STP in Securities Industry

While much has been written recently about Straight Through Processing, there is still a need for clarity regarding what STP is, why it is needed and how it will be implemented. These basic questions will be addressed in a series of two articles.

- This article defines STP and introduces some of the potential STP solutions.
- The second article will cover the planned changes to the infrastructure and potential solutions for improving:

    - Internal processing to reduce risk and control cost
    - Communication between firms and the worldwide securities industry infrastructure

WHAT IS STP?

STP is a major topic at industry conferences and in numerous articles, yet there is no common definition of what constitutes Straight Through Processing. Some of the interpretations are:

- Processing without human intervention
- End-to-end computing
- Paperless processing
- Exception-only processing

Each of these interpretations is valid, depending upon the viewpoint of the reader. However, regardless of which of these interpretations is adopted, one overriding question remains: When does STP begin and end?

- Does STP include pre-trade processing and trade processing as well as post trade processing?
- Does STP only consider firm to firm interfaces, or does it also include the processes within a firm?
- Are customer interfaces also included?

In The Summit Group, we believe that for the industry to effectively have Straight Through Processing, both internal and external connectivity will have to be established, from the initiation of the transaction by the customer through to reporting the completed transaction to the customer. At TSG, we regard STP to be 'Customer to Customer Automation'.

VISION OF THE FUTURE

In 1998, The Summit Group evaluated the implications of these trends and established a five-year vision of the future for securities processing. Events of the last year have substantiated these conclusions, which were organized into two categories:

MARKETING

Firms will increasingly use technology such as Customer Relationship Management to provide one to one marketing, which will use 'high tech' solutions to achieve 'high touch' relationships with clients.

Markets for different instruments in different regions and countries will become increasingly homogenous and the retail market will act more and more like the institutional market, with the exception of block trades.

Despite slow-downs in Asia, crises in Russia and risk in emerging markets, the world economy will continue to move towards deregulation as capitalism becomes even more pervasive. This will increase competition from traditional as well as non-traditional participants.

Utilities such as exchanges, depositories and clearing houses will have to compete in order to remain relevant. They will compete with each other, as well as with vendors.

PROCESSING

Fewer process steps will be required to complete transactions due to automation and a shorter settlement cycle. This will continue the industry's evolution away from clerical staff towards technically proficient people at all levels who will be in increasingly short supply.

The traditional operations functions will disappear as the best people are refocused into areas such as risk management, technology evolution, customer satisfaction, exception processing and new product development.

Firms will continue to oscillate between centralization and decentralization to reduce cost. There is no optimal solution. Some firms will be moving towards one end of the pendulum's swing while others move towards the other end as firms increasingly understand that they obtain their benefits from the process of managed change and activities such as Continuous Process ImprovementTM, rather than from any one organizational philosophy.

The increased use of standards will make more connectivity possible and increasingly necessary. Increased connectivity will reduce rekeying of data, increase the use of exception-only processing, and establish the opportunity for outsourcing. Businesses that used to make the bulk of their profits from their wide margins in inefficient markets will have to change their product mix in order to survive.

Fewer, stronger players will struggle constantly to differentiate themselves but standardized processing will force firms to differentiate in non-traditional ways. A few global mega-players will emerge to dominate the securities processing environment, but their very size will create opportunities for boutique firms seeking niche opportunities.

Highly automated processes will reduce costs and control risk, but customers will increasingly require customized solutions that will ultimately require more innovation and automation.

outsourcing will become essential as firms focus their best talent and energy on their core competencies in order to compete successfully. The pace of outsourcing will increase as firms realize that non-strategic functions should be removed from the firm.

In summary, the three major reasons why the industry needs to implement STP are:

- Increased customer demands for efficiency, timeliness and quality ·
- Changes in regulatory requirements ·
- Increased competition

The industry's need for managing risks and controlling costs has led regulators worldwide to begin moving their markets towards shorter settlement cycles. To attain this goal, each market has begun a series of initiatives that will identify and implement the necessary changes; one of these initiatives is STP.

WHAT NEEDS TO BE DONE TO IMPLEMENT STP?

To make STP a reality for securities processing, the industry must be active on several fronts:

STANDARDS

Today, although there are many different proprietary solutions offered by vendors, there are two major sets of competing standards: FIX and SWIFT. SWIFT has created a set of standard messages that supports post trade processing, while FIX has concentrated on the pre-trade and trade activities of brokers and managers. Both sets of standards are evolving to overlap the other, but they are not yet compatible. Both organizations have recently announced that they are beginning to work towards compatibility.

CONNECTIVITY

Network Connectivity requires routing, format mapping and protocol conversions. These are functions that are facilitated by Middleware that will be discussed in the next article in this series.

TOOLS

There are many different automated tools that have been created by vendors. While each tool offers some advantages, most are not designed to work easily with other applications; so, some level of systems integration is required. Some of the tools that will be discussed in the next article are:

- Automation and customization
- Reconcilement
- Delivery instruction content and timeliness
- Central database / data repository

VENDOR SUPPORT

Vendors are actively involved in providing solutions, but vendor solutions are not always compatible or easily integrated with other solutions because each vendor provides their services to make a profit and protect its market niche.

Some of the areas that must be examined are:

- New security issues
- Customer interactivity
- Vendor support applications
- Data storage/retrieval

UTILITY DEVELOPMENT

Industry utilities, including exchanges, depositories and clearing agencies, are all trying to extend their services to better support their participants, as well as protect themselves from disintermediation. They are working on solutions such as:

- Eliminating paper by incorporating all instruments into depositories and clearing houses
- Implementing cross collateralization between infrastructure agencies

- Matching pre-trade and trade information
- Merging with other industry utilities

REGULATORY CHANGE

Legislators and regulating agencies around the world are also trying to define environments that make their markets attractive to cross border investors, while maintaining a strong and viable internal infrastructure. Most countries are working on:

- Shorter settlement cycles
- Enforcement of processing rules

WHAT ROADBLOCKS MUST BE OVERCOME?

Despite the amount of effort that has already been expended, STP will not arrive without a significant amount of additional work by firms throughout the industry and by the industry's infrastructure. There are many roadblocks to be overcome to realize STP, including:

INERTIA

Many industry participants would prefer to keep things as they are, following the philosophy "If it ain't broke..."

SEGMENTATION

Different types of firms (Brokers, banks, and investment managers) each place a different emphasis on what needs to be improved.

KNOWLEDGE BASE

Each firm in the industry approaches an opportunity like STP from a different knowledge base and a different set of capabilities.

EXPENSE

Implementing STP will be a significant expense to many firms that have fallen behind their peers in automation and process optimization. Upgrading systems and procedures to support T+1 will be very expensive and should be combined with implementing STP to obtain operational benefits.

EFFORT

When the US market moved the basic settlement period from five days to three days, the industry made a significant number of changes. These changes affected the thousands of banks, brokers and investment mangers throughout the country. Each firm had to identify the impact of the shorter settlement cycle on their firm and then implement the changes by a specific industry deadline.

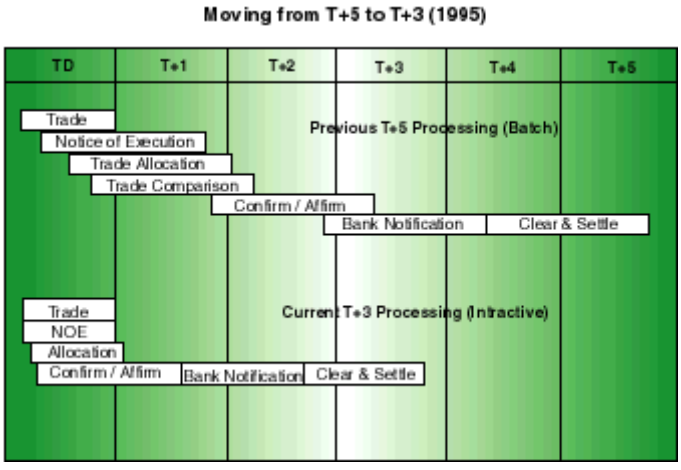

Figure 2. T+5 Process Compared to T+3

As difficult as these changes were, the move to T+1 will make the T+3 implementation look easy. For T+3, most firms merely ran their batch system more frequently and made some small changes to their interfaces. To fully implement T+1, many firms will have to make significant and fundamental changes to their primary systems and will have to move towards STP.

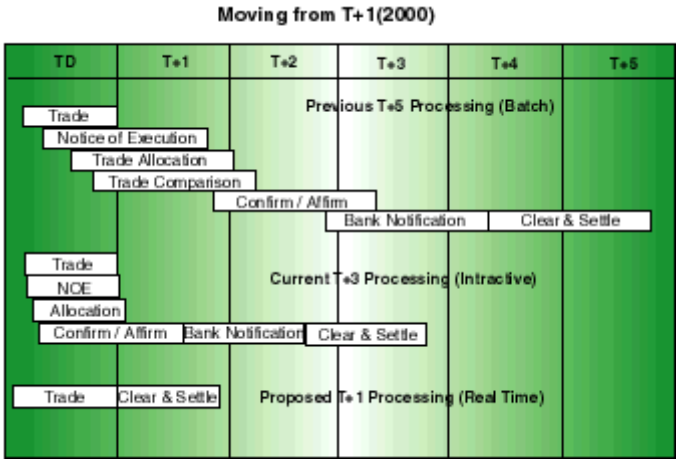

Figure 3. T+5 Process Compared to T+3 and to T+1

The change to a next day settlement cycle (T+1) will require firms to consider real time processes for many activities or at least to process transactions less linearly and more in parallel. Today's sequential process, as shown in Figure 4, requires that each step be completed before the next can begin.

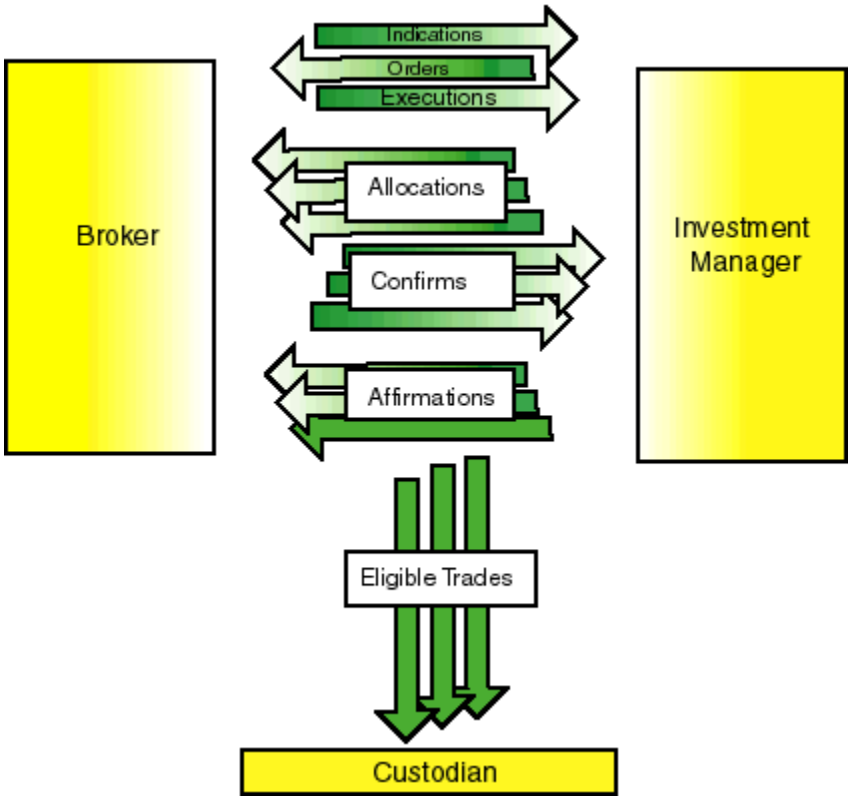

Figure 4. Current Sequential Settlement Process

This model evolved from the industry's historic paper-based model, and the subsequent automation of individual processing steps. While it was possible to move from T+5 to T+3 without modifying this model, it will not be possible to further shorten the settlement cycle to T+1 without radically changing the processing model. This will be discussed later in this article, in the section on the GSTPA.

WHAT SOLUTIONS ARE AVAILABLE?

There is no shortage of potential solutions. Brokers, banks and investment managers all have unique as well as overlapping problems. As such, they are working independently on ways to improve their competitive position, and are also working together on industry-wide solutions. Vendors are actively looking for ways to extend their existing products and develop new niche opportunities, and the infrastructure has mobilized to offer wide-ranging solutions.

INVESTMENT MANAGER SOLUTIONS

Investment managers need many of the systems that are required by brokers, and have some of the same processing needs at every step in the Securities Processing Value Chain (Figure 1). While investment managers, in general, have less of a requirement for high volume clearing and settlement systems, they still perform a critical role in ensuring efficient trade processing.

Most investment managers tend to see STP as a process that integrates the trade flow from initiation through affirmation. They are primarily concerned with the connectivity of internal applications within their firm, and therefore see connectivity to external applications as an important, but secondary priority.

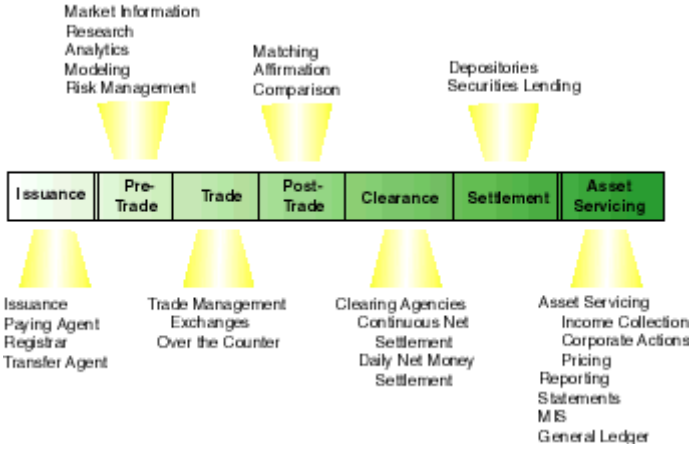

Figure 4. Securities Processing Value Chain

Several vendors are trying to create packages of solutions that will support the managers' internal end to end processing needs. Advent bought Data Exchange to extend its market reach towards larger firms; Thomson has assembled a variety of systems such as Portia, OASYS and ALERT to meet the managers' integrated automation requirements; and State Street is trying to position itself closer to the investment managers. This acquisition trend will undoubtedly continue for many years to come. These solutions all share the same primary characteristic: they are working to establish a single set of seamless applications.

The constant flood of improvements in front office technology has stimulated the managers' implementation of new functionality. Whether they build internally or buy applications, brokers and managers have been improving rapidly as they have tried to optimize their front office systems and stay ahead (or at least even) with their competition. These new applications have usually taken advantage of newer technologies, having evolved within an architecture of heterogeneous platforms. Not only have these firms had to integrate data across multiple databases and files, but they have also had to move the data as seamlessly as possible across multiple technical platforms.

As individual applications were created, each better than the last, firms found themselves in an ever shifting technical environment. This made it difficult to integrate these systems using in-house resources. By looking to external systems integrators for technical support, firms were able to acquire "best of breed" technology and still move data from one application to another; but, as soon as another "best" system was identified, another round of integration was initiated. In the past, as technology departments focused on solving problems for specific product areas or instrument types they installed multiple databases, and the integrity of the data was always suspect.

This created an opportunity for vendors to develop or assemble suites of integrated applications that support firms from front to back, which require a minimum of sophisticated systems integration experience.

BROKER SOLUTIONS

Vendors such as Comprehensive Software Systems, ADP, Power Securities and others are all trying to present single integrated back office processing solutions for small to medium size brokers.

Another solution for small to mid-size brokers trying to attain seamless processing without a major capital investment has been to outsource through correspondent clearers. A correspondent clearer, such as Bear Stearns, Pershing, or National Financial typically sells their processing as a complete solution and provides an integrated system that will support all aspects of trade processing, from pre-trading through settlement and recordkeeping. This solution has a particular appeal for firms that do not have the resources to correct their systems for the Year 2000 or do not see any added value in performing their own processing.

The problem for large brokers is different. In addition to trying to integrate their applications, they have a large number of older legacy systems that need to be modernized, and due to their volumes, need increased efficiency in processing street side information for clearing and settlement. In this context, large brokers are similar to the banks that are discussed next.

BANKING SOLUTIONS

The environment for the major custody and trust banks is very different from the managers and most brokers. Banks have built up large, complex systems that are already internally integrated. Since there have been fewer front office demands and, the banks have been able to continuously improve their internal interfaces. While their systems are old and have other problems such as reporting constraints and the need to prepare for the year 2000, they are stable.

The banks' focus has been on interfacing to their customers and to the street, and meeting their customers' changing requirements. This has all been difficult to achieve since the banks cannot unilaterally impose processes or standards. When they tried to solve this problem by creating proprietary formats in the late 1980's, their customers rebelled demanding a single set of standards. This resulted in S.W.I.F.T. adding the 500 series, and in additional efforts such as ISITC and FIX.

Since the banks saw their proprietary formats as a way to control their customers, they initially resisted common standards; but they eventually gave in to industry pressure. Banks have now embraced these standards as the long term solution to their processing needs, but still see a need to manage the process and are now actively involved in the Electronic Trade Confirmation (ETC) initiatives.

ETC's basic premise is to electronically capture information about the trade as early as possible in the process, and then to enhance that information at various stages without any rekeying of the initial data. Banks hope that by receiving clean data electronically, they will be able to efficiently use their large processing infrastructures at increasingly lower unit costs, thereby continuously lowering their prices and avoiding disintermediation.

INDUSTRY INITIATIVES

While individual firms are looking for solutions to their own specific problems, there have been numerous industry initiatives. The most recent series of changes was initiated by the Group of Thirty.

GROUP OF THIRTY

In the mid-1980's, a group of thirty retired CEO's of worldwide bank and brokerage firms formed with the goal of improving how securities were settled across borders, reducing the risk associated with cross-border trading, and streamlining the overall settlement process to improve efficiency. The group created nine recommendations in 1989. Each of these recommendations was established with the expectation that Working Groups would adopt them in every country with a securities market. Implementation of these recommendations in countries around the world has been inconsistent and cross border processing remains inefficient and risky. Emerging markets have been quick to implement the standards since they had very little existing infrastructure to change, while the established markets had to make major investments to modify their processes and infrastructure and have therefore been slower to adapt.

OTHER INITIATIVES

In addition to the Group of Thirty, there have been several significant efforts specifically designed to improve processing in the US and around the world. These efforts include improving the effectiveness of the infrastructure, making the discrepancies in the standards less important, and preparing the industry for a shorter settlement cycle.

The three initiatives that will affect banks the most are:

- GSTPA's Trade Flow Manager
- DTC's TradeSuite products
- S.W.I.F.T.'s new network

Global STP Association

The GSTPA was organized to "promote the efficient electronic flow of cross-borders trade information on trade date from the point-of-trade to all parties involved in post-trade activities, in a cost-effective and secure manner."

To meet this goal, the group looked at all of the interactions between the participants in the trade and settlement process and decided to focus on the communications between the broker/dealer, the investment manager and the global custodian.

The GSTPA recommendation is based on the following principles, as quoted from the GSTPA's report:

- "Multilateral inter-connectivity is the backbone of the solution, linking all parties to a transaction at the earliest possible time in the trade life cycle.
- A transaction will be progressively enriched and followed-through during its entire life cycle, rather than dealt with one message at a time.
- Matching of the net cash amounts that must enrich the allocation will be preferred to a confirmation/affirmation process.
- Global custodians and broker/dealers will both view the allocations, and will enrich them just in time) with their settlement instructions. This will relieve the managers from their middleman role and will allow the global custodian to get an early start on some activities such as the recall of securities lent.
- The solution must provide easy access to market participants of any size.
- An open architecture solution is essential, enabling the existence of many vendors and standards in an environment of virtual cohesiveness."

To implement these principles, GSTPA developed a conceptual solution which involves four major components:

- "At least one open network providing the level of inter-connectivity, capacity, speed, resilience, and security that the industry needs.

- A Transaction Flow Manager that enables the transactions to flow through the various steps of a transaction life cycle, calling upon vendors and participants for services, functionality, and information according to the choice of the parties to the trade, and controlling the smooth flow of information along a critical time line.
- Access to the network for all participants, directly or through vendors.
- Access to vendors for functionality and services based on participants preferences."

The GSTPA model (Figure 3) proposes that each required bit of data will be added just in time, and that the Transaction Flow Manager will push the trade to whatever point is needed to confirm and enrich the trade. This means that the TFM will determine when data elements can be obtained as well as where they can be obtained from, and will automatically manage the process of sending and receiving messages to/from the relevant participants. When all of the data elements have been collected, the trade will settle.

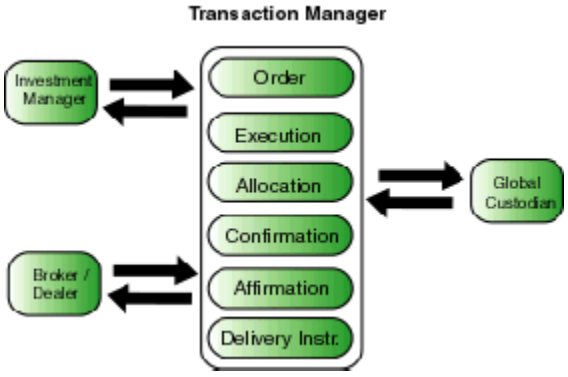

Figure 6. GSTPA Process Model

GSTPA has identified several key components for this concept:

- The interactive network that will support this multilateral connectivity.
- The Transaction Flow Manager that will deal with the flow of information through all the steps of the trade life cycle [for each trade].
- The standards that are necessary to operate this collective process, and the provision of bridges between current and future methodologies.
- Access providers will basically offer market participants the easy interfaces to the network, at the appropriate level of sophistication relative to their clients' needs for trade processing and information retrievals.
- Functional providers will offer market participants specific features and services that will support them in the processing of their trades, dealing with NOES, allocations, matching of NOEs and allocations, and matching of net amounts, etc."

GSTPA has prepared a Request For Proposal that defines the open architecture that would meet the primary needs of this concept that will be sent to potential vendors. GSTPA concluded,"an implementation in the year 2000 leading to broad scale utilization in the year 2001 would be desirable."

DTC Tradesuite

In 1998 the Depository Trust Company introduced DTC TradeSuite, which DTC describes as a comprehensive family of post-trade messaging, matching, settlement, and communications products. The product was designed with an open architecture, and it provides expanded connectivity and includes the post-trade processing functionality of DTC's Institutional Delivery (ID) system, Standing Instructions Database (SID) and the DTC Hub.

These products currently support over two million post-trade and settlement messages daily for more than 10,000 institutional investors, broker/dealers and custodian banks. Since DTC's existing trade messaging and settlement services are incorporated into TradeSuite, the users of DTC's ID, SID, Matching, and DTC Hub services automatically became TradeSuite users, and were given the option of also using TradeSuite's new communications services.

These products are available using a variety of standards and protocols, including FIX, S.W.I.F.T. or DTC formats, and TCP/IP, SNA or x.25 protocols.

Trade Message

Trade Message automates the exchange of post-trade messages between brokers, custodians and institutions, including block trade notices of execution, allocations, trade confirmations and affirmations.

TradeMatch

TradeMatch automates the comparison of investment managers' allocations with brokers' trade confirmations, which facilitates early trade agreement and identification of potential exceptions, while triggering settlement messaging for matched trades without the need for separate affirmations.

TradeSettle

TradeSettle provides automated settlement processing by electronically enriching allocations, trade confirmations and settlement messages with account and settlement data from DTC's Standing Instructions Database (SID), and then routing settlement instructions to custodian banks and brokers' clearing agents. DTC trades will then settle automatically.

TradeHub

TradeHub provides real-time global communications services between several global networks, as well as numerous order management, portfolio management and ETC systems.

The DTC has been very effective at reducing cost and risk in the US settlement process, and the addition of these services could ultimately extend DTC's services more towards the front office and potentially to cross border transactions.

S.W.I.F.T.

In addition to its standards, which are used throughout the world for post trade communications, S.W.I.F.T. has two networks that are used by its participants: The standard network and a forthcoming TCP/IP network.

1. The Standard Network

The existing S.W.I.F.T. network uses a protocol, called X.25 that sends information in separate packages of information and uses leased or dial-up lines. Packet switching networks such as this are designed to ensure accurate transmission of messages and files over lines of differing telecommunication quality such as are found in many emerging countries. S.W.I.F.T.'s network sends these packets through the use of a store and forward standard, called CCITT X.400. S.W.I.F.T.'s "black box" architecture gives each firm a simple way to connect to each other through the network, and a consistent methodology for interfacing with their own applications.

Messages and file transactions are processed by S.W.I.F.T. immediately, with automatic verification and authentication. If the sender and the receiver are both connected on-line, a message transfer typically takes less than 20 seconds. This current process is most effective for operationally-oriented messages that are not time sensitive in today's settlement environment. However, as the worldwide settlement cycles continue to be shortened to reduce risk, and as the trade processing activities increasingly require connectivity to the front office's systems, S.W.I.F.T. has developed an interactive, real-time network to support this new level of message traffic.

2. TCP/IP Network

S.W.I.F.T. is currently building a Next Generation, TCP/IP-based communications network that will permit real-time, interactive services that will be used to facilitate S.W.I.F.T.'s role in a variety of global market infrastructure projects, including:

- CLS (Continuous Linked Settlement) in the Foreign Exchange market
- Bolero in the Trade Finance market
- GSTPA (Global Straight Through Processing Association) in the Securities market

The Next Generation project is being designed and developed in three phases, as follows:

Phase I - Basic interactive services (CLS)

This Phase is driven by S.W.I.F.T.'s users' functional and timing requirements for CLS. Phase I includes a secure IP network covering 500 endpoints in 30 countries, and is scheduled for completion by 2002. The major features are:

- Basic interactive services and interfaces to support CLS and other market infrastructures
- Basic bank-to-Bank interactive services
- A new Alliance Lite (browser-based) interface
- Secured by the PKI (Public Key Infrastructure)

Phase II - Advanced interactive messaging (GSTPA)

This phase will support true intelligent interactivity such as that which is required by the GSTPA securities transaction monitor. The network will be extended to 2,500 endpoints in 50 countries and S.W.I.F.T. will be able to offer interactive real time messaging, including validation and translation. Lite and Gateway (high-volume) interfaces will be upgraded. Phase II will incorporate comprehensive service level monitoring. Central applications will include support for the GSTPA functionality.

Phase III - FIN replication and migration (NG FIN):

The network will grow to 10,000 endpoints in all countries on the S.W.I.F.T. network. NG FIN will be released and the migration from Current Generation FIN (CG FIN) to NG FIN will commence.

NG can be visualized as a collection of three technical layers woven together by a common architecture and common services for naming and addressing, security, and service management: The Phases will be developed in the context of these layers:

- Layer 1 - Secure IP Network.
- Layer 2 - Information Transfer Layer which includes:
    - Interactive messages
    - Store and forward messaging
    - Interfaces
    - Message processing such as validation, copy, translation and transformation
    - PKI infrastructure
- Layer 3 - Central applications. These can be written and/or operated by S.W.I.F.T. itself or by third parties such as market infrastructures or vendors.

SUMMARY

The number of potential solutions that can be delivered to resolve segments of the STP problem is potentially overwhelming. To organize the information into manageable segments, we have divided the solutions into two major categories: internal solutions and external solutions. While some of the vendor applications can support firms in both categories, most of the work that is required can be defined within these two categories.

INTERNAL SOLUTIONS

Internal STP requires automation of functions as well as connectivity between the applications. In order to establish internal interfaces between existing applications within our firms, there several issues that must be resolved. These include:

- Data availability
- Timing
- Technology
- Batch vs. real-time processing

In the second article in this series we will examine the available internal solutions, which overcome these issues, such as:

- Re-engineering
- Outsourcing
- Reconcilement
- Imaging and Workflow
- Automated Exception Processing
- Central Data Bases

EXTERNAL STP SOLUTIONS

While firms are resolving their internal STP problems, they can and should be working on external solutions. For years, most external connectivity was the result of hard coded, point to point connections that were established in one direction or bi-laterally. Increasingly, vendors are working to provide pre-packaged or at least semi-packaged solutions.

The issues that affect the external Straight Through Processing problem are:

- Delivery instructions with correct content and which are timely
- Formats and Standards
- Connectivity

The second article will also examine the external connectivity solutions between firms, between firms and the infrastructure and between firms and their customers, and will include a review of:

- Standards (S.W.I.F.T. and FIX)
- Middleware
- Customer Notification Softwar
- Internet opportunities