competitiveness in global financial markets, the U.S. Security and Exchange Commission (SEC) has decided to shorten the settlement cycle of security transactions from the current T+3 to T+1. As a result, key players in financial markets will need to develop capabilities to cope with challenges arising from this impending change. One initiative for addressing the issue is referred to in the securities industry as Straight Through Processing (STP). STP provides a nonstop flow of information from trade execution to settlement. It is to be used for cross-border trades to speed up settlement, reduce risk, and facilitate the move toward T+1. This paper presents a general model of security trading processes under the umbrella of STP, and proposes a framework of STP readiness assessment from a global perspective of electronic business, which can be used to guide the STP implementation in organizations.

Keywords: straight through processing; cross-border transactions; electronic security trading.

INTRODUCTION

The financial services sector is undergoing rapid changes on a global basis. The NYSE reported an increase from US$382 billion (13,015,000 trades) in 1980 to US$11.2 trillion (221,040,000 trades) in 2000. Global equity markets are also growing at a fast rate with the number of global security trades doubling every three years. Whereas in the U.S., the volume of equity transactions has increased 17 times since 1980, 20% of these transactions were re-

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lated to cross-border trades (Baker, 2001). Financial markets in other countries are, by no means, isolated from the developments in the major global markets. For example, reported in its 2001 fact book, the Australian stock market has achieved an average daily trade volume of 58,718 trades valued at A$1.55 billion and is expected to show continued growth from local as well as global institutional and retail players.

Percentage wise, current estimates of online cross-border security trading volume are only in the 5-7% range and predominantly by sell-side users; yet online systems will continue to increase in importance as additional buy-side institutions overcome their hesitation and recognize the benefits of Straight Through Processing (STP) and order execution (Platt, 2001). Platt predicts that 10-15% of buy-side clients will be using online systems within the next 12 to 18 months and the growth trend will continue with no ceiling. "The ability to process cross-border security trades efficiently, with minimum manual intervention and fewer mistakes, not only supports larger foreign exchange institutions, but also allows smaller volume institutions to compete in a lower spread environment," (Platt, 2001, p.18). Though they present tremendous opportunities and potential, cross-border security trades also bring about problems and challenges to financial institutions.

CHALLENGES TO GLOBAL FINANCIAL MARKETS

In the United States

As far as end investors such as pension funds, mutual funds, and corporations are concerned, today's cross-border, post-trade securities processing environment increasingly represents poor value and dead weight on performance. Intermediary firms, such as investment managers, brokers, custodians, and clearers suffer from high fixed costs in the form of incompatible databases and manual procedures (Kirby, 1999). With every prospect of cross-border securities flows doubling every two or three years, there is a significant and growing level of risk exposure that needs to be managed. There are also significant inefficiencies in cross-border transactions across firms, as 70% of such transactions are currently performed using manually intensive methods. This has led to a failure rate as high as 15-20%, and caused delays in 60% of such trades. These failures are caused by data re-entry, lack of standards, delays, handovers, frequent manual intervention, and other breaks in the security transaction workflow. As a consequence, 40% of fund managers' back office cost may be attributed to reconciling these transactions. While cross-border transactions are more exposed to settlement risks and inefficiency, domestic transactions are not exempt from them. According to the securities industry association, under the current T+3 settlement cycle, approximately US$1.8 trillion worth of trades remain outstanding everyday. There is a growing consensus on the need to increase productivity and efficiency by reducing operational costs, mitigating risks to participants, and eliminating volume sensitivity to enable the business to grow (Kirby, 1999).

As an effort to reduce transaction failure and operational cost, the U.S. securities industry has scheduled to move from T+3 to T+1 in mid-2005 followed by one year of processing and testing. The effort, known as T+1 or trade-plus-one-day clearing, is mandated by the Security and Exchange Commission (SEC) to settle all

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trades within 24 hours. The T+1 effort, however, presents the security industry one of the biggest challenges, the challenge of having to create a global network that processes millions of transactions instantly, must interface with thousands of companies, and cannot afford to crash (Hoffman, 1999). The T+1 effort will require security industry players to completely re-engineer all of their trading processes as well as their underlying infrastructures. Trade groups such as the Securities Industry Association have already begun forming working groups of different firms to brainstorm to attack these issues.

One initiative that would help support T+1 is referred to in the industry as Straight Through Processing (STP), which is proposed to be used for cross-border trades to speed up settlement, reduce risk, and facilitate the U.S.'s move toward T+1 (Massaro, 1999). A group called the Global Straight Through Processing Association (GSTPA), which is made up of 40 firms, plans to build a global network to promote the more efficient flow of information to brokerages, custodians, and other firms involved in cross-border trade processing. Streamlining the information flows will reduce the number of failed cross-border trades by opening up connectivity among participants involved in post-trade, pre-settlement securities processing. According to GSTPA, a reduction in processing time would reduce US$280 billion daily from being exposed to operational risks in the U.S. With the SEC's impending rule change to mandate T+1, STP will be one of the top trends in investment-management technology for a few years to come.

In Other Countries

In other countries outside the U.S., such as in Australia, the pressure is mounting in the same magnitude. With rising trade volumes and cross-border security transactions, and the move from T+3 to T+1, key players in the Australian financial markets will need to develop capabilities to cope with challenges. Based on a case study by BearingPoint (formerly KPMG, in Australian financial institutions, about a third of the total failures in the business process across banking, insurance, capital markets, and investment management sectors may be related to the lack of Straight Through Processing (STP). While a significant number of breaks in business processes have been solved through various initiatives such as process re-engineering and cost reduction, a broader assessment of STP readiness needs to be carried out to precisely identify potential STP "hotspots" in the processes. These failures (hotspots) arise because of the complexity of the interactions among brokers, manufacturers, banks, custodians, financial consultants, and other third parties. These "end-to-end" business processes are highly fragmented and frequently require manual intervention, handling and dealing with system incompatibilities. According to Elliot and Briers (2001), in the financial industry, the "state of integration between a bank's internal systems is a real issue. Banks lacking the capacity for straight through processing recognize the need to build that capability."

Likewise, many Southeast Asian countries are currently at T+3 and undergoing movements toward STP. In the case of Malaysia, after the consolidation of banking industry, new banks launch to automate and to re-engineer their processes to achieve STP. Financial institutions are in the process of adopting new systems to enhance data management, integrating data and business processes, managing transactions across their entire life cycle (Alok, 2002).

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STRAIGHT THROUGH PROCESSING (STP) AS ONE POSSIBLE SOLUTION

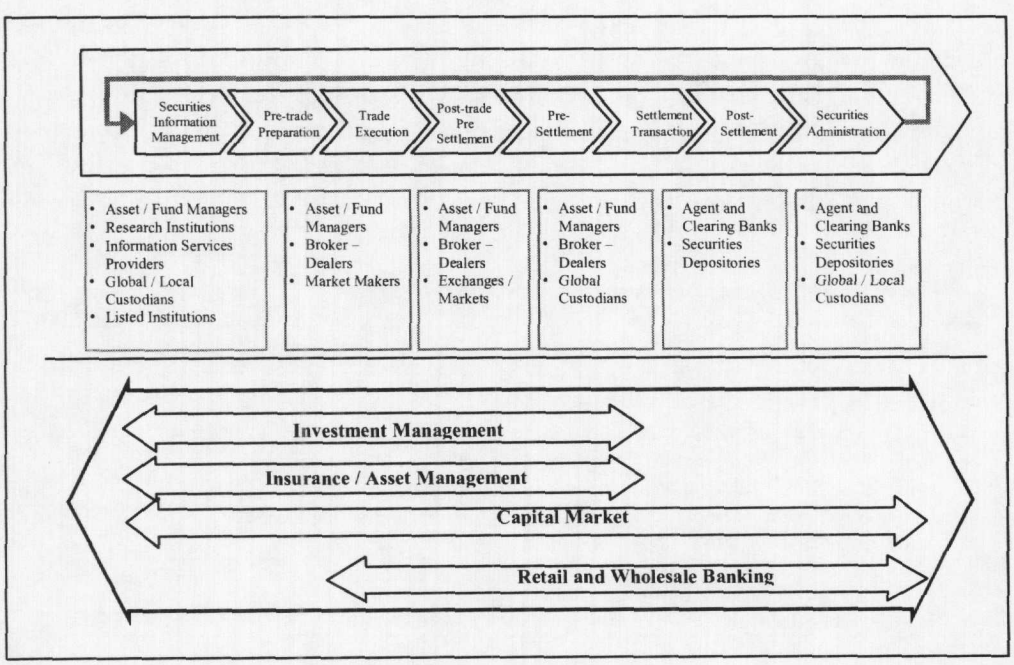
Straight Through Processing (STP) is defined as the end-to-end automation of security trading process from order to settlement (Hee and Huang, 2002; Anonymous, 2001). It involves the seamless, automated electronic transfer of trade information to all parties in as close to real-time as possible. It also involves moving electronically through a trading process from initiation through post-execution and final settlement without manual intervention. It aims to achieve:

- No re-keying of information once the transaction has entered the workflow;
- Automatic linkages and paperless processing from front-end to back-end, regardless of the parties involved, or their geographic location;
- Workflow automation to facilitate transaction monitoring and exception alerts;
- Manual intervention or data processing only on an exceptional basis.

Properly implemented, STP can increase efficiencies, improve customer services, and reduce operational costs and risks. Figure 1 depicts the security trading processes as well as the participating parties that are under the umbrella of STP.

STP may be implemented in different levels. *Intra-STP* refers to STP implementation inside an organization and all of its branches. *Extra-STP* refers to STP between firms that allow direct access into other companies' internal processes, and it 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

Figure 1: Trading Processes And Participating Parties Under STP Umbrella



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between industries. As the implementation of STP expands, cost reduction effect escalates.

STP READINESS ASSESSMENT

More than half (51%) of the IT and business managers representing 113 financial services firms, who attended a Wall Street conference on straight through trade processing in January 2002, said they have not begun upgrading their organizations' IT infrastructure and business rules for the purpose of reaching straight through processing goals (Mearian, 2002). Among them, 41% are still evaluating how to move to straight through processing and T+1 and the remaining 10% have not even started to evaluate their systems. In his letter to the industry regarding T+1, the former chairman of SEC Arthur Levitt urges the securities industry to focus closely and promptly on what changes the industry must make to prepare for T+1 and to dedicate the resources necessary for this effort (Levitt, 2001).

Nine challenges of implementing STP are identified and discussed below. Financial institutions can use them to self evaluate their status. The degree to which the current operating state of a firm is different from the likely future scenario demonstrates the level of readiness the firm has for STP. The specific items in the nine challenges can be easily converted to a Likert scale checkbox form to measure the readiness of a firm's STP implementation. Firms with operations that are predominantly described by the current state situation in the nine challenges are at risk of falling too far behind in the STP "race". They may experience greater difficulty in reaping the full benefits of STP compared with their competitors who have already begun the process. Firms that begin the transformation of their organizations earlier will be able to leverage from their learning process and be ready to join the network of other STP ready counterparts.

STP IMPLEMENTATION

The success of a firm's STP initiative goes beyond technology and systems integration. It re-defines the way of running a firm's operations and needs to be done systematically. It is dependent on a firm's ability to merge process, technology, structure, and culture into a single cohesive force to address the challenges posed by STP. As Borelli and Auxier (2002) stated, "to achieve real STP and T+1, many diverse transactions, system functions, and operations must occur simultaneously. This highly parallel-processing environment will

Challenge 1: Attain single point data capture process	
Current State	**Likely Future Scenario**
■ Redundant re-entry of data in process ■ Paper based processing /execution requiring manual input ■ Multiple independent front-end and back-end systems ■ Entry of security master information into multiple systems in value chain and manual scrubbing of security master files ■ Exception report or paper based document to manually adjust / correct entries across multiple system ■ Multiple work stream / system for different sub processes ■ Manual workaround for low volume specialized products	■ Single point for all data capture – non disparate data ■ Entry of instructions occur once only in the continuous interaction cycle

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Challenge 2: Fully automated internal workflows	
Current State	**Likely Future Scenario**
■ Manual initiation of pulling executions from front to back office ■ Frequent need to re-enter or re-initiate data transfer across system ■ Batch files frequently used to transfer data across workflows / systems ■ Specialized and unique requirements need to be manually monitored in the front, middle or back end ■ Transactions completed in batches before being relayed to next stage processing ■ Frequent manual and exception processing throughout the internal process	■ Automated and fully integrated / seamless workflow management process ■ Limited exception-based processing and control processes ■ Alerts automatically and near immediate relay for further instructions

Challenge 3: Fully automated external workflows	
Current State	**Likely Future Scenario**
■ Batch processing of transaction data across to third party systems for information interchange ■ Front-end distribution channels not fully interfaced with third party systems on near real time basis ■ Back end interface with third parties occur at predefined intervals ■ Certified records of holdings require manual intervention and frequent adjustments ■ Selected domestic and international contracts requires manual fax confirmation to custodian or settlement parties	■ Automated and fully integrated / seamless workflow across third party systems ■ Fully electronic holdings ■ Alerts automatically and instantaneously relayed for further instructions ■ Full and continuous electronic linkages between third party systems

Challenge 4: Practical real time processing	
Current State	**Likely Future Scenario**
■ Systems run on manually initiated batch process, resulting in accumulated transactions ■ Notification or confirmation of transaction occur only after batch files uploaded, resulting in blocks of idle processing capacity ■ Adoption of "end-of-day" processing practices ■ Designated system will go off line for batch transaction processing ■ Momentary gaps or delays in confirmation feed between transaction event and actual processing, creating risk exposure ■ Computation of asset market value based on closing prices (static) rather than actual prices (dynamic)	■ Infrequent batch cycle needs to be replaced with practical real time processing ■ On line processing rather than off line processing

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Challenge 5: Front, middle, and back-office total connectivity	
Current State	**Likely Future Scenario**
■ Cross-border transaction requires manual re-entry of instructions and re-entry of confirmation – current practice constraint by regulatory requirements ■ Limited connectivity between front, middle, or back office systems ■ Incompatible systems across front, middle, and back office system ■ Single purpose and ridged applications built for system interfaces ■ Segregation of transactions in offices to manage and control risks across departments ■ Product centric type processing in system	■ Seamless integration within and across office systems (intranet and extranet), domestically, and internationally ■ Real time risk monitoring and management systems ■ Single office space concept, removal of front vs. back office separation of processing

Challenge 6: Adopt industry standards and protocols	
Current State	**Likely Future Scenario**
■ Adoption of selected domestic industry standards in some cases, and limited application of international standards ■ Messaging standards not utilizing the full capability of XML-enhanced features ■ Institutions develop proprietary codes for use, often based on unsystematic code assignments or firm specific codes ■ Cost of maintaining links across system without standards increases cost of links	■ Concerted development and adoption of industry standards and protocols ■ Implementation and utilization of existing and emerging industry standards to enable efficient exchange of data ■ Widely adopted or emerging industry standards (Security Identifiers: ISIN, Counter-parties Identifiers: BIC, Currencies: ISO, Messaging: XML, SWIFT, FIX, ISITC, Data Standards: ISO 15022).

Challenge 7: Multilateral interfaces with third parties	
Current State	**Likely Future Scenario**
■ Frequent use of email, fax, and phone for execution and transference of instructions between third parties ■ Significant levels of manual information exchange across multi-parties in international transactions ■ Manual matching / reconciliation of instructions with transactions or funds in cross-border trades ■ Transaction details frequently not relayed on real time basis (e.g. domestic trades processed overnight in batch files, international trades by ISITC files frequently during the day) ■ Funds processing and clearing performed in batch modes across third parties	■ Global adoption of emerging standards for messaging to achieve efficiency and improve cost for maintenance of linkages ■ Internal systems to maintain state and share with Virtual Matching

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Challenge 8: Just -in-time data enrichment	
Current State	**Likely Future Scenario**
■ Movement of data across networks and workflows not enriched in a timely manner, they remain in "suspension" whilst waiting for additional / new data to be built onto it ■ Transactions process frequently remains in "suspension" during transition from a few minutes to days of elapse time although actual applied processing time only requires a fraction of a second	■ Data enrichment should be made with appropriate data whilst flowing through the network ■ Participants in the process will actively facilitate the virtual enrichment of data to push the transaction to completion ■ Move towards a "zero latency" data transmission and fulfillment

Challenge 9: Global STP implementation process capabilities	
Current State	**Likely Future Scenario**
■ Lack of theoretical framework to understand implications of Global STP workflows ■ Evolving concepts / models across industries ■ Limited exposure to STP project management capabilities	■ Practical knowledge of robust and proven STP rollout methodology ■ Ability to re-design, manage, and continuously upgrade STP infrastructure

need to be supported by a complementary-technical architecture and organization design."

Operating financial services in this increasingly globalized world will yield long-term benefits for the firm with a global centric view of doing business. The most successful firms will adopt new and innovative *intra-STP, extra-STP* and *global-STP* propositions that cut across the firm, third parties, and national boundaries. STP is built on a customer-centric approach that will give a better understanding of customer needs and motivations and lead to a better opportunity to realize the full potential of STP. Implementing STP requires organizational learning, which often requires lead-time for firms to absorb and become part of their culture. As a firm progresses from an *intra-STP* to *extra-STP* and *global-STP* operating environment, it will build on its capabilities and increase its competitive and strategic advantage.

Currently, only a handful of institutions in the financial industry have taken on the global STP challenges. The case study in the appendix summarizes a STP project conducted by the BearingPoint in Australia, following the STP readiness assessment framework presented above. It highlights some of the benefits of embarking on STP readiness assessment and implementation. The tactical benefits include reduction in transaction costs, error rates, risk exposure, increased capacity and operational efficiency in transaction processing, and improvement in customer service through knowledge management. The strategic benefits include the opportunities to develop new products, the ability to extend businesses into new markets globally, and the flexibility via open-systems enterprise architecture.

CONCLUSION

The rapid growth and recent T+1 development of cross-border security trading have an impact not only on investment firms and the capital markets in which they operate, but also on surrounding banking and insurance institutions. Firms that do not have the capability to complete the

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transaction cycle effectively will be forced out of the industry. To remain competitive, firms need to address the challenges brought about by STP immediately. Global-STP capability may not be achieved by simply initiating a series of projects to address the challenges. It needs to be approached by a well-orchestrated re-engineering activity, and enterprise-wide technology solutions. Firms should take a holistic view of change–the use of process re-engineering with technology integration. It should be performed in an integrated approach rather than distinctive process re-engineering projects or technology initiatives. The change must also embrace the concept of the "continuous interaction cycle" approach, as STP transactions must satisfy the requirements of all the parties concerned in order to achieve its intrinsic value. Considering the proposed T+1 implementation timeframe, financial firms need to assess their readiness for STP, and begin the process right now.

STP is an emerging technology that has a potential to substantially enhance the effectiveness of cross-border security trading and the development of global financial markets. However, research on STP has been laggard and limited. Opportunities as well as challenges lie ahead when STP is being implemented in financial firms and institutions in the USA and other countries around the world. This study proposes an STP readiness assessment framework that can help manage STP implementation risks and increase STP implementation success rate from a global perspective of electronic business. Future research may further study STP implementation strategies based on the STP readiness assessment framework proposed by the current study.

APPENDIX

Case Study - Global Asset Management Company

A leading asset management company with operations dispersed globally is responding to changes in the securities industry with respect to compressed trade settlements. The project objective was to analyse the transaction-processing environment and make specific recommendations for changes needed to support compressed settlements, T+1, connectivity to GSTPA and a domestic trade match utility. The project also developed tactical recommendations to facilitate short-term improvements to their current environment and long-term strategic recommendations to support future business initiatives and industry trends.

Benefits

- Detailed current state review of business processes and global technical architecture
- Strategic assessment for conformity to STP best practice and readiness for T+1
- Development of high-level future state framework
- Future state roadmap highlighting requires technical and operational changes
- Internal and external communications strategy

BearingPoint worked with the client's technical and operations staff to build a current state transaction flow model. This was the basic building block driving a gap analysis leading the organization to a future state model. Utilizing subject matter experts in the areas of technology, GSTPA, and securities processing, BearingPoint delivered an analysis, showing the organization where the future lies for participants in the Investment Management arena.

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Jarrad Hee, is a (Senior) Manager in Strategy and Business Process, Financial Services in BearingPoint Australia. Dr Hee has successfully managed and led project teams across the Far East and Australia, and has consulted for senior executives in numerous international high profile wholesale and retail banking, and capital markets engagements. His focus areas are in business integration / transformation strategies, re-engineering and enterprise-wide IT strategies. Prior to joining BearingPoint, he held an executive position in the capital market industry in Singapore. He has a MBA and BBA (Merit), and was an Australian Commonwealth Research Scholarship recipient conducting doctoral research in strategic management. Dr Hee has published numerous professional white papers and his research interest includes financial industry transformation strategies.

Yining Chen, Ph.D., is, Associate Professor, School of Accountancy at Ohio University. Her current teaching and research interests are in accounting information systems, financial

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accounting, and auditing. Professor Chen earned her doctorate from the College of Business Administration, University of South Carolina. She was Assistant Professor of Accounting at Concordia University in Canada for two years. She has also held instructional positions at the University of South Carolina. Professor Chen has authored articles in Auditing: A Journal of Practice & Theory, Journal of Management Information Systems, Issues in Accounting Education, Review of Quantitative Finance & Accounting, Internal Auditing, Journal of End User Computing, and Journal of Computer Information Systems.

Wayne Huang is associate professor at the Department of Management Information Systems, College of Business, Ohio University, USA. Wayne has more than 12 years' teaching and research experience at research universities worldwide including US, Australia, Singapore and Hong Kong. He worked as a system analyst in IT industry before joining academic field. His research areas include eCommerce, mobile commerce, groupware, computer-mediated communication, and eEducation. Wayne has published more than 50 academic & professional papers including JMIS, DSS, I & M, IEEE transactions, European Journal of Information Systems, and JGIM. He was invited to present his research work in US, UK, Australia, Austria, Denmark and Japan. His research paper has been awarded with the Highest Quality Rating certificate by ANBAR Electronic Intelligence, UK, 1999.

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