Java™

Java Capabilities

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Technical Expertise

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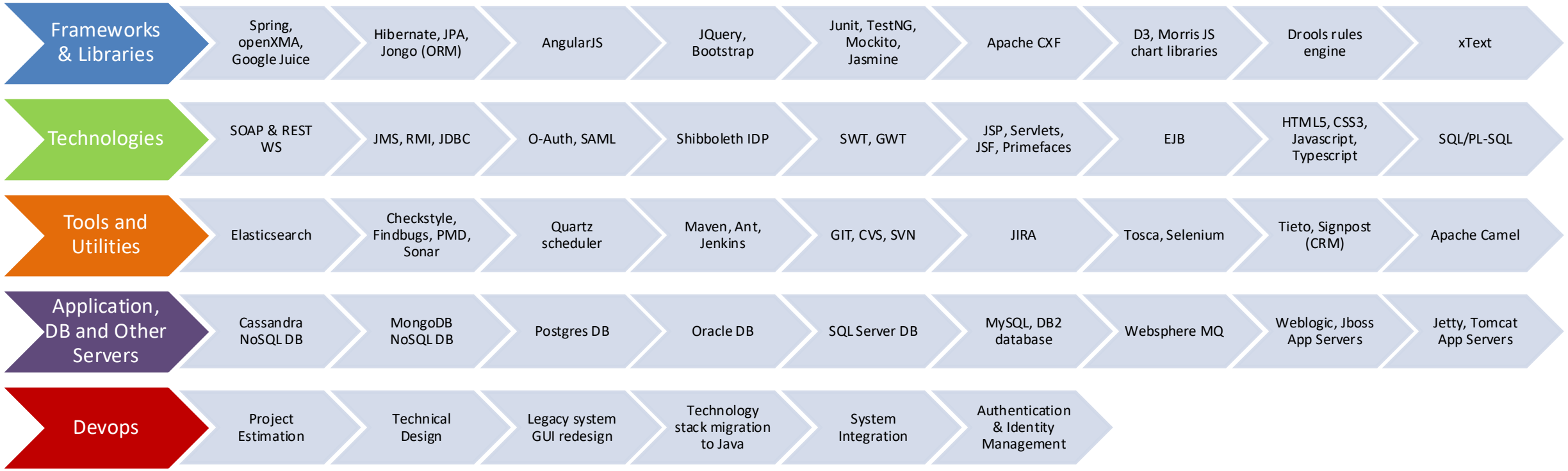
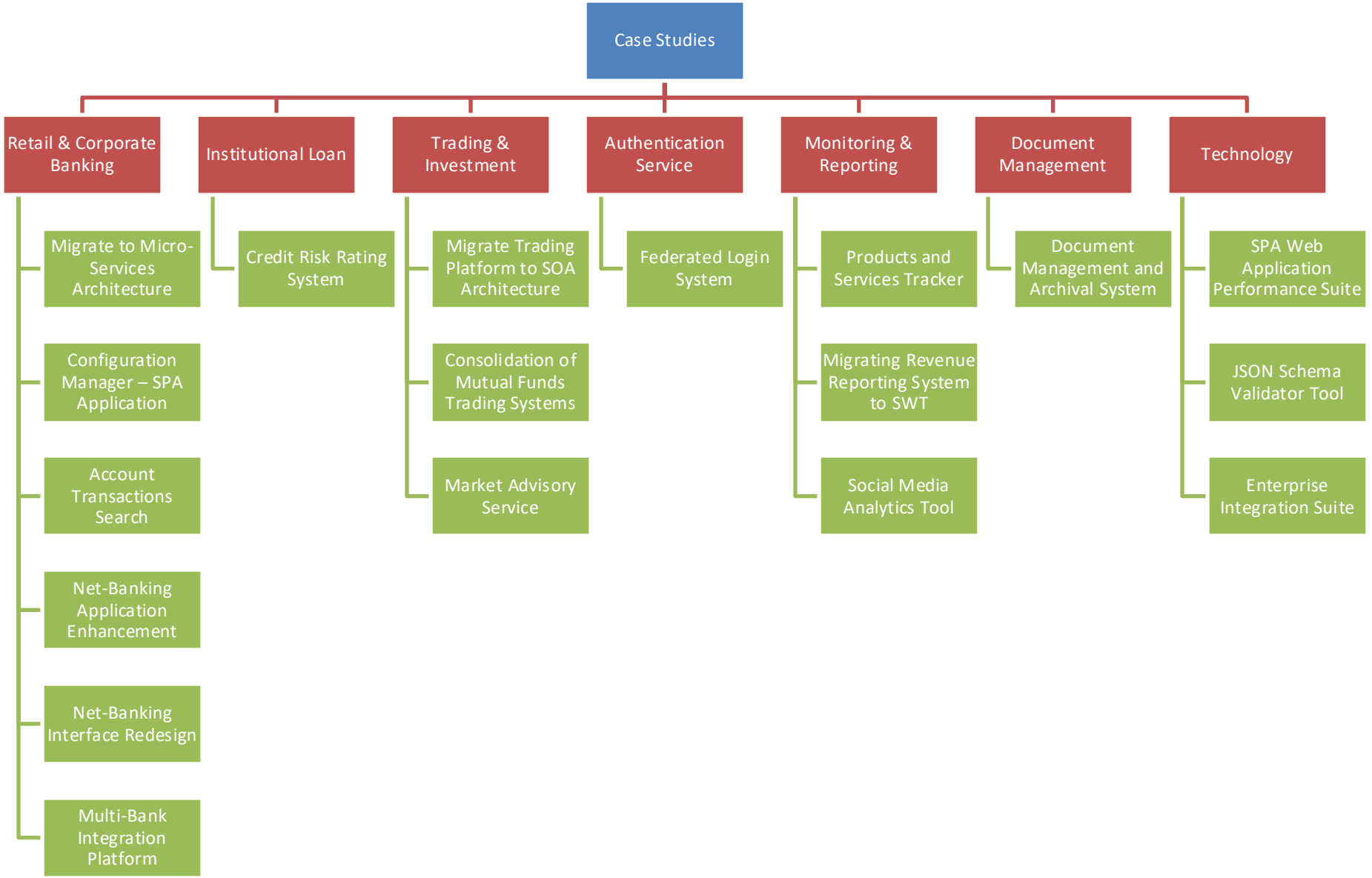


Domain Distribution



Credit Risk Rating System

Business Need : Assess the credit worthiness of the institutions (banks and sovereigns) for loan approval by evaluation of the credit limit and their credit risks

Key Challenges :

- Defining generic functions and complex mathematical formulas for reusability
- Design of a highly dynamic UI for client rating evaluation dependent on configured rating model
- Integration with other group applications
- Analysis of the existing legacy systems without much documentation

Solution :

- Design rules framework
- Design Rating Data Model
- Integration with external data sources
- Implement new rating models for calculation of credit rating.
- Support multiple modes for rating models
- Provide beta version feature for new rating definitions

Benefits :

- ✓ Highly dynamic and configurable application to evaluate credit worthiness of bank
- ✓ Time for introducing a new model reduced by considerable amount
- ✓ Modular approach for reusing the existing model definition

Technology Stack

- Spring
- Hibernate
- Web-Service SOAP
- Primefaces
- Postgres database
- openXMA
- Maven
- Weblogic
- Jetty
- Jenkins
- Sonar

Migrate to Micro-Services Architecture

Business Need : Expose services provided by back-end systems to enable their use without tight coupling across application tiers

Key Challenges :

- Access limitation on backend systems created dependency for test data creation on external team
- Lack of documentation around the systems and their interfaces

Solution :

- Use RESTful web service to expose the back-end systems features
- Create a Web API layer to manage authentication and access to the micro-services
- Use filters to intercept requests to apply cross-cutting concerns

Benefits :

- ✓ Loose coupling of backend systems between themselves and with the web applications
- ✓ Central module managing secure access to backend systems
- ✓ Stateless interaction with backend systems
- ✓ Low protocol overhead
- ✓ Isolate regression impact of any change to specific micro-service

Technology Stack

- RESTful Web Service
- RMI
- JDBC
- Servlet filters
- Jetty
- Weblogic
- Oracle
- JIRA
- Sonar
- Jenkins
- Checkstyle
- Junit
- TestNG
- Spring
- Maven

Federated Login System

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Business Need : Provide a single sign-on (SSO) authentication across all applications in an enterprise

Key Challenges :

- High learning curve for OAuth 2.0 and SAML as them being new protocols
- No one-stop solution available to provide authentication and identity management
- Testing challenges during integration with external APIs for token management

Solution :

- Integrate with Facebook API using OAuth for authentication
- Security tokens are managed by separate service responsible for token generation and verification
- Separate federated login database used for tokens management
- Separate database used for maintaining user's metadata
- Use Shibboleth as Identity Provider (IDP)

Benefits :

✓ Same credentials can be used to authenticate multiple applications

✓ Central system used for Identity Management

Technology Stack

- SAML
- OAuth 2.0
- RESTful web service
- Shibboleth
- Facebook API
- SVN
- Spring, Spring Social
- Hibernate
- SOAP Web-Service
- Oracle
- Open-XMA
- Primefaces
- Maven
- Weblogic
- Jetty
- Jenkins
- JIRA

Social Media Analytics Tool

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Business Need : Analysing social media strategy effectiveness by comparing the data set with required objectives from social media data sources like Facebook

Key Challenges :

- No historical test data availability for competitor
- Need to identify sentiments from the comments provided
- Need to present all data in charts with a timeline to show the data progression between a range of time

Solution :

- Create a Facebook application on the Facebook developer's section to generate application ID and secret key
- Use out of the box Datumbox API to analyze the sentiment of comments
- Design the layout of dashboard to present the data as per reach, engagement, sentiments and demographics
- Create charts using the javascript libraries Morris and D3
- Maintain the large data in a nosql database
- Utility created to load historical data into the database to get statistics for last one year
- Schedule jobs to fetch the data from social media sources at defined intervals

Benefits :

- ✓ Enable analysis of effectiveness of any campaign in social media
- ✓ Provide data representation with respect to competitor to get relative view
- ✓ Identify data broken down as per the geographical area for do location specific analysis
- ✓ Bring out the statistics more clearly with the extensive use of charts

Technology Stack

- Cassandra
- Apache Tomcat
- RESTful web service
- Facebook API
- Datumbox API
- d3 JS charts
- morris JS library
- Jquery
- Javascript
- HTML5
- CSS3
- Junits
- Maven
- SVN

SPA Web Application Performance Suite

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Business Need : A framework to measure performance of single page application and provide the performance output categorized as per different widgets available on page

Key Challenges :

- There is no default categorization or identifier provided by the DOM structure
- Categorization needed to be provided as manual input by end user
- A single resource can be shared across multiple widgets
- No impact on end user experience due to additional scripting on the page for stats gathering
- Compatibility of the tool to support new as well as existing SPA applications

Solution :

- Capture the performance stats on server side to keep product compatible with existing applications
- Design data model to maintain the relationship between the page URLs, resources and widgets
- Use Nosql database to capture the stats from the page hits to support large amount of data
- Use RESTful web service for communication between client browser and server for no end user impact
- A dashboard UI is designed with the feature to display performance stats at the widget level
- An interface is provided for maintaining the widgets through GUI

Benefits :

- ✓ Analysis of single page application at the widget level
- ✓ No impact to the end user experience
- ✓ Large amount of data can be persisted for future analysis
- ✓ A User friendly interface to enable end user for categorization of the widgets

Technology Stack

- Apache tomcat
- MySQL
- MongoDB
- Spring MVC
- AngularJS
- RESTful web service
- Maven
- Bootstrap
- JQuery
- CSS3
- HTML5

Net-Banking Interface Redesign

Business Need : Redesign the user interface of the customer facing net-banking application to migrate it from the legacy interface

Key Challenges :

- Extensive use of scriplets used in the JSPs breaking the MVC pattern
- Complex div structure for generation of the PDF in real-time
- Interfaces integrating with the application were dynamic
- Old browsers were needed to be supported with the new technology stack
- Restriction on use of browser specific hacks for CSS to achieve browser compatibility

Solution :

- Migrated the application on latest technology stack including HTML5 and CSS3
- Created legacy browser specific CSS for make the new design compatible with older version
- Used tabular structure data before PDF generation
- Redesigned the pages as per new layout
- Used unique IDs in page designs to make the page compatible for test automation using TOSCA

Benefits :

- ✓ Migrated from the legacy interface
- ✓ New interface having latest branding approach
- ✓ More user friendly interface provided to end-users
- ✓ Legacy code issues also refactored during redesign

Technology Stack

- Jboss
- Oracle
- SVN
- Jenkins
- Maven
- JSP
- Servlet
- SOAP Web Services
- JIRA
- PMD
- Checkstyle
- CSS3
- HTML5
- TOSCA

JSON Schema Validator Tool

Business Need : Automate the validation of JSON response against a RESTful web service end-point with respect to defined specification

Key Challenges :

- No OOTB parser available to convert the specification mentioned in markdown file to JSPN schema
- No default feature of specifying namespace in JSON
- Test data should be common and understood by coding, testing and BA teams

Solution :

- Read and parse API specification(.md file) using custom algorithm to create a JSON schema forest.
- A JSON Schema is embedded in another JSON Schema by using Runtime namespacing.
- Test suite is created in Excel using which this tool makes HTTP call to the Web-API under test
- Response from Web API is validated against the JSON schema
- Notification is sent to recipients about test run output with full test run report

Benefits :

- ✓ Significantly reduced manual effort required in validating API endpoints against JSON schema specification
- ✓ Reduced the turn around time to test multiple RESTful web services
- ✓ Allows to create Test Suite in simple XLS format which is easily maintainable and adaptable during the test run
- ✓ Allows test run against multiple environments.
- ✓ Ability to configure testing scope and test environment
- ✓ Report can be generated for each test run including test status, summary and cause of failure

Technology Stack

- Spring
- RESTful web services
- Apache HTTP components
- JSON
- Apache POI
- Maven
- JUnits
- Mockito
- Findbugs
- PMD
- SVN
- JIRA

Account Transactions Search

Business Need : Provide transactional search facility to the end-user to query and filter his account transactions

Key Challenges :

- Technology stack not defined to be used in this solution
- Manage huge set of data flowing in from mainframe system
- High transactions volume due to which standard JMS could not read messages from MQ

Solution :

- Multiple POCs conducted to evaluate Oracle Coherence, Cassandra, Active MQ, etc
- Read data from messaging queue using the Websphere MQ API due to high transactions volume
- Transform the data read into a standardized transaction format
- Store transformed data into the Cassandra database to manage huge dataset
- Store and index transactional data in Elasticsearch

Benefits :

✓ Able to search and filter data within all credit and debits into a bank account

✓ More control provided to end-user in analysing transactions into an account

Technology Stack
• Cassandra • Elasticsearch • Websphere MQ • DB2 • SVN • Maven • JIRA • Sonar

Consolidation of Mutual Funds Trading Systems

Business Need : Consolidate the mutual funds trading and registration data from multiple geographies into one platform so as to setup a global mutual fund distribution platform

Key Challenges :

- There were 14 databases to consolidate with largest databases having of around 150 GB
- A total of 850 database tables were to be merged
- Many tables had size in the range of 200 - 300 million records
- An effective validation process was needed to confirm successful consolidation of the humongous data
- There is only 4 hours of production deployment window to perform any data validation and analysis of failed records
- Should be able to accurately report the records failed along with the corresponding validation rules
- Real-time state of the validation process should be reported to show the progress status

Solution :

- Data was categorized into separate groups based on different properties.
- Groups having common data across geographies are excluded from the merge operation
- A batch file was created to setup the validation framework data model with one click
- Geography agnostic new data model designed for the validation framework
- Merge process was triggered with a stored procedure which is tracked with a unique ID
- Separate stored procedure was created to check the progress of the validation process

Benefits :

- ✓ Central platform for mutual funds distribution
- ✓ Consolidate dataset of data distributed across multiple geographies
- ✓ Accurate validation of the merged data using a custom validation framework
- ✓ Extensive reporting for validation failures with the low level details

Technology Stack

- Database: MS SQL Server
- Oracle Weblogic Server
- Tieto Client Managament
- Spring Integration
- Google Web Toolkit
- SOAP web service
- Selenium Test Automation
- GIT Source Control

Multi-Bank Integration Platform

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Business Need : Platform to empower financial institutions to securely and rapidly enhance their digital offerings by leveraging financial transparency

Key Challenges :

- Platform should support multiple banks which have distinct proprietary APIs
- Consolidated view to be presented with data flowing from multiple banks
- The platform should provide a standard dictionary of banking terminology while exposing its API

Solution :

- Use of OpenBank (OBP) API to abstract the integration with multiple banks APIs
- Analysis of the existing OBP APIs to extract the data relevant with respect to the platform
- Used Apache Camel for integrating the Platform service with OBP API
- Maintain application specific metadata in separate database
- Use OAuth to provide authentication mechanism

Technology Stack

- OpenBank API
- Apache tomcat
- MySQL
- Apache Camel
- Apache CXF
- Signpost
- OAuth 1.0
- RESTful web service
- Maven
- SVN

Benefits :

- ✓ Capability to provide processed data which can be leveraged to enhance the digital offerings
- ✓ Reduction in turn around time for integration with multiple banks with the use of common platform
- ✓ Data can be filtered or transformed to present an optimized display with respect to the whole spectrum of multichannel devices
- ✓ A single platform can be used to cater to multiple offerings

Market Advisory Service

Business Need : Stock market advisory service to monitor the stock ratio's and provide event based notification for configured custom rules

Key Challenges :

- Flexibility to monitor data from multiple exchanges across geographies
- Enable user to set up complex custom rules based on stock prices and stock ratios
- Personalize customer communication for alert notifications through various channels

Solution :

- Download Stock dataset from Quandl for historic stock prices
- Quartz scheduled EOD job to read last day stock price data from Quandl and update ratio's
- A rules framework to support custom rule creation
- A scheduled job to notify on any threshold breach
- Notify user for any event via mail or message

Benefits :

- ✓ User can make informed investment decisions
- ✓ Flexibility to customize the thresholds not provided by any OOTB service
- ✓ Time updates are provided by the notification alerts on threshold breach

Technology Stack

- Quandl Web API
- Apache camel
- RESTful Web Service
- Spring
- Apache CXF
- Quartz Schedulers
- MongoDB
- Jongo
- AngularJS
- HTML5
- JQuery

Migrate Trading Platform to SOA Architecture

Business Need : Refactor equity and mutual funds trading application to decouple the application tiers with the database and third party sources by migrating to a SOA based architecture

Key Challenges :

- Availability of backend systems for integration testing
- Web services implementation framework was not closed

Solution :

- Perform POC to evaluate the web service frameworks
- Design a service layer to abstract the access to database and third party sources
- Service layer exposes a web service end-point to provide the data or information from database and third parties
- Exposed service makes a call to database to fetch required data
- Where applicable, the service also calls the third party and collates the response with the database call and returns the consolidated response back

Benefits :

- ✓ Loose coupling between application tiers
- ✓ Improved time to market as changes are limited to a particular service and can be deployed separately
- ✓ Limited the impact caused by any regression

Technology Stack

- Jboss
- Oracle
- Apache CXF
- SOAP Web Services
- CVS
- Jenkins
- Maven
- JSP
- JPA
- Hibernate
- PMD
- Checkstyle
- CSS3

Document Management and Archival System

Business Need : Migrate legacy code in C++ to Java for a central document archival system. Make the document management system flexible by providing feature to modify configurations in real-time.

Key Challenges :

- Verification of digital certificates hosted at third parties
- Learning curve involved in analysis of legacy code due to lack of documentation
- Maintain the document versioning

Solution :

- Download and manage the third party certificates in internal network
- Read document saved as BLOB from database
- Collate data from BLOB for a customer
- Save the collated data in central document managed system
- Redesign the master data and attributes to make them dynamic
- Maintain versioning of documents in a separate relational table

Benefits :

- ✓ Migrated from legacy technology stack
- ✓ Rich interface using SWT
- ✓ User friendly interface with additional functionality
- ✓ Flexibility of changing master data and attributes real-time

Technology Stack
• Oracle • Weblogic • SVN • Maven • Spring • Hibernate • openXMA • SWT

Configuration Manager – SPA Application

Business Need : Provide ability to update configuration of an application from a single page application interface

Key Challenges :

- Index the properties to provide search functionality
- Learning curve in implementation of single page application

Solution :

- Design interface to load existing configuration from property file
- Add ability to make changes and submit the changes
- Add ability to upload property file
- Use AngularJS framework to make the interface a Single Page Application
- Added pagination for limiting the results on page

Benefits :

- ✓ Able to modify the configuration in real-time
- ✓ Able to also search through the existing list of configurations
- ✓ Flexibility to override the existing properties from a file
- ✓ Responsive interface using Single Page Application design

Technology Stack
• AngularJS • TypeScript • RESTful Web Service • Jetty • Weblogic • Oracle • JIRA • Jenkins • Spring • Maven

Net-Banking Application Enhancement

Business Need : Enhancement of net-banking application with additional features for user personalization, account and product management

Key Challenges :

- Language constraint as all existing code was in German
- Test data dependency on external team to provide data for 181 external entities

Solution :

- Two core banking systems contain the product and customer data
- Synchronous jobs pull data from the core system to internal system to make data available 24x7
- Interface is redesigned to add new features
- Setup mechanism to persist the settings for each customer

Benefits :

- ✓ User able to manage the personal details online
- ✓ Personalization on the basis of language, default account, account visibility settings, etc.
- ✓ Flexibility to maintain all types of accounts e.g. savings, loan, lease, etc. in one application
- ✓ Platform capable of maintaining credit card products of self as well as third party banks

Technology Stack

- Jboss
- Oracle
- SVN
- CVS
- Jenkins
- Maven
- JSP
- Servlet
- EJB 2
- SOAP Web Services
- JIRA
- PMD
- Checkstyle
- CSS
- HTML
- TOSCA
- Unix shell scripts

Products and Services Tracker

Business Need : Track the movement of all products and services exchanged between departments and manage their associated price movements

Key Challenges :

- Consolidated solution needed across multiple geographies
- Different countries had their own set of business rules not compatible with each other
- The solution needs to cater to internationalization

Solution :

- All the metadata for departments, products, services, pricing, etc. is maintained in SAP
- Subset of the metadata is pulled from SAP into excel files
- All transactions for all departments is uploaded to analysis

Benefits :

- ✓ Collated information available in one place for analysis
- ✓ Improve efficiency of the departments with optimization of transactions
- ✓ More accurate pricing model can be achieved
- ✓ Reduction in manual effort of collating all information

Technology Stack

- Drools Rules Engine
- Oracle
- Apache Tomcat
- Jetty
- Spring Batch
- openXMA
- Hibernate
- SVN
- Maven
- Jenkins

Migrating Revenue Reporting System to SWT

Business Need : Migrate the Revenue Reporting System technology stack to SWT interface to provide a uniform Desktop GUI to its users

Key Challenges :

- Not all components in GWT have one-to-one mapping in SWT
- Initial page load time was high due to multiple IO calls
- Editable table from GWT could not be provided by the openXMA framework

Solution :

- Redesign the screen as per the widgets of SWT
- Migrate the compatible GWT components to their corresponding SWT widgets
- Transform the incompatible GWT components to a new widget
- Only load critical components on page load and fetch other data asynchronously
- Reflect data changes on the screen with asynchronous transactions

Benefits :

- ✓ Consistent interface with respect to other applications in enterprise
- ✓ Quick data rendering without page reloads
- ✓ Enhancements to the application can be done using openXMA framework
- ✓ More resource available to support SWT based application with client

Technology Stack

- Apache Tomcat
- SQL Server
- Hibernate
- openXMA
- SWT
- SVN
- Ant
- JUnit
- PL/SQL

Enterprise Integration Suite

Business Need : Encourage use of standard integration pattern defined by the SOA architecture team

Key Challenges :

- Defining xText grammar for Restful resources
- Supporting proprietary protocols

Solution :

- Based on Eclipse Rich Client Platform (RCP)
- Import existing web services
- Create contracts for mainframe and other web services as per defined standards
- Create RESTful resources and generate stubs for server and Typescript for services
- Define mapping between services
- Create and document service bus configuration

Benefits :

- ✓ Platform standardization for defining and generating services
- ✓ Simplified service modelling for REST and SOAP
- ✓ Increase the productivity of software integration projects
- ✓ Support for propriety protocols

Technology Stack

- Java8
- xText
- xTend
- Google Juice
- Google GSON API
- Swagger documentation
- Node JS
- RESTful web services
- TypeScript
- Junit
- Jasmine
- Jenkins
- Sonar

Clients

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Thank You