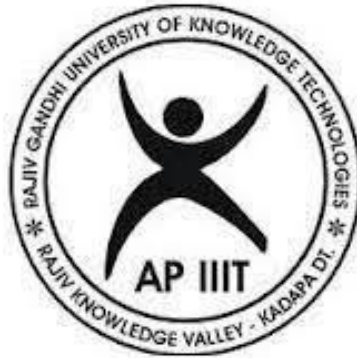# PLANNING PLATFORM
(Supply Chain Management)

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

RGUKT

Rajiv Gandhi University of Knowledge Technologies

R.K.VALLEY

Submitted by

C.MOUNIKA -R170422

Under the Esteemed guidance of

Mr. Satya Nandaram N
RGUKT RK Valley.

DECLARATION

We hereby declare that the report of the B.Tech Major Project Work entitled **Supply Chain Management** which is being submitted to Rajiv Gandhi University of Knowledge Technologies, RK Valley, in partial fulfillment of the requirements for the award of Degree of Bachelor of Technology in Computer Science and Engineering, is a bonafide report of the work carried out by us. The material contained in this report has not been submitted to any university or institution for award of any degree.

C.MOUNIKA- R170422
Dept. Of Computer Science and Engineering

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RGUKT

(A.P.Government Act 18 of 2008)
RGUKT, RK VALLEY
Department of Computer Science and Engineering

CERTIFICATE FOR PROJECT COMPLETION

This is certify that the project entitled **"PLANNING PLATFORM"** submitted by **C.Mounika(R170422)** under our guidance and supervision for the partial fulfillment for the degree Bachelor of Technology in Computer Science and Engineering during the academic semester-2 2022-2023 at RGUKT, RK VALLEY.To the best of my knowledge, the results embodied in this dissertation work have not been submitted to any University or Institute for the award of any degree or diploma.

Mr.N.Satya Nandaram ,   Mr.N.Satya Nandaram,
Project Internal Guide   **Head of the Department**
Assistant Professor   HOD Of CSE
RGUKT, RK Valley   RGUKT, RK Valley

Abstract

Sales and Operations Platform bridges the gap between demand and supply,
by creating a collaborative and consensus driven forecasting and planning
process that incorporates market intelligence.This solution also fosters S & OP
collaboration with contract manufacturing organizations and channel partners
and its powerful Rough Cut Capacity Planning (RCCP) and Inventory Planning
solutions enable optimal scenario analysis and supply-demand integration.
Technologies used are -Java/J2ee-Microservice architecture,React Js,
and MySQL.

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INTRODUCTION

The Demand Planning Platform bridges the gap between demand and supply, by creating a collaborative and consensus-driven forecasting and planning process that incorporates market intelligence. The solution also fosters S&OP collaboration with contract manufacturing organizations and channel partners and its powerful Capacity Planning and Inventory Planning solutions enable optimal scenario analysis and supply-demand integration.

| MATERIALS PLANNING | → | PRODUCTION PLANNING | → | SALES & OPS PLANNING | → | DEMAND PLANNING |
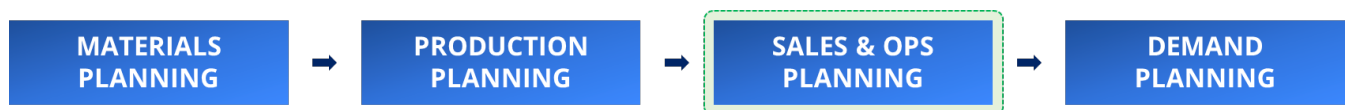
PROJECT EXPERIENCE (S&OP)\

We developed and enhanced S&OP into a multitenant product with high scalability, extraordinary Performance, NextGen User Interface.
The solution is most comprehensive and capable end-to-end global supply chain software ecosystem combining networks, data, and applications to deliver enduring customer value.

Next-generation technologies: Java, ReactJS, MS access, Elasticsearch, Kafka, JGraphT, Airflow.

TEAM: Bharath, Ajay, Santhi G, Ravindar V, Reddemma N, Mounika C, Sai Marala, Udaya Sree A and Kamal Deep were part of the core team building the supply-chain management planning platform.

Purpose:

With new revolutionary technology based architecture and analytics platform, users can make contextual business decisions using big data in real-time. The enhanced platform (Plan Streaming) provides multi-level comprehensive data cleansing across every facet of planning, forecasting and Enable rapid response to changing business needs and bridges the gap between demand and supply.
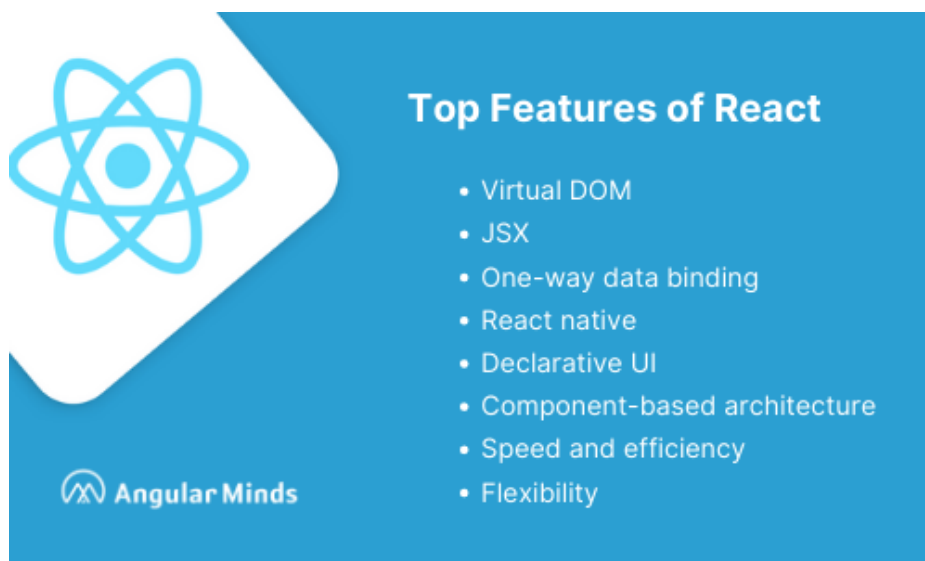The planning platform enables companies who want to be ready to succeed with the cloud-based planning platform for every need across their organization. It's the foundation for our technology, providing the toolkit to enable you to assimilate information from a wide variety of sources, to cleanse and analyze that data, allowing you to align understanding and expectations across your organization – so that you can be ready to act.

Technologies Used
➔ ReactJS
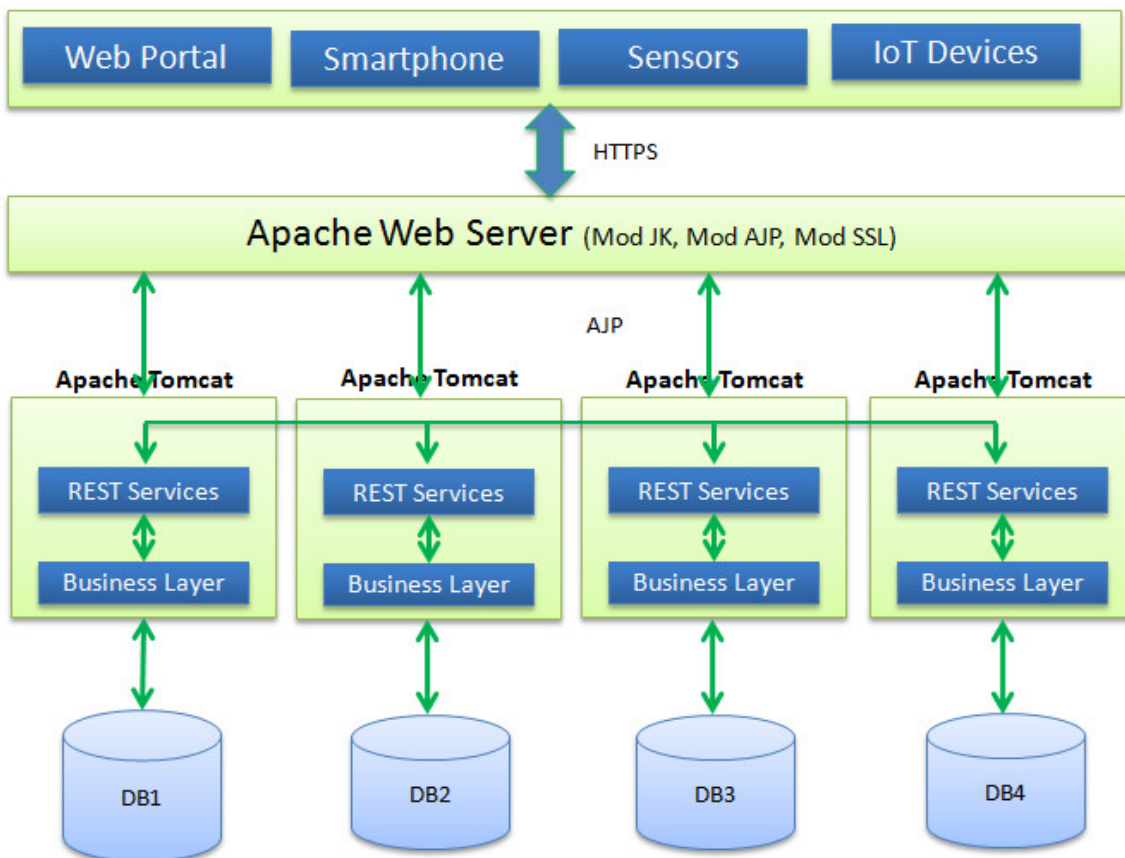➔ Java/j2ee-Microservices architecture
➔ MySQL

ReactJS

The React.js framework is an open-source JavaScript framework and library developed by Facebook. It's used for building interactive user interfaces and web applications quickly and efficiently with significantly less code than you would with vanilla JavaScript.

Top Features of React

- Virtual DOM
- JSX
- One-way data binding
- React native
- Declarative UI
- Component-based architecture
- Speed and efficiency
- Flexibility

Angular Minds

Java/j2ee-Microservice architecture

The term Microservice is becoming popular since last few years. This is a way of designing a software system as a bundle of independent services. These bundles can be deployed independently. This architectural pattern is more focused on scalability, loosely coupled and easy to maintain. This is most suitable for variety of different clients including Internet of Things, devices, desktop browsers, mobile browsers and native mobile applications. These services can also be used for integration with third party systems.
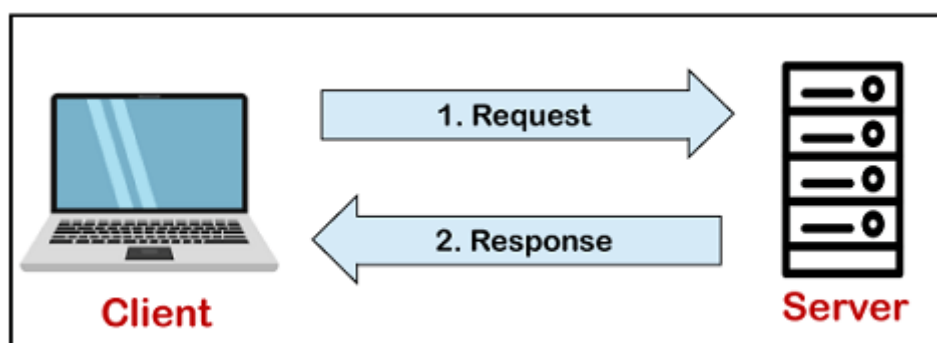
Services as component

Component is a software unit that can work independently and easily replaceable and upgradeable without affecting the functionality of the other component. Microservice architectures will use libraries, but their primary way of componentizing their own software is by breaking down into services. We define libraries as components that are linked into a program and called using in-memory function calls, while services are out-of-process components who communicate with a mechanism such as a web service request, or remote procedure call.

MySQL

MySQL is a relational database management system based on the Structured Query Language, which is the popular language for accessing and managing the records in the database. MySQL is open-source and free software under the GNU license. It is supported by Oracle Company.

How it works?

KEY MODULES

Automated Demand Forecasting	Collaborative Sales Forecasting	Integrated Business Planning
Automated Demand Forecasting optimizes the Demand Plans for the highest accuracy and fidelity for every channel at the most granular levels to prepare for the most volatile conditions with no Opportunity or Inventory Loss	Improve forecast accuracy with accelerated forecasting and deeper analysis with Collaborative Sales Forecasting.	Integration of information and processes to enable a more flexible, accurate, and faster E2E network
- Statistical forecasting in the Planning Process - Demand Driver Analysis - New Product Forecasting	- Forecast accuracy with real-time collaboration - Composite dashboards with improved accuracy - Controls for sales forecasting process	- Gain additional flexibility in supply - Increase overall speed of network Improve accuracy of forecast – the first time

Feautures

- **New Product Introduction Modeling**

  This feature that allows forecasting new products. Challenges during NPI modelling are Absence of historical data, Replacement for an existing product, positioning the new product vis-à-vis old product, Retaining the customer base, Avoiding shortages and excess inventory. SW models new product forecasting using Standard Curves and using the similar product.
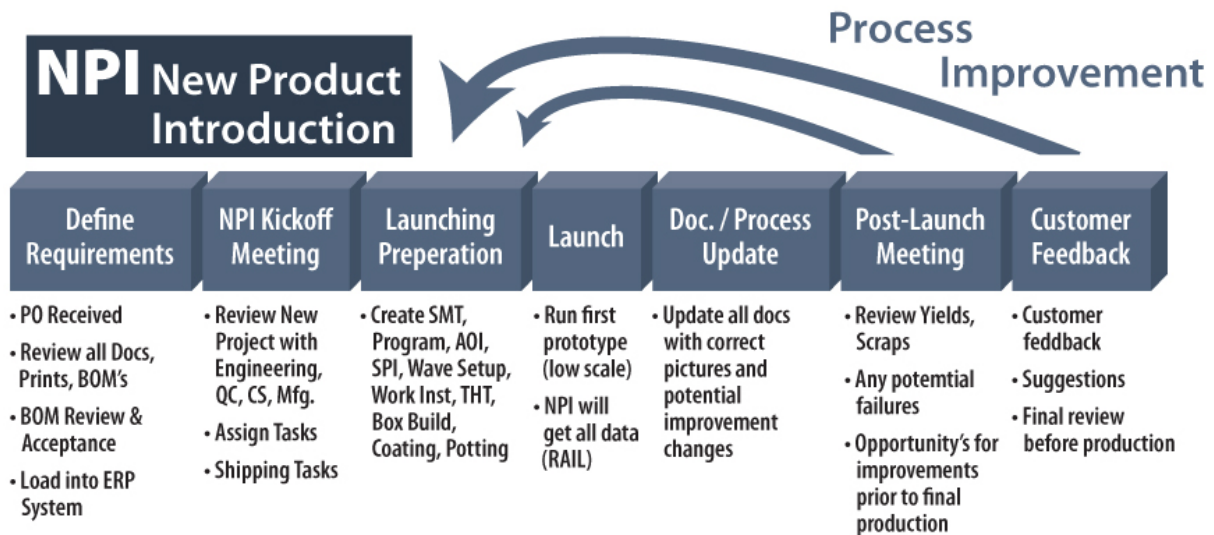
- **Exception Based Planning** :

One of the biggest issues in demand management is dealing with unexpected changes. These unanticipated changes in demand render management plans useless, and send managers into crisis mode. However, there is a better way to stay on top the unpredictable world of demand management. Exception based demand management is the best way to streamline the supply chain while still being prepared for sudden changes in demand.

What is Exception Based Management?

An exception is any deviation from the acceptable business process planning strategy that the organization has implemented. Exception based demand management uses a forecasting process that also identifies anomalies in the forecast. You are then able to proactively make corrections before any damage is caused.

When an exception based demand management strategy is used, the key players in the organization decide what type of exceptions should be identified in the forecast. This requires balancing the cost of managing the exceptions with the cost savings in properly executing the strategy.

No forecasting model is going to be completely accurate. An organization can either weather the ups and downs of the errors in the forecast, or it can use exception based management techniques to eliminate many of the errors and inefficiencies produced by the forecast.

EBP is a key new module in Planning Platform and a key component for our customers managing 'big data'. In short EBP is a practice where deviations from a plan are brought to the attention of the user by exception instead of needing to review everything all of the time. It means resources are much more efficient in tracking down and resolving problems.

Illustration

Rule 1
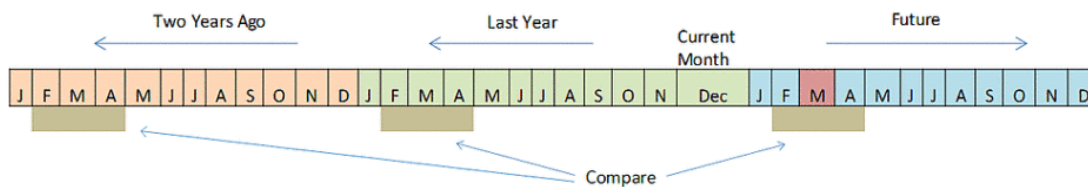
Rule 2
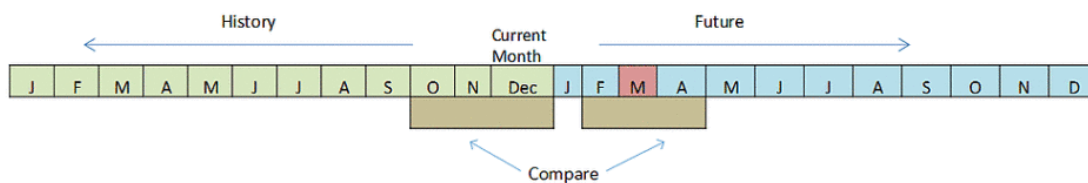
- **SMART TAR:**

  SMART TAR stands for Template Assignment Refresh. SMART TAR is valid for Templates associated with Filtered List. Post data load, Filtered List may get modified because of new Items addition, Discontinuation of Item, movement in hierarchy etc. These actions put the need for refreshing the filtered list and Template Worksheet in the background process.

- **Business Rules:**

  The power and robustness of business rules can be utilized in many ways depending upon business requirements. Business rules can not only automate time series computations but also scan across the total horizon and perform time series computations, aggregations and disaggregation based on different time anchors and set events. The core capabilities of Planning platform Business Rule Framework are listed as follows.

- o Hierarchy Aware Business Rules

- o Forward Chaining Capability

- o Time Phase Triggering Capability

- o Time Aware Business Rules

- o Disaggregation Logic

- o Capability of being triggered by Master Data Attributes

- o Business Rule Validation Framework.

- **Mobile Dashboards:**

  Uses OLAP architecture and Roambi Analytics to display dashboards in Mobile (IPhone or IPad). The Platform's Insight mobile app runs on a configurable cloud platform that easily adapts as your needs change. You can perform critical S&OP functions on an iOS device with just a few taps of your finger.

- **Analytics Reports**

  This feature that enables to fetch data in the reports from OLAP cube. The key benefits of OLAP reports are fast processing of reports, report jobs not being blocked by any of the other jobs in the environment.

- **Report Scheduling:**

  System allows the users to schedule reports through the UI. When user needs easy access of Reports with latest data through mails without logging to SW application, it allows the users to schedule a report. Admin users can assign or distribute reports to users through this feature. Admin users are responsible for creating user groups, adding user(s) to this group and assign a particular report to this user and he can set a schedule for this assignment. This schedule can be a recurrence or on multiple dates basis.

- **Web Templates:**

  The templates allows user to view the updated planning data and provides user to perform changes/overrides as required and can refresh to see the latest data. Usability is a major driver in Web Planning as it uses IE browser for opening the planning template with data.

- **Telescopic Planning:**

  System provides the capability to perform more detailed level planning, by zooming into the smaller planning buckets, for near term horizon. Thus, while overall forecasting & planning is done at one bucket size, say monthly. Executives can plan at more detail level in smaller bucket, say weekly, for near future.

This planning platform is integrated with a Cognitive Sourcing system which combines market intelligence and enterprise data with artificial intelligence to identify opportunities and risks for enterprise sourcing teams.

PlatformData will enable Unilever to leverage the AI and Machine Learning process to drive scalability, process improvement, incremental cost saving opportunities and risk avoidance for direct material supply chain. Many of PlatformData's customers and target market have underinvested in innovation for the direct materials sourcing process.
The unique PlatformData Cognitive Sourcing Platform allows customers to sense, recommend, act, and learn

- **Cost Management System** Platform's Cost Management System specializes in providing Part Level opportunity thus increasing Customer data visibility. It analyses key indicators and provides actionable insights to the user with the help of mix-n-match filters, which can be used to optimize the sourcing process. It includes features like **Internal Analytics, Opportunities, Negotiation Playbook**

- **Market Intelligence** is information about customers, data about room for entry/growth in a market, capturing market share, competitive intelligence and much more. While each type of marketing intelligence is different in its own way, all of them are important for, setting prices, developing content, and designing and implementing business strategies

This includes Benchmarking, Competitiveness, Partmatching, Raw Material, Predictive costing

- **Smart RFX** solution you can collaborate with your suppliers spanning everything from information sharing, collaborative data gathering all the way to the end-to-end Quote, Bid, and Award process. Platform is able to witness thousands of negotiations on the platform, observe where both parties started, what negotiation levers were most effective, how the negotiation evolved to final agreements and awards, and then continuously earn from all this community interaction to offer actionable insights for future negotiations.

- **NPI (New Product Introduction)** solution that enables early engagement and cross functional collaboration between New Product Program Management,Engineering, Supply Chain and Sourcing teams to accelerate time to margin and reduce risks as they shape the supply chain for new product programs

- **Supply Risk navigator** Risk Solution to help companies protect margins and revenues in these times of economic crises

Integrated Business Planning:
IBP reduces Supply / Demand mismatch

IBP is a process for aligning a company's business goals with its finance, supply chain, product development, marketing and other operational functions. Think parts suppliers that work with automakers and need to constantly retool to accommodate design changes, or food producers operating on razor-thin margins that must manage both uncertain supply chains and fickle customer tastes.

# Software Development Model (Product engineeing):

Agile Development Agile:

The Agile methodology is a way to manage a project by breaking it up into several phases. It involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating. Continuous collaboration is vital, both with team
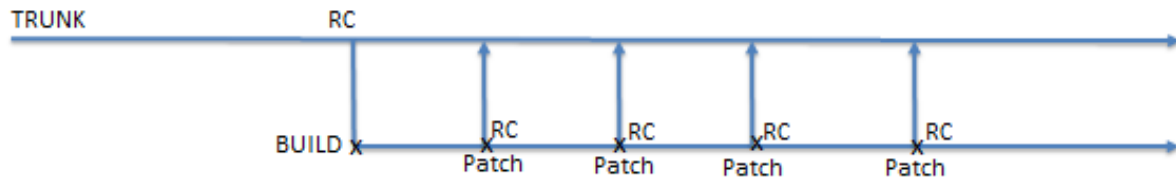members and project stakeholders.
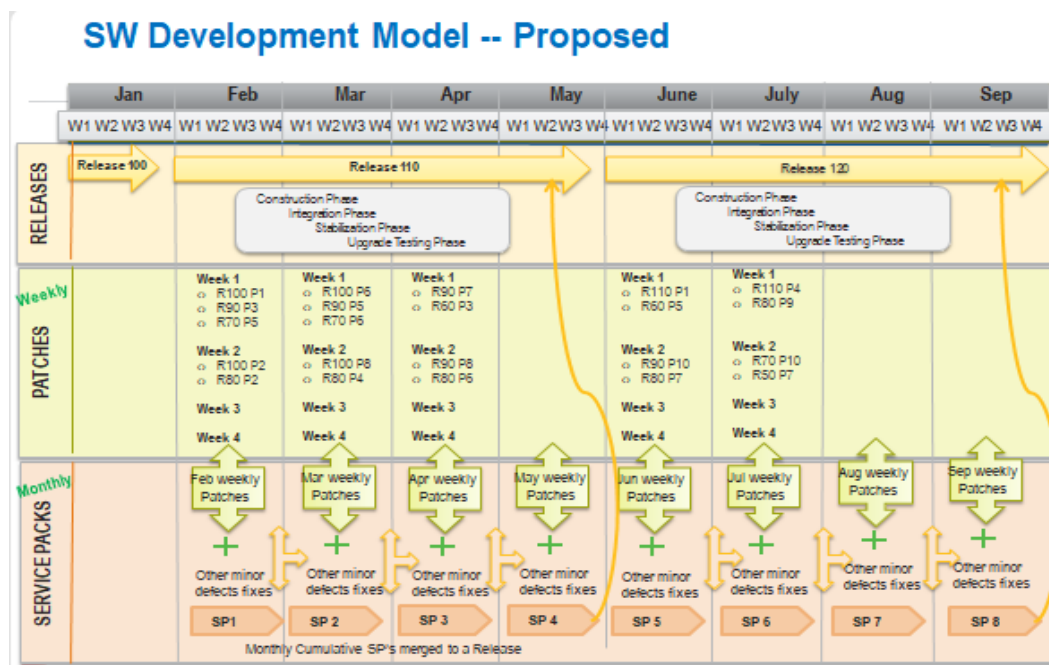
Platform Branching & Release Strategy:
## Branching:
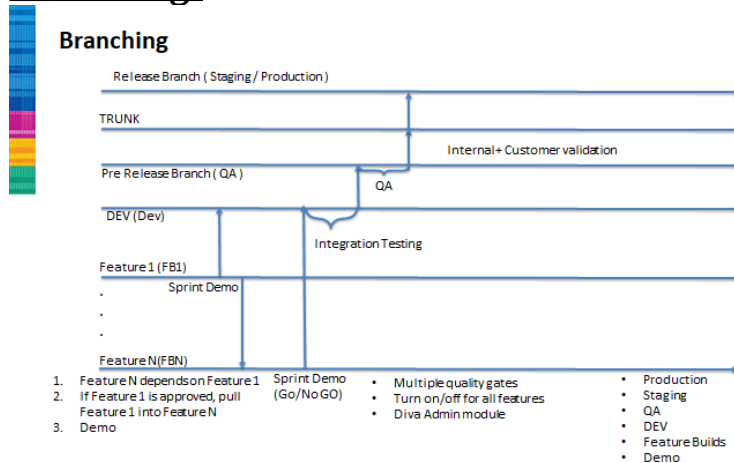
Versioning:

- This process assumes that Sprint 11 + 12 has already been applied in production
- The steps enumerated below are for Sprint 13 release and beyond
- Create a branch from TRUNK for the current version in production. Branch name will be the starting revision number of this branch.
- The current production build will be 0.5.<Branch Rev number>.0
- Merge the Sprint 13 code from TEST branch to TRUNK
- Perform testing and create a new BUILD branch for Sprint 13
- Perform sanity testing and tag the base release
- Deploy this tag on the staging site and have the services team perform testing
- Fix any critical issues that are found. If fixes are needed then create a patch as shown above.
- Deploy the base release + patch on the staging environment
- After the release is approved apply the release + patch on the production environment
- At any given time there will be only one release in production.
- Staging will be the mirror of production except when the next release is being tested
- Every week push data from production to staging

Patching:
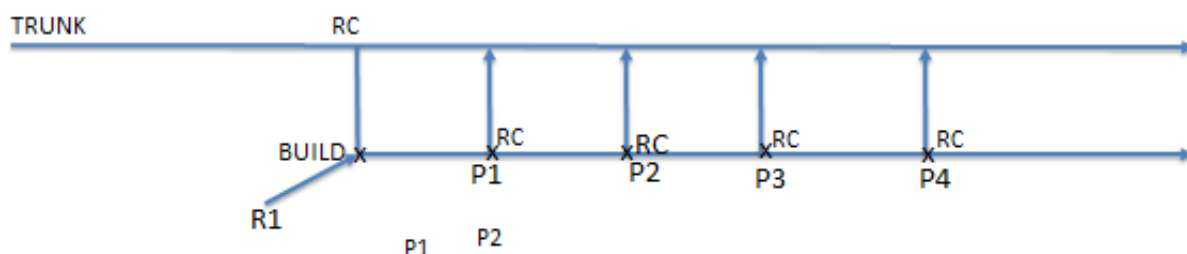
- R1 – base revision for this release
- P1 … P4 are patch releases
- Patch releases are full releases and not delta

- Patches have to be computed the same way for each micro-service, React and Django
- For each released version of the product we need to keep track of each component's version.

Build Enhancements:

- Create BOM (bill of materials) for each build
- BOM will consist of the following
- Jar file for each microservice
- Zip file for React
- Zip file for Django
- Create database tables to store each build and the associated BOM
- BOM should be represented via JSON
- Once the build is done the build model should be populated
- Deployment should take a build as input and based on the BOM perform the build
- For each component the build number will be the version number as per the versioning strategy
- What should the version number be for the overall build?
- Integrate Maven into the build
- Maven will pull out the version of each component for a build
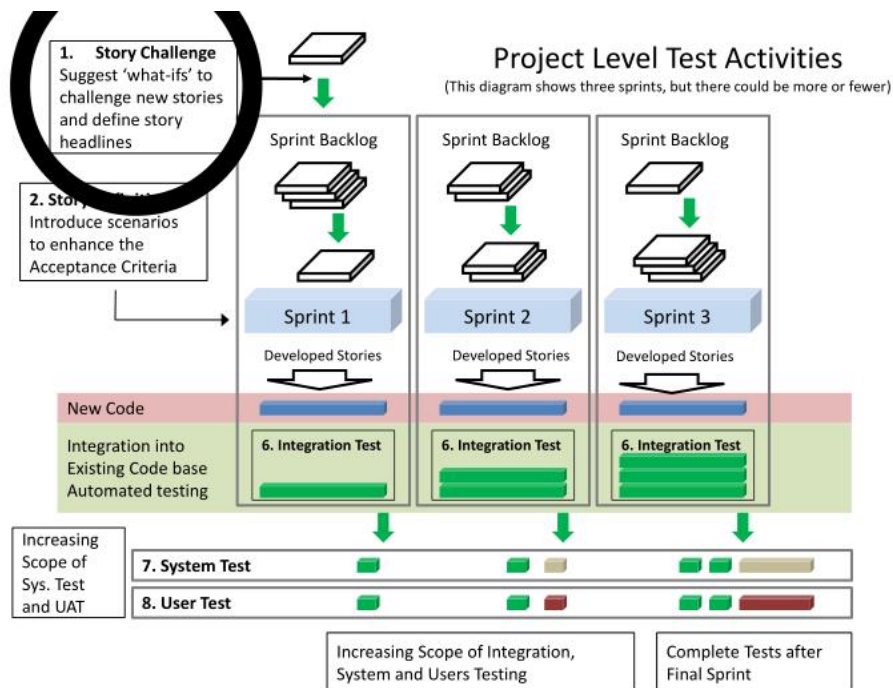
CI/CD pipeline:
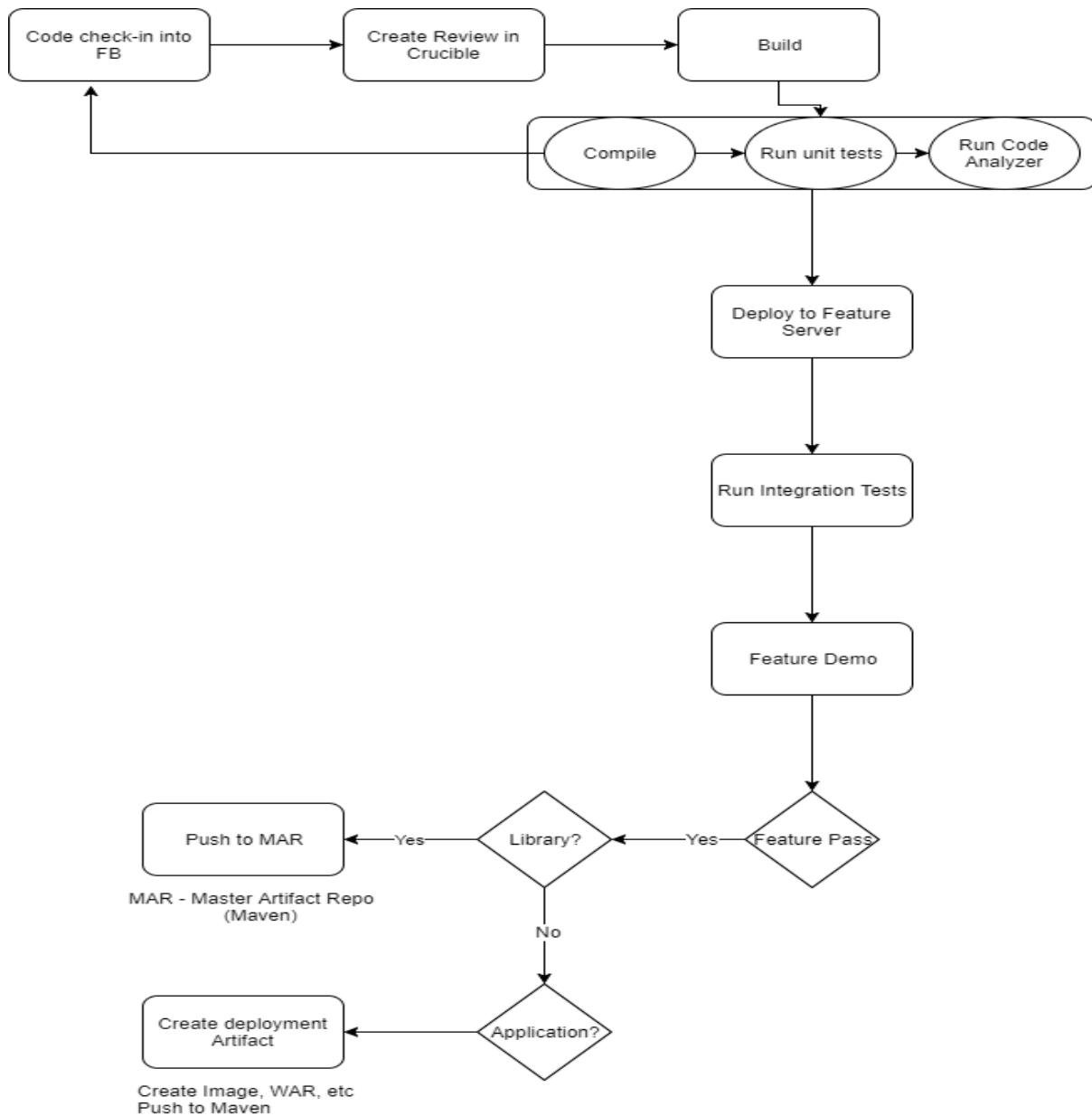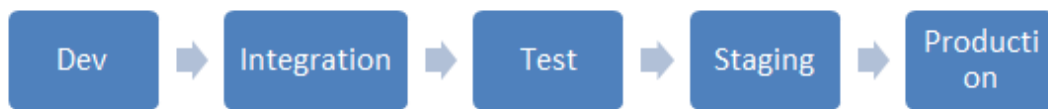
Product QA (Testing):
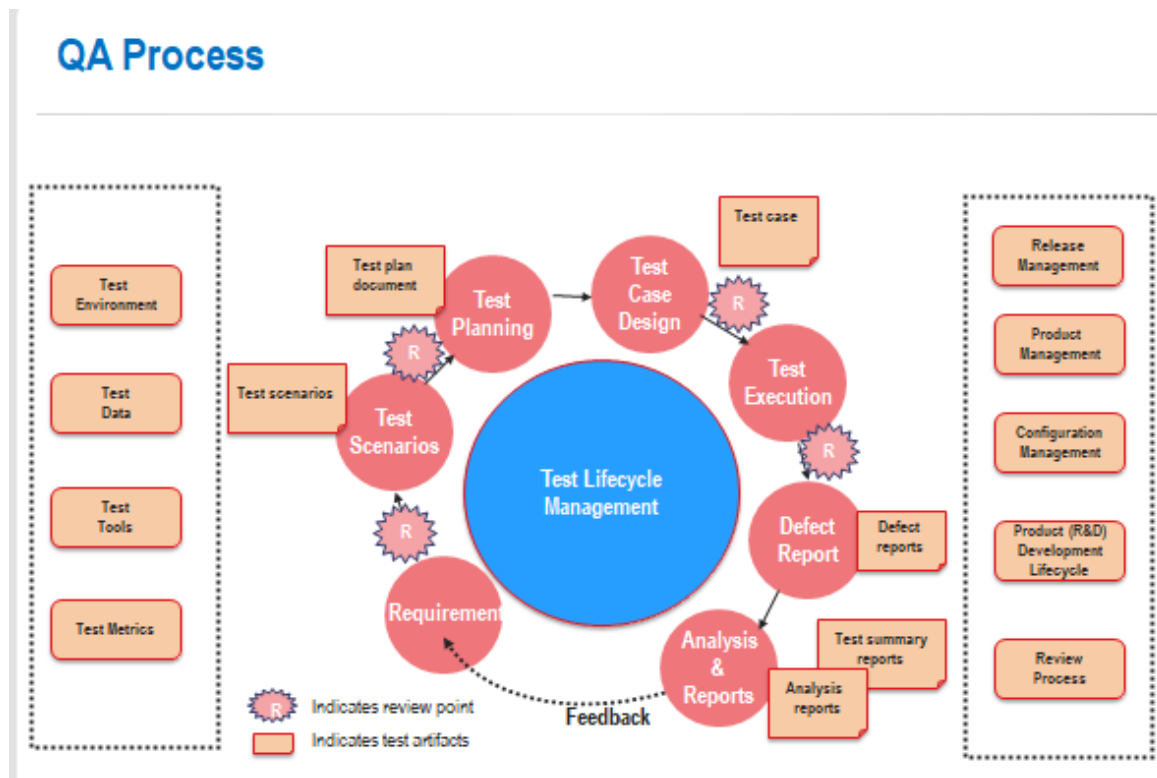
Test Strategy for the Releases:

Conclusion

The supply chain management/product planning project goes through continuous developments and improvements through agile model for development and testing.Also it uses the most modern technologies like reactjs framework of javascript and a well enough architecture of j2ee microservices,with mysql db connection.

References

https://www.slideserve.com/xaria/agile-test-strategy-powerpoint-ppt-presentation
https://reactjs.org/
https://www.javatpoint.com/mysql-tutorial