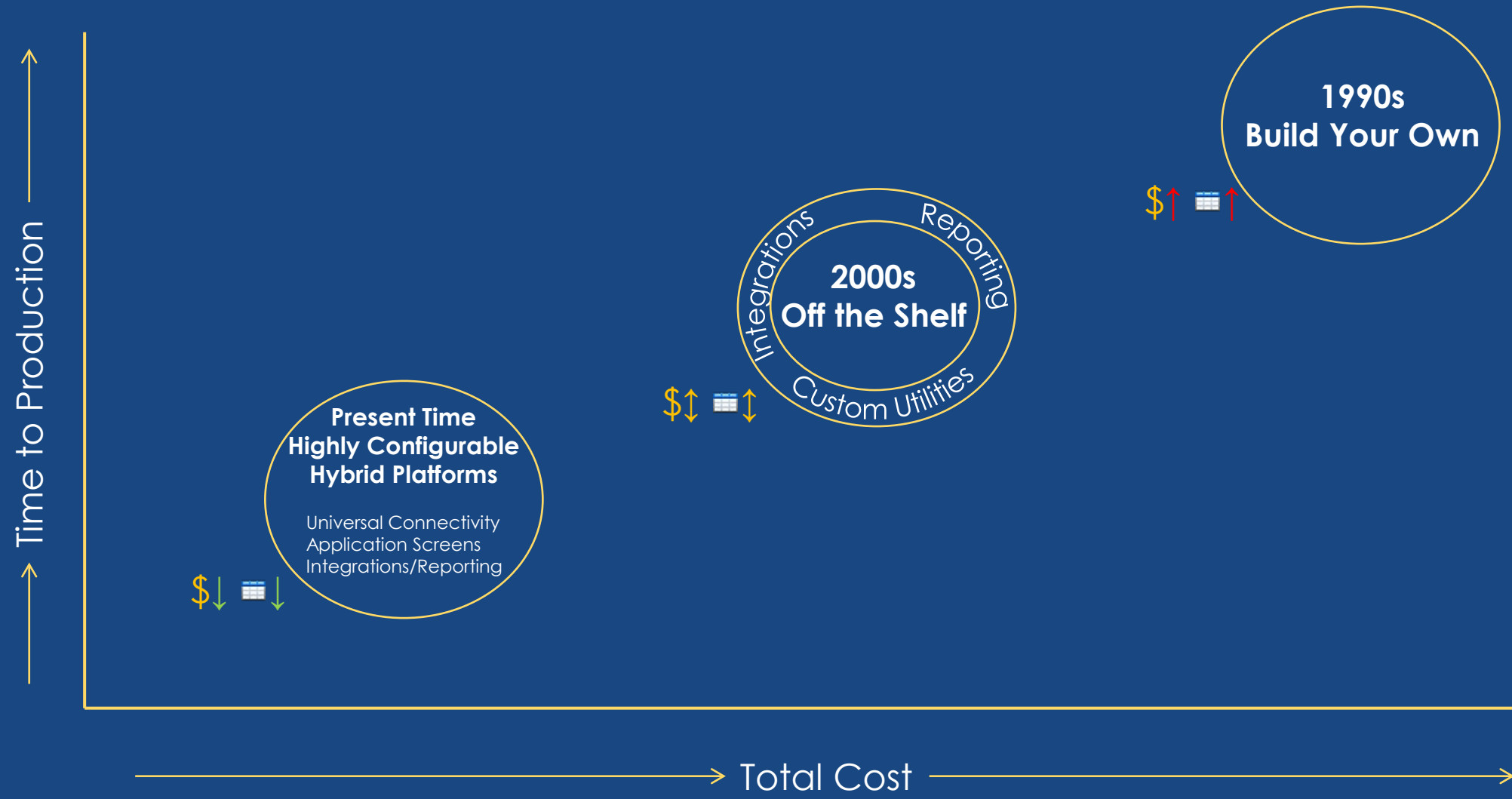
JAR Platform

JORVAK

Technology Solution Evolution



What is JAR Platform?

- Jorvak Analytics and Reporting (JAR) is a web based cloud ready integrated toolkit for:
  - **Data Integration** – Database, AWS, SSH, FTP, Network Shares, Loaders, Extractors and more
  - **Application Screens** - Front end UI creation with full role based row/column level security
  - **Analytics and reporting** – HTML Reporting with drillable visualizations and Full Excel based templates for Data presentation/visualization with pivot tables/charts, slicers etc.
  - **Cloud Management** – Integration with Microsoft Azure (AD, SQL etc.), Amazon Web Services (S3, Redshift etc.) and Google Analytics for tracking and analyzing web traffic

- JAR can connect to any database which has JDBC driver available (Nearly all databases have a Java driver) Currently tested on popular databases like Hadoop Hive, Cassandra, SAP HANA, Oracle, Exadata, Teradata, SQL Server, AWS Redshift, IBM DB2, MySQL, PostgreSQL and more

- JAR utilizes open source/common technologies (Excel, SQL, XML, HTML, CSS and JavaScript)

- JAR configuration is set up through XML or Properties files, no Java coding is required

- JAR capabilities can seamlessly be combined to enable complete solutions

UNIVERSAL CONNECTIVITY

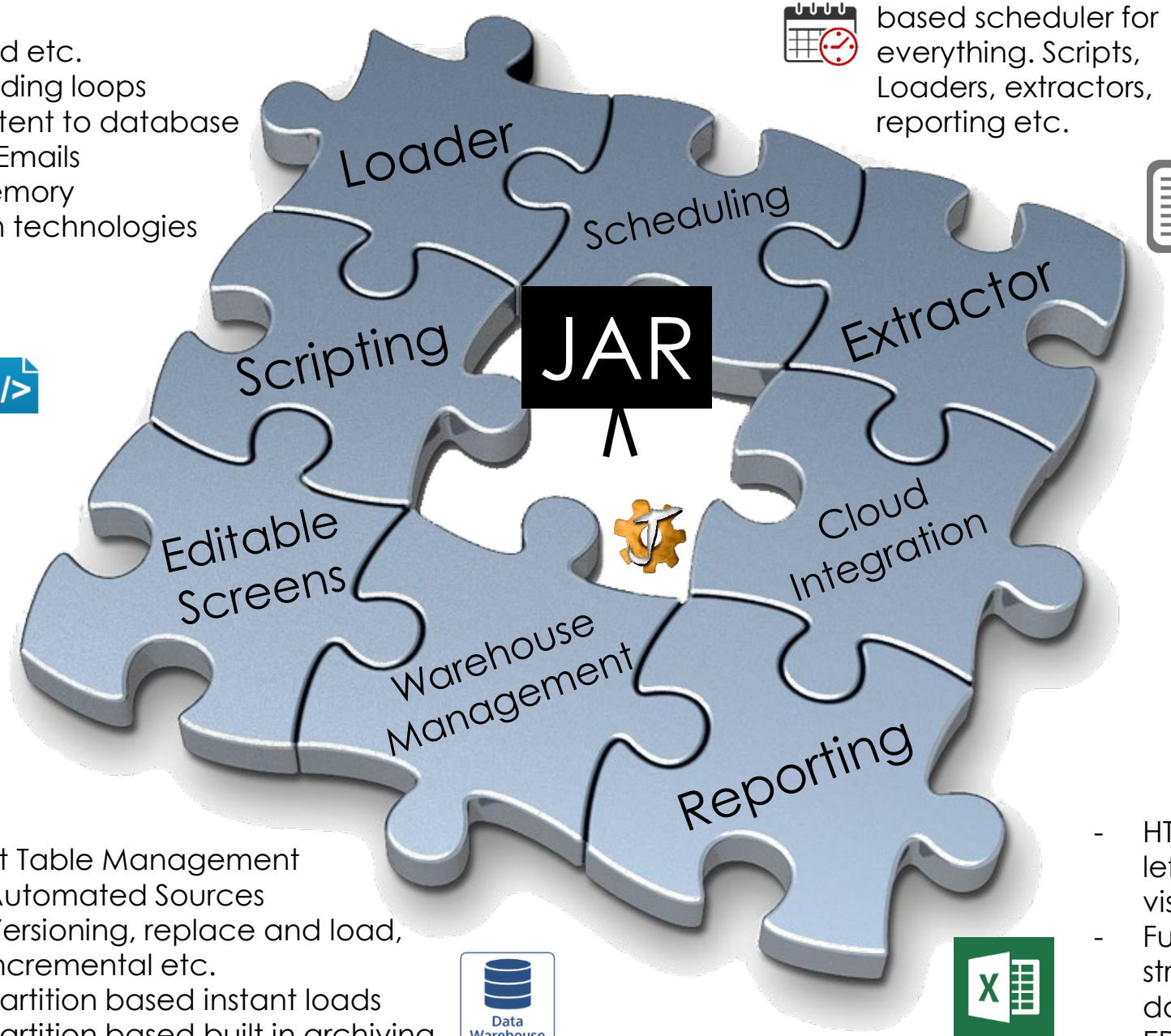
Tested connectivity with the above, but JAR connects to anything with a JDBC driver (over 99%+ of all databases)

JAR Integrated Architecture

Load any format
- Flat Files – CSVs, Fixed etc.
- Full EDI support including loops
- Stream XLSX file content to database
- Outlook Calendars/Emails
- DB to DB using in memory conversion between technologies

Built in dependency based scheduler for everything. Scripts, Loaders, extractors, reporting etc.

Export Data in any format: CSV, Tab, Custom etc.
- Adhoc or scheduled



- Integrations Simplified
- Full replacement for shell scripting with API, AWS, Checksum, Database, FTP, LDAP, Network Shares and SSH commands.
- Automated error management and notifications

Full integration with Microsoft Azure (AD, SQL etc.), Google Analytics and Amazon Web Services S3 storage and Redshift Data Warehouses

Fully configurable data management front end UI screens built entirely using XML configuration with full row/col level role based security

Fact Table Management
- Automated Sources
- Versioning, replace and load, incremental etc.
- Partition based instant loads
- Partition based built in archiving

- HTML Reporting with built in left and right click drillable visualizations (graphs etc.)
- Full Excel template based streaming exports and dashboards
- EDI file generation via export

JAR Features and Capabilities

Enterprise Features

- ✓ High Performance
- ✓ Security
- ✓ Scheduling of Jobs / Processes
- ✓ Scalable
- ✓ SaaS Auto Update Delivery
- ✓ Data Warehouse
- ✓ Native Connections
- ✓ XML Based Configuration
- ✓ Time to Deliver
- ✓ Cost

Reduce Development Time

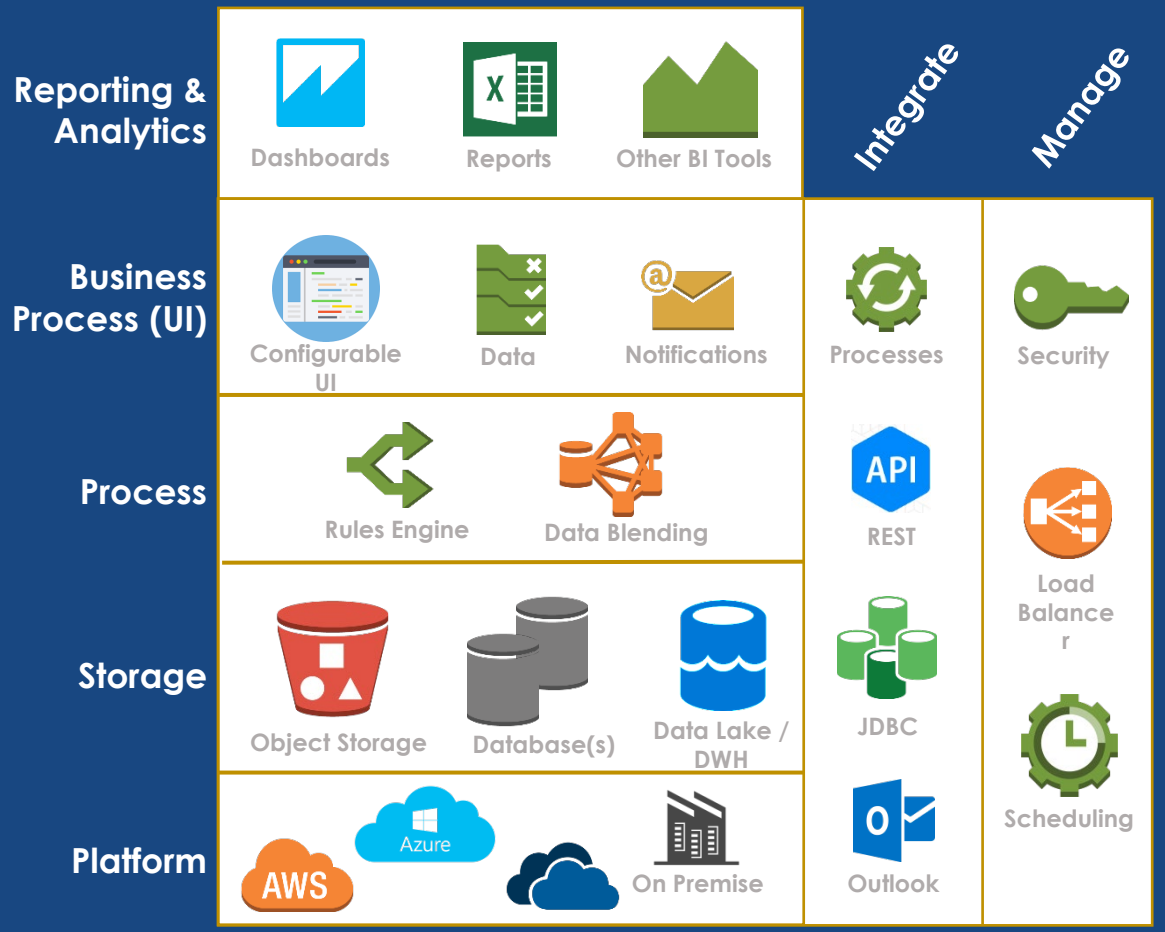
- Cut integration development and time by ~33%
- Leverage client analysts and eliminated the need for developers
- Reduced SDLC Documentation

Performance (Examples)

- Excel Export Performance without significant memory usage:
  - ✓ Extract 100,000 rows x 50 cols wide (5 Million cells) in 45 secs
  - ✓ Extract 1 Million rows x 50 cols wide (50 Million cells) in 6 mins
  - ✓ Extract 802K rows x 149 cols (119.5 Million cells) in 11.5 minutes
- Load into Oracle: 237M rows x 165 cols (39.1 Billion cells) in 1 hr. 14 secs.
- Extracted from Database, zipped and sent to AWS S3
  - ✓ Teradata – 7.3 Million rows x 15 cols wide (109 Million cells) in 7 mins
  - ✓ Oracle - 276M rows x 151 cols (41.6 Billion cells) in 4 hrs. 51 mins.

Rapid Reporting

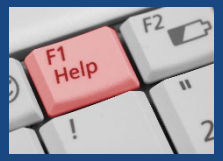
- Rapidly create reports using Excel templates for executive dashboards, reporting and application screens supporting graphs, pivot tables and pivot charts and macros embedded directly in the Excel template.



JAR Platform Wide Automation

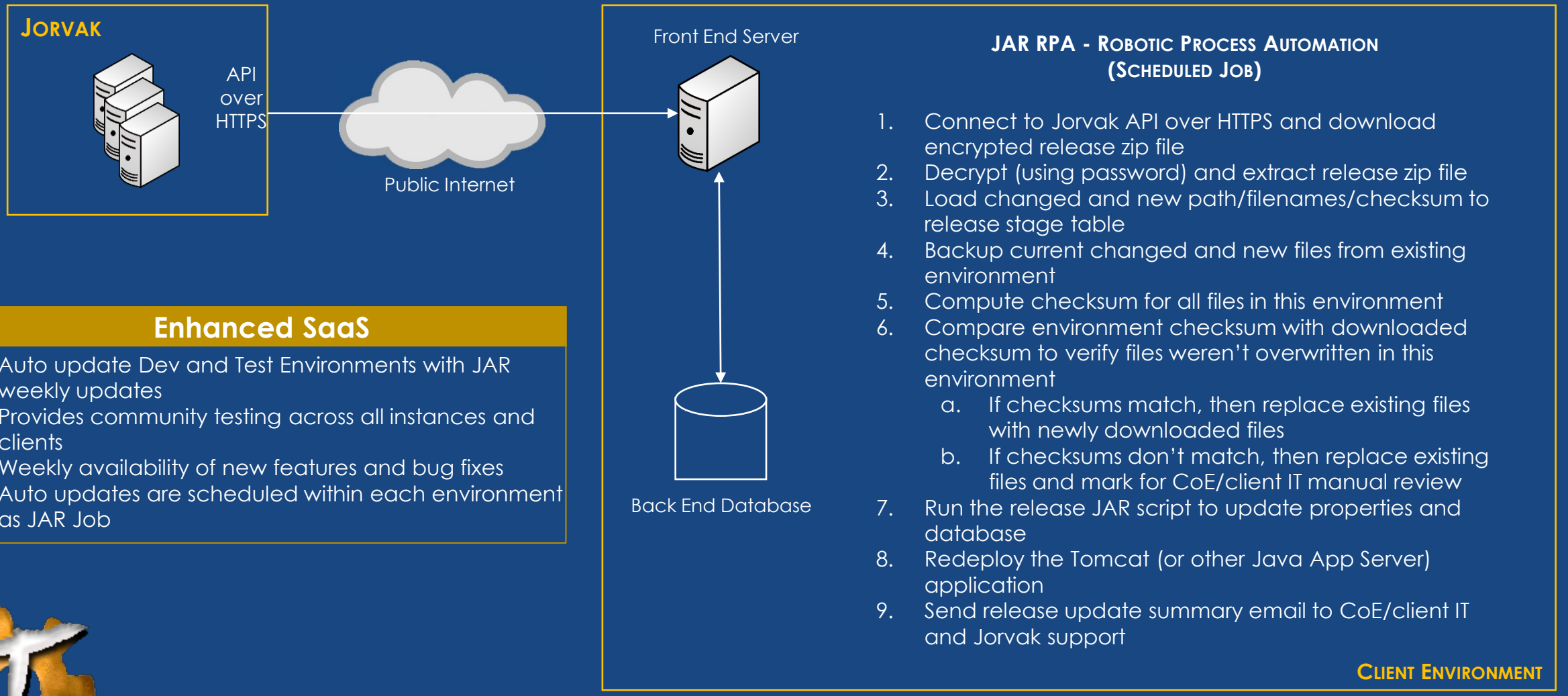
Auto Update Platform – Scheduled fully automated self update capability

Self Service Workflow based Security – Account and Requests are full automated self service with assigned approvers for each security role



Integrated Help Desk/Ticketing – 2 click screenshot based help requests. Fully integrated IT ticket management for two way requestor and responder communication

JAR SaaS Fully Automated Update Delivery using RPA

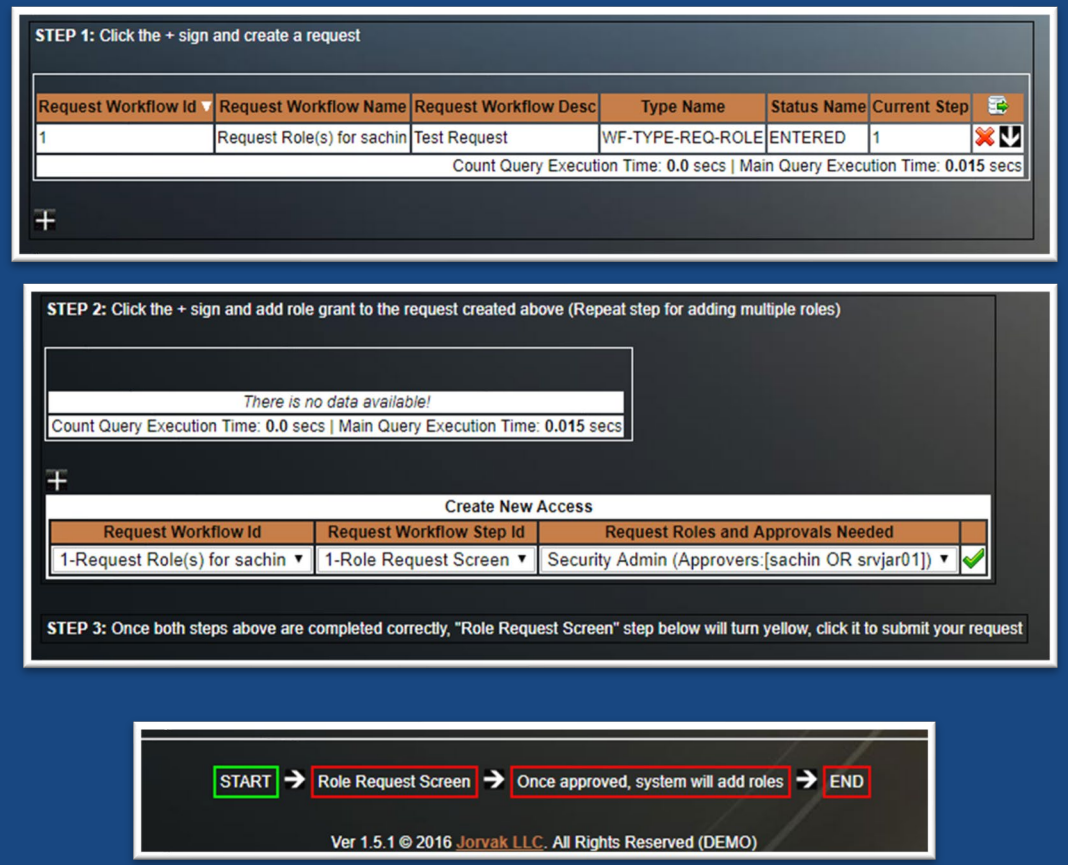


Enhanced SaaS

- Auto update Dev and Test Environments with JAR weekly updates
- Provides community testing across all instances and clients
- Weekly availability of new features and bug fixes
- Auto updates are scheduled within each environment as JAR Job

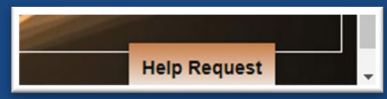
JAR Security Automation and 2-Click Help Request

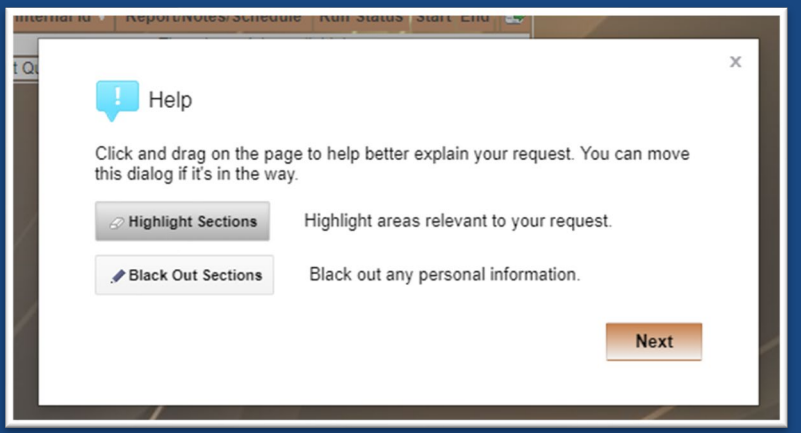
Workflow based Security Account/Role Management

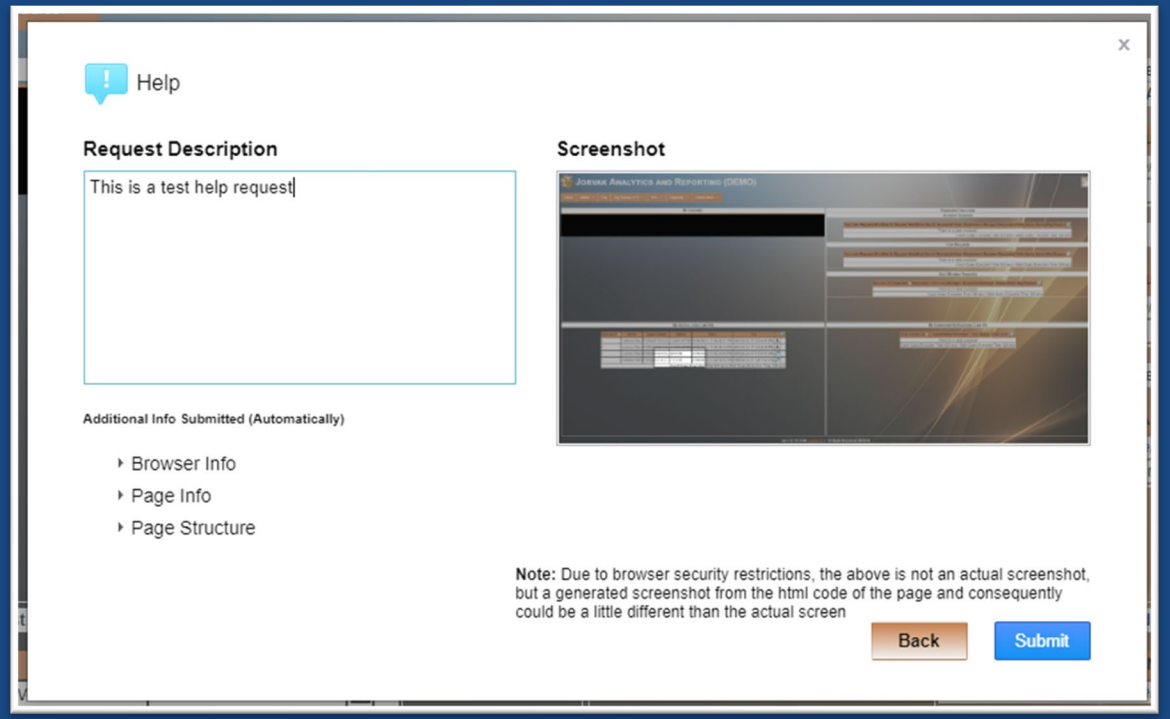


No IT or operational involvement for security account/role management. Significantly simplifies audit and DevOps

Screenshot based 2-click built in Help Request







JAR Features and Capabilities

Component	Example Alternatives
Reporting & Analytics	Cognos, Qlik, Tableau, Power BI
Business Process (UI)	UI Frameworks & BPM Solutions (Tibco, Appian, etc.)
Integration	Talend, Informatica, Pentaho Data Integration
Scheduling	Autosys Scheduler, Quartz Scheduler, Spring Batch
Scripting	Ansible, Chef, Puppet, PowerShell
Process/Extractor	Talend, Informatica, Pentaho Data Integration
Warehouse Mgmt	Native to Data Warehouse features and many third party add-ons

JAR Implementations at TOP 5 Pharma Company

Application Component	Data Steward	Membership Analytics	Cloud Analytics	Medicaid Liability	Analytic Reporting	Payments	Unstructured Data Analytics	Cloud Integrations	Robotic Process Automation
Editing	✓	✓	✓	✓		✓	✓		
Loading		✓	✓	✓		✓	✓		✓
Extracting			✓	✓		✓	✓	✓	✓
Scheduling	✓		✓			✓		✓	✓
Reporting	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scripting			✓	✓		✓			✓
Cloud Integration			✓					✓	
Warehouse Management			✓					✓	
Help Request Management	✓	✓	✓	✓	✓	✓	✓		

Sample Application – Submission Validation System (SVS)

- HORIZONTALLY SCALABLE – PARALLEL VALIDATION EXECUTION
- BEST OF BREED DATABASE TECHNOLOGIES

ONE TIME DEFINITION

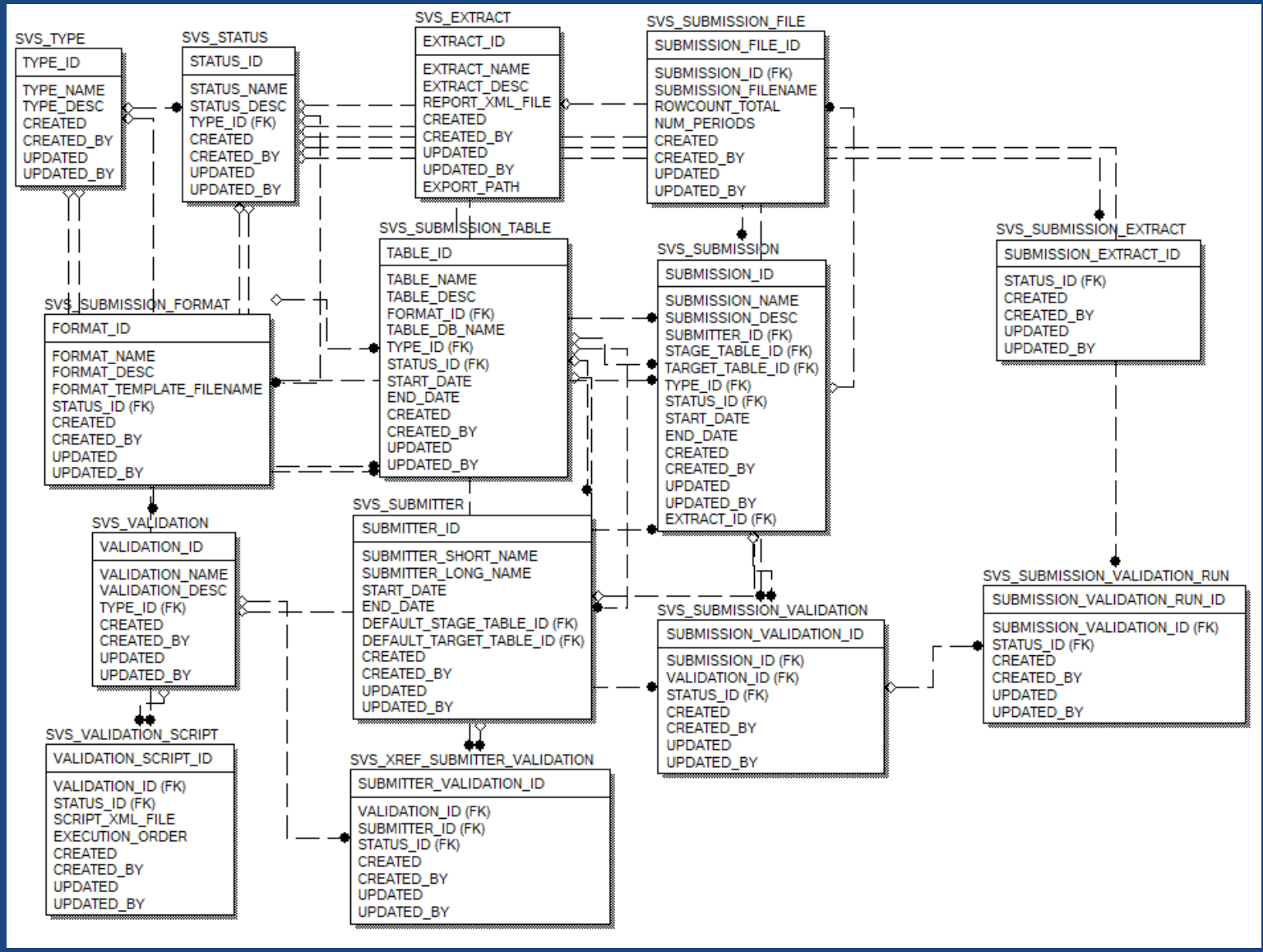
DAY TO DAY OPERATIONS

DEFINE DOMAINS	LOAD	VALIDATE	REVIEW	EXTRACT
FORMAT SUBMITTER TABLE VALIDATIONS	SUBMISSION LOAD FILES	VALIDATE	REVIEW RE-PROCESS	EXTRACT
1. Define Submitters 2. Define Formats (NCPDP, Custom etc.) 3. Define Stage and Target tables for one or more submitters 4. Define validations and link to submitters	1. Create submission for a Submitter and Time Period 2. Load summary and detail files for each submission 3. Run pre-defined base validations for the submitter	1. Choose from the pre-defined validation set assigned to submitter or override validations to be run 2. Execute validations and track status	Review results of validations and re-process as necessary	Select extract aggregation level and other options and extract to pre-defined locations for load to Revenue Management System (RMS)

Submission Validation System (SVS) – ER Diagram

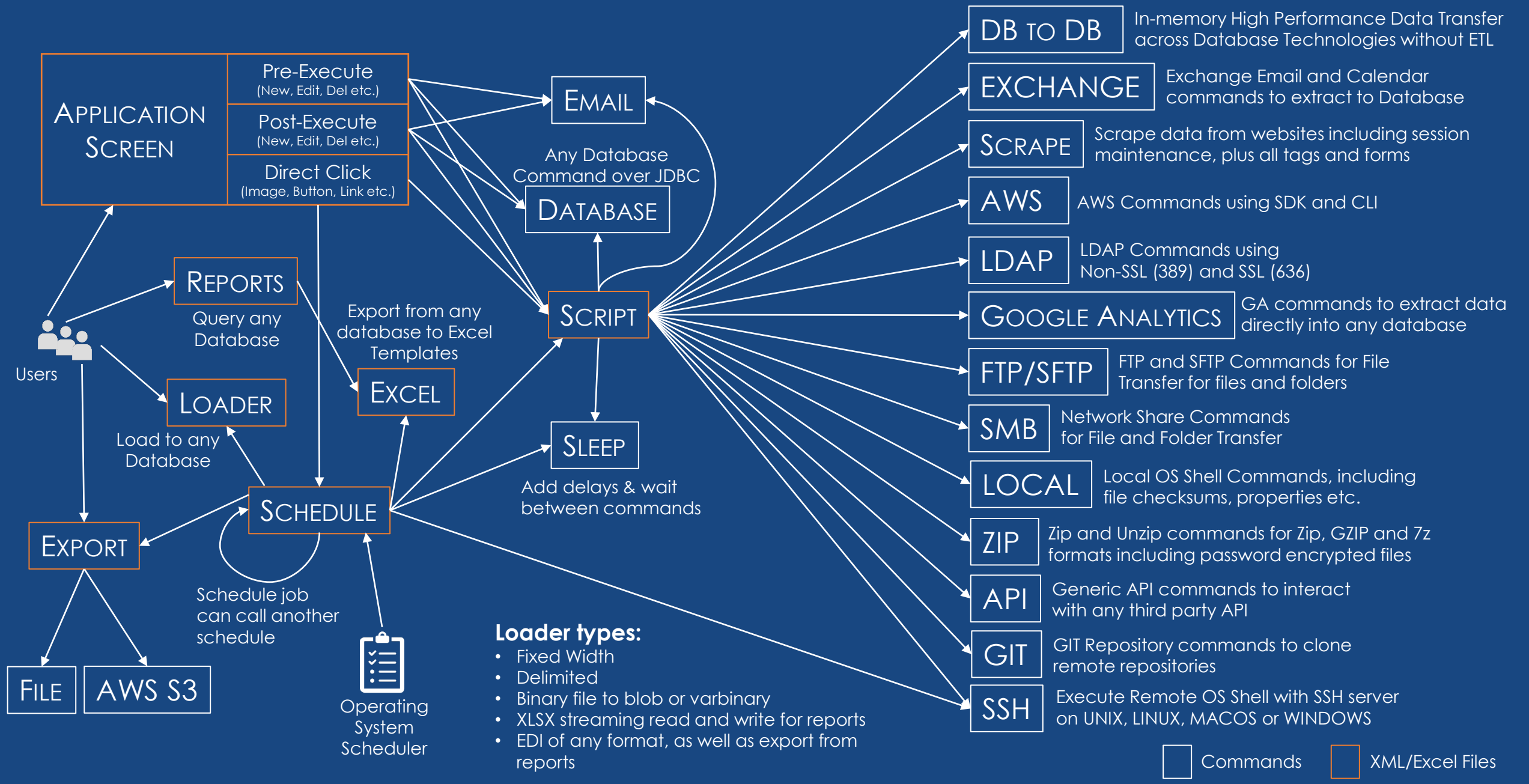
Sample Database schema design

- Define
- Load
- Validate
- Review
- Extract



Anatomy of a JAR Application

All Configuration Done via HTML, JS, CSS, XML and SQL



JAR Configurability – Reporting Engine

End User

JAR App Server
(Tomcat, Weblogic etc.)

Similar Processing as below for Scheduled Reports
Notifications, attachments, links via email

User Request from Browser → Servlet calls Reporting Engine class

Process XML Configuration

If parameters are specified, send parameter request to user → Receive Parameter Request

Provide Parameter Input → Process validations on user supplied input and return to user for any issues, otherwise save provided values

Process variables for intermediate lookups and calculations using parameters and queries against any Database, AWS, FTP etc.

Process any pre-executes (database, ftp, script, email etc.) before generating report

Process SQL query against appropriate database and process result set using configured column formatting

Format – HTML

Provide paged result set, defined Visualizations (graphs etc.) back to user HTML session on a batched row basis

Format – Excel

1. Read in Excel Template
2. Populate data into Excel
3. Return excel file to user session as file

Format – Flat FIle

Process user provided input to export data to user session as file

Format – Cloud

Process user provided input to export data to cloud storage (ex: AWS S3 etc.)

Process any post-executes (database, ftp, script, email etc.) after generating report

Return report output to user based on format requested → Receive Report Output
Screen – HTML
File – Excel, Flat file etc.

JAR Configurability – Editable Screen Engine

User Request from Browser

Servlet calls Editable Screen Engine class

Process XML Configuration

If parameters are specified, send parameter request to user

Receive Parameter Request

Provide Parameter Input

Process validations on user supplied input and return to user for any issues, otherwise save provided values

Process variables for intermediate lookups and calculations using parameters and queries against any Database, AWS, FTP etc.

Process any pre-executes (database, ftp, script, email etc.) for specific actions (new, edit, del)

Process SQL query against appropriate database and process result set:

Present User data returned in editable format using configured column formatting for user inputs (Drop Down, Date, Popup, Field etc.)

Process User Input for Edited Rows with specified validations

Process Delete requests as physical or logical deletes based on configuration

Process any post-executes (database, ftp, script, email etc.) for specific actions (new, edit, del)

Return screen output to user based on action performed (edit existing, new, delete or custom actions)

Receive Editable Screen and perform actions for new row, edit or delete existing rows or custom actions specified by XML configuration

JAR Configurability – Loader Engine

End User

JAR App Server
(Tomcat, Weblogic etc.)

Similar Processing as below for Scheduled Loads
Notifications, links via email

User Request from Browser → Servlet calls Loader Engine class

Process XML Configuration

Process configuration and specified HTML template to present user screen for uploading files → Receive Screen for Uploading Files

Upload one or many files → Process uploaded files verifying restrictions (extension, size etc.) and save to specified temporary path

If parameters are specified, send parameter request to user → Receive Parameter Request

Provide Parameter Input → Process validations on user supplied input and return to user for any issues, otherwise save provided values

Process variables for intermediate lookups and calculations using parameters and queries against any Database, AWS, FTP etc.

Process any pre-executes (database, ftp, script, email etc.) for specific actions (new, edit, del)

Process input file based on configuration (Flat – Fixed, Delimited OR Excel) and using column configuration load data into specified database

Process any post-executes (database, ftp, script, email etc.) for specific actions (new, edit, del)

Return screen output to user based with success or errors or job id for background load requests → Receive Screen with Success or Errors or Job Id for background load request

JAR Simple Technology Stack

Only 3 items required: Tomcat, JVM and a Database Schema

Front End Server

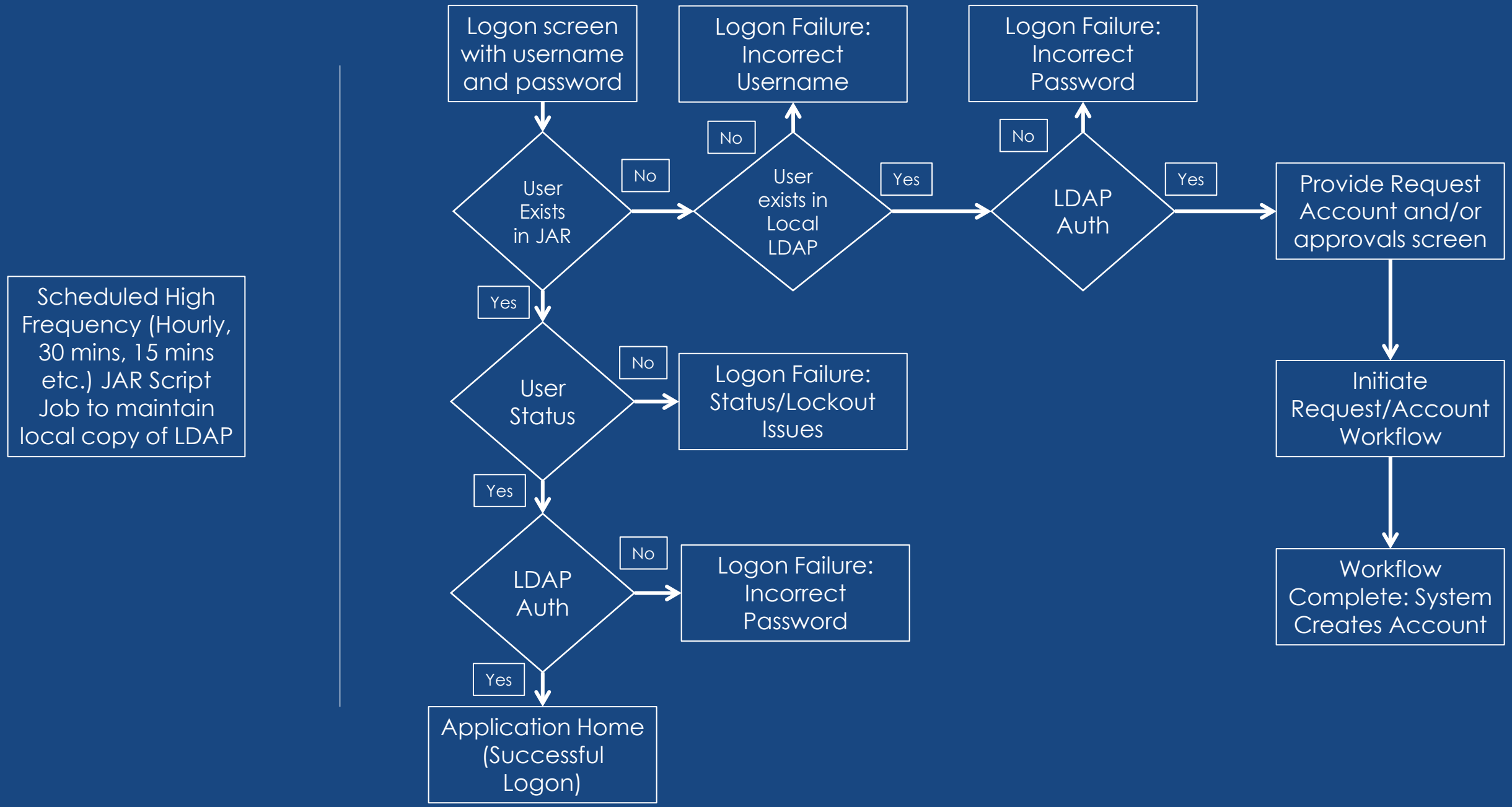
Required
- **Tomcat** App Server
- **JVM** – Java 1.8 or Open JDK

Optional
- AWS CLI
- Azure CLI
- Oracle Client
- SQL Server BCP CLI

Back End Database

Schema/Database
- Oracle

OR
- SQL Server

Note: Can be a managed cloud database service such as AWS RDS or Azure SQL Service

JAR Security – Automation – Self Request