

IT314 - Software Engineering



Group Number : 33

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1. Tools and Technology

1.1. Frontend:

- **React.js**: A JavaScript library for building user interfaces. React allows for building reusable components and efficient updates to the user interface through the use of a virtual DOM.

1.2. Backend:

- **Node.js**: An open-source JavaScript runtime built on Chrome's V8 engine. Node.js allows for running JavaScript code outside of a web browser, making it useful for building server-side applications.
- **Express.js**: A web application framework for Node.js. Express simplifies the process of building server-side applications by providing a set of features and tools for handling requests, routing, and middleware.

1.3. Database:

- **MongoDB**: A popular NoSQL document database that stores data in flexible, JSON-like documents. MongoDB is known for its scalability, performance, and ease of use.

1.4. IDE:

- **Visual Studio Code**: A free and open-source code editor developed by Microsoft. Visual Studio Code provides a range of features and extensions for code editing, debugging, and source control.

1.5. Tools:

- **Git**: A distributed version control system used for tracking changes in code. Git allows for collaboration among multiple developers and enables efficient management of code changes.

- **GitHub:** A web-based platform for hosting and managing Git repositories. GitHub provides features for version control, collaboration, and project management, making it a popular choice for open-source projects and software development teams.

2. Effort Estimation using Function Point Analysis

2.1. User Stories List

List Of User Stories to be classified.

1. As an admin, I want to be able to add/edit/delete user details in the database.
2. As an admin, I want to be able to backup and restore the data in the system.
3. As an admin, I want to be able to approve courses/resources/grants to faculties.
4. As an admin, I want to be able to generate reports on the use of the system.
5. As a faculty member, I want to be able to view and update my personal profile.
6. As a faculty member, I want to be able to view and update my contact information.
7. As a faculty member, I want to be able to upload my research work and academic material.
8. As a faculty member, I want to be able to view my feedback and evaluations from students.
9. As a student, I want to be able to search for faculty members based on different criteria.
10. As a student, I want to be able to view detailed information about faculty members of my institution.
11. As a student, I want to be able to communicate with my faculty members through the system.

12.As a student, I want to be able to provide feedback and evaluations to the faculty members belonging to my institute.

2.2. Categorizing into FPA types

External Inputs (EI):

Low: User Login, Approve courses (by admin), Generate Report (by admin),

Average: User Registration, Add/Edit/Delete user details(by admin), Update User's Own profile, Search for faculty members, Communicate with faculty members (by students), Provide Feedback (by students)

High: Upload Material (by faculty),

External Outputs (EO):

Average: View User's own profile, View Feedback and evaluations (by faculty), View faculty profile.

External Inquiries (EQ): None

Internal Logical Files (ILF):

Average: User Data, Update Data, Post Data

External Interface Files (EIF): None

2.3. Determining the complexity and weight of each type

Calculating Unadjusted Functional Point

Measurement Parameters	Low	Average	High
External Input (EI)	3	4	6
External Output (EO)	4	5	7
External Enquiries (EE)	3	4	6
Internal Logical Files (ILF)	7	10	15
External Interface Files (EIF)	5	7	10

2.4. Calculate Unadjusted function points (UFPs)

Count of measurement parameter	Low	UFP for low category	Avg	UFP for avg category	High	UFP for high category
External input(EI)	3	9	6	24	1	6
External output (EO)	0	0	3	15	0	0
External Inquiries(EQ)	0	0	0	0	0	0
Internal Logical Files(ILF)	0	0	3	30	0	0
External Interface Files(EIF)	0	0	0	0	0	0
Total for categories	3	9	12	69	1	6

2.5. Determining the Value Adjustment Factor (VAF)

Complexity Adjustment Factor	Low (F=14)	Average (F=42)	High (F=70)
$(0.65 + 0.01 * F)$	0.79	1.07	1.35

2.6. Estimating the Effort

Functional Points	Low	Avg	High	Total
(CAF * UFP)	7.11	73.83	8.1	89.04

Total Functional Points = 89.04