

# **iBPS(Intelligent Business Process Management)**

*Project report submitted in partial fulfilment of the requirement for the degree*

*of*

**Bachelor of Technology**

*In*

**Information Technology**

*By*

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Under the supervision of

**Mr. Yogesh Parashar**

*To*



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Pradesh**  
May -2018

## **Candidate's Declaration**

I hereby declare that the work presented in this report entitled “**iBPS(Intelligent Business Process Management)**” in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology in Information Technology** submitted in the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from February 2018 to April 2018 under the supervision of **Mr. Yogesh Parashar** (Reporting Manager, Newgen Software Technologies Ltd. ).The matter embodied in the report has not been submitted for the award of any other degree or diploma.

Pallavi Panjabi (141404)

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

**Mr. Yogesh Parashar**

Reporting Manager

Dated:

## **ACKNOWLEDGEMENT**

I would like to express a special thanks and gratitude to my project guide Mr. Yogesh Parashar who helped me in conceptualizing the project and actual building of procedures used to develop the project. I would also like to thank my head of department for providing me this golden opportunity to work on a project like this.

Thanking you,

Pallavi Panjabi (141404)

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## LIST OF ABBREVIATIONS

<b>S No.</b>	<b>Abbreviations</b>	<b>Description</b>
1	BAM	Business Activity Monitor
2	BPM	Business Process Management
3	BRMS	Business Rule Management System
4	DMS	Document Management System
5	EJB	Enterprise Java Bean
6	GUI	Graphical User Interface
7	IBM	International Business Machines
8	Ibps	Intelligent Business Process Suite
9	J2EE	Java 2 Platform Enterprise Edition
10	MDM	Master Data Management
11	MSSQL	Microsoft Structured Query Language
12	NDS	Novell Directory Services
13	OS	Operating System
14	XML	Extensible Markup Language

## **ABSTRACT**

iBPS is a scalable, multiuser, rule-based Business Process Management (BPM) system. It allows organizations to streamline their business processes. It can handle document/form-based processes and integrate with other business applications. You can define and deploy multiple processes on the same system, share resources, and streamline operations. Business processes can be monitored and optimized using extensive monitoring facility supported by the system.

Newgen is offering its End to End Enterprise Content Management and Business Process Management suite to client Bank, for addressing and automating Commercial Loan Process for bringing visibility and control in the overall process.



## CHAPTER -1

## INTRODUCTION

### 1.1 INTRODUCING WORKFLOW

**Business Process Management (BPM)** refers to set of activities, which organizations can perform to automate, integrate, and optimize business processes. BPM enables the organizations to speed up critical business decision making process, increase operational efficiency, lower costs, and increase customer satisfaction. Nowadays, software products are available in market, which enable you to perform Business Process Management and these products are known as Business Process Management Solutions (BPM Solutions).

Workflow, simply defined, is a sequence of actions or steps used in business processes. In other words, workflow is an enabling technology that allows businesses to streamline and automate their processes for greater efficiencies. Nowadays, workflow or Business Process Management solutions are being extensively used by organizations for optimizing their business processes.

BPM solutions provide the business managers an end-to-end solution to assess, monitor, streamline, and optimize the various tasks required to perform a business process. BPM is an essential and required technology solution for organizations because it enables them to define, control, and optimize how business processes are managed and how business decisions are made. BPM solutions also enable the management of an organization to identify the bottlenecks in business processes and remove these bottlenecks to increase efficiency and speedup the execution of business processes.

Some examples of workflow processes are:

- Recruitment process
- Loan processing
- Admission process
- Bank account creation
- Credit card application processing
- Bill generation

iBPS is a scalable, multiuser, rule-based Business Process Management system. In short, it can be defined as, “Software that enables the definition, implementation, monitoring, and management of components of a business process.”

It allows organizations to streamline their business processes. Processes can be monitored and optimized using extensive monitoring facility supported by the iBPS system.

For business processes like loan applications, insurance claims, medical records, order processing, and customer care, the high volume of work can be a big challenge. The key to accept these challenges is to find innovative ways. Newgen iBPS is designed to meet these challenges and enhance business processes effectively. It helps in removing bottlenecks, improving productivity, and meeting deadlines. Whether your business is manufacturing, banking, telecom, distribution, healthcare, government, utilities or insurance, your success is based on the speed and control over the business processes. Now you can automate all your business processes using Newgen iBPS.

### **Some typical characteristics of workflow are:**

1. They involve more than one person/application and a logical structure to the routing sequence.
2. Much like the business processes they automate, Workflow applications are more organization specific. For example, a bill process may range from a simple two-participant process to one that encompasses multiple databases and approval points. So, workflow refers to the enabling technology that helps customers build workflow applications according to their organizations.
3. The application characteristics of routes, rules, and roles are much more definable and specific in a workflow application than in an average GroupWare application. So, an information sharing GroupWare application becomes a workflow application when:
  - A specific process is defined (For example, A -> B -> C)
  - Specific roles are set (A – originator, B – reviewer, C – approver)
  - Specific rules are in place (Contract is valid when C approves it, the Contract goes back to B for the changes to be incorporated if C rejects it, and so on).

## **1.2 SYSTEM COMPONENTS**

The major components with their respective functionalities have been detailed below.

### **1.2.1 OmniApp**

OmniApp is graphical user interface used to register applications, components, component instances, external applications and views. OmniApp displays list of component instances associated with user's view. Every user is associated with a view which contains the list of component instances added in it. When a particular view is loaded the user is able to see various component instances associated with it on the OmniApp Main screen. Using OmniApp, user is able to perform various operations including:

1. Register applications.
2. Register components.
3. Register component instances.
4. Register external applications.
5. Register views.
6. Change settings.
7. Set themes.
8. Manage User Profile Settings like save view, reset view, my settings and change password.

### **1.2.2 Process Modeler**

iBPS Process Modeler is a graphical tool for process definition. A business process is defined as a set of activities where work is accomplished, called worksteps, and flow controls where, based on rules, decisions are made to choose the next activity.

You can model your business process according to the set of activities, which are performed one after another based on decisions on the information available with the workitem. There are two kinds of activities, an activity where a well-defined work is to be done, called a workstep, and the other where decisions are made and routing is done, called flow-control steps.

Process Modeler performs various operations including:

1. Create/Delete Project
2. Create/Design/Deploy/Delete Process
3. Import/Export Process
4. Define Process Variants

### **1.2.3 Process Client**

Process Manager or Monitoring Desktop is a web-based tool, which is used for monitoring the status of workitems, worksteps, users, and so on. It is also used for generating various reports and provides an extensive search module for searching the status of workitems and activities. It also enables the process owners to carry out the routine administrative tasks of assigning users, enabling/disabling processes, ad-hoc routing of workitems, and so on. User, Group, and Queue Management is also part of this component.

iBPS also provides standard desktop for the processing of workitems. It allows users to log in to their respective queues, based on a assigned rights, and process the pending workitems in the selected queue. iBPS also provides a standard viewer for the workitems, called the WorkDesk, which combines the capabilities of a workflow and a Document Management System (DMS). It provides some standard tools such as Check-Lists, Exceptions, Form View, Document View, and Actions, thereby, allowing users to process workitems more efficiently. iBPS also provides an easy mechanism of integration with other external applications. It is further empowered by various other features such as Reminders, Referrals, Searches, Work-Audits, Document Check-in/Check-outs, and so on. The iBPS Process Client has been built in a way that it facilitates the launching of other customized viewers for workitems. This component is also available in a Web-enabled version in the form of iBPS Process Client-Web.

Process Client performs various operations including:

1. Create/Delete Workitems
2. Search Workitems
3. Reassign Workitems
4. Lock/Unlock Workitems

5. Share/Unshare Workitems
6. Change Priorities of Workitems
7. Settings Reminders
8. Setting User Preferences
9. Launch BAM
10. Launch Archive

### **1.2.4 Form Builder**

The functioning of any software requires an interface through which a user can interact with the system. Such an interface can be used to accept, view, and modify data pertaining to the system. Form Builder is an application that provides the facility of designing forms through its Graphical User Interface (GUI), and executing forms by associating certain functions with them.

This interface can be a part of different Newgen applications or any third-party application.

The forms designed using this interface can be reused, thus, significantly reducing the coding time for programmers/developers.

If an end user wants some modification in the forms, the same interface can be used to modify the earlier designed forms without changing the application; either the user or a support person can make the changes and satisfy the customer need without involving the developers.

Building a form can be divided into two phases:

1. Form designing using Form Builder Designer (.exe).
2. Form execution through Form Builder User Control/Applet.

### **1.2.5 iBPS Service Manager**

In a workflow system, it is customary to have a centralized-monitoring system, which can monitor and control various services distributed over the whole system. The services, being an integral part of the workflow system, can be installed on many machines depending upon the load on the systems and will also need a central controlling so that they can be stopped and started centrally from one location.

The iBPS Service Manager (SM) is a multithreaded server that manages a number of Services like the print, fax and mail utility process server, external programs remotely or locally through a web interface.

iBPS Service Manager performs various operations including:

1. Register/Unregister/Connect/Disconnect Application Server.
2. Create/Associate/Dissociate/Test/Upgrade Cabinets.
3. Register/Unregister/Connect/Disconnect Log Server.
4. Register/Unregister Services like Process Server, Print Fax & Email, Import service etc.

### **1.2.6 Rights Management**

For defining the rights in a process, the iBPS application provides a user-friendly graphical interface known as Rights Management. The Rights Management consists of Profiles, User and Group for assigning and managing of rights accordingly.

The Owner/Administrator can define rights on folders and documents. Access Rights allows the User to share documents, folder, Data Class and Annotations with other Users of the Group. The user can also assign rights to other users and group on the documents and folders, which are created by him.

This module includes the detailed description of the various types of rights that can be assigned at different levels in the process like at user/ group or profile.

Rights Management performs various operations including:

1. Add/Modify/Delete Profiles.
2. Add/Modify/Delete User.
3. Add/Modify/Delete Group.
4. Add/Modify/Delete Roles.
5. Manage Profile Associations.
6. Manage Audit Log.
7. Manage Password Policy.
8. Manage Rights for various iBPS components.

### **1.2.7 Business Activity Monitoring(BAM)**

The term 'Business Activity Monitor' refers to the aggregation, analysis, and presentation of real-time information about activities inside organizations. A business activity can either be a business process that is orchestrated by Business Process Management (BPM) software or a business process that is a series of activities spanning multiple systems and applications. The Business Activity Monitor, developed by Newgen Software, is an enterprise solution to provide a real-time summary of business activities to operations managers and the top management.

BAM performs various operations including:

1. Add/Modify/Delete Reports.
2. Export/Import Reports.

### **1.2.8 Master Data Management(MDM)**

Master Data Management System is a platform independent web-based tool, using which client can perform database management operations on their cabinets. Using this tool user can Add, Modify the Tables and their Fields based on their rights. This tool can also enable the users to perform data entry and modification operations in the Tables.

MDM can be used from anywhere by the supervisor users to perform the Table centric operations using their web browser, such as Internet Explorer or Mozilla Firefox. It has an

easy to use interface, which enables the users with minimal database level knowledge to create and work with the databases and perform the commonly used CRUD (Create Read Update Delete) operations on tables and the data.

MDM performs various operations including:

1. Add/Modify/Delete/View Tables.
2. Import/Export Tables.
3. Apply Data Operations.
4. Download/Upload Data from/to tables.

### **1.2.9 Business Rules Management System(BRMS)**

OmniRules is a complete Business Rule Management System for managing business rules through authoring, design and deployment. It also provides easy maintenance of rules after they are deployed. OmniRules is a Web-based UI with ease to design, author, manage, and deploy rules. User need to log in to the system with an authentic username and password. Being a Web-based tool, OmniRules is easily accessible on Internet Explorer and Mozilla Firefox.

BRMS is used to perform various operations including:

1. Register/Unregister Cabinet.
2. Create/Modify/Delete Entities.
3. Create/Modify/Delete Rules.
4. Approve/Reject Rules.
5. Deploy Rule sets.
6. Search Rule and Entities.
7. Export/Import Rule Set.



### **1.2.10 OmniFlow Transport Management System**

The OmniFlow Transport Management System (OTMS) is a web based tool, which automates the transport procedure of the processes and configuration settings between different iBPS Systems.

Features:

- Process Definition baseline and transport
- Cabinet configuration baseline and transport
- Process configuration baseline and transport
- Queue changes baseline and transport
- Audit log configuration baseline and transport

OTMS performs various operations including:

1. Register/Unregister Target Cabinet.
2. Generate Request Ids.
3. Set Baseline Request Ids.
4. Set Transport Request Ids.

### **1.2.11 iBPS Server**

iBPS server is multi-tier, platform-independent solution, built using robust server-side Java and J2EE technologies. It provides facility to automate business processes for increased productivity, efficiency, and control. It controls workflow processes and also maintains the integrity of process definitions. It provides standard workflow operations such as initiation of workitems, processing rules, sequential, parallel and ad-hoc routing of workitems, and so on. The iBPS server carries out certain periodic housekeeping functions to maintain the integrity of the workflow processes, check for expiry of workitems, and determine if any process is stalled. The iBPS Server is designed to cater to high-volume transaction processing environments, by providing Load Balancing to prevent bottlenecks. It also provides a host of other operations including automatic triggering of external agents/applications and maintenance functions like automatic diversion of workitems based on expiry/priority/threshold, and so on.

The iBPS server has been further empowered by Event Logging capabilities, thus providing a transaction log. The engine is based on server side JAVA-based technology. It is designed to serve small as well as big corporate. It is capable of handling thousands of transactions per day.

It supports ORACLE and MSSQL. It has its own application server, which handles session management, database license management, and so on. It is compliant with Interface 2 and 3 of WfMC (Workflow Management Coalition). It provides EJBs for the complete logic of workflow, which can be deployed on application servers such as Weblogic, JBoss, and so on. It also provides a complete set of XML Application Programming Interfaces (APIs) for all the functions of a workflow engine.

### **1.2.12 Queue Management**

Queue is a list of variety of tasks, which are processed by same set of users. You can define queues independent of business processes. Queue Management includes defining new queues, modifying existing queues, deleting existing queues, viewing queue details, adding temporary users to queues, and so on. The iBPS Process Manager allows the definition of a specific Queue Manager for every queue in the system.

### **1.2.13 User/Group Management**

New users and groups can be added or removed from the system. They can be associated with different queues so that they can access workitems and process them. Facility to assign users to a queue, for some fixed time duration, and assigning roles to users is also available in the system.

### **1.2.14 Process Management**

Process Management includes monitoring and managing your business processes. It includes operations such as enabling/disabling a complete process. When a process is disabled, then no new workitems can be created or introduced in the process. It also includes managing activities and workitems in a process. It provides exhaustive operations on workitems, such as moving a workitem to another queue, reinitiating a workitem, managing exceptions on a workitem, locking a particular workitem, changing attributes, aborting a workitem, and reassigning a workitem to another user. The iBPS Process Manager allows the definition of a specific process manager for every process in the system.

### **1.2.15 Search and Reports**

This feature provides an extensive search facility for workitems on various criteria such as activity name, created by, and locked by, attributes of the workitem, expiry date range, validity date range, and so on.

The iBPS Process Manager provides many graphical and transactional reports such as user performance, system performance, average turnaround time, items in a queue, delays, average turnaround time of an activity, and so on.

## **CHAPTER -2**

## **KEY FEATURES OF IBPS**

This section describes key features of iBPS:

### **2.1 VISUAL ROUTE DESIGNING**

- Provides a graphical tool for defining business processes.
- Enables disseminating work by defining different activities.
- Supports both manual and automated activities.
- Provides a set of standard properties for each activity, such as data access, predefined filters, expiry, entry settings, and so on.
- Provides support for customized properties for each workstep.
- Provides assurance of the orderly and timed execution of tasks by expiry at the workstep.
- Allows replication of tasks at two or more activities through copy-definition.
- Provides compiled reports to measure correctness of process definition.

### **2.2 MULTIPLE BUSINESS PROCESSES**

- Supports the definition of multiple processes.
- Allows the definition of parent-child relationships between processes (For example, LC and LC Amendments).

### **2.3 VERSION CONTROL**

- Provides support of different versions of the same business process.
- Facilitates the flow of workitems in the earlier version as well as creation of new workitems in the latest versions of the processes.

### **2.4 RULE BASED PROCESSING**

- Provides rules for entering and exiting from a workstep.
- Provides rules to direct the routing of workitems by the server.
- Supports the definition of rules on CONSTANTS, the values for which can be set/ changed by the Process Manager as per the requirement of the process.

## **2.5 PARRALEL PROCESSING**

- Routing of copies of a workitem to more than one workstep for parallel processing.
- Collection of copies of the workitem for further processing.
- Facility to conditionally distribute workitems also available.

## **2.6 AD-HOC ROUTING**

Supports manual routing of workitems in any workstep in a process. However, this is an administrative task, and available with the Process Manager.

## **2.7 HOLDING WORKITEMS**

- Facility of holding workitems for a specific period of time.
- Support of bringing hold workitems in the flow, before completion of hold time.

## **2.8 QUEUES**

- Supports group and user queues.
- Provides facility of adding users and tasks in a queue.
- Supports process-independent queues.
- Enables workitems related to different processes to lay in the same queue.
- Provides facility of defining a coordinator/manager for a queue.
- Provides support of queue monitoring to the administrator.

## **2.9 REASSIGNMENT OF WORKITEMS**

- Support of assignment of a workitem to an expert member of the same queue.
- Reassignment rights on a workstep as well as the queue level.

## **2.10 LOAD BALANCING**

- Provides an integrated, intelligent Load Balancer to maintain equal workloads across all participants of a process.
- Facilitates load balancing at the servers by supporting multiple processing servers for processing business rules.

## **2.11 GENERATION OF RESPONSES AND NOTICES**

- Supports templates for standard responses/notices in MS Word and Excel.
- Enables templates to be launched in the native application with data.
- Saves these responses/notices automatically with the workitem.

## **2.12 EVENT TRIGGERS**

- Supports the definition of triggers, which can be associated with rules, user actions, exceptions, and so on.
- Supports standard triggers such as mail, launching of external applications, execution of programs, and generation of responses.
- Allows the definition of customized triggers.

## **2.13 EFFORTLESS REMOTE ADMINISTRATION**

- Easy to deploy and administer
- Web browser-based UI for remote administration
- Definition, modification, and deletion of queues
- Definition of user and groups
- Rights to access workitems
- Progress tracking of workitems
- Remote monitoring of queues/processes/users
- Changing process states (Enabling/disabling processes)
- Starting/suspending/terminating/aborting workitems
- Temporary diversion of one user's work to another
- Prioritize workitems
- Temporary inclusion of users to queues
- Ad-hoc routing of workitems
- Setting turnaround times for processes/activities

## **2.14 COMPREHENSIVE REPORTS AND TRACKING**

- Graphical and transactional reports
- Web based reports
- Reports for user and process performance
- Work load reports
- Reports to measure the correctness of process definitions
- Detailed process history reports
- Extensive statistic reports such as process/activity turnaround times
- Detailed delay reports
- Exception reports

## **2.15 AUDITING OF USER WORK**

- Supports work audit; percentage of work to be audited is configurable
- Provides support of audit comments by the auditor
- Routes the work to the performer if the work is rejected
- Supports the Audit Log configuration, which enables the administrators and supervisors to define and control what data will be logged for audit purposes

## **2.16 STANDARD FRONT END FOR PROCESSING WORKDESK**

- Supports a standard interface for image-based processing
- Provides support of various tools to process the workitem
- Provides standard interfaces for check list, exception handling, actions, and document display



- Provides queue selection for processing
- Provides annotation facility for documents
- Provides recording of conversation
- Provides assignment of workitems to a specific user
- Provides easy searching of workitems
- Provides support of user filters
- Provides scan facility for paper documents
- Provides document type categorization
- Provides zoom-in, zoom-out
- Provides rescanning of documents

## **2.17 ESCALATION**

- The status of a workitem can be escalated if it is not processed at the immediate level to keep track of a subordinate's work and workload.
- Escalation ensures that the higher priority task will be completed first and on time.
- Conditional escalation can also be defined in the process.
- Escalation can be set to individual users or a specific role.
- Escalation mails can also be sent as a group mail in which each member of the group receives the mail.

## **2.18 SCALABLE PROCESSING SERVER FOR PROCESSING TRANSACTION**

- Processes workitems for routing
- Provides support for multiple instances running on same or different machines
- Provides support for associating one server for processing a single workstep's workitems
- Runs different threads for processing expiry and hold workitems
- Is implemented using server-side Java
- Is available on Windows, Linux, and Unix

## **2.19 J2EE AND XML BASED APPLICATION SERVER FOR SCALABILITY AND AVAILABILITY**

- Scalable and platform-independent architecture
- J2EE-based transaction support
- Exposure of consolidated functionality-level, XML-based API for easy integration with client applications
- Exposure of functionality-level Java Beans API
- Responsible for transaction management, connection pooling, and session management
- Available on Windows, Linux, and Unix platforms
- Support for J2EE-based application servers such as BEA Weblogic™ and IBM Web Sphere™
- Also supported on Oracle 10g, SunOne, and JBoss
- WfMC compliant interface; exposes API for interface 2 and interface 3 of WfMC standard

## **2.20 AUDIT LOG CONFIGURATION**

Process managers can configure the system such that only a specified set of user/system actions may be logged.

## **2.21 INDUSTRY STANDARD IMPLEMENTATION**

- WfMC compliant; supports interface 2 and 3 of WfMC standard
- Exposes API in the form of XML
- J2EE-compliant server implementation
- Mozilla browser on Linux OS enabled

## **2.22 FORM APPLLET IN WORKDESK**

Display of Data Entry forms supported via the Form Applet. Hence, no downloads of OCX etc. required on client machines.

## **2.23 INTEGRATION VIA JMS**

Enables the external clients to send messages to the MDB deployed on application servers to perform operations such as creating, saving, and completing workitems. Helpful in third-party integrations.

## **2.24 WEB SERVICE ENABLED**

- Enables workitems to access the Web methods of a remotely deployed Web service

- Enables exchange of data between the process workitem and the Web method based on the mapping defined as part of the process definition
- Supports both synchronous as well as asynchronous mode to invoke Web methods

## **2.25 FUNCTION CATALOGS**

Custom functions can be developed and made available in a process for use at multiple worksteps.

## **2.26 SPECIALIZED INTERFACE FOR CUSTOMER SERVICE AGENTS**

Specialized Query Desktop that enables searching and tracking of workitems in processes while maintaining complete confidentiality of sensitive data associated with them.

## **2.27 INDUSTRY-STRENGTH SECURITY**

- Define users and groups in the system
- Grant users access permissions on workitems through queues and streams.
- Secure login and passwords for each user
- Support for data and password encryption

## **2.28 HIGHLY OPTIMIZED AND SCALABLE DATABASE FOR HANDLING TRANSACTIONS**

- Enables implementation of core business logic of iBPS using JDBC
- Is scalable up to millions of transactions

- Provides support for MS-SQL Server and ORACLE on Windows, ORACLE on Linux, and ORACLE on Unix
- Contains all major workflow functionalities such as queue management, sequential and parallel routing, queue monitoring, load balancing, tracking, routes versioning, powerful searches, access rights, and administration
- Supports ad-hoc routing and tracking of workitems

## **2.29 PLATFORM INDEPENDENT MONITORING DESKTOP PROCESS MANAGER**

- Exposes standard workflow monitoring features through a Web interface.
- Is implemented using Java Beans for application logic and JSP/Servlets for presentation layer.
- Uses XML interfaces to internally communicate with the Application Server.
- Is available on Windows, Linux, and Unix platforms. Support for Apache/Tomcat on Windows and Linux and iPlanet on Unix.

## **2.30 LDAP AUTHENTICATION SERVICE FOR OS INTEGRATED SECURITY**

- Synchronizes with directory service for user/group information
- Supports Windows NT and 2000 Active Directory, iPlanet, and NDS services
- Supports single sign-on for authentication

## **CHAPTER -3**

## **CLIENT**

### **3.1 INTRODUCTION**

Gap analysis document is aimed at identifying gaps and defining specifications for the Commercial Loan Process at Client Bank. The process aims at, streamlining the Loan Origination Process (LOS) for the Bank's various Line of Business i.e. Commercial & Industrial (C & I), Business Banking, Commercial Real Estate (CRE) & Multi-Family, Small Business Administration Loans (SBA) & Equipment Leasing & Financing. The solution aims at integrating loans workflow solution with Fiserv Premier, Ez-Lender, Fiserv Director and also to include the third party searches (UCC Search, Census Tract, Experian, Equifax, OFAC, Flood Search etc)

Newgen is offering its End to End Enterprise Content Management and Business Process Management suite to Client Bank, for addressing and automating Commercial Loan Process for bringing visibility and control in the overall process.

The key objectives of the Process are:

- To Reduce physical movement of paper
- Single user Interface for all line of business
- To improve turnaround time of existing commercial loans process
- To provide end to end tracking & reporting through an exhaustive workflow for New Loans, Renewals, Reviews & Modifications
- To use technological advancement and develop flexible process with advance features
- Process performance evaluation and improvement
- To resolve existing challenges and pain areas

## 3.2 SOLUTION SCOPE

Commercial lending process is being developed for Client Bank which aims at streamlining bank's current operations and remove following challenges' and bottlenecks:

### Generic Areas:

- Obsolete technology and design leading to inefficiencies, high TAT and cost of operations. For example: Commercial Approval Memorandum (CAM) is currently generated manually through a series of long and rigorous process.
- Automation of the loan application process which is being carried out manually. Eg: System is expected to capture the Borrower, Guarantor and related parties data and push the entire record to the Fiserv Premier.
- User friendliness: Ease of use is critical. Fields and tabs should be easy to navigate. System should be smart enough to dynamically populate fields on the basis of chosen product type.
- GUI: Look and feel should be very impressive and as per local standards, this is one of the key requirements.
- Standardization and unification of the origination process. As a part of the process, users work on disparate systems and duplicate data entry also happens at few stages.
- Rework is required in almost 50-60% of the cases. Capture loan wise complete information at initiation level.
- TAT definition and monitoring for each step. Automatic triggers can be sent to the next level in hierarchy.
- Currently users have to input data in multiple systems as all the systems are not tightly coupled. Focus with the new system would be to bring all systems under one umbrella and users should work only on one single platform, Omniflow.
- Automated Compliance Checks (REG O) & sub process with restricted access.

### **Business Related Areas:**

- Automation of processes: New Loans, Renewal, Modifications & Review.
- Automation of sub-processes: Modification after approval, Termination & 3rd party requests-automatic correspondence with departments handling 3rd party appraisals.
- Third party search (UCC Search, Census Tract, Experian, Equifax, OFAC, Flood Search etc) url's to be initiated through the system & output to be captured in the system as a PDF document.
- Manual exception and deviation management.
- Lack of automated capturing and monitoring of covenants both financial & non financial covenants. Documents that are expired are not being tracked. System intends to automate the same and also alert is sent when document expires.
- Manual handoff of credit package from one department to another at few stages.
- Lack of electronic movement of cases between branch and portfolio management team leading to high TAT and inefficient customer service.
- Lack of standardization of Ticklers. System should allow rule based tickler sets for various lines of business and automated customer correspondence through E-mail & Letters.
- Currently users attach and scan the documents manually to Sharepoint. This should be replaced by robust system that can eliminate the operational inefficiencies and reduce the overall cost.

### **Underwriting:**

- Eliminate excel based work to calculate ratios. New system should automatically calculate ratios and populate them on screen for all the users.
- All the Aggregate (Relationship data) data to be fetched which includes the related loans, DDA accounts, MMF accounts, Saving accounts & certificate deposits. Hence displaying the entire summary to the underwriter.
- Credit Approval Memorandum (CAM) is being generated manually which makes the process really cumbersome. New system should automatically generate it.
- System is expected to fetch the existing collateral data from Fiserv therefore keeping the track of cross collateralized loans.



- System is expected to set up the collateral and generate the collateral summary. Summary should calculate Loan to Value (LTV) and the collateral coverage ratios.
- Risk Rating is being done manually. System is expected to automate the same and calculate the risk rating based on set criteria.

### **Credit Policies:**

- Automation of credit risk policies based on economic criteria & one up approval. Lack of automation in credit policy results in manual intervention and higher TAT.
- System should also monitor and track the various deferrals and approvals taken at various stages.

### **Documentation:**

- With new system, a lot of steps could be automated/eliminated to bring in the operation efficiency allowing same set of resources to process higher volumes.
- Tacking & monitoring of various documents received from Attorney & Ez - Lender hence removing the delays in the process.
- Disbursement Instruction Setup from the system
- System should automate the pre-closing & post-closing checklists with hard stops at mandatory items.

### **Loan Booking & Filing:**

- Loan booking is currently being done manually. System is expected to integrate with Fiserv Premier and therefore automating the entire process.
- Mandatory check before Booking of loan for the five documents i.e Note Document, Disbursement Register, Escrows, Auto Debit Form & Photo Id.

### **Decision & Customer Correspondence:**

- System should allow decision with approval conditions and maintain the decision entire history.
- Email Correspondence with set templates to the customers and attorney's along with the communication logs should be maintained in the system.

### **3.3 DOCUMENT CONVENTIONS**

**Document Type:** SRS (Software Requirements Specification Document). This document includes the BPM (Business Process Management) representation of the requirements for Client CLOS implementation.

- Process Worksteps and Users have been underlined
- Internal references to sections in this document have been italicized.
- Bold lettered words have been used to highlight key words
- Short forms have been used for some commonly abbreviated terms. Such abbreviated terms are expanded at the first occurrence of usage. A list of all the short forms and important terms has been included at the end in the Glossary section.
- Word(s) used as a phrase are enclosed with single or double quotes ('xyz" or 'abc xyz') for distinction.

## **CHAPTER -4**

## **OVERALL DESCRIPTION**

### **4.1 DOCUMENT CONVENTIONS**

The proposed solution will be built on Newgen's CLOS Accelerator – the platform that helped many Banks & Institutions to streamline its end to end commercial loans process.

The solution will be designed with a vision to create a system that would enable quick Commercial Loan Process & Disbursement to enable improved efficiency and focus on reduced cost and turnaround times for the process while at the same time providing enhanced visibility of operations.

Newgen understands that Client Bank's key objective is to automate end to end Commercial Loan Origination cycle by seamlessly integrating with existing applications while accommodating all of CLIENT's segment and product offerings.

The solution would be deployed on the robust business process management (IBPS) of Newgen software which has pre integrated components for capturing documents & workflow management.

### **4.2 SOLUTION FUNCTIONALITIES**

The solution will cover workflow based process implementation on Newgen iBPS product suite.

The value addition provided by the Newgen solution to CLIENT can be highlighted as below:

1. Improved TAT (Turn around Time).
2. Easy to Use GUI.
3. Ability to perform End to End Case Tracking.
4. Standardization and unification of the origination process
5. Ability to find bottlenecks in the existing process and take remedial actions.

6. More face time for customer as there is substantial reduction in manual work.
7. Capturing the audit trails and historical look-backs.
8. Reduced operational costs.
9. Enhanced quality of credit decisions
10. Improved Regulatory compliance.
11. Archival of the annexed documents in CLIENT's DMS (Fiserv Director) for future reference.
12. Ability to track performance of each individual stakeholder in the process using periodical reports.
13. Reduced effort due to seamless integration with Core Banking System.
14. Reduced cost and time using early eligibility check to filter out the unwanted loan cases at an early stage of processing.
15. Automation of sub-processes wrt 3rd party appraisals. Automatic correspondence with departments handling 3rd party appraisals.
16. Manual exception and deviation management.
17. New system to automatically calculate financial ratios and populate them on screen for all the users.
18. Automation of credit risk policies, one up approval, Compliance Checks (REG O, REG U & REG B) & Lending Matrix.

### **4.3 OPERATING ENVIRONMENT**

The system will be operating primarily in a Microsoft Windows Operating Environment.

CLIENT's current infrastructure is as follows:

- Operating Systems – Microsoft Windows 2012 R2
- Databases –Microsoft SQL Server
- Messaging- PTP2301/ XML/CSV
- Current Architecture: Sub Net Cloud

The proposed LOS solution will be integrated with the following applications

- Fiserv Premier
- Fiserv director
- Ez Lender
- Other Third Party searches

## CHAPTER -5

## SOLUTION FEATURES

### 5.1 INITIATION

Initiation step will be the 1st step for all loans. Lender at this step would input minimal customer information fields in the application deduct fees if 3rd party/ appraisal requests are required, initiate 3rd party flow, attach required documents, execute checklist and move the case to Application Coordinator. Lender will also be given a provision for Customer portal where in Lender can get the docs uploaded from customer directly

#### Features at this step:

- Provision to copy data from any workitem present in Omniflow.
- Generate Loan Account Number
- Generate application form
- Execute checklist and upload documents.
- In case of exception, application coordinator should send the case back to the lender not at prospect step but a different step (Lender Exception). Time will be tracked for this new step for Lender.
- Dynamic checklist and document upload based on selection criteria in control parameters and number of borrowers/guarantors in the loan.
- Checklist also provides facility to dynamically upload year wise documents. Example: If user wants to upload personal financial statements for the borrower of last two years, checklist will provide facility upload year wise financials.
- Lender Portal: Lender will create a workitem in the Newgen system and will do minimal data entry.
- Lender will then send a link on email to the Borrower using communication Tab on the form. The document upload functionality will get enabled.
- User will select & upload document which would be attached to Newgen system.
- If there is a change in person down the line in the process, provision to regenerate the checklist would be provided.
- Checklist would not be mandatory at initiation step. However it will be mandatory at every step thereafter.
- Provision to initiate 3<sup>rd</sup> party/Appraisal requests sub-workflow.

## **FUNCTIONAL REQUIREMENT**

**REQ1:** Enter Mandatory fields with basic customer information to generate loan application form

**REQ2:** Enter the minimal deal requests i.e. loan info, fees collected, amortization & repayment terms and Collateral info etc.

**REQ3:** Execute Checklist and attach required documents (no item will be mandatory at this step)

**REQ4:** Generate application form (automatic from application)

**REQ5:** Whenever there is a change in the loan application at any step in the process, lender should have the option to regenerate the application form.

**REQ6:** Collect Fees if 3rd party/ appraisal checks required

**REQ7:** Initiate 3rd party/ appraisal requests sub-workflow (if required)

Most of the information will not be mandatory at this step. Only Loan control parameters, fields used to generate application and 3<sup>rd</sup> party requests fields (if sub-workflow is initiated) would be mandatory for users to fill. 3rd party flow will execute in parallel with the main flow, with the restriction that all the reports and appraisals should be completed before disbursement step.

## **5.2 APPLICATION PROCESSING**

Lender will move the case from initiation to application coordinator step if customer decides to proceed with the loan request. User at this step can initiate various search (UCC Search, Census Tract, Experian, Equifax, OFAC, Flood Search etc) url's & output of the url's will be attached a PDF document. User also can also initiate 3rd party/ Appraisal requests if required, enter remaining customer data into the application, attach required documents, execute checklist and move the case to underwriting.

### **5.3 UNDERWRITING**

Case from application processing (or from compliance) would move to underwriting. Underwriter at this step inputs the Loan Information (Loan Request, Interest, Structure, Amortization & Repayment & covenants) after seeing the proposed deal request from the lender. Risk Rating & Financial information is fed into the system by underwriter for the calculation of Risk Score & Financial Analysis. Underwriter also inputs the various narratives (Transaction Summary, Relationship Summary, Business Background, Risks & Mitigates etc.) as per the analysis. Automatic CAM is generated at this stage

### **5.4 COMPLIANCE**

Loan application from Underwriting after CAM generation would move to compliance sub process for only Reg O cases. Reg-O case will be identified in the system by using EOD code (Employee-Officer-Director Code) where the user selects the code and enter the Name or TIN no, basis which system will automatically determine the case is Reg-O or not. In Compliance sub process user can also send back the case to application coordinator for any issues/concerns.

Reg O cases would be identified by EOD(Employee Officer Director) code filled during Initiation Step. If EOD code is Director or Reg O Officer then user checks in the system using the Name or Tin no of the person. If it matches then case would automatically move to Compliance sub process.

**NOTE: There are around 20 more steps that cannot be discussed as it is the company policy and is confidential.**



## **CHAPTER -6 EXTERNAL INTERFACE REQUIREMENTS**

Following hardware and software interfaces would be the part of LOS:

### **6.1 USER INTERFACE**

- The standard/optimum screen resolution for IBPS will be “1280X1024” pixel.
- Email Notification font will be “Din Regular”.
- Users will have access to IBPS over “https” protocol using Internet Explorer 11.
- Following interfaces will be provided by IBPS:
  - IBPS Administration Login.
  - IBPS Client or Web Desktop Login.
  - BAM Login.
  - Master Data Management (MDM).

The above points are subject to change based on the discussions & will be finalized with the technical team during design phase of the project. The application screen design layout is subjected to fine tune during the prototype phase of the project.

### **6.2 HARDWARE INTERFACES**

- The documents will be scanned using document scanner. These documents will be uploaded into IBPS.
- The IBPS system will use CLIENT printer to print documents.

### **6.3 ACTIVE DIRECTORY**

The system will interface with Active Directory of the CLIENT to bring in the information of users that will be accessing the system. To do this, the following details will have to be shared during installation:-

- IP/URL address of Active Directory
- Credentials (user name and password) to fetch user data and import in Newgen OmniFlow system.

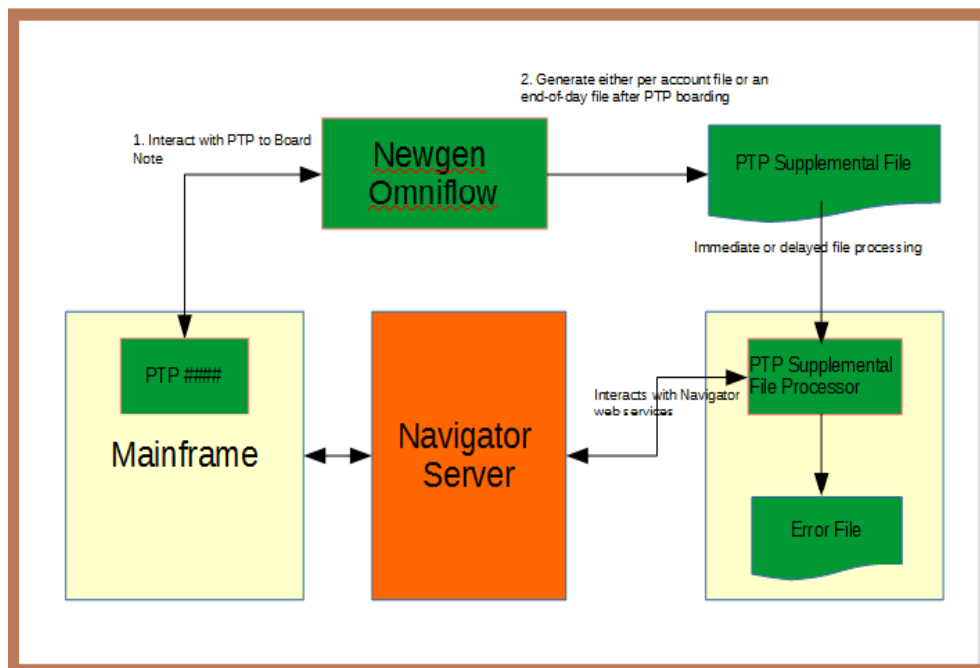
## 6.4 SOFTWARE INTERFACES

### FISERV PREMIER DETAILS

FISERV Premier is Core Banking System which is used for loan Origination system. The Premier bank platform serves as the foundation on which a financial institution is built, and is surrounded by a host of other value-added banking solutions from Fiserv. Navigation within Premier is browser-based (also called Navigator).

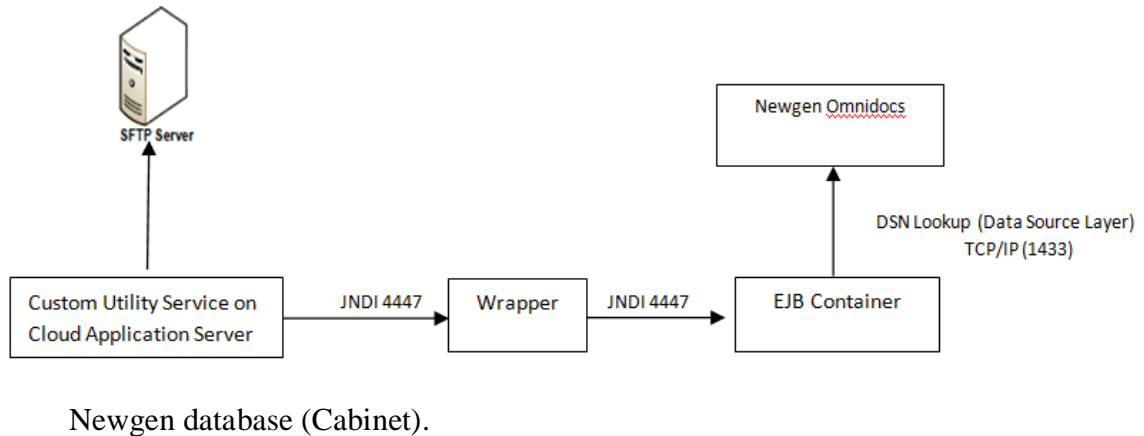
### Integration Methodology:

- OmniFlow will interact with Fiserv Premier for pushing the loan information using BSP2301/PTP2301 Dynamic Link Library (DLL) which exposes functions for transmitting and receiving data to and from an enterprise server using TCP/IP from a Windows program.
- The interactions with Fiserv (OmniFlow-> BSP2301 Dynamic Link Library (DLL) will be real time. OmniFlow will pass the input message to the BSP2301 for Loan Creation and wait for the response for the output.



**FIGURE 1** Omniflow & Fiserv Premier Interface

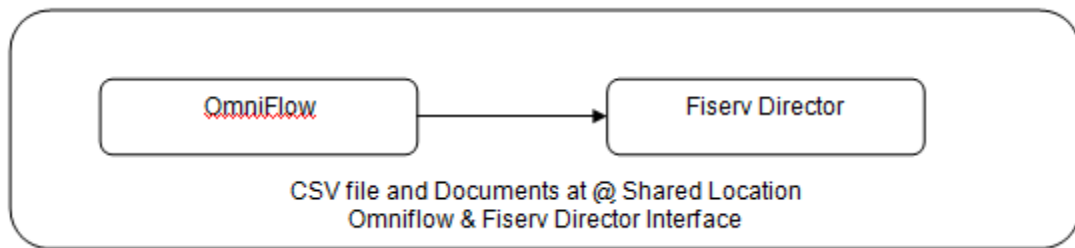
- For fetching the data from Fiserv, CLIENT will provide dump of Aggregates data daily at EOD in Excel file format at a folder location on SFTP at some share location. A utility will be scheduled to read the Excel (.xls) files and store data in



**FIGURE 2** JNDI Connection

## **FISERV DIRECTOR**

- Fiserv Director is the Document Management System (DMS) used for storing docs . OmniFlow will interact with Director for document archival during closure & retrieval.
- Interactions with Director (OmniFlow-> Director) will be via shared location.
- Integration Methodology used SFTP Folder. Omniflow will send CSV and all documents attached with workitem at Post Closing Review workstep in a shared folder. It will also be ensured that no duplicate documents are uploaded in FISERV Director from the Shared Location



**FIGURE 3** Uploading of documents through Fiserv

- Document Fetching in Omniflow from Fiserv Director will be done using Director Retrieval Interface 1.0 Requests should be sent via HTTP POST method (SSL optional).

## CHAPTER -7 OTHER NON FUNCTIONAL REQUIREMENTS

### Software Quality Attributes

- **Customizability:** IBPS offers extensions to existing functionality to better suit the needs of a user.
- **Integrity:** Maintain correctness and harmony among all related pieces of data.
- **Security:** Data remains protected from unauthorized access. This includes both change access and view access.
- **Maintainability:** Software has quality to adapt changes, improve over time, correct any bugs and be proactively fixed through preventive maintenance.
- **Robust:** Software is robust enough to cope with unusual situation.
- **Resilience:** Software has capacity to absorb sudden bursts of legitimate loads.

## **REFERENCES**

Following documentations have been referred during preparation of this document

- SOW (Scope Of Work) - Commercial Loan Origination Platform for CLIENT
- RFP (Request for Proposal)- Loan Origination Platform
- Gap Study Document for Commercial Loan Process