PROJECT SEMESTER REPORT

Integrated Service Flow

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ABSTRACT

In ISF the main goal is to develop and provide services to internal as well as external users of Ericsson. It provides software used by Project manager to assign different work to employees of the organization.

As being a part of back-end team of ISF. My main motive was to create APIs which on integration with front-end and data base provides services to the user.

The back-end also has an interface, but this interface is not used by the end user. It's used by other applications. They are any kind of service (data, computation, actions, activities, events) that need to occur in support of other applications needs. API is an acronym that means: Application Programming Interface. It's the interface that is used by an application, typically a front-end application, to talk to the back-end application. API are methods and functions that wrap some operations. It can be defined as a set of protocols for building and integrating application software. APIs let our product or service communicate with other products and services without having to know how they are implemented

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Abbreviations

1. ISF – Integrated Service Flow
2. UI - User Interface
3. API – Application Programming Interface
4. DB – Database
5. ORM – Object Relational Mapping
6. WF – Workflow
7. SVN – Sub Version
8. SIT – System Integration Testing
9. LLD – Low-level design

8. INTRODUCTION

8.1. Introduction to Organization

Fig. 1 – This Figure shows logo for Ericsson

Ericsson is Swedish multinational networking and telecommunications company Headquartered in Stockholm. The company offers services, software and infrastructure in information and communications technology for telecommunication operators, traditional telecommunications, networking equipment's mobile and fixed broadband, operations and business support services and extensive service operations etc.

Organization Name – Ericsson India Global Services Private Limited

Address – Noida, Uttar Pradesh, India

Ericsson India Global Services Private Limited was found in 2010.

The Company's line of business includes developing or modifying computer software and packaging Ericsson is largely involved in 2G/3G/4G mobile networks infrastructure market.

Ericsson products and services: -

1. System integration including Operating Support Systems, Business Support Systems, IP networks and architecture, solution and life-cycle managements etc.
2. Network Services including technology deployment, network transformation, Support services, and network optimization.
3. Broadcast Services including playout of live and prerecorded, commercial and public services television programs, including presentation, trailers, closedcaption subtitles and in-version sign language interpreters.

8.2. Introduction to Team

→ Team name – ISF (Integrated Service Flow)

→ The Team for which I am working as an Intern is ISF.

OVERVIEW

ISF provides a software platform to integrate to various workflows which happens inside an organization for different types of roles played by the employees of the organization.

They can be Project Managers, developers, Delivery Responsible etc. It helps in performing the tasks by these individuals using a Web Interface and not manually.

OBJECTIVES

→ The key functionality blocks of the ISF Project are:

- **Project Establishment and Scope**: The project is created in ISF defining its key features such as its Market Area, country, customer, service area and project type. The Project is then Approved and divided further into the project scopes for ease of tracking and maintenance.

- **Workflows**: The Workflows are step by step guide that are created by team lead and distributed to the respective team members. the Work, Flows are further divided into the steps which are known as the Work Orders. The precise tracking of the duration and timing of Work Order enhances quality delivery of the work.

- **Auto-mated Work Orders**: Automated Work Orders are the steps comprising of the BOTs. BOTs are Java or macro code snippets either made by user or RPA team.

- **Reporting and analytics**: Reports are generated by the ISF on the site which offer critical measurement and real time data for effective decision making.

- **Resource Management**: The resources that needed for the project can be in raised in ISF.

- **Engineer Engagement**: The practitioners can see here the details of their workeffort which is calculated on the basis of the time taken on the Work Order by he/she vs the average time taken.

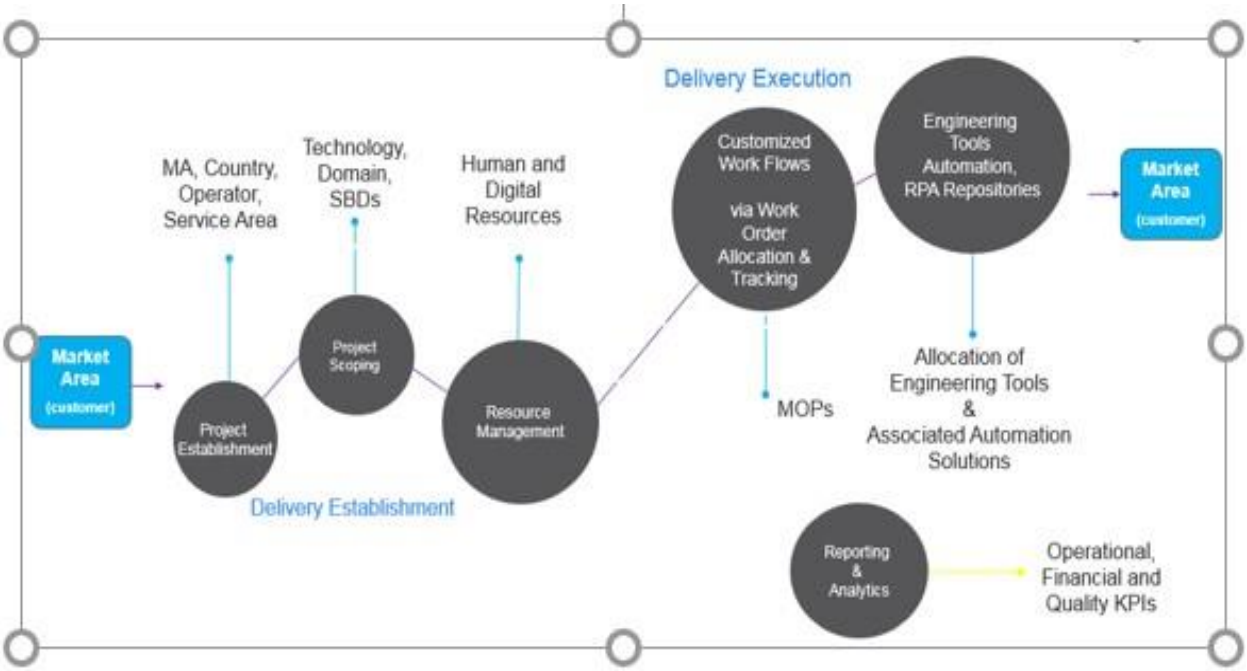

Fig 2: This figure shows Flow between different modules

- **The team has mainly three parts or groups:**

1. Support Team
2. Development Team
3. Testing Team

- **Development Team**

→ The development team is subdivided into three parts:

1. User Interface (UI) Developing Team
2. Application Programming Interface (API) Development Team
3. Database (DB) Team

- I am in the Application Programming Interface Development Team of ISF.

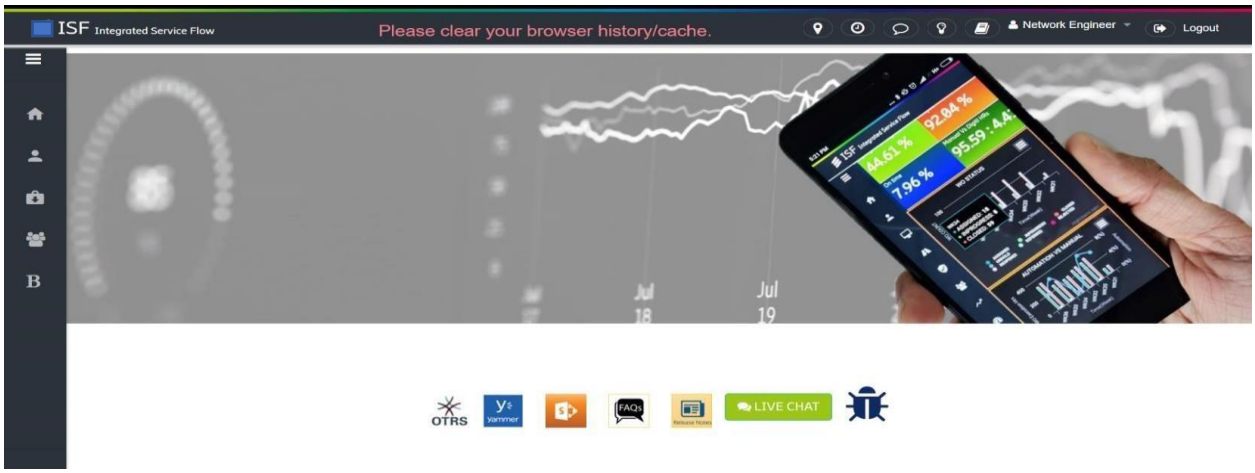

Fig.3 – This figure shows the home page of the website for ISF.

8.3. Internship Program Objective

→ The major objectives of internship are:

- To expose students to a job and a profession or industry.
- To provide students with opportunity to develop skills in the field of interest.
- To assist students in gaining vital work-related experience and building strong resume for bright career.

- To help students in developing business contacts i.e. creating network contacts.

- To help students potentially land permanent or contractual jobs from host company.

8.4. Internship Project Objective

→ With the development of the project, we aim to meet the following objective:

- To facilitate the users of ISF an ease of work by removing obstacles and Increasing productivity.

- To make sure whether the front-end part and overall system will meet the project requirement.

- To align project to business goals, managing project status, milestones and unexpected difficulties effectively.

- To ensure the project works file in alignment with Website to make users effectively enjoy the new application

- To ensure that the website also works fine, gets updated regularly and used on daily basis.

9. PROJECT DETAILS

9.1 Problem Statement

→ The Project was to develop a windows Application for an already existing We functionality. In ISF there is a feature where the roles such as project managers, person responsible for deliveries etc. assigns different types of works to the engineers according to the requirements. Earlier they had to track all the events manually by themselves by contacting each other. Similarly, if the engineer is assigned a work or task, he/she had to record the details about the work manually.

ISF through its web interface provides as ease to such difficulties by providing the executions of all the tasks using UI, APIs and DB support. Now, they do not have to go through all these tasks manually. They can just create a task using ISF and put in the details for that task assign it to the respective engineer. Also, the engineer can see the task assigned to them and can work accordingly. Now, they must track the working of their tasks by going to website each time they want to stop, pause, or perform any other task etc.
Earlier Engineer were not able to give any feedback or recommendation regarding task assigned to them. But with the help pf this Windows Application Called Add Step Feedback they can go and give their feedback and recommendations needed related to their assigned work called Work Orders. The development of the project included various tasks. Where Application Program Interface Development associated with UI Developments and DB support.

9.2 Requirement behind Feedback Story:

→Development of Feedback Story was basically based for the benefits of engineers who were allotted Work Orders from their Project Manager and Delivery Representative.

In the past time they were not able to express their view, ideas and problems faced by them related to work. But with the help of Feedback story they can express their views related to the Work Orders. So, this new feature was introduced by ISF by which they are able to express themselves to their managers and representative efficiently.

10. Project Development:

10.1 Story Grooming:

Story grooming is a phase of Development where LLD is provided by the Team Leader. Where story is described to every member of the team and they are informed about their roles in terms of development.

10.2 API Development:

Add Step Feedback page:-The MyBatis was used as choice of ORM to fetch, insert and delete data for in Feedback Detail table of the database. MyBatis was implemented using XML mapper instead of JAVA. This Mapper was called by DAO layer and the DAO layer was called by the service layer. In Service Layer the the logic of the code was implemented.

The controller layer was called as an get or post request, which requests service layer method.All these service were developed in spring These are various URLs for insertion , get, delete and enable/disable.

- . **My role in the Project**

My role in the above project was to develop 2 APIs. which have been integrated with the front-end side and provide a useful service to the end user.

1. getFeedbackHistory

- The request to is to add a Feedback after completing the Step name and Comments in the Add Step Feedback Page. After clicking on ADD button getFeedbackHistory API is called.

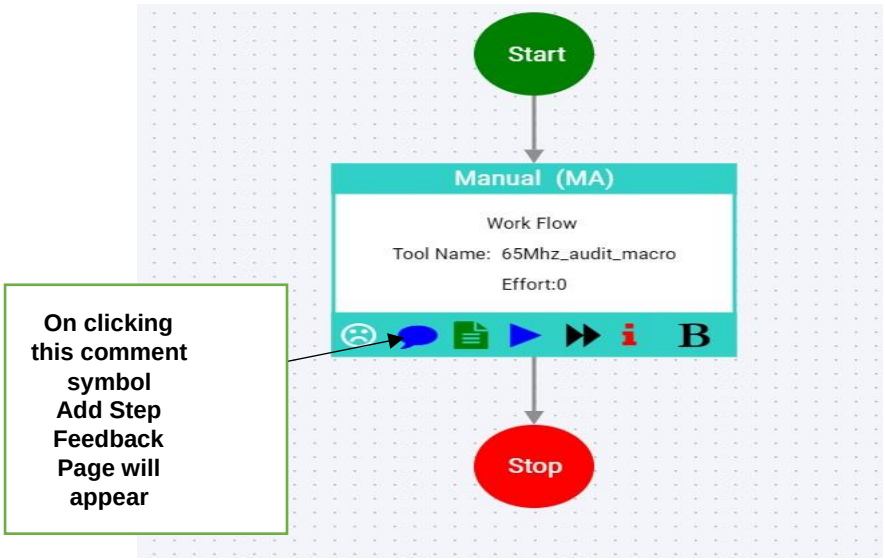

Fig. 4: This Figure shows worlflow of a particular WorkOrder

- Each time Project Manager assigns a WorkOrder to his employees. Work Order has its WF (work Flow) shown above. By clicling a commnet box Add Step Feedback page will appear. It is used to fetch latest 10 comments against the WF or STEP level from db.

- When we click on ADD button save API used to save data in DB and Parallelly GetFeedbackHistory fetch latest 10 entries against the step or WF and shown bottom area of the comment pop up.

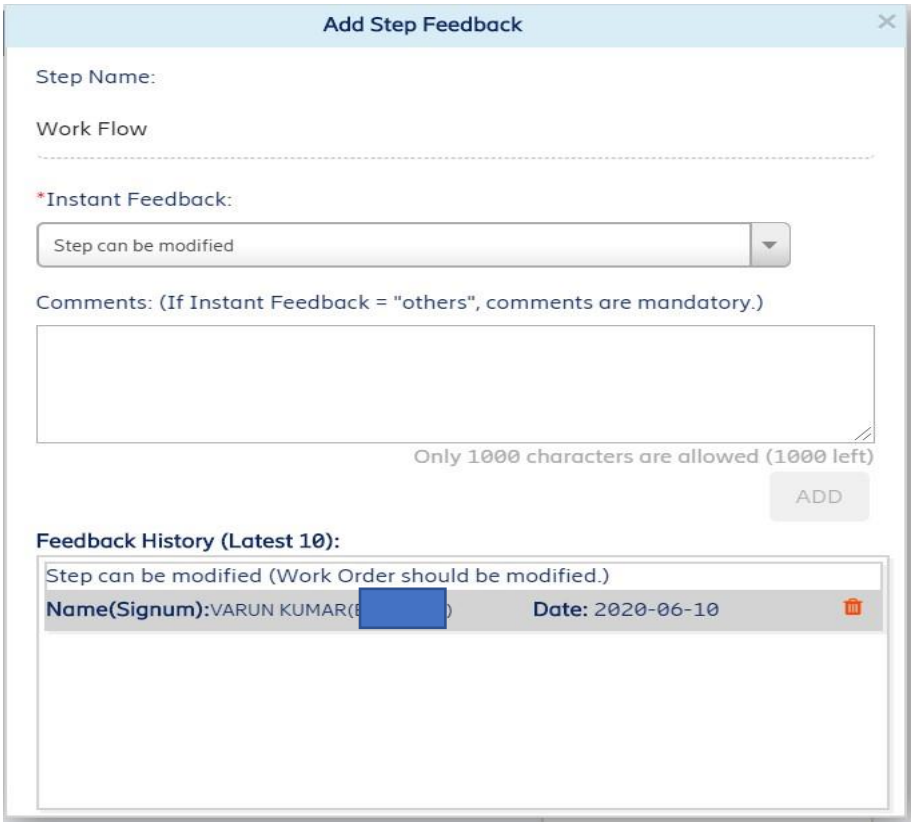

Fig. 5: This Figure shows Add Step Feedback page

URI: server_base_URL/ ISF_API_DEV_MAJOR/getFeedbackHistory

Request Type: POST

Result JSON:

[
{
"feedbackActivityID":11,
"feedbackDetailID":133,
"feedbackComment":"Step can be modified(Work Order should be modified)",
"replyOnComment":null,
"feedbackStatus":"NEW",
"sadCount":0,
"createdOn":"2020-06-08 11:00",

```
   "userRole":null,
   "modifiedOn":"2020-06-08 11:00",
   "modifiedBy":"AKHVARU",
   "createdBy":"AKHVARU",
   "stepID":"5657f299-5911-4f9e-a765-56f68055c23b",
   "stepName":"Work Flow ",
   "creatorName":"VARUN KUMAR",
   "instantFeedbackText":"Step can be merged",
   "active":true
}
]
```


2. getInstantFeeback

- Add Instant Feedback page is used by the Project managers. getInstantFeedback is an GET API which is used to bring all the information related to the feedback comments. Project managers views all the feedback related to different work orders.

- getInstantFeedback brings the information related to feedback comments from the table ref_feedbackStory from DB.

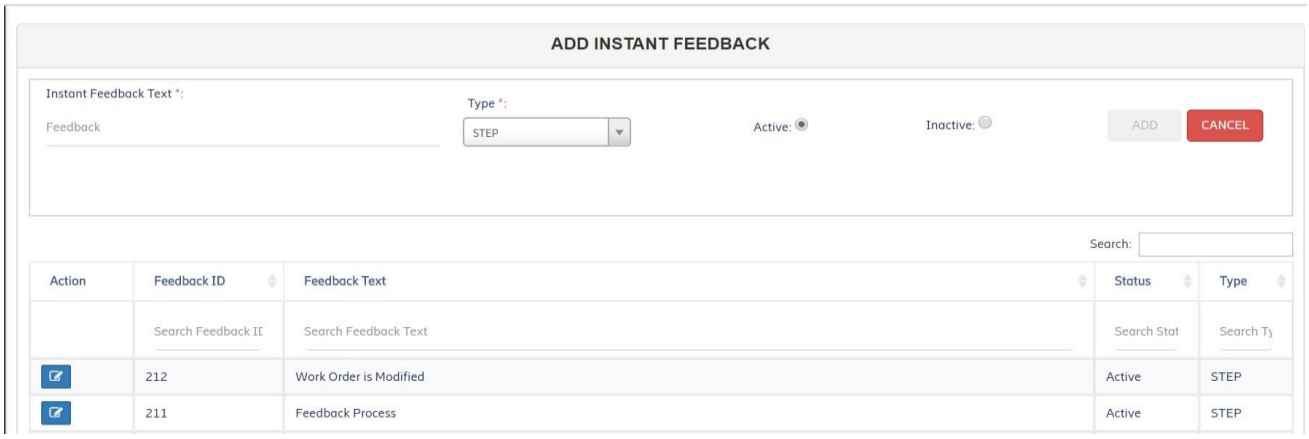

Fig 6: This Figure shows the view of Add Instant Feedback

URI: server_base_URL/ ISF_API_DEV_MAJOR /getInstantFeeback

Request Type: GET

Result JSON:


```
[
{
    "instantFeedbackID": 141,
    "feedbackText": "work order",
    "isActive": true,
    "feedbackType": "STEP",
    "createdBy": null
  }
]
```

11. TECHNOLOGY AND TOOLS

Spring

It is used to create standalone spring-based application that developer can just run because it needs very little spring configuration. Spring Boot does not generate code and there is absolutely no requirement for XML Configuration. It uses convention over configuration software design paradigm that means it decrease the effort of developer.

Fig. 7: Spring Boot logo

Advantages of Spring Boot

- Create stand-alone Spring applications that can be started using java-jar.
- Embed Tomcat, Jetty or Undertow directly
- It provides opinionated 'starter' POMs to simplify Maven configuration.
- It automatically configures Spring whenever possible.
- It provides production-ready features such as metrics, health checks and externalized configuration.
- Absolutely no code generation and no requirement for XML configuration.

Spring Boot Features

- Web development
- Spring Application
- Application events and listeners
- Admin features

- Externalized Configurations
- Properties Files
- YAML support
- Type- safe Configurations
- Logging
- Security

JSON

JSON (JavaScript Object Notation) is a text-based, human-readable data interchange format used for representing simple data structures and objects in Web browser-based code. JSON is also sometimes used in desktop and server-side programming environments. JSON was originally based on the JavaScript programming language and was introduced as the page scripting language for the Netscape Navigator Web browser.

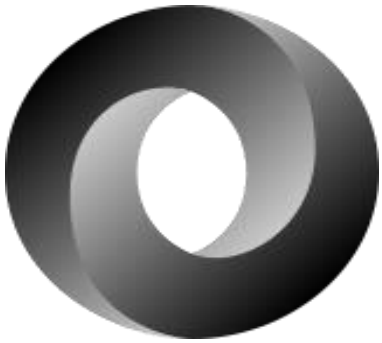

Fig. 8: JSON logo

JSON is used in JavaScript on the Internet as an alternative to XML for organizing data. Like XML, JSON is language-independent and may be combined with C++, Java, Python, Lisp and many other languages. Unlike XML, however, JSON is simply a way to represent data structures, as opposed to a full mark-up language. JSON documents are relatively lightweight and are rapidly executed on Web server. JSON consists of "name: object" pairs and punctuation in the form of brackets, parentheses, semi-colons and colons. Each object is defined with an operator like "text:" or "image: " and then grouped with a value for that operator. The simple structure and absence of mathematical notation or algorithms, JSON is easy to understand and

quickly mastered, even by users with limited formal programming experience, which has spurred adoption of the format as a quick, approachable way to create interactive pages.

TORTOISE SVN

TortoiseSVN is a popular Apache Subversion client for Windows, implemented as a Microsoft Windows shell extension. As it isn't integrated into a specific IDE it can be used with a range of development tools; for example, it can be integrated into Microsoft Visual Studio using a third-party plugin such as VisualSVN. The key benefits of using TortoiseSVN include:

Fig. 9: Tortoise SVN logo

- Icon overlays, which allows you to see the status of every versioned file and folder at a glance.

- Easy access to all Subversion commands through a Tortoise SVN sub-menu. That's automatically added to the Window's content menu.

- Window Integration, which allows you to work with tools you're already familiar with.

- Context-aware sub-menu – available commands are filtered based on the selected file or folder. You will not see any commands you within the current context.

- Powerful commit dialog – with integrated spell checker, auto completion capabilities, and the ability to double-click on a modified file to open the diff program.

MYBATIS

MyBatis is a first-class persistence framework with support for custom SQL, stored procedures and advanced mappings. MyBatis eliminates almost all of the JDBC code and manual setting of parameters and retrieval of results. MyBatis can use simple XML or Annotations for configuration and map primitives, Map interfaces and Java POJOs (Plain Old Java Objects) to database records.

Fig. 10: MYBATIS logo

MYBATIS offers the following advantages −

- Supports stored procedures − MyBatis encapsulates SQL in the form of stored procedures so that business logic can be kept out of the database, and the application is more portable and easier to deploy and test.
- Supports inline SQL − No pre-compiler is needed, and you can have the full access to all of the features of SQL.
- Supports dynamic SQL − MyBatis provides features for dynamic building SQL queries based on parameters.
- Supports O/RM − MyBatis supports many of the same features as an O/RM tool, such as lazy loading, join fetching, caching, runtime code generation, and inheritance**.**

POSTMAN

Postman makes API development faster, easier, and better. The free app is used by more than 3.5 million developers and 30,000 companies worldwide Postman is designed with the developer in mind and packed with features and options

Fig. 11: Postman logo

Postman features includes:

- Powerful, simple to use GUI
- Saved history of API requests
- Unlimited collections, environments, tests, and sharing
- Automated testing with collection runner
- Web-viewable, detailed API documentation
- Flexible API monitoring, for uptime, performance, and accuracy.

JENKINS

Jenkins is an open source automation server written in Java. Jenkins helps to the non-human part of the software development process, with continuous integration and facilitating technical aspects of continuous delivery. It is a server-based system that runs in servlet containers such as Apache Tomcat.

Fig. 12: Jenkins logo

12. TESTING

1. Functionality Testing –

Functionality testing involves checking the response of the API. This type of testing can be performed by clients also. Functionality testing is firstly done by developers and then client does it. Client first sees if all the requirement that they proposed
meets or not and then feedbacks the developer.

2. Responsive Testing –

Responsive testing is very important because theme should give Majority users as they open the application, a sense of satisfaction. The refreshing of the window Application as well as the website is working or not.

3. Unit Testing –

In Unit Testing, the modules of the application were tested separately. The whole application is differentiated into various parts and then all those parts are tested separately.

There were number of test cases created by the development team according to the functionalities and the working of the application was tested as par the tested as par the test cases prepared.

4. <u>System Integration Testing</u> –

SIT is inter-module functional testing.
It is performed mid-release.
The Application is tested by the testers and/or developers.

5. <u>User Acceptance Testing</u> –

UAT is an intra-module functional testing.
It is performed once a user story is delivered.
It is performed by the testers and the business analysts.

13. CONCLUSION

Integrated Service Flow is a fast and accurate description of service delivery. It offers easy and transparent communication with the market Area on requests status and unifies diverse customer requirements. The easy tracking of the delivery execution quality, time and type make delivery execution module one it's kind and the way it keeps simplicity of the information is appreciable.

I have Learned various types of Technologies required for project, product and layout design. My main focus had been on backend designing of theme development. With the help of this internship I have gained significant amount of knowledge I hope it will be helpful for my future carrier.

Making this project was sometime difficult but solving those difficulties gave very knowledge. The team 'ISF had always helped me to sharpen my knowledge and to acquire new skills. Throughout my time of Internship, I have acquired lots of new experiences. I got chance to use different developments tools, research on them and use them. Overall in this period of internship all my theoretical knowledge gained from college had gained a practical experience.

14. FUTURE SCOPE

ISF is a very important part of Ericsson. Day by day I am able to gain new experience in this team. New technologies are used in this team to develop new ideas which can help internal as well as external users of Ericsson. In particular interval of time new features are developed and presented in front of the users.

At present our team is making transition towards Cloud computing for the proper availability of the services provided by us. We are also making our way towards Git. So that there will be proper versioncontrol system which can track changes in our source code during software development. In Future time we are also planning of moving Our web application to mobile application with the help of new technologies for the betterment of the user.
So, with the help of these new technologies we hope to give more services to our users.

15. REFERENCES

- https://www.baeldung.com/spring-bean-annotations
- http://svnbook.red-bean.com/en/1.6/svn.intro.whatis.html
- https://www.tutorialspoint.com/mybatis/index.htm
- https://www.toolsqa.com/postman/api-testing-with-postman/
- https://www.jenkins.io/doc/tutorials/