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Next-Generation Exception and Data Quality Platform for Cash Management Systems

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Synopsis:
The use of straight-through processing to automate processes in cash management systems has thrown up the problem of exceptions. These exceptions need to be managed; a process that involves identification, investigation, resolution and analysis. This can be achieved by using industry-standard business process management and business rules management techniques and tools.

The term 'cash management' encompasses a wide variety of functions and services in financial services firms. The core activity of cash management systems is the reconciliation of cash and share settlement between a firm and its business partners. Naturally, this involves complex business processing such as processing corporate actions, moving money to support transactions and managing liquidity. With increasing complexity and interplay of business processes, most firms have embarked upon a strategy of straight-through processing (STP) to automate as many processes as possible, which has introduced the problem of exceptions.

Exceptions and Exception Management

Any deviation from the expected behaviour of a business process is an exception. For example, during the processing of a trade settlement, if there is a CUSIP[1] ID missing in the data files, the processing needs a decisive intervention. There will be a break in the STP of the settlement business process. This will necessitate the resolution of the exception before the business process can terminate logically in a normal way. The system components that help in the resolution of an exception are collectively identified as an exception management platform or solution. For efficient and accelerated processing, the system should have a reasonable level of intelligent automation built in. The degree of automation depends on the richness of previous domain experience and the innovation quotient of its technical internals.

If we look at the evolution of exception management platforms in the cash management domain, the first generation of systems can be broadly classified into two phases:

- Application-centric: A multitude of business applications will participate in the STP of a cash management business process. In this model, the exception management components are part of the business application itself.

- Business process-centric: In this model, the exception management components are created for one business process of a cash management system. For exceptions arising from any of the business applications constituting the business process, there will be a common exception management platform to address the exceptions.

1. Committee on Uniform Security Identification Procedures

There are several drawbacks with these approaches:

- As they address exceptions at an application or at a business process level, they take a 'silo' or a narrow approach to exception management. At times, exceptions can be causes for operational risk events.
- These approaches are largely reactive and focus on treating the symptoms rather than the root causes.
- All exceptions are treated equally.
- Both approaches have ineffective knowledge management of exceptions leading to operational ineffectiveness when similar exceptions in other applications or business processes are taken through a cycle of exception resolution.

As with all areas of the financial system, cash management systems are subjected to a rapidly changing regulatory environment. A typical regulation will define several rules. Any deviation from those rules can also be treated as an exception. For example, in the RegNMS[2] regime, a violation of the trade-through rule is also treated as an exception; in an anti-money laundering (AML) scenario, a deviant wire transfer is treated as an exception. Given this, the traditional silo approaches to exception management are clearly outdated and there is a need for an integrated or a unified approach to address different types of exceptions and also to help in risk management and control.

The Problem of Data Quality

Cash management systems deal with data from disparate sources. Organisations have not standardised their data exchange practices – trading partners and content providers submit data in proprietary formats. Data accuracy and integrity can be compromised due to various reasons.

- Data reception: Problems at this stage are normally associated with data that is missing, unexpectedly received, or of an invalid format or structure. The occurrence of these types of errors are due to non-standardised data exchange practices and outdated or non-existent data transformation mechanisms.

- Data validation: Problems at this stage are normally associated with data not conforming to acceptable thresholds or data that fail key logical tests. The occurrence of these types of errors is mainly due to inadequate definition of quality of data.

- Data integration: Problems at this stage are normally associated with data duplication, timeliness or relevance. The occurrence of these types of errors is due to the fact that similar data is owned by different groups.

Next-Generation Exception and Data Management Platform

The next-generation exception management platform should deal with the sub-optimal approach of older systems and should address an enhanced set of business drivers:

- Focus on data quality: Have a mechanism to define data quality rules and fix them before data flows through the various business processes of the cash management system.

2. A series of initiatives that amend a portion of the original Securities and Exchange Act of 1934 (11A) to modernise and strengthen the regulatory structure of the US equity markets.

- Reduce operational cost: Increase automation of the exception resolution process and provide connectivity to different partners such as customers and business partners.
- Reduce operational risk: Address regulatory drivers and improve operational control.
- Increase operational effectiveness: Provide unified case management and transaction views; real-time management; pro-active management of processes; and applied learnability in decision trees for a higher degree of intelligent automation.

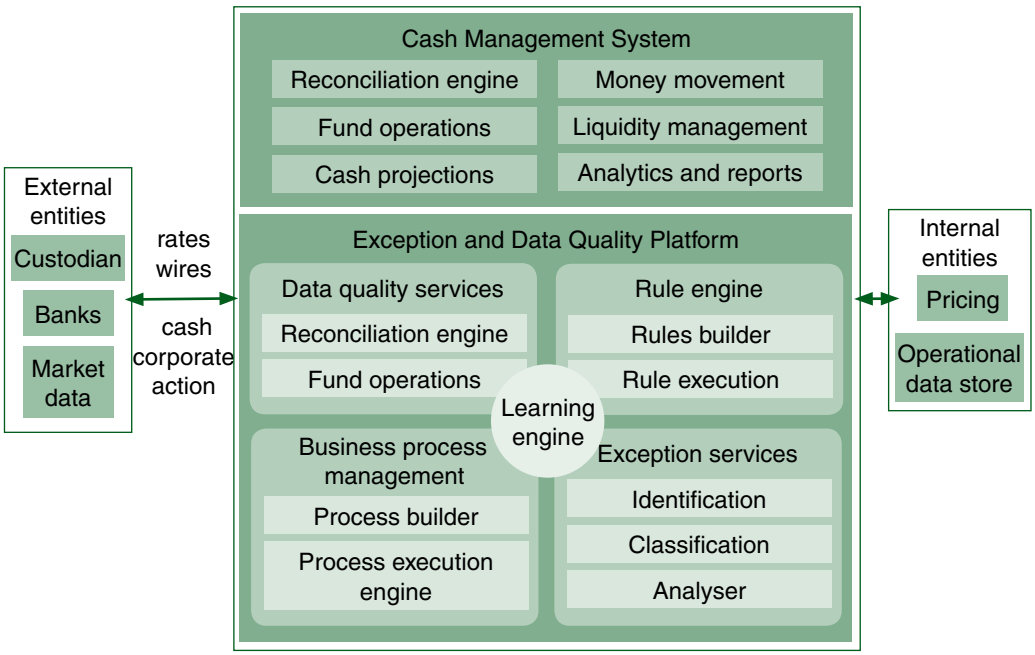
The data quality and exception management platform should support the entire cash management system and its underlying application internals, business processes and business rules.

The functionalities offered by cash management systems are dynamic in nature due to the changing regulations and business dynamics. The data quality and exception management platforms should be built with this in mind. The best way to implement agility is to ensure that business users are significant participants in the process. This can be achieved by using industry standard business process management (BPM) and business rules management (BRM) techniques and tools.

Data Quality Management

All data flowing in and out of cash management systems should be accurate. To ensure this happens, there should be a mechanism to define rules for data accuracy. For example, these can be simple rules to check duplication of data. Business users should be able to define and control business rules to

Figure 1: Exception and Data Quality Management Platform



Source: Infosys Technologies Ltd

allow them to adapt their systems as required. This can be achieved by using rule engines provided by business rules management systems (BRMS). Business users can define rules for data attributes and all critical data should be run through these rules. Violations can be tagged and can be corrected by providing user interfaces. In cases of highly critical data, workflows can be introduced by using BPM tools to ensure multi-level approval mechanisms are built into the correction mechanisms. This will avoid any rogue correction of critical data, which can lead to operational risk exposure. Also, some rules may be applicable at enterprise levels. Hence, data accuracy rules can be defined once and can be used in multiple systems across an enterprise.

Exception Management

Exceptions arising from applications and business processes in a cash management system and those which cannot be classified as data quality issues usually have to be taken through a multi-step resolution process:

Exception identification

Exceptions should be identified in real-time or batch mode, as they occur in business applications, and passed on to the exception management platform. Exceptions should be tagged and classified by type, severity and value at risk. This can be done by non-procedural rules-based systems like BRMS. Upon tagging and classification, defined users should receive exception alerts.

Most operational risk events originate as exceptions in some business processes. By integrating exception management platforms with operational risk systems, firms can gain a holistic picture of potential risks.

Exception investigation

Exception investigation comprises a series of steps, with the outcome of each step determining the next step to be taken. The goal of exception investigation is to identify the underlying cause of the exception and provide a resolution. Investigation processes should be modelled just like any other core business process. This will allow the investigation process to be configured as a decision tree for each type of exception. Intelligent agents can be used to automatically execute most of the steps in the investigation, significantly reducing the need for manual processing. A major benefit is that the investigation process can be changed with minimum re-work to accommodate changes to the underlying business process, business rules or even legacy systems.

Exception resolution

Once the investigation process identifies the root cause of an exception, actions should be taken to resolve it. Resolution may require collaboration by different functional teams within the firm. The exception management platform should support collaboration and communication between teams during the investigation and resolution process; this is best achieved by using BPM tools. A BPM modeller can model the resolution process as a workflow consisting of a series of automated and manual steps. It should also suggest possible resolution actions, depending on the type of exception and the cause of the exception.

Exception analysis

The exception management platform should have an analytics engine that analyses historical exceptions to identify common root causes. This facilitates changes to the business process, systems or business rules in order to prevent the recurrence of exceptions. The platform should offer a set of reports that analyse exceptions by frequency, value at risk, severity, resolution time and other parameters.

Externalising Workflow from Core Business Processes

It is very important to externalise the workflow and the business rules of data quality and exception management with the core business processes of the cash management system. The workflow definitions and business rules may change over time. It is important to design the system components of the exception resolution process in a way in which they are not tightly coupled either to any business application or the exception management platform. This can be achieved by leveraging the principles of service-oriented architecture (SOA) and creating these system components as self-contained services and exposing them through open standard protocols.

A cash management system that has an integrated data quality and exception management system is more efficient and less prone to operational risks. By effectively leveraging BPM, BRM and SOA, the resolution process change management can be made more agile for future changes. As business users also play a critical role in rules management and workflow definition, regulatory changes are much easier to introduce. An exception management system with adaptive learnability, business user-controlled definition, intelligent decision-handling, multi-level security, and tracking and notification features is what will drive the next-generation cash management systems.