

# CHAKRA – Back Office

## FUNCTIONAL OUTLINE



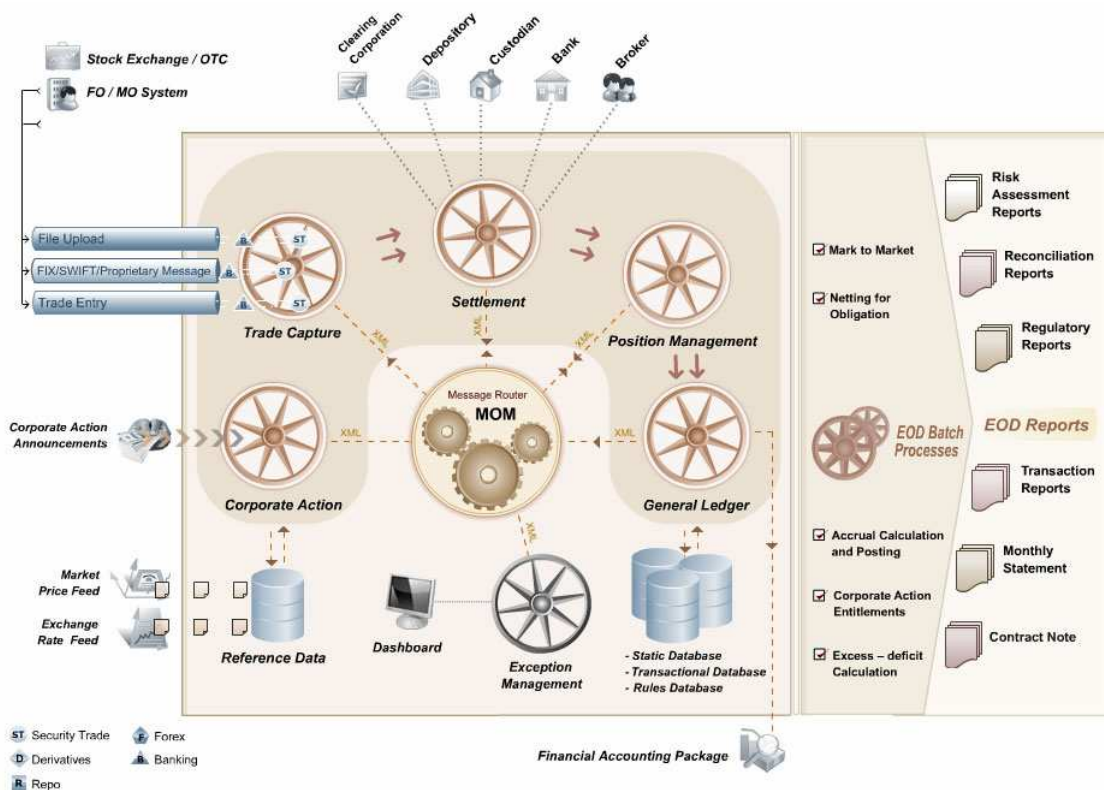
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# 1 Introduction

**CHAKRA – Back Office** is a comprehensive, modular and customizable application framework for automating the entire post-execution trade life-cycle management, enabling Straight Through Processing (STP) in the back office operations of brokers and custodians. It provides out-of-the-box application components covering all major processes, starting from trade capture & enrichment through all the way to settlement, accounting, corporate action and reporting. CHAKRA – Back Office is built on state-of-the-art Java EE platform, based on a configurable & message-driven architecture, offering flexibility, scalability and extensibility.

CHAKRA’s easily configurable rule-engine makes it really agile for adapting to custom business rules and changing market practices. The built-in reporting framework offers ultimate flexibility for meeting any reporting needs for years to come. It’s innovative design and unique architecture provides a unified platform to support multiple asset-classes, multi-currency cross-border trading and multi-enterprise operational environment. The underlying infrastructural framework offers the capability for real-time interfacing with market intermediaries (i.e. Exchanges, Depositories, Clearing Corporations and Custodians). The figure below provides a comprehensive view of the functionalities covered by CHAKRA and the possible interfaces with the external entities.



**Figure 1: Functional components and communication flow of CHAKRA**

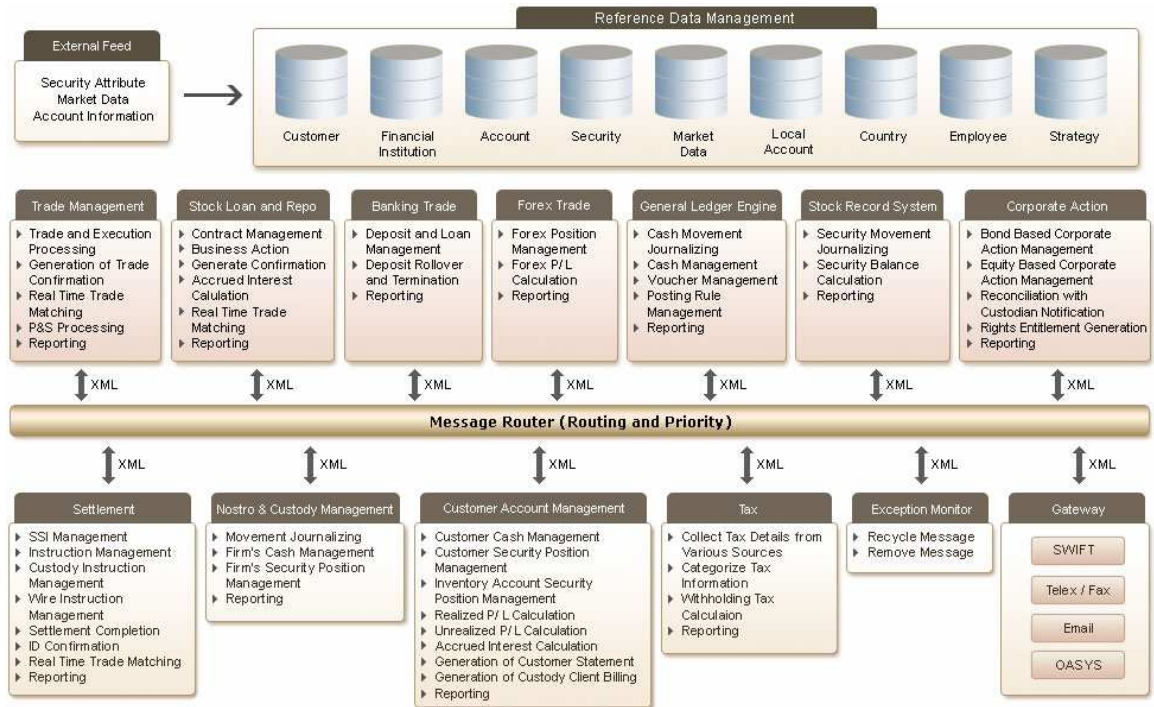
## 2 Salient Features

The salient features of CHAKRA listed below make it suitable for deploying across the major capital markets of the world without major changes, besides configuring for specific market practices/regulations and customizing for a firm's business operations. CHAKRA has been designed for handling high transaction volume, which makes it suitable for use in both retail and institutional business.

- Supports multiple asset classes and trade types seamlessly on a single platform
- Supports cross-border trades and multi-currency settlements
- Supports multi-enterprise, multi-office operational environment
- Configurable rule engine for customer/market specific business rules and controlling system operational behavior
- Easy to integrate with existing front and middle office systems
- Adapter framework for easy implementation of real time interface with market intermediaries and other legacy systems
- Message based architecture provides horizontal scalability for handling transactional growth
- Easy localization for multi-lingual support
- Web interface for all operations to supplement automatic and scheduled batch processes
- Configurable access control based on role, enterprise and account
- Full audit trail
- Visually rich dashboard for monitoring operations and highlighting exceptions which minimizes human intervention

### 3 Functional Overview

CHAKRA’s functionalities cover the entire post-execution trade life cycle process and they are implemented as modular and loosely coupled components, which can be implemented together or separately. The following diagram depicts the functional architecture of CHAKRA :



**Figure 2: Functional architecture of CHAKRA**

**Following is a summary of functions and features supported within the various components of CHAKRA :**

#### Reference Data

- Repository for all basic system entities
  - Clients
  - Accounts
  - Exchanges
  - Brokers
  - Custodians – Local and Global
  - Depositories

- Clearing Corporations
- Banks
- Market data vendors and services providers
- Multiple asset classes – Equity, Fixed Income and Exchange Traded Derivatives, Forex, Banking (Loan & Deposits)
- Support for all types of Fixed Income instruments:
  - Coupon bond – Corporate and Government bonds
  - Discount bond
  - MBS
- Daily market price processing from feeds of multiple sources
- Daily Forex rate processing
- Multiple holiday calendars
- Support for multiple physical and electronic addresses for a customer and account with provision to schedule different report deliveries to different addresses
- Intra-organizational user hierarchy and user roles

### **Equity and Fixed Income Trade**

- Trade capture from different external sources.
  - Exchange connectivity – SWIFT, FIX or exchange specific messages
  - Front / Middle Office systems
  - File uploads
  - Manual entry through web browser based UI
- Rule based trade enrichment for commission, tax, fees, etc.
  - Account, Instrument, Market & Trade attribute driven commission & tax charge rule
  - Handles multiple rules with date range
- Real time communication with relevant external entities for Allocation, Confirmation and Affirmation of transactions
- Capable of Sending & Receiving information in real time to/from relevant entities for post trade processing (for clearing & settlement)
- Real time trade matching with clearing corporation for OTC trades
- Margin computation and daily margin evaluation

## Forex Trade

- Capable of handling Spot and Forward trades

## Banking Trade

- Capable of handling Term deposit, Notice deposit, Open ended deposit, Rollover and Loan.

## Lending and Borrowing

- Securities (Equity/Bond) Lending, Borrowing & Repo/Reverse Repo Trades
- Capable of handling actions like Re-price, Re-rate, Substitution and Early closeout

## Settlement

- End-of-Day Netting
- Rule based Settlement Standing Instruction based on various attributes of a trade
  - Settlement accounts of Customer & Firm can be automatically identified based on different attributes
    - Delivery type
    - Currency
    - Market
    - Instrument
    - Customer
    - Account
    - Settlement type
- Real time communication with external entities for settlement
  - CSDs
  - Registrars
  - Custodian and Clearing Banks
- Pre settlement matching
- Pair-off and split of eligible settlements
- Support for both full and partial settlement completion
- Conditional authorization of settlements
- Custody Management
  - Holdings in Electronic form
  - Holdings in Physical form
    - In vault without name transfer

- Sent for transfer
- Status-wise Holdings
  - Free
  - Pledged
  - Lend

## Corporate Action

- Supports all common corporate action events
  - Cash Dividend
  - Coupon Payment
  - MBS Pay Down
  - Redemption of Bonds
  - Bonus Issue/ Stock Dividend
  - Stock Split/ Reverse Split
  - Stock Merger
  - Spin Off
  - Name Change
  - Rights Issue/ Subscription/ Expiry
  - Warrant Expiry
  - Multi-currency Cash Dividend
  - Dividend Reinvestment
- Captures corporate action announcements
- Daily calculation of entitlements based on account balance
- Automatic and manual posting of entitlements
- Reconciliation with custodian provided entitlement statements

## Position Management

- Real time balance update in firm's books.
  - Security & Cash positions of Customers are updated by Trade Date, Value Date & Settlement Date as and when transactions come in
- End-of-Day unrealized P&L calculation & portfolio valuation (Mark to Market)
  - Supports different price types for Mark to Market – Closing, Average, Bid, Ask, etc
- End-of-Day Bond accrual calculation and posting
  - Handles calculation of all kinds of Bonds including MBS

- Real time update of realized P/L
- EOD update of unrealized P/L
- Monthly statements
- Daily excess and deficit calculation of securities for future settlement
- Manual adjustment through vouchers
- Custodian position management

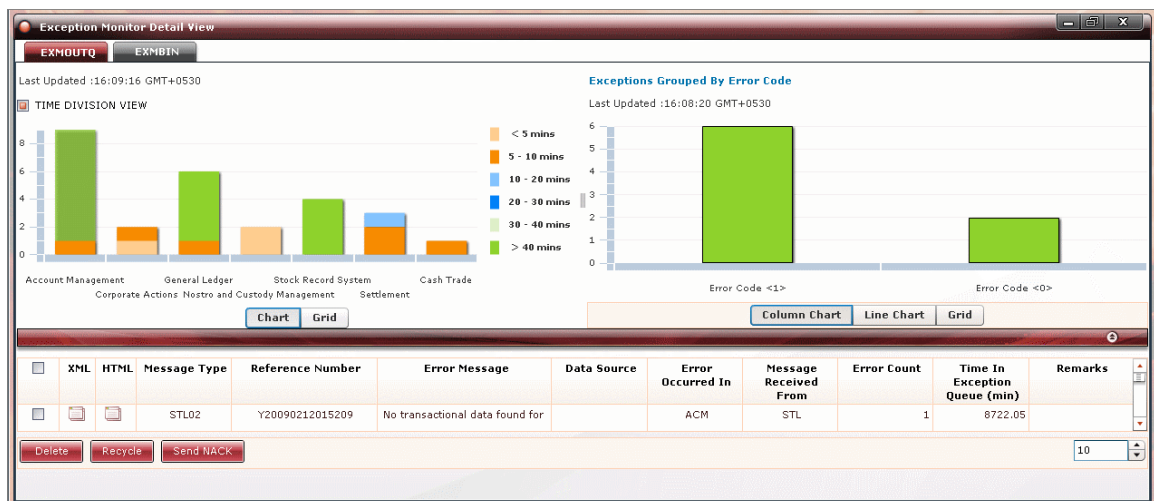
### General Ledger

- Configurable rule based G/L posting
- Real time G/L posting and trial balance update
- Option for real time update of ledger balance or by End-of-Day batch process
- Manual adjustments through vouchers

### Exception Management

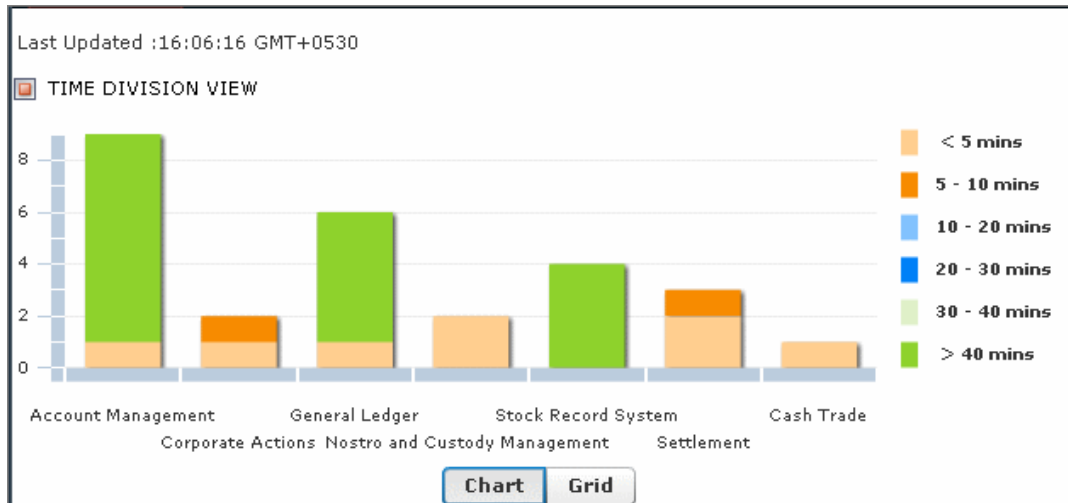
- Console based real time exception monitoring and management
- Drill down to exception details from exception console
- Configurable alerts on exceptions

Sample views of the real time Exception Management console is given below.



**Figure 3: A view of the Exception Management console**






**Figure 4: A sample view of the exception queues showing exceptions in real time**

## Reporting

Reporting in CHAKRA is handled through its built-in, customizable framework that is flexible, robust and can support both online and batch reporting. It can support various kind of reporting needs, such as - regulatory, risk analysis, audit and client reports. CHAKRA comes with a set of commonly used reporting requirements as pre-designed (but customizable) reports. However, in most cases, reports are custom developed as a part of implementation, based on client's specific requirements and preference, nature of business, as well as the country/market it is operating in. Reports can be transmitted in electronic format by mail or can be printed out for physical distribution.

- Following is a sample list of reports generated in CHAKRA :
  - Account Audit Trail
  - Contract Note
  - Customer Crosses
  - Credit Exposure
  - Settlement Fails
  - Firm's Portfolio Position
  - Settlement Completions
  - Corporate Action Income Projection
  - Stock Record Positions
  - Illogical Stock Record Positions
  - Excess / Deficit Cash on Financing Trades
  - and more....



**Report Id: STL101**  
**Report: Equity Fails**

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**Report generation criteria :**  
 Report Date: 20071031 Price Usage: UNREALIZED\_PL\_CALC

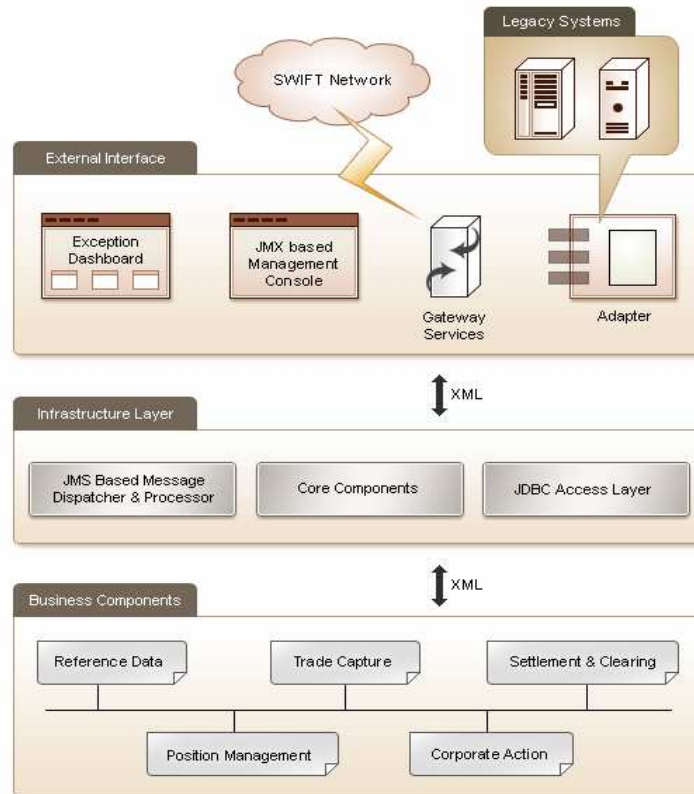
**Country Code:KZ**

| A/C No       | A/C Name          | Security Id    | Security Description | Quantity      | Amount            | Market Value     | Trade Date | Bank Code |
|--------------|-------------------|----------------|----------------------|---------------|-------------------|------------------|------------|-----------|
| Firm A/C No  | Firm A/C Name     | Reference No   | Receive/ Deliver     | Price         | Currency          | Difference       | Value Date | Age       |
| 001162000    | KAUSIK            | ASFI           | ASTANA-FINANCE JSC   | 2,500         | 43,355.10         | 50,000.00        | 20071023   | HSBK      |
| 070169000    | INVENTORY (TRADE) | T2007102300109 | DVP                  | 17.000000000  | KZT               | 6,644.90         | 20071025   | 6         |
| 001ACC345    | KAUSIK SAHA       | ASFI           | ASTANA-FINANCE JSC   | 1             | 104.02            | 20.00            | 20071023   | ABN       |
| 070169000    | INVENTORY (TRADE) | T2007102300111 | DVP                  | 100.000000000 | KZT               | -84.02           | 20071025   | 6         |
| 001ACC345    | KAUSIK SAHA       | ASFI           | ASTANA-FINANCE JSC   | 1,000         | 146,387.22        | 20,000.00        | 20071023   | ABN       |
| 070169000    | INVENTORY (TRADE) | T2007102300110 | DVP                  | 143.500000000 | KZT               | -126,387.22      | 20071025   | 6         |
| <b>Total</b> |                   |                |                      | <b>3,501</b>  | <b>189,846.34</b> | <b>70,020.00</b> |            |           |
| 001162000    | KAUSIK            | ASAV           | ASIA AVTO JSC        | 546           | 2,140.06          | 7,098.00         | 20071023   | HSBK      |
| 070169000    | INVENTORY (TRADE) | T2007102300109 | RVP                  | 4.000000000   | KZT               | 4,957.94         | 20071025   | 6         |
| 001162000    | KAUSIK            | ASAV           | ASIA AVTO JSC        | 655           | 8,018.14          | 8,515.00         | 20071023   | HSBK      |
| 070169000    | INVENTORY (TRADE) | T2007102300110 | DVP                  | 12.000000000  | KZT               | 496.86           | 20071025   | 6         |
| <b>Total</b> |                   |                |                      | <b>1,201</b>  | <b>10,158.20</b>  | <b>8,515.00</b>  |            |           |

Report Date: 26 May 2008 18:53:05 1

**Figure 5: Sample report for Daily Failed Settlements (Equity)**

## 4 Technical Architecture



**Figure 3: Component and Communication Stack of CHAKRA**

CHAKRA uses state-of-the-art technology framework to ensure a robust, scalable and high-performing system that is easy to maintain, enhance and integrate with existing operational system. Major benefits of the solution's technology architecture are:

- Java EE Compliant Design
- Seamless deployment in any Java EE Container
- Web based access
- 100% pure Java solution
- Loosely coupled and modular components, interacting through asynchronous messaging, provide scalability and robustness
- Supports industry standard MOM for guaranteed delivery of mission critical data
- JDBC persistence layer
- XML messaging allows easy integration with internal & external systems
- Configurable exception processing management framework