

**SOFTWARE
REQUIREMENT
SPECIFICATION**

**MEDICAL
REIMBURSEMENT CLAIM
MANAGEMENT SYSTEM
(MRCMS)**

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1. Introduction

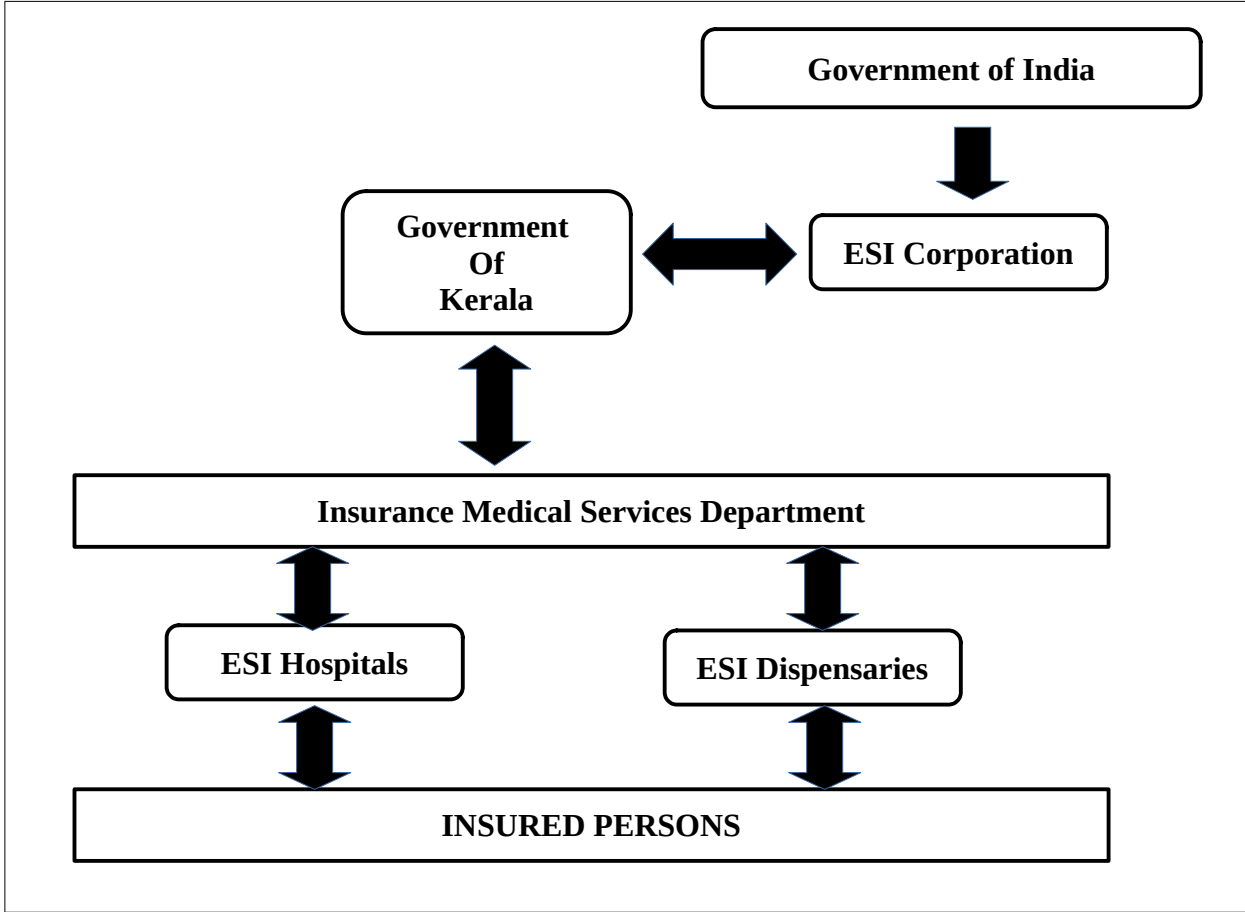
1.1 About the Department

Insurance Medical Services department, established in 1985, under the administrative control of Labour department, Government of Kerala is the line Department of Government of Kerala implementing the Employees State Insurance Scheme (ESI) in the Kerala State. Employees State Insurance Scheme is the country's first integrated multi-dimensional social security scheme for workers in the organized sector. It is has been assigned with the significant and socially useful task of providing comprehensive medical care services to the worker population and their dependents and protecting against certain eventualities that result in loss of wages or earning capacity. The scheme also takes care of physically disabled workers and their dependents with monetary support, where death or disablement has occurred due to employment injury or occupational disease.

About 12 Lakhs Insured Persons and their family members constitute the beneficiary chain of about 30 Lakhs in Kerala. Administration of medical care is the statutory responsibility of State Government and it is implemented through Insurance Medical Services Department. Medical facilities are provided through 9 Hospitals, 145 Dispensaries and one annexure in Government Chest Disease Sanatorium, Pulayanarkottah. Apart from these, the beneficiaries can avail services of 3 Hospitals directly run by ESI Corporation. Treatment under Allopathic, Ayurvedic and Homoeopathic system is provided to ESI beneficiaries.

The ESIC is the collector and custodian of funds; reimburse the expenditure to Government of Kerala in the agreed ratio 7:1 on the basis of audit certification from Accountant General on final account payment system.

Key beneficiaries are the employees registered under the ESI Scheme under the ESI Corporation of India.



1.2 Organizational bodies concerned with Insurance Medical Service

1) Government of Kerala

Kerala Government is the implementing agency of ESI Scheme in the Kerala State. The share of fund 7/8 is transferred to Government of Kerala accounts annually. Government of Kerala is the top authority, functioning as a policy maker in co-ordination with the ESI Corporation regarding the implementation of ESI Scheme.

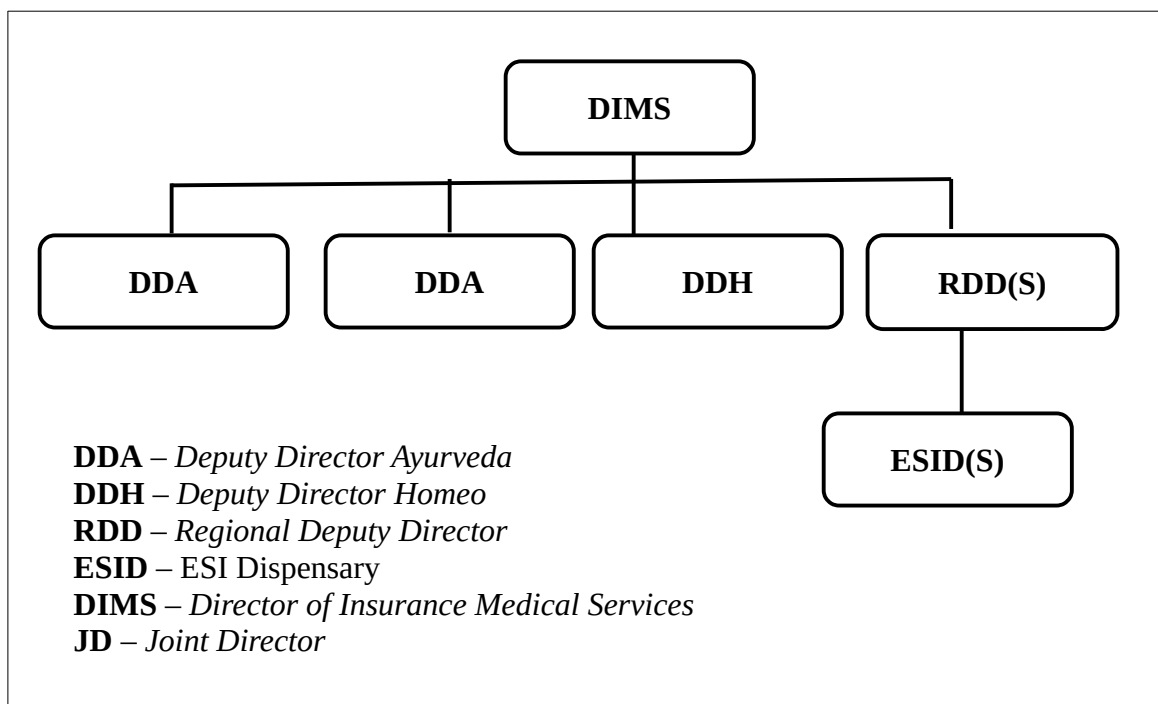
2) ESI Corporation.

ESI Corporation is the policy maker of ESI Scheme which is applicable to all the states of India. According to the ESI Act and subsequent to ESIC policy updations, policies and rules are framed by the Government of Kerala, which is applicable to Kerala State . Though all the states are functioning on the basis of same ESIC Manual and Act, there may be changes in policy among each state in implementing the same. In reality, ESI Corporation decides the eligibility of the beneficiary for the entry to the ESI Scheme.

3) Subordinate offices of Insurance Medical Services Department

Subordinates are the Administrative offices, ESI Hospitals and Dispensaries functioning under the Director of Insurance Medical Services Department. The Directorate of Insurance Medical Services , Regional Deputy Directorates and Deputy Directorates (Homoeo and Ayurveda) are administrative offices whereas The ESI Dispensaries and ESI Hospitals are the line level organizations which provide services to the key beneficiaries – Insured Persons. The subordinate administrative offices provide services to the Insured Persons through ESI Dispensaries and Hospitals.

Structure of IMS Department



4) ESI Local Offices

These are the field level offices of ESI Corporation handling registration and entitlement of beneficiaries.

1.3. Authorities involved in the Process of Medical reimbursement claim management

Directorate and the subordinate office only concerned with the workflow for the supposed Project. Other organizational institutions mentioned above are treated as External interfaces. The Structure of the Insurance Medical Services Department.

A) DIRECTORATE OF INSURANCE MEDICAL SERVICES

1) Director of Insurance Medical Services

role: Top authority,

place of work : Directorate

type of authority : Top level

immediate subordinate : Joint Directorate

2) Joint Director of Insurance Medical Services

role: second top authority, policy maker, administrator

place of work : Directorate

immediate superior: Director

immediate subordinate : Junior/Senior Superintendent

3) Junior/Senior Superintendent

role : Supervisor

place of work : Directorate

immediate subordinates : section(s)

note: Though Senior supdt and Junior supdt are posts which differ in grade, in the case of MRC processing, both executes the same functions and can be treated as a single unit of supervision.

4) Section(s)

role: starting point in claim process.

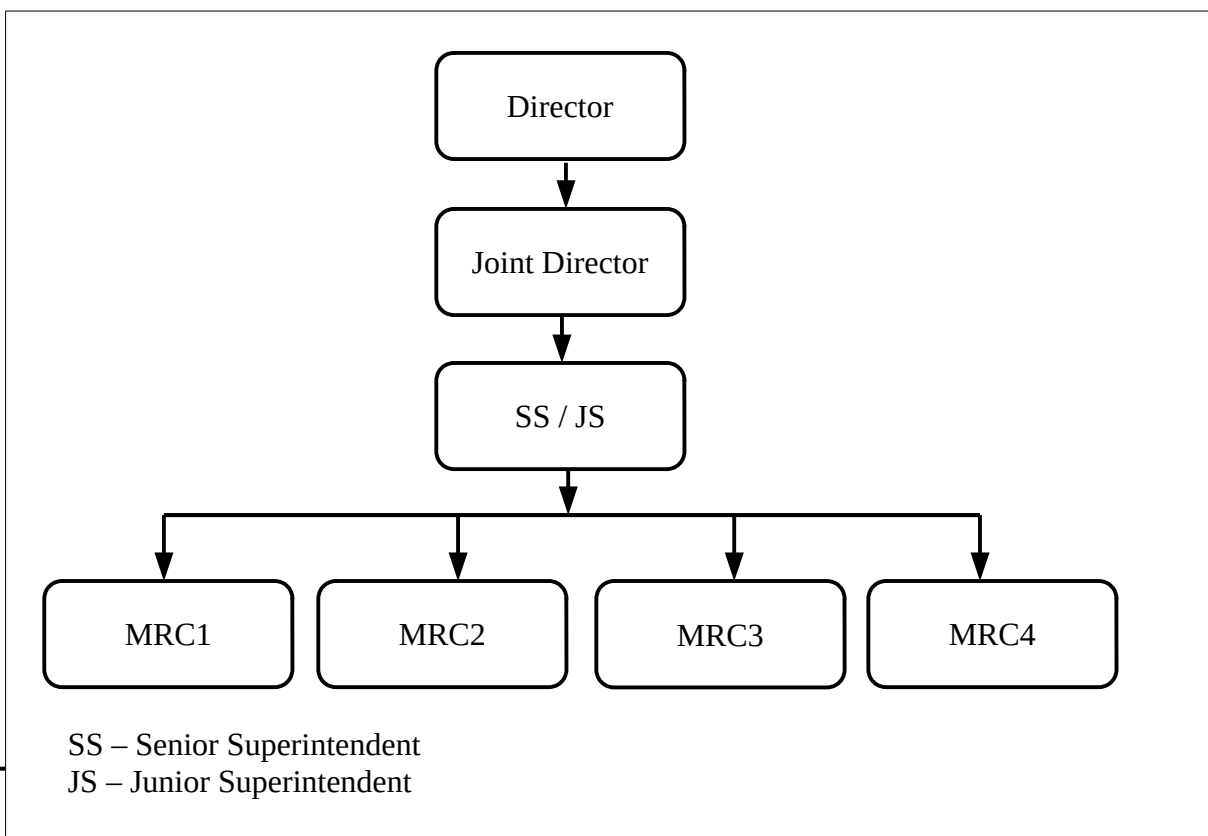
Immediate superior: Senior/Junior superintendent

subordinate : NIL

5) Cashier

role: payment authority

note: The cashier executes payment according to the payment orders into the payment portal (currently BiMS), other than that Cashier does not have any authority.



Authority Structure – Directorate of Insurance Medical Services (DIMS)

B) REGIONAL DEPUTY DIRECTOR

1) Regional Deputy Directorate

role: Head of Zone, Sanctioner

place of work : Regional Deputy Director

Immediate superior : Director

immediate subordinate: Senior/Junior supdt.

2) Senior/Junior Supdt

role: Supervisor

place of work : Regional Deputy Director office

immediate superior: Regional Deputy Directorate

immediate subordinate : Section(s)

3) Section(s)

role: starting point in claim process.

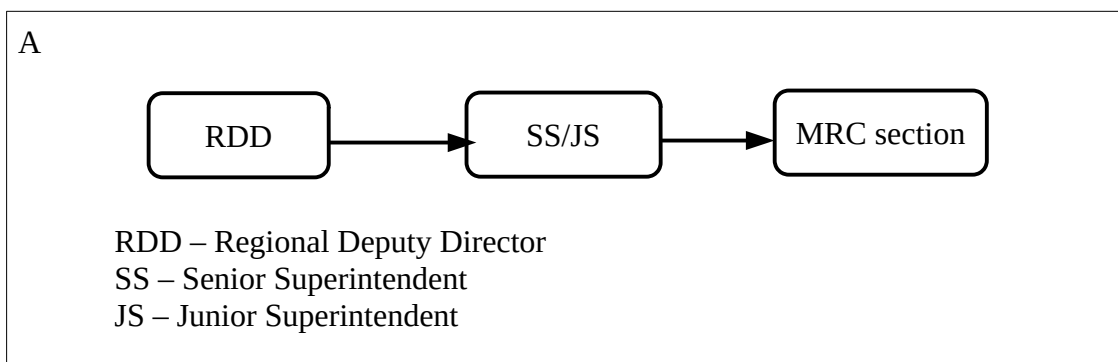
Immediate superior: Senior/Junior superintendent

subordinate : NIL

4) Cashier

role: payment authority

note: The cashier executes payment according to the payment orders into the payment portal (currently BiMS), other than that Cashier does not have any authority.



Authority : Regional Deputy Director

C) DEPUTY DIRECTOR(Ayurveda)

role: Head of Ayurveda

place of work : Directorate

Immediate superior : Director

D) DEPUTY DIRECTOR(Homoeo)

role: Head of Homoeo, Sanctioning authority

place of work : Directorate

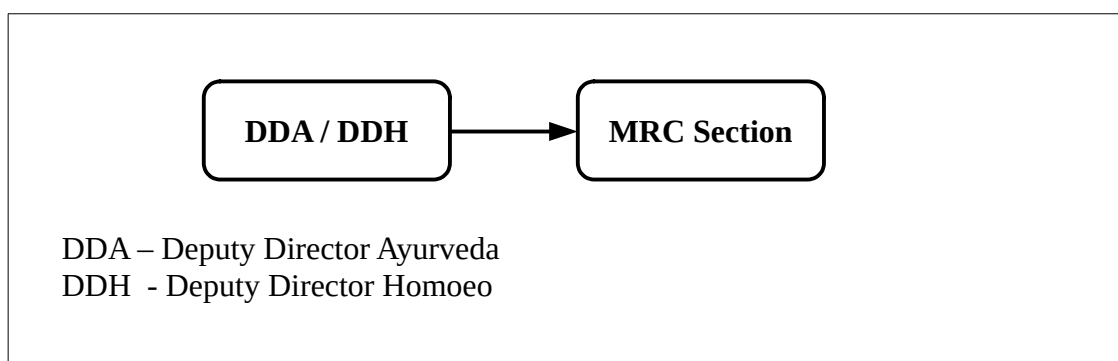
Immediate superior : Director

immediate subordinate: Section

4) Cashier

role: payment authority

note: The cashier executes payment according to the payment orders into the payment portal (currently BiMS), other than that Cashier does not have any authority.



Authority structure – Ayurveda and Homoeo Deputy Director

1.4. Need for New System

The need for an effective and efficient system for the management of medical reimbursement claims arised as a result of the increased demand towards better efficiency, management, and convenience to IPs according to the current standards. Requirement for increasing the throughput of claim processing and drastic reduction of payment time is a basic requirement. The short falls in the existing system is as follows.

- Only single channel. Claims can only be sent to the registered dispensary only. No online submission facility. The IP has to visit the registered Dispensary to submit every claim. Inconvenience and money loss to IP.
- No standard process in claim receipt, verification and communication. The handling method depends on the employees handling the claim managements. Transfer of one such employee from one organization to another creates disturbances in process.
- Difficulty in tracking the status of claims by IP.
- Difficulty in scheduling payment according to availability of fund
- No forecasting of fund and other resources currently available
- Difficulty in integration with BIMS and BAMS

The shortfalls mentioned above necessitate the implementation of a new online system which enhances efficiency, effectiveness, convenience and comfort for IP, the key stakeholders of the department.

The aim of this **Software Requirement Specification (SRS)** document is to define and document the requirements particularly **functional and non-functional** of the required **medical reimbursement claim management system software**.

1.5. Purpose of the Software

The purpose of the "Medical Reimbursement Claim Management System" software in the Insurance Medical Services Department is to streamline and automate the process of managing medical reimbursement claims for the department.

1. **Efficient Claim Management:** The software should aim to improve the efficiency of managing medical reimbursement claims by automating manual processes, reducing paperwork, and streamlining workflows. It has to provide a centralized platform to handle all aspects of claim processing, from submission to verification, sanction, and payment.
2. **Accuracy and Compliance:** By implementing the software, the Insurance Medical Services Department should ensure that claims are processed accurately and in compliance with relevant regulations and policies. The system can validate claim information, verify supporting documents, and apply predefined rules to determine claim eligibility and reimbursement amounts.

3. **Timely Processing:** The software has to be able to, timely processing of reimbursement claims, ensuring that beneficiaries receive their reimbursements promptly. It shall automate various steps in the claim management process, such as document verification, review, and payment, reducing delays and improving overall claim turnaround time.
4. **Transparent and Traceable:** The software has to be enhanced transparency in the claim management process by providing clear visibility into the status of each claim. Stakeholders, including beneficiaries, department personnel, and the Government, should track the progress of claims, view historical data, and generate reports to monitor performance and identify bottlenecks.
5. **Data Management and Analysis:** The software has to facilitate efficient data management by maintaining a centralized repository of claim-related information. This allows for easy retrieval, analysis, and reporting of data, enabling the Insurance Medical Services Department to gain insights, identify trends, and make data-driven decisions for process improvements and policy enhancements.
6. **Improved User Experience:** The software should provide a user-friendly interface for beneficiaries, department personnel, and administrators. It has to simplify the claim submission process, provide notifications, and updates, and offers self-service features, such as claim status tracking and online documentation submission, to enhance the overall user experience.
7. **Cost Reduction:** By automating manual processes, reducing paperwork, and streamlining workflows, the software should contribute cost reduction within the Insurance Medical Services Department. It should reduce administrative overhead, eliminate manual errors, and optimize resource utilization, resulting in improved operational efficiency and cost savings.

In short, the "Medical Reimbursement Claim Management System" software in the Insurance Medical Services Department should serve the purpose of improving the efficiency, accuracy, and transparency of managing medical reimbursement claims. By automating processes,

ensuring compliance, and providing timely reimbursements, the software should enhance the overall claim management experience for beneficiaries while optimizing operational effectiveness within the department.

The intended solution aims to utilize open source platform and consume the resources provided by Government of Kerala, which is through Kerala State Wide Area Network, which reduces the cost in implementing equivalent solution.

1.6. Intended Audience

The Intended Audience for this project can be broadly classified under the following categories, these are:

1. **Insured Persons**
2. **Dependents and Family members of Insured Persons**
3. **Employees' State Insurance Corporation**
4. **Government of Kerala**
5. **Insurance Medical Services Department**
6. **Kerala State Labour and Skills Department**

1.7. Scope of the Project.

The scope of the "Medical Reimbursement Claim Management System" software project in the Insurance Medical Services Department covers the following areas. This project aims to provide the modules for handling ;

1. **Organization management** : Management of the Organizations with processing of Medical reimbursement claims – administrative offices and ESI Dispensaries.
2. **Management of Insured persons (IPs)** : Registration, activation and management of Insured Persons with their family members and dependents, the Key beneficiaries of ESI Scheme.
3. **Authority Management:** Authorities are the decision makers of Insurance Medical Services Department at various levels in the hierarchy like Director, Joint Director, Deputy

Director etc. Some authorities in the lower line do not have decision making powers though they form part of the authority hierarchy.

Creation of new authority types, assigning roles and permission to each authority type, creating members of authority types, management including activation, transfer deactivation and assigning charges and allied activities are the main functions of Authority management.

4. User Management

Creation of various types of users by authorized user, User registration, activation and updation.

5. Roles and permission management

Assigning various roles to the Domain users.

6. IP (Insured Person Management)

- Registration of Insured Persons, the key stakeholders into the system – through form inter face and bulk upload data through spreadsheet, .csv, .xml,.json and through APIs.
- Activation, Entitlement, updation, deactivation of Insured Persons.
- Incorporating Family members and Dependents of Insured Persons.

7. Claim management

a) registration

Claim registration (by Insured person and by department user), activation, updation in the Organizations of Insurance Medical Services, claim register

- b) Claim processing, verification, status communication through email, phone. Communication letter creation, forwarding
- c) bundle management, claim register creation and management
- d) Claim sanctioning, sanction order generation

8. Sanction order management:

Generation of sanction order for individual as well as for group or claims. Generation of sanction order list, de-sanction order, bundle management, Sanction order register.

9. Fund management

Payment schedule for Sanctioned claims should be prepared according to availability of fund in each organization. Incorporation of availability of fund to all organizations, their utilization status, forecasting fund requirement for specified period are the main area.

10. Payment management

1. Payment List Generation:

Payment list generation according to availability of fund.

2. **Reimbursement Payment:** submission of payment list to the BiMS web portal for crediting the amount to insured person's account.

3. **Payment Acknowledgement:** Once the payment is initiated ,the Insured persons should be alerted through email/SMS. Sufficient APIs should be provided.

11. Communication management : All the status of claims and transaction details at any key events should timely be messaged to insured persons through email and SMS. Generation of communication letter, maintenance of communication database.

12. Reporting

Customizable reports connected with all entities and process.

1.8. Terms, Definitions & Abbreviations used

1.8.1 Terms and Definitions

Insured Person (IP): A person who is entitled for ESI Scheme.

Employer: An institution /company/ organization which comes under the purview of the ESI Act.

Beneficiary: An insured person, his family and/or dependants as defined by the ESI Scheme.

Insurance Number (IP No): A unique number assigned to each registered employee by ESI Corporation of India. This number is called the IP No and is used to obtain the benefits under ESI Scheme. For all communication and treatment, this IP No is necessary.

ESI Dispensary: ESI Dispensary is the primary contact institution for IPs and beneficiaries for treatment, reference, and medical reimbursement. There are two types of Dispensaries in Kerala, Single doctor type and multi doctor type dispensaries. Single doctor type dispensaries have only one doctor and multi doctor type dispensaries have more than one doctor. Single type dispensaries work in Morning shift only and multi doctor type work in two shifts. The ESI Dispensaries provide primary care to the Insured persons and dependants of IPs.

ESI Hospital: ESI Hospitals provide secondary care to the Insured persons and dependants of Insured persons. These are the higher centres of ESI Dispensaries. The Insured persons are referred to ESI Hospitals for Specialty treatment. These hospitals work 24*7, on shift basis and have inpatient treatment facilities as well.

Specialty (S) & Super Specialty (SS) Treatment: The medicine departments are basically classified as Specialty (S) & Super Specialty (SS) Treatment. Super specialty treatment includes Cardiology, Nephrology, Urology, Neurology, Oncology, Plastic Surgery etc while Specialty treatment includes Orthopedics, General Surgery, General Medicine, Gynaecology, Anesthesia, Pediatrics. Other Specialty treatments such as Ophthalmology, ENT, Dermatology, etc.

Private Empanelled Hospitals : Insurance Medical Services department empanel private hospitals for providing Specialty/ Super specialty treatment to Insured persons , which are not available in ESI Hospitals.

Branch Office/ Local Office: The basic unit office of ESI Corporation is the Branch offices/ Local offices which registers the employees into the ESI Scheme. They provide services like issue of Entitlement Certificate, Eligible Leave encashment etc. to the IPs.

Entitlement Certificate: These are certificates issued by the ESI Corporation to the IPs which certifies the eligibility of IP to avail different medical benefits. This certificate is issued two times a year. One from Jan 1st to 30th June and the second certificate is from 1st July to 31st December every year.

Medical Reimbursement Claim (MRC): Claims submitted by an Insured Person for getting reimbursement of medicines and equipment which were not available through the ESI framework.

Application form: A Medical Reimbursement Claim by the IP is submitted along with a prescribed application form, signed by the Insured Person, without which, the claim is invalid.

e-Pehchan Card: This is a card that all IPs should be kept and produce whenever is needed. This card can be downloaded from ESI portal.

Insurance Medical Officer (IMO): Insurance Medical officer is in charge of an ESI dispensary. He/ She keeps the power to delegation to pay the MRC bills having claim up to Rs 10000/- and to pass the bills having claims greater than Rs. 25000/-. The detailed delegation powers of authorities are explained in this document and this delegation are subjected to change time to time according to the department decision.

Assistant Insurance Medical Officer (AIMO):

A medical officer in charge of an ESI dispensary. Same as Insurance Medical Officer except in grade. The functions of both IMO and AIMO are the same with respect to the MRC processing though they are different grades with respect to designation.

Passing an MRC bill: It is the process of sanctioning the eligible amount against an MRC bill submitted by the IP.

Clerical Staff/Ministerial Staffs: Clerk, Senior Clerk or any senior officer in the ministerial section of an office of an ESI Dispensary/RDD office/DIMS office who is carrying out the clerical jobs on the received MRC bills.

Ministerial Head: A Head Clerk, a Junior Superintendent, Senior Superintendent, Lay Secretary falls in this category.

RDD : Regional Deputy Director – Holds charge of a Zone of Insurance Medical Services Department. The ESI Dispensaries and ESI Hospitals are attached to a particular Zone.

JD : Joint Director – the second top authority in Insurance Medical Services Department – Head of Medical Reimbursement Claim Department – JD sanctions claims on behalf of the Director.

Director :- Head of the Department – representing Insurance Medical Services Department in the Government.

Claimed Amount: This amount is the actual medical expenses incurred in the treatment of IP/Dependants. It is the amount claimed by the IP according to his own grounds.

Recommended Amount: The amount recommended by an authority in the hierarchy to pass in the submitted MRC claim.

Sanctioned Amount: Final eligible amount passed by an authority according to his delegation of powers, as per the Rules and Regulation.

Proceedings / Sanction order : An order issued by the sanctioning authorities such as IMO, RDD, DDA, DDH, JD and Director regarding claim sanction. It is also named as “Proceedings”. Payment is made based on this Sanction order /Proceedings

Forwarding Letter: - A communication letter issued by any of the authorities for physically sending claims/remarks/explanations/queries to the Organizations/Institutions signed by the Authority.

Allotment: The fund allotted by the finance department to pay the MRC applications by the ESI dispensary, Regional Deputy Directorate or Directorate of Insurance Medical Services. The Finance Department of Kerala State allots the fund to the DIMS and DIMS disburse the allotment to RDDs and ESI Dispensaries against the allotment request. Normally allotment to disburse MRC claim are allotted in bulk.

Treasury: Treasuries are the institutions under the Treasury department of Kerala State Government. Accepting Revenue due to the Government, Payment of money to various departments for their plan and non-plan expenditure, compilation of monthly accounts under Revenue and expenditure Heads and rendering the same to the Accountant General are the main functions of the Treasury Department.

BiMS (Bill Information and Management System): An electronic bill portal maintained by the Department of Treasuries, Government of Kerala. Disbursement of claim amounts to the accounts of Insured Persons are carried out through BiMS Portal. For these, payment related information in the prescribed format is uploaded to the BiMS interface by the cashier of Organization concerned.

CSV file : Text file containing comma separated records. One of the file format used for exchanging information between applications.

An example of a csv is attached as **Annexure 7** in this document.

Drawing and Disbursing Officer (DDO): The officer in the ESI dispensary or Regional Deputy Directorate or Directorate of Insurance Medical Department who is capable of Drawing funds from the Treasuries and disburse to the payees.

<u>Institution</u>	<u>DDO</u>
ESI Dispensary	Insurance Medical Officer
Regional Deputy Directorate	Regional Deputy Director
Directorate of IMS Dept	Director

e Office File Management System: - The web application software by the Government for workflow management.

Receipt: An acknowledgment slip issued by a claim receiving person in an Organization. It contains information such as receipt number, date year concerned and optional description.

File Number : The number generated in the workflow management (manual/electronic).

MRC Register: - A register kept in every office section where MRC applications are handled. Once an MRC bill is taken for processing, the important details of the bill are entered into the register.

Section : The smallest sub-unit holding MRC for an Organization. According to the volume of claims there may be more than 1 section for an organization. Normally an authority of Clerk will be in charge of one section while supervisory officers like Head Clerk/JS/SS are in charge of multiple sections. Physical claims are under the custody of the person handling the section. When an employee in clerical authority is transferred to another location, it needs to transfer all physical documents concerned with the claims to the next person taking over the charge of the section.

Check List: A list of prerequisites that are necessary to process a submitted MRC bill. Eg:- bill vouchers should be countersigned by the doctor, whether enclosed discharge summary or not, etc.

Sanctioning Authority: - The ultimate authority assigned with the responsibility of sanctioning the claim. In the department sanction of the medical reimbursement is claims are done by a medical officer in the various levels of delegation. In the dispensary, for a claim under the power of delegation of the IMO (currently Rs.10000/-) . level it is done by the Insurance Medical Officer. For claims under the power of delegation Regional Deputy Director (RDD) the sanctioning authority is RDD. (Currently between Rs.10000 and Rs.25000). For claims above Rs.25000 and less than Rs. 75000 the Joint Director of the department has the authority to sanction the claims. For claims between Rs.75000 and Rs.300000 the Director of the department is assigned the power of delegation. For all claims above the delegation of Rs.300000/- special sanction is obtained from the Labour and skills department of Government of Kerala.

1.8.2. Abbreviations

MRCMS	- Medical Reimbursement Claim Management System
IP	- Insured Person
MRC	- Medical Reimbursement Claim
ESI	- Employee State Insurance
ESIC	- Employee State Insurance Corporation
IMS	- Insurance Medical Services
JD	- Joint Director
RDD	- Regional Deputy Director
DDA	-Deputy Director Ayurveda
DDH	- Deputy Director Homoeo
IMO	- Insurance Medical Officer
AIMO	- Assistant Insurance Medical Officer
SS	- Senior Superintendent
JS	- Junior Superintendent
HC	- Head Clerk
EC	- Entitlement Certificate
DDO	- Drawing Disbursing Officer
BiMS	- Bill Information and Management System
CB	- Contingent Bill
Supt	- Superintendent
DSC	- Digital Signature Certificate.
SS	- Super Speciality
CGHS	- Central Government Health Scheme
NABH	-National Accreditation Board for Hospitals.
SPARK	- Service and Payroll Administrative Repository Kerala

1.8.3. References:

- (a) THE EMPLOYEES' STATE INSURANCE (CENTRAL) RULES, 1950, Ministry of Labour, NOTIFICATION New Delhi, the 22nd June, 1950
- (b) HANDBOOK of EMPLOYEES' STATE INSURANCE ACT, 1948 with Main Features of ESI Act, Rules, Regulations and DIGEST OF CASES (1948-2018) published by Law book publications.
- (c) A hand book – Capacity Building Initiative- Printed by Insurance Medical Services Department, Government of Kerala.
- (d) National Health Insurance Program, "Reimbursement Claim Process Guidelines," [Online]. Available: <https://indiafilings.com/learn/national-health-insurance>.
- (e) Insurance Medical Services Department, "Existing System Documentation," IMSD-SRS-001, Version 2.0, 03-06-2023
- (f) ISO/IEC/IEEE 29148:2018, "Systems and software engineering -- Life cycle processes -- Requirements engineering," International Organization for Standardization, Geneva, Switzerland, 2018.
- (g) HIPAA Privacy Rule, 45 CFR Part 160 and Part 164, Subparts A and E.
- (h) IEEE Std 830-1998, "IEEE Recommended Practice for Software Requirements Specifications," The Institute of Electrical and Electronics Engineers, New York, NY, USA, 1998.

2 . OVERALL DESCRIPTION

There is a high demand in replacing the existing system of processing, sanctioning and payment to a new automated system in order to increase the efficiency, transparency and accountability in the Claim management process. Forecasting resources and fund requirements,

speedy disposal of claims, delay in processing are be objectives to be achieved. It is aimed to be a B2B and B2C automated web application enhancing efficiency, accuracy, reducing manual effort, and demanding improved citizen satisfaction.

2.1. Product Perspective

The Medical Reimbursement Claim Management System (**MRCMS**) software should be designed to be an independent system that operates within the existing infrastructure of the Insurance Medical Services department, interacting with various stakeholders involved in the medical reimbursement claim process like Insured Persons and authorities handling MRC management process.

The **MRCMS** software should be a standalone application that will integrate with the department's existing systems and databases, such as the backbone database and the claims processing system. It should provide a user-friendly interface for managing the entire lifecycle of medical reimbursement claims from submission to disbursement.

The **MRCMS** software should communicate with external systems, such as Health information system of ESI Corporation, Bill Information & Management system of Kerala Govt Treasury and financial systems, to retrieve relevant policy information and process claim payments. It will also generate reports and notifications to keep all stakeholders informed about the status of claims and any updates or actions required.

MRCMS should be a generic and **Open-Source** software that capture the information and automation of registration of Insured Persons and claims, Verification and validation of claims, approval / rejection of claims, sanction and payment of claims and generates the reports in the predefined formats. The software would provide a holistic view of the Processes involved in delivery of medical reimbursement Claims, for a better decision making and information delivery.

From a functional perspective, the **MRCMS** software will include features such as:

- Insured Persons registration and management
- Organization management
- Authority management
- Claim management

- Workflow management for claim processing
- Sanction order management
- Account management
- Payment management
- Integration with external systems

The **MRCMS** software should adhere to industry standards and regulatory requirements, including privacy and security standards to ensure the confidentiality of sensitive data.

Overall, the **MRCMS** software should provide a centralized and efficient platform for managing medical reimbursement claims, sanction order processing, payment management and reporting streamlining the process, reducing manual effort, and improving transparency and accountability within the Insurance Medical Services department.

2.2. Architecture and Features : Preferred Software platforms:

1) in the LAMP environment with any of the following PHP Frameworks

- Symfony (latest stable maintainable version)
- Yii2
- Laravel (Latest stable version)
- Cakephp (latest stable and maintainable version starting from 4 with MariaDB/MySQL/PgSql as Database

2) In Python Framework dJango, Flask, Frappe

2.3. Hosting

It is mandatory to host all applications in the State Data Center with all the compliance guidelines issued by Government of Kerala/IT Mission/any agency authorized by Government of Kerala in this regard. The Developed application should be “Production” mode in all respects so that the hosted application in the staged server can be moved to the production mode within the time limit specified by the State Data Center/IT Mission *CERT*/ or any other agency mentioned by Government of Kerala for this purpose from time to time. The vendor should make any updation/modification required for the application to meet the required security requirements consequent to the security test done by the *CERT*/

Empanelled agencies/Any other Agency or Organization specified by Government of Kerala in this regard.

2.4 Testing

The vendor selected should ensure that all the functionalities are satisfied as per requirement by conducting automated as well as manual software tests. If any type of malfunction, degraded performance or error is observed consequent to the automated/manual test done by the Department, the same should be rectified by the vendor within the time-span allowed in the staged server.

2.5. Backup

Periodical and incremental backup provision through interface should be given to the system users. Automated live backup using cron jobs should also be provided.

2.6. Archiving

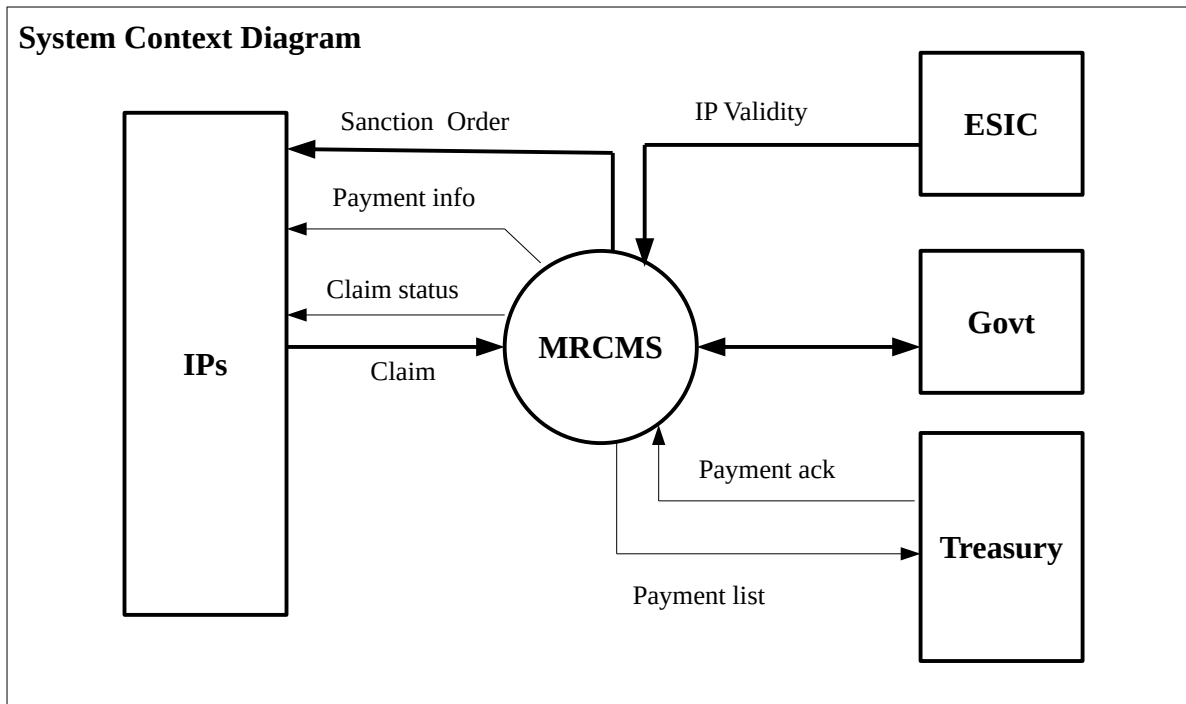
Removing old data by specifying custom periods in the manner of archiving should be implemented. This facility should be restricted to the system user. On the archival system, It should also possible to regain old state from the archival data.

2.7. Support and maintenance

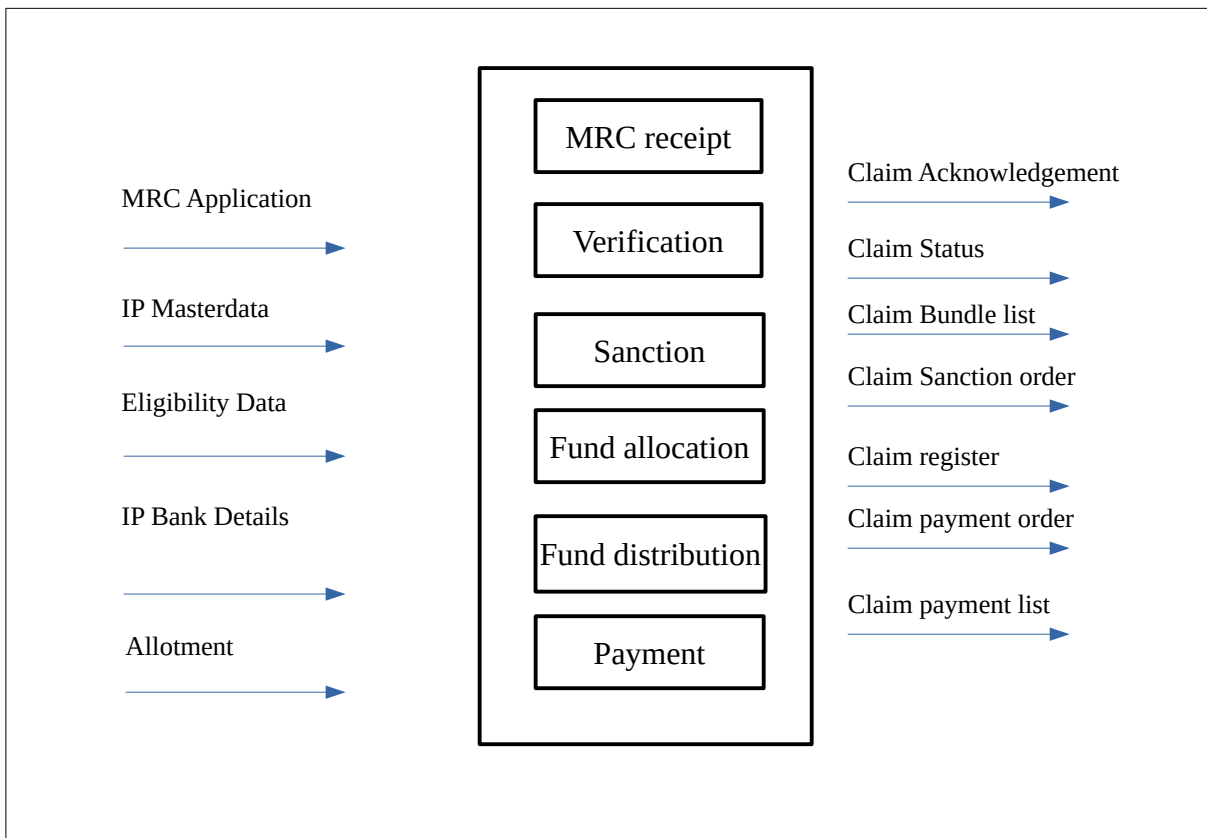
The vendor should provide live support for one year in the production mode software in addition to the services made in the staged server version without any additional cost. The term year mentioned here starts from the date on which it runs on the production server after completing all software tests. In the event of failure of the system due to uncertain events, support upon agreed terms should be provided.

3 . SYSTEM REQUIREMENTS AND FUNCTIONAL REQUIREMENTS

3.1 System context diagram



3.2. System Diagram



3.3 Main inputs and outputs

Inputs

a) MRC application – Hard copy

contents :- application, prescription, essentially certificate, entitlement certificate, bill statement, bill vouchers, emergency certificate, bank passbook copy

b) IP Data : ESIC holds online database of Live IPs. However, separate database is to be maintained for this purpose. A customization API interface should be there to input data from ESIC portal.

c) Allotment : Through data entry – year wise, month wise

Outputs

IP Register

MRC Acknowledgment

MRC Register

Claim bundle list

Claim Forwarding letter

Claim Rejection memo

Claim Return memo

Claim Sanction Order

Claim Payment Order

Claim status reports

Claim payment acknowledgment

Payment status reports

Modules

System configuration module

Superuser module

User management module

IP Management Module

Domain configuration module

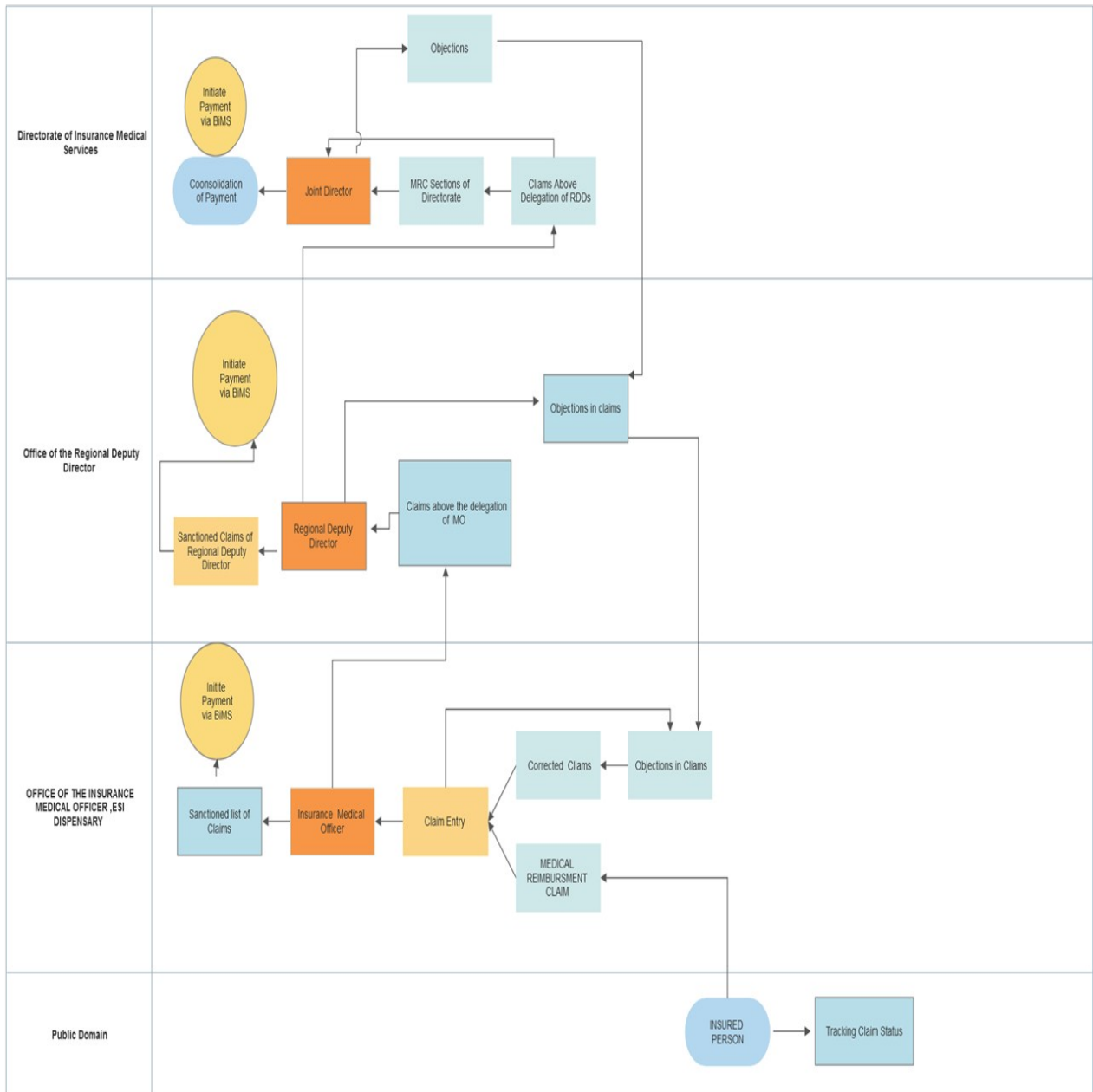
Claim management

Account management

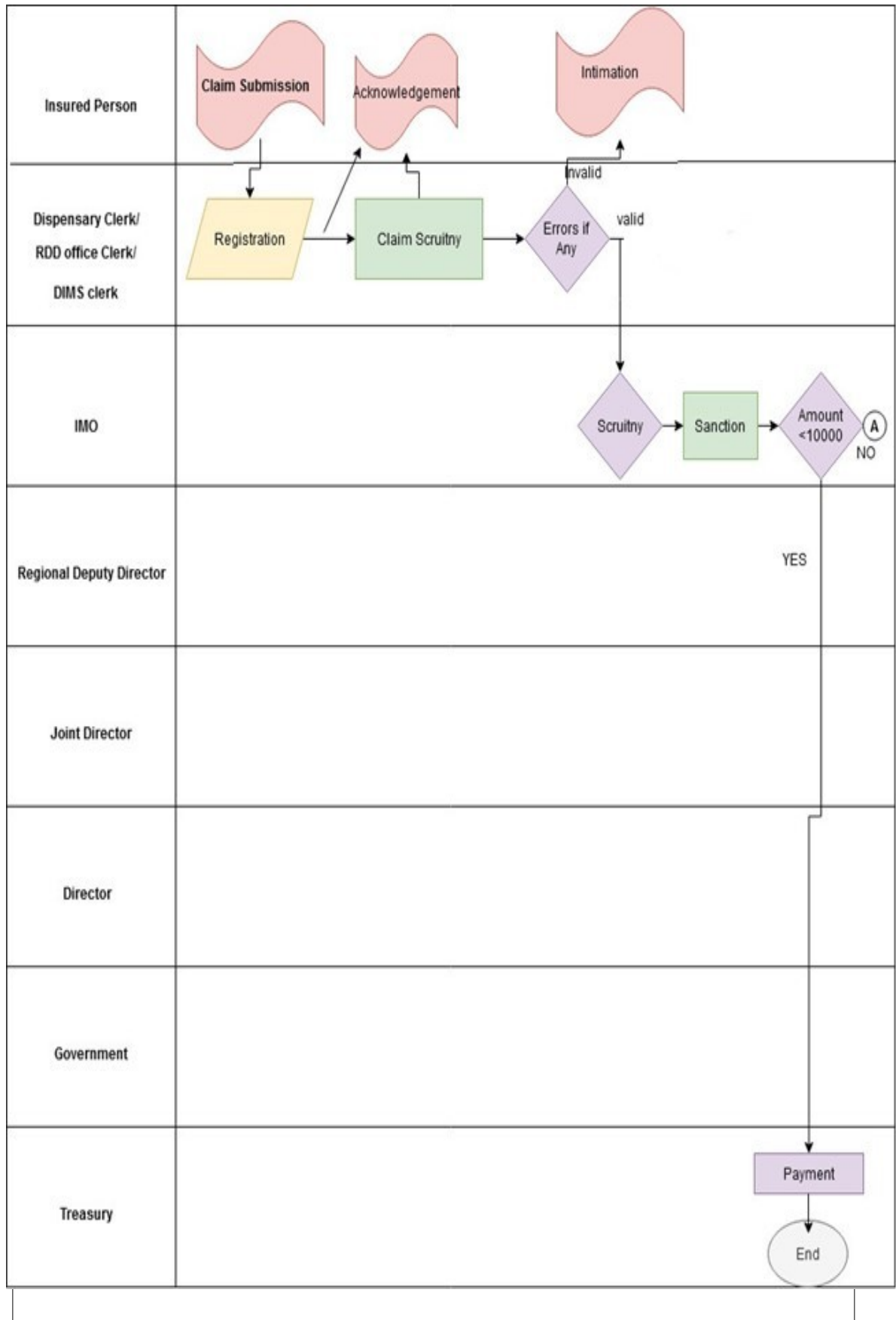
Payment

Reporting

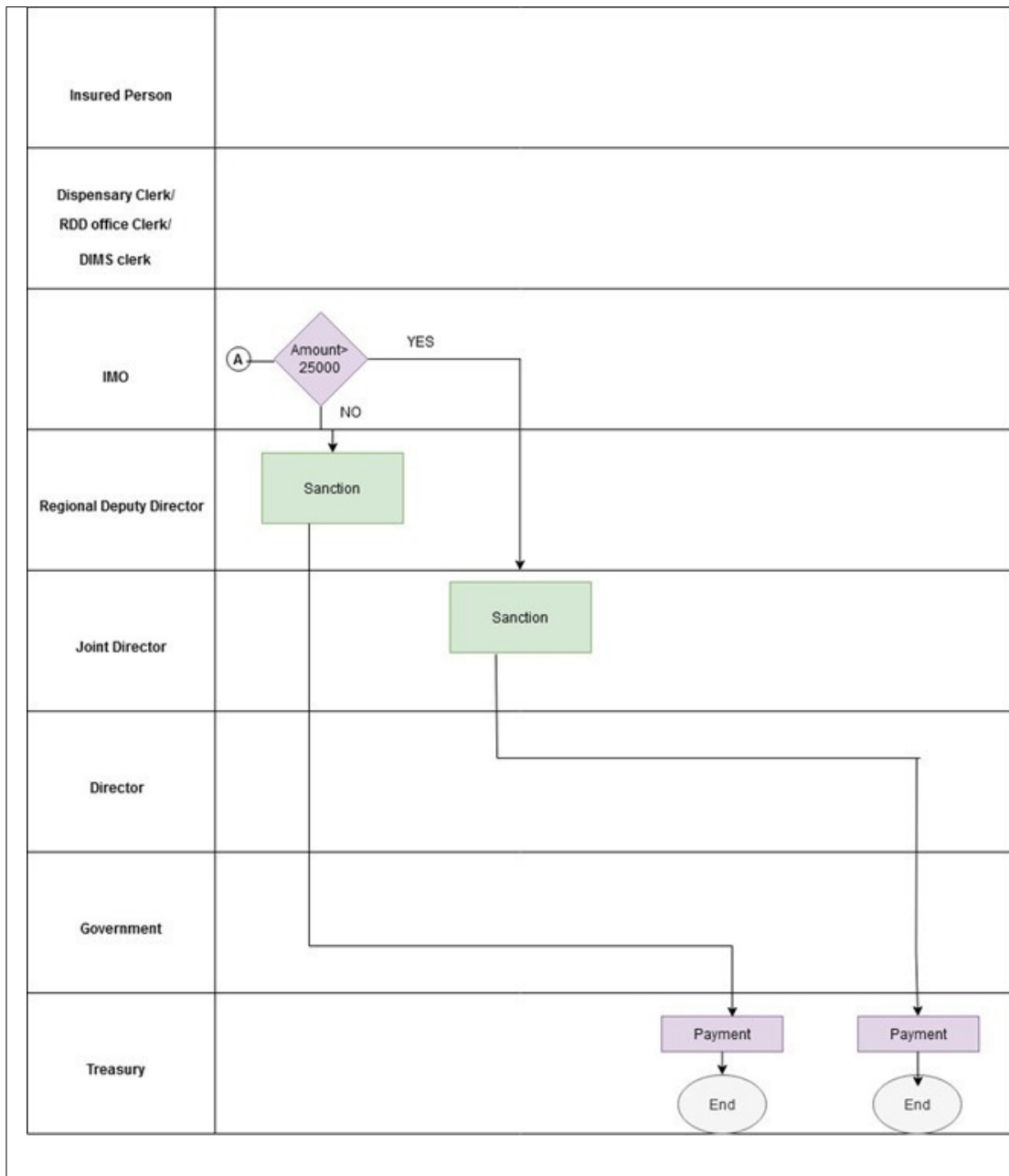
3.4. Process flow – High level



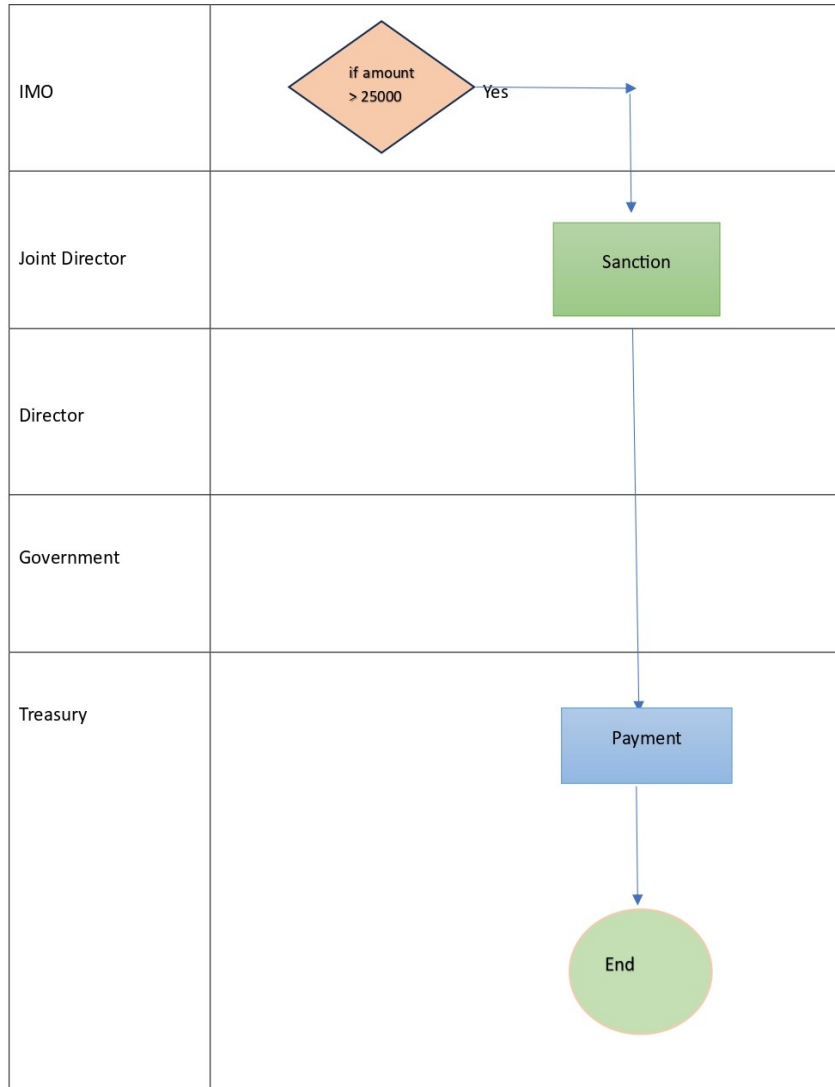
3.5. Process flow – Dispensary



3.6. Process flow office Regional Deputy Director



3.7. Process flow DIMS



4. FUNCTIONAL REQUIREMENTS

System Administration:

The system should provide administrative functionalities to manage user accounts, roles, permissions, and system configurations. Administrators should have the ability to add or remove users, define user roles, and access rights, configure system settings, and perform routine maintenance tasks such as backups, updates, and performance monitoring.

4.1. User Authentication and Authorization:

The system should provide secure user authentication and authorization mechanism, using username and password with captcha, to ensure that only authorized personnel can access and perform actions within the system. Change of password using mail-id or mobile number verification is a must. User roles and permissions should be defined to restrict access to specific functionalities and sensitive data based on the user's responsibilities.

There must be 7 types of users with functionalities detailed below.

Superuser , System user, Domain Administrator (Admin), Role Manager, Domain users, Guest.

a) Superuser: Superuser is intended to do the Installation and configuration of the application and execute updations and migrations required. The Superuser creates system user, and the system user functions all system work which is common to all users and organizations.

b) System user: The system user manages all domain resources which are applicable to the whole system irrespective of the user and organization. The system user creates domain resources, organizations and authorities. System user is intended to do routine system works which are not related to domain specific work such as backing up, import/export master configuration data and report template maintenance.

c) Domain administrator (Admin): Domain administrator(Admin) creates/manages resources which are specific to a domain such as a dispensary, administrative office etc. A

major part of admin work is activate/deactivate IPs and users pertaining to organizations. Each organization should have one admin.

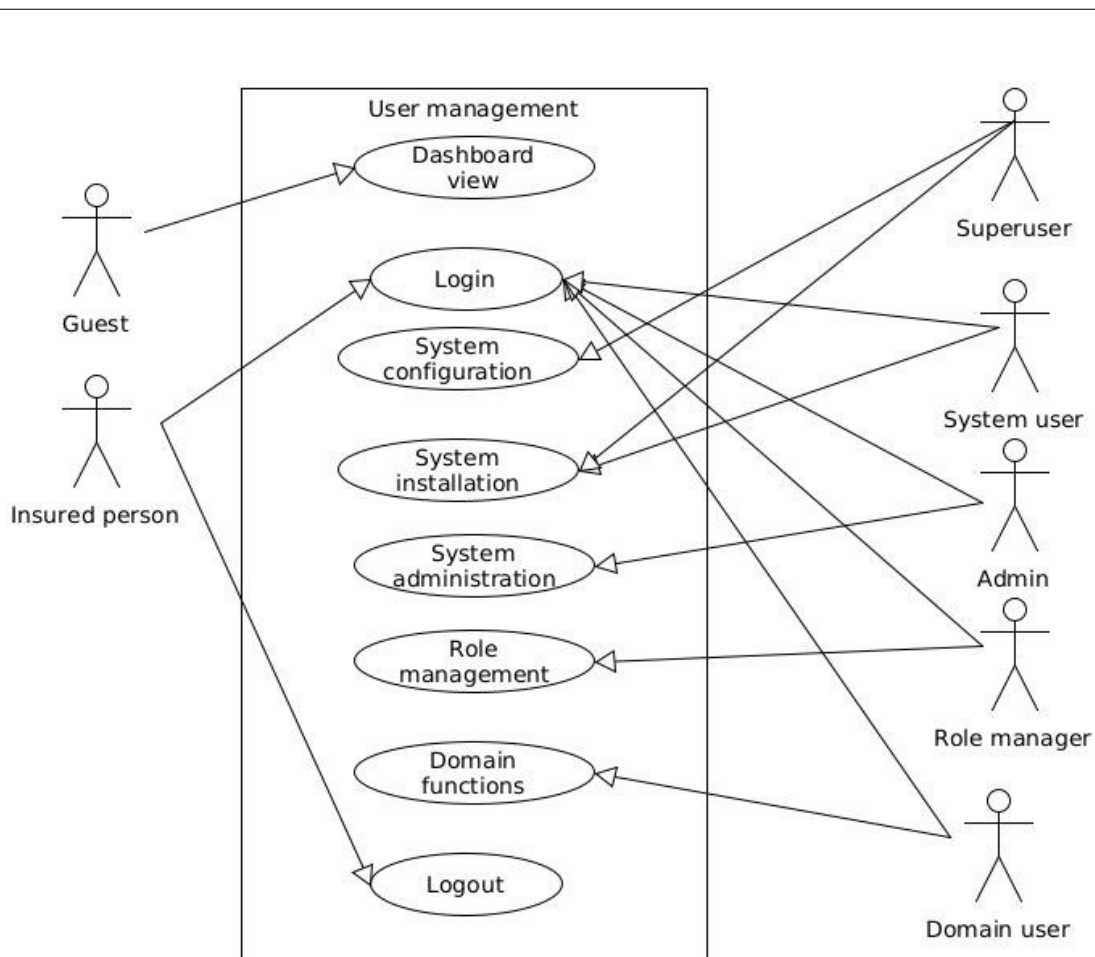
Roles: Organization management, Authority management, IP Management

d) Role manager : User whose only duty is to change roles and re-assign. - does not have domain function access.

e) Domain users : All users come in the actual workflow – does not have system and user management roles.

f) Insured person: The beneficiary of Insurance Medical Services Department. Should have access to reports regarding his claims, status, payment list, payment summary and all reports addressed to the general public.

g) Guest : Does not have an account in the system. Only restricted dashboard view is available



User Registration:

- The system should provide a user registration process for all users, including employees, healthcare providers, and insurance policyholders.
- Users should be required to provide necessary information during registration, such as name, contact details, and credentials (e.g., username and password).

User Login:

- The system should support user login functionality to authenticate and authorize users.
- Users should be able to log in using their registered credentials (e.g., username and password).

Password Security:

- The system should enforce password security measures, such as minimum length, complexity requirements, and expiration policies.
- Passwords should be stored securely using appropriate encryption techniques (e.g., hashing) to protect user accounts.

Role-based Access Control:

- The system should implement role-based access control (RB AC) to manage user permissions and restrict access to specific features and data.
- Different user types such as super admin, system user, domain administrator, role manager and domain user.
- The domain user type should have different authorities which are ;
Director, Joint Director, Regional Deputy Director, Deputy Director, Insurance Medical Officer, Senior Superintendent, Junior Superintendent, Head Clerk, Clerk and Data entry operator(DEO).

User Profile Management:

- Users should be able to manage their profiles, including updating personal information, changing passwords, and modifying contact details.
- Certain profile modifications may require additional verification or authorization steps for security purposes.

Two-Factor Authentication (2FA):

- The system should include optional two-factor authentication for enhanced security.
- Users should have the option to enable 2FA, which can involve methods like SMS verification, email verification, or authentication apps.

Audit Logs and Activity Tracking:

- The system should maintain comprehensive audit logs and track user activities for security and accountability purposes.
- Activities like login attempts, access to sensitive data, and critical operations should be logged with relevant details, such as timestamps and user identifiers.

Session Management:

- The system should manage user sessions securely, including session timeouts, session termination on logout, and handling session-related vulnerabilities (e.g., session hijacking or fixation).

Access Restriction and Validation:

- The system should enforce access restrictions and validation checks to ensure users can only access authorized features and data.
- Access controls should be applied at both the application level and the database level to prevent unauthorized access or data leakage.

Password Recovery and Account Lockout:

- The system should include password recovery mechanisms for users who forget their passwords.
- Account lockout policies should be implemented to lock user accounts temporarily or permanently after multiple failed logins attempts to protect against brute-force attacks.

These requirements aim to establish secure and controlled access to the Medical Reimbursement Claim Management System, ensuring confidentiality, integrity, and availability of data while preventing unauthorized access or misuse. It's important to further refine and customize these requirements based on the specific needs, regulations, and security standards applicable to the Insurance Medical Services department.

4.1.1. User Roles and Permissions

The user management module should enable privileged users to define different user types, authorities, roles and permissions within the system. User types include superuser, system user, Role manager, Domain user, Insured person and the Guest user. Domain level users are the users concerned with performing workflow decisions and actions named authorities, and should be assigned with hierarchical permissions. Other than the domain users the superuser, system user, role manager should not have workflow access.

The authorities defined with Domain users are Director, Joint Director, Regional Deputy Director, Deputy Director (Ayurveda and Homoeo), Insurance Medical Officer, Senior Superintendent, Junior Superintendent, Head Clerk, Clerk and Data entry operator. The hierarchy and number of the authorities are not fixed and the application should be capable of incorporating new authorities with new roles and permissions, which is a domain administration work to be performed by Domain administrator (Admin).

4.1.2. Permissions related with different entities :

- **Insured Person:-** Register IP, Edit IP, Activate IP, Inactivate IP, Transfer IP, view status, update profile.
- **Authority:-** Create authority, change authority type, assign/reassign roles,
- **User:-** Register user, activate user, inactivate user, assign/re-assign authority, update user type.
- **Organization:-** Add organization, update organization, drop organization, assign/reassign authorities, update fund information, activate organization, inactivate organization.
- **Claim :-** Register claim, Edit claim, activate claim, inactivate claim, forward claim, retrieve claim, sanction claim, withdraw sanctioned.
- **Sanction order :-** Create sanction order, withdraw sanction order, lock / finalize sanction order.
- **Payment list :-** Generate payment list, lock payment list, unlock payment list, undo payment list.
- **Payment order :-** Create payment order, lock payment order, undo payment order.
- **Payment updating:-** Create payment update undo update. Lock payment update.

-

4.1.3. Authority wise permissions (Domain user type)

- **Data Entry Operator (DEO):-** Register claim, update claim.
- **Clerk :-** Register claim, update claim, issue remarks, forward claim, access reports and dashboard
- **Head Clerk:-** Register claim, update claim, issue remarks, forward claim, access reports and dashboard.
- **Junior Supdt:-** Register claim, update claim, issue remarks, forward claim, access reports and dashboard.
- **Senior Supdt:-** Register claim, update claim, issue remarks, forward claim, access reports and dashboard.
- **Regional Deputy Director:-** All permissions + Sanction Order permissions
- **Deputy Director :-** Sanction order + all domain permissions
- **Joint Director :-** Sanction order + all domain permissions.

4.1.4. User types and related functionalities

Superuser

Run installation script

Configure database

Create system users

System User

Create organization

update organization

invalidate organization

create authority

update authority

invalidate authority

Create backup schedule

Routine backups

User registration and validation of domain users

Admin

IP registration and validation

invalidate IP

Role manager

Permission management of Domain users

Guest

View portal

Insured Person

Update profile

submit claim

view status

submit comments

4.2. IP Registration and management

The Insured Person registration module in a Medical Reimbursement Claim management system software for the Insurance Medical Services department is a critical component that handles the process of enrolling individuals into the insurance system. Below are the detailed functional requirements for this module:

4.2.1. Insured Person Registration: The system should allow authorized personnel (system user) to register Insured Persons into the system. This registration process may involve collecting various personal details, contact information, and unique identifiers like Aadhaar or social security numbers. There should be option for bulk upload of the data through spreadsheet, .csv, .xml, .json format for which the template for the data should be downloaded from the portal itself. If the user downloads the template, clear all the data and upload, it should be taken as new data to the system and if the user keeps some data downloaded from the system, it should be treated as the updation of existing data. API mechanism for downloading IP data should also be present in the system.

4.2.2. Information to be captured for IP.

a) Basic data:

IP No, Name, Address, email, phone, mobile, date of birth, local office registered

b) Entitlement data: Entitlement period information according to entitlement certificate issued by various local offices:

date of issue of certificate, period of entitlement, issuing local office.

c) Family members: Family members according to definition of ESI Manual. - Father, Mother, Spouse, Children.

d) Nominee details: Nominated person for receiving any benefits in the case of death of the employee should be registered. The nominee must be one of the family members of the IP and validation of such matter should be executed.

e) Account information: Bank details of the IP for crediting the claim amount sanctioned to the Insured Person should be updated either at the creation time of IP or at any later interfaces like claim registration. There should be option for adding multiple bank accounts, but only one be live at a time – the default account. Option should be there in the claim registration interface to change the default bank account. If the Bank accounts information is not available, option should be there to add new bank and branch details in the same interface.

4.2.3. Document Upload: The system should enable the insured person or authorized personnel to upload necessary documents, such as identity proof, address proof, policy documents, and other relevant certificates required for the registration process.

4.2.4. Data Validation: Ensure that the entered data is accurate, complete, and follows the required format. Perform validation checks on fields such as dates of birth, phone numbers, and addresses to prevent errors.

4.2.5. Entitlement Expiry Notifications: The application should trigger alerts to both insured individuals and administrators concerned when a entitlement period is about to expire at the time of accessing a related interface.

4.2.6. Privacy and Security: Implement robust security measures to safeguard the sensitive personal information of insured individuals. Access controls should be in place to restrict unauthorized access to the system.

4.2.7. Search and Retrieval: The system should offer search and retrieval functionalities to quickly access and view insured individuals' information based on different search criteria such as

name, Insurance No, date of birth, local office and dispensary. The primary key should be the IP number.

4.2.8. Audit Trail: Maintain an audit trail of all registration-related activities, including the user who performed the action, date, and time, to ensure transparency and accountability.

4.2.9. Integration with Claim Processing: Ensure seamless integration with the medical reimbursement claim processing module, enabling quick and easy access to registered insured individuals' data during the claim settlement process.

4.2.10. Notifications and Communication: The system should be able to send notifications to insured persons regarding policy updates, claim status, and other relevant information via email, SMS, or in-app messages.

4.2.11. Multi-channel Access: Provide accessibility through multiple channels, such as a web application, mobile app, or customer service centre, to facilitate user-friendly registration for insured individuals.

4.3. Organization Management

Organization in this context means the Administrative units of Insurance Medical Officer, headed by an Authority. There are organizations or offices which are purely administrative in nature (does not have direct contact with Insured Persons) and organizations which have direct contact with Insured persons. At present, Directorate of Insurance Medical Services, Deputy Directorate (Ayurveda), Deputy Directorate (Homoeo), Regional Deputy Directorates (3 numbers) comes under the classification of pure Administrative units and 145 numbers of ESI Dispensaries are primary offices in which the Insured persons are attached.

The application should have facility for defining new organizations of these types and also to add new organizations of these types.

4.3.1. The various functions associated with Organization management

- **Creation of Organization**

Creation of organization of types - Dispensary and Administrative office type

- **Creating Sections under the organization.**

Section is the subdivision of organization into sub units for proper load management of work. Each section is assigned with charge of the lowest level authority person – an

authority of clerk. According to the volume of claims in an organization, the number of sections ranges from 1 to n. Documents generated from a particular section is identified by the section code appended in the id of the report. The claims are kept in serial bundles according to sections.

The system user should be able to create new sections with existing as well as newly created organizations. Assigning authorities to the sections of each organization is also a required functionality.

- Update Organization
- Assign head of organization

The Head of the organization should be one of the authorities mentioned in the authority database. Only authority with sanctioning power shall be assigned with the Head of the organization. Authorities like DEO, Clerk, Head Clerk, Junior Superintendent and Senior Superintendent should not be given “Head of organization” position.

The existing head of authorities are as follows

Dispensaries - Insurance Medical Officer / Assistant Insurance Medical Officer

Regional Deputy Directorate – Regional Deputy Directorate

Deputy Directorate (Ayurveda) - Deputy Director (Ayurveda)

Deputy Directorate (Homoeo) - Deputy Director (Homoeo)

Directorate of Insurance Medical Services – Director

The application should have facility for adding new authorities and assign these authorities as Head of Offices by the system user.

- Attach Insured persons to Organization (if it is Dispensary)

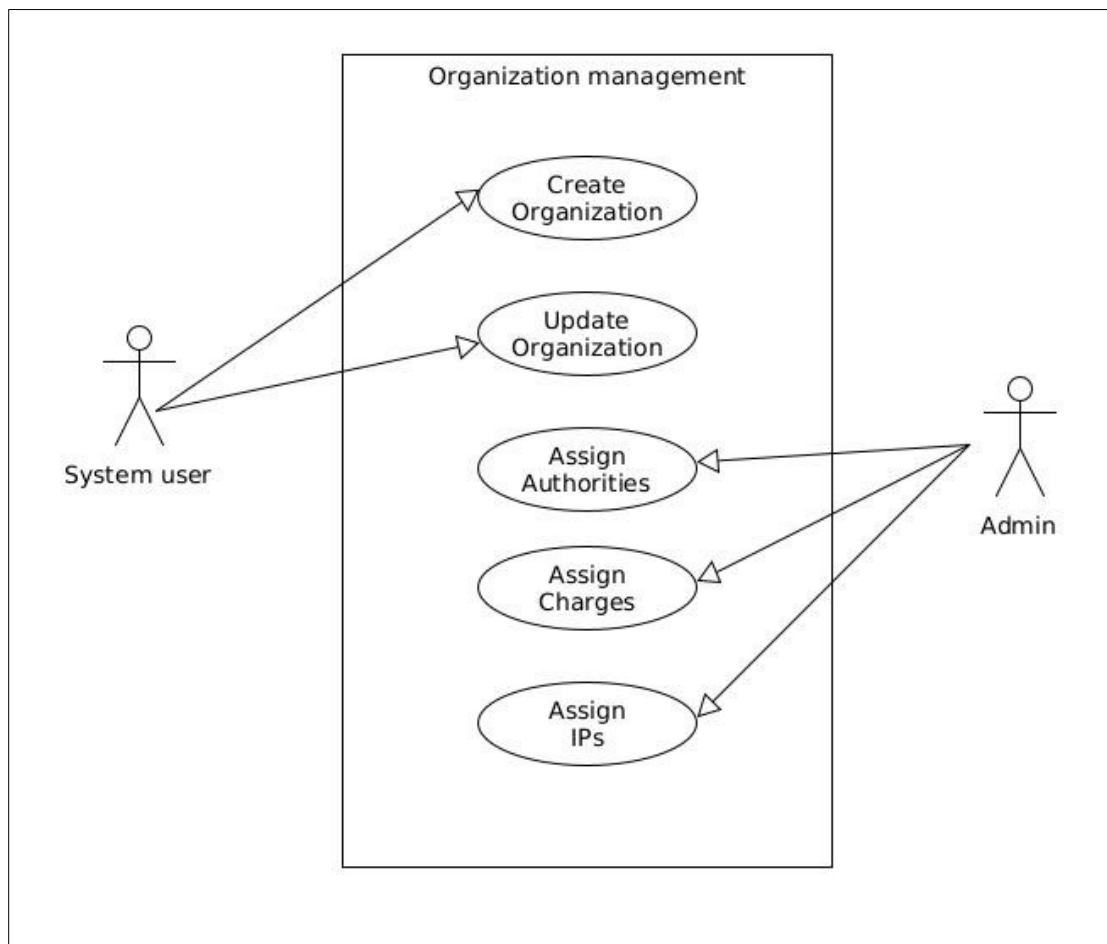
Attach insured persons to the organization only if it is a Dispensary. For administrative offices, the option should not be available to the user concerned.

- Assign charges to concerned Domain users : Assigning users with charge of Organization should provide a user with access to the entities in the application subject to the roles and privileges of the user concerned. The user should be able to access only the resources of the organization where he have been assigned charges .

4.3.2. Local Office management

There should be a facility for maintaining Local office master data, from where the Insured persons are entitled and attached to a dispensary. Local offices issues list of IPs (only IP numbers are included in the list) entitled to each dispensary with their entitlement period.

The system should be capable of updating the entitlement period in batch mode through .csv, spreadsheet,.xml and .json format data.



4.4. Authority Management

Functions associated with Authority management

a) Creation of Master Authority data

The System user should be able to create all the authorities in the application at the start of implementation either via individual interface or by batch updation through spreadsheet, .csv, .xml and .json format data as input. Option should be there for downloading the template of master data, fill the template and then upload. Sufficient validation should be there and each bulk update should be treated as a single transaction.

The existing authorities

Director, Joint Director, Regional Deputy Director, Deputy Director, Insurance Medical Officer, Senior Superintendent, Junior Superintendent, Head Clerk, Clerk and DEO (Data Entry Operator). Except for the top level authority Director, the number and level of hierarchy in each authority is dynamic. For example, the number of regional deputy directors are currently 3 , each having jurisdiction of 3 geographical locations of Kerala (termed as zone) such as South, Central and North. The existing zones may be split to form more zones or may be merged to form fewer zones – Thus application should provide such facility so that administrative/system users are able to add new authorities or remove existing authorities, assign roles and charges to them with easy steps.

b) Assigning privileges to Authorities

Privileges : Register user, activate user, inactivate user, Assign organization, Entitlement updation, Claim registration, Claim updation, Issue claim remarks, forward claim, return claim, reject claim, sanction claim, de-sanction claim, create payment order, cancel payment order, create payment list, cancel payment list, bundle management, lock payment order, lock payment list, unlock payment order, unlock payment list, issue claim acknowledgment, payment updation, create forwarding letter, approve forwarding letter.

The system user should be able to assign privileges, roles and charge of organizations to Authorities.

4.5. Template Management.

It is required to prepare custom reports and communication letters to the Insured persons and authorities in the system whose format and data cannot manipulate in advance. Hence a template management module should be there to dynamically create reports and documents based on the data from the application with the following features.

- The System user should be able to create a document model with a name in the application.
- The user should be able to upload the format of the document (with data markup) in html format and the master template data as .xml/.json format.
- The Admin user should be able to create document models and upload connected these template files for their organizations.
- These templates should be made available to the interfaces wherever there is a requirement of generation of custom report/communication letter.
- The document models created by the System user should be accessible universally among the application and the document models created by Admin authority should only be accessible to the concerned organization.

4.6. Digital Signature management

All the formal documents generated through the application needs to be digitally signed by authorities concerned. It requires a mechanism to incorporate digital signatures of Head of offices and sanctioning authorities into the application. Also, a facility for digitally signing the application of the IP should be given if he wishes.

The system should have a facility to

- Manage various token drivers of digital signatures
- Enable the IP and sanctioning authorities to digitally sign on documents.
- Verify validity of a digitally signed document

4.7 Claim Document management

There should be facility for maintaining claim document master data which manages the types of documents to be uploaded along with the claim application. The uploadable format should include .jpg, .jpeg, .png, .giff and .pdf. The administrative/system users concerned should be able to create new type of documents, specify them mandatory or not for each type of claim and activate/deactivate such document types. There should also be a size limiting factor. The domain users/Insured persons need to upload type of these documents at the time of registering claims.

4.8. Rate management

The amount admissible to the claims submitted by Insured person is determined by the assigning the rate list to each claim (These rates may applicable to the whole drugs used or may cover a subset of the drugs in the list)

4.9. Claim management functions

4.9.1. Claim Category management

In the department, sanction of the medical reimbursement of claims are done a medical officer in the various levels of delegation. In the dispensary, for a claim under the power of delegation of the IMO(currently Rs.10000/-) level, handled by the authority Insurance Medical Officer[**Category A**].

For claims under the jurisdiction of Regional Deputy Director (RDD), the sanctioning authority is RDD of the concerned zone. (financial power currently lies between Rs.10000 and Rs.25000)[**Category B**].

For claims above Rs.25000 and less than Rs. 75000 the Joint Director of the department is assigned them. For claims between Rs.75000 and Rs.300000 the Director of the department is assigned the power of delegation [**Category C**].

For all claims above the delegation of Rs.300000/- special sanction is obtained from the Labour and skills department of Govt of Kerala [**Category D**].

Speciality Bill Category	Eligible Amount Recommended by Insurance Medical Officer	Sanctioned / Forwarded to	Sanctioned and paid by
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Category A	Rs upto 10,000/-	Sanctioned by IMO	Paid by IMO
Category B	Rs. 10,001 to Rs 25000	Forwarded to RDD by IMO	Sanctioned and paid by RDD
Category C	Rs. 25,001 to 10,00,00/-	Forwarded to Joint Director/Director by IMO	Sanctioned and paid by Joint Director/ Director

It is required by the application to maintain a master data regarding the various categories of claims, financial power of each authority in each category of claim and the source fund for each category. The sanction order and payment order should convey head of account information regarding each source of fund.

4.9.2. Registration of Claim

Claim, the structured application submitted by an Insured Person for reimbursing the expenditure incurred as part of the drugs and other accessories acquired, which were not available from the IMS premises during the treatment with all supporting documents, is the key entity of the MRC application.

Facility should be given to register the claim by the IP himself and also by the authorities of the organization where the IP is registered. Only valid and entitled claims of IPs need to be allowed for registration. On successful registration of the claim, communication to the Insured person in the form email message and SMS should be made.

Information to be captured for claim

- Insured Person.
- Patient(s) and relation with Insured person
- Treatment period
- Entitlement status during treatment period
- Hospital from where treatment have been taken
- Disease / Diagnosis
- Type of treatment
- Inpatient or outpatient
- Amount incurred by IP
- Account information of IP

Documents in connection with claim which are to be uploaded

Application in the prescribe form signed by IP

Doctor's prescription (for outpatient)

Entitlement Certificate

Essentiality Certificate

Bill voucher statement

Bill Vouchers

Discharge summary (for inpatient treatment)

Emergency Certificate (for treatment without reference from IMS)

Diagnostic report

Test/Investigation report

Declaration

Supporting documents.

The type and number of documents connected with MRC processing is dynamic. i.e., the type of document and number of documents to be attached with the claim changes frequently with changes in policy and rules. The proposed application should have facility to create document categories and add or remove these categories and mark them as mandatory or optional for a particular type of claim. While executing the claim registration process, uploading interface for the documents of each category in .pdf/.jpg/.png/.jpeg format must be provided. Further progress in this process should be possible only after all mandatory documents have been uploaded.

4.9.3. Classification of claim

This proposed application primarily focus on the processing of the Specialty medical claims.

A specialty medical reimbursement claim application refers to a request made by an insured person to seek reimbursement for expenses related to specialized medical treatments or procedures.

When an insured person requires specialized medical treatment that is not available within the ESI network hospitals, they may seek treatment outside the network. In such cases, they can apply for reimbursement of the medical expenses incurred. There may be cases where treatment has been done on ESI Organizations but the medicines may not be available at the ESI premises during the treatment period.

An IP/ Beneficiary can submit an MRC application for Specialty Treatment obtained from any of the following healthcare institutions.

OP treatment from ESI Dispensaries

OP /IP Treatment from ESI Hospitals.

Medicine purchase against the prescription of ESI doctors.

Medicine purchase against the prescription of Government Medical Officers outside the ESI Dispensary

Emergency Treatment taken outside the ESI Institutions.

Diagnosis / tests taken outside the ESI Institutions.

4.9.4. Categorization of Claims

The application should be able to categorize and classify the claim type internally (A, B, C & D) from the parameters supplied at the time of of the claim registration. The automated categorization of claim from the claim registration interface should be based on this master data kept.

- A – Sanctioning authority – Insurance Medical Officer, ESI Dispensary
- B – Sanctioning authority – RDD, concerned zone
- C – Sanctioning authority – JD/Director, Directorate of Insurance Medical Services.
- D – Sanctioning authority – Director, require permission from Government.
- Rule 60

The system should provide interface for uploading related Documents according to the Rule 60 master data

- Rule 61

The system should provide interface for uploading related Documents according to the Rule 61 master data

Only relevant information connected with the category of claim needs to be captured for claim registration. The interface should be automatically configured for this.

4.9.5. Entitlement and eligibility checking

The application should check the entitlement master data for every claim at the time of registration. Entitlement master data keeps updated entitlement information of the Insured Person by updating entitlement certificates issued by the concerned Local Office for certain period. The application should verify whether the period mentioned in the claim have entitlement benefit. Claim periods which are out of the entitlement period should not be allowed to register. However, there should be a facility to update the entitlement period in the claim interface itself (without switching to entitlement interface) for eligible employees.

Only claims whose IP is live at the claim period should be considered for registration.

upload supporting documents

There should be options for uploading .pdf, .jpg, .png formats of supported documents at any level authority. The system user should be able to set size limits upon these uploaded documents. Facility to upload and withdraw these documents should be provided until the next stage or till the locked state. The audit trail regarding uploaded documents such as who uploaded which document who edited should be tracked.

4.9.6. Documents verification

The application should verify whether all the mandatory documents concerned with the type of claim is uploaded with the interface. However, there should be facility to make this verification mandatory or optional by the system user(at the claim registration stage). In such situation, the mandatory documents can be uploaded in the later processing stage, allowing registration without insisting to upload all documents.

For the verification of the documents, there should be a checklist interface to mark whether the document concerned is present or not.

4.9.7. upload supporting documents

There should be options for uploading documents (at any level authority) whose types are not mentioned in the claim document master data and are not of a general type. An interface for providing details of such document should be provided for each supporting document. .pdf, .jpg, .png, and .gif formats should be supported. The system user should be able to set size limits upon these supporting document document types. Facility to upload and withdrawal of these documents should be provided upto the next stage or till documents have been locked. The audit trail regarding uploaded documents such as who uploaded which document who edited should be available.

4.9.8. Validate account information

The default bank account maintained in the IP master database needs to be verified with the account information provided by IP in the claim. If the account information in the claim is different from the default account of IP in the system, the domain user should be able to select other bank accounts of the IP in the system matching with the one provided. If the account information in the claim is not matching with any of the bank accounts updated with the IP, adding new bank account information for the IP should be followed.

There should be a mandatory checkbox form element available for the user for verifying the correctness of the account information.

4.9.9. Processing claims

Processing is the intermediate step before sanctioning process of the claim. Processing starts only after preliminary works mentioned above are completed in all respects. Each authority has its own activities according to the roles and privileges assigned.

Processing involves the following activities.

- Verifying the legal validity of documents
- Estimation of the claimable amount
- Issue remarks and forward claim to next authority
- Communication with Insured persons and Authorities outside the organization.

Verifying the legal validity of documents

The application should provide an interface in the same page for listing all the documents connected with the claim, and on clicking / mouse-over, a separate/inline window/tab with zooming facility should be opened for accessing the document.

If any of the documents are found incorrect/invalid, option should be there for providing the details of invalidity as comment and submit the claim.

Further action in the processing should happen according to the authority who marked the invalidity of document.

- If the current authority is the Sanctioning authority, the claim should be forwarded to the lowest level authority for preparation of draft returning letter.
- If the current authority is the lower in the hierarchy, the claim should be forwarded to the next hierarchy with comments.

- If the current authority is intermediate in the hierarchy, he should be able to
 - 1) Forward to next authority with his/her own comments.
 - 2) or if he finds that it is valid, make it valid and forward to next higher authority/sanctioning authority with comments.
- It should not be able to forward claims without issuing comments. There should be verification using regular expressions so that only valid comments can be entered.

Estimation of claimable amount

The system should aid in calculating the recommended amount by the data available from the rate of medicines. The system should be capable of uploading the rate lists such as CGHS rate, CGHS package rate and non package rate and make necessary updations on time.

There should be an inline block/element inside the same form for assisting to calculate the amount admissible.

- If the claim is categorized as a package rate claim the amount should be calculated based on the package rate ratio to the total amount of the claim.
- If the claim is classified as a non package one, the authority should be able to search and select standard rate by typing medicine name. For each selection of drug in the basket, the sum should be aggregated.
- The package rates and non package rates for individual drugs should be managed and maintained by the Rate management module.
- For sanctioning authority, history of latest accessed drugs should be available with clear facility.

Issue remarks and comments

- Authorities in the workflow should be able to make comments or remarks on each claim at the processing stage. Facility should be given to edit comments of the owners if the same has not been seen by other authorities and further steps has not been initiated. Audit trail regarding the uploading of the documents should be there. There should be an inline multilingual editor for recording comments.

Forward claim to next authority

The application should be able to select the next authority to take action based on the recommended amount of the latest authority. There should be option for setting the financial power of each authority in the system. The financial power may change dynamically set sanction limit of authorities according to various decisions and the system should provide sufficient interface to update the same. Categorization of claim should be made depending upon the amount recommended by an authority at each stage.

- For a sanctioning authority, options for “forward claim without sanction” and “sanction and claim” options should be available.
- If a claim is sanctioned by an authority, the default next authority should be the lowest authority in the hierarchy within the organization. However, there should be option to change the next authority by the current authority.

Communication with Insured persons and Authorities outside the organization.

It is required to communicate with the Insured person and authorities outside the organization where a letter in the formal template is required. These are the situations where a communication letter is required.

- Intimate the IP about requirement of additional documents
- Intimation of absence of required documents to the IP
- Any other communication with IP
- Rejection of his/her claim
- Forwarding to higher authority where financial power of current authority exceeds his limits.

There should be facility for creating the following documents

- Forwarding letter to higher authority
- Forwarding letter to lower authority
- Claim return memo to IP
- Claim rejection memo to IP
- Additional document requirement letter to IP

pdf letters/documents are to be generated only after saving and confirming the form interface. After confirmation, no editing should be allowed.

For forwarding letter to a higher organization, all the data concerned with the letter need to be automatically populated assisted with editing the body contents.

For “absence of documents” letter, the details of required documents should be fetched automatically and put in the body content of the letter.

There should be default documents generated from the application data depending on the context of interface. However, the system should provide facility for preparing custom reports and letters/documents depending on the data from the application and the html template.

The available document models should be available for selection in all interfaces depending on the context.

States of a claim

The MRC has the following states

1. Data entry
2. Registered
2. Processing
3. Sanctioned
4. Rejected
5. Returned
6. Paid
7. Closed

State chart of Claim



4.9.10. Process Rule 60 claim

Medical benefits to insured person who ceases to be in an insurable employment on account of a permanent disablement. An insured person and his spouse is eligible under Rule 60 must produce the relevant Rule 61 Eligibility certificate issued by the ESI Corporation branch office along with the MRC application. The insured person also needs to produce the copy of 12 months advance contribution paid receipt as well.

4.9.11. Process Rule 61 Claim

Medical benefits to retired insured persons. — An insured person who leaves the insurable employment on attaining the age of superannuation, or retires under a Voluntary Retirement Scheme or takes premature retirement after being insured for not less than five years, shall be eligible to receive medical benefits for himself and his spouse

An insured person enrolled under Rule 61 is eligible to claim Medical Reimbursement only for the treatment incurred from ESI institutions only.

4.9.12 Expired Insured Person – Claim Process (Death of an Insured Person)

If an insured person passes away before the submission of the Medical Reimbursement claim, the nominee has the right to claim the amount from the ESI. For this, the nominee must produce the **nominee certificate** obtained from the Branch office of the ESI Corporation to the ESI Dispensary where he submits the MRC Claim Application. The bank account details of the nominee must also be included in the claim application.

If an insured person covered under the Employee State Insurance (ESI) Scheme passes away after submitting a medical reimbursement claim application, the following general procedures typically apply:

1. **Claim Processing:** The submitted claim application will undergo the regular processing by the concerned authorities within the ESI Scheme. This may involve verifying the submitted documents, assessing the eligibility criteria, and evaluating the medical expenses claimed. The eligible reimbursement amount will be credited to the bank account of the insured person.
2. **Review and Verification:** Sometimes, the nominee or the beneficiary reports the death of the insured person to the ESI dispensary. The ESI authorities will review the claim application and associated documentation to ensure they meet the required guidelines and comply with the scheme's regulations. They may also request additional information or documentation such as nominee certificate/ account details of the nominee etc. if necessary.
3. **Payment or Rejection:** If the claim is deemed eligible and valid, the reimbursement amount will be paid to the insured person or their nominated beneficiary. However, if the claim is rejected due to non-compliance with the scheme's rules or other reasons, the ESI

authorities will notify the insured person's family or legal representative about the rejection.

It is important to note that specific procedures and requirements may vary depending on the country, region, or specific policies within the ESI Scheme. It is recommended to contact the appropriate ESI authorities or consult the scheme's guidelines for accurate and up-to-date information regarding claim processing in the event of the insured person's death.

4.9.13. Sanctioning the claim

The authorities are subjected to sanction an amount that is permissible by the higher and lower delegation powers mentioned in the table. The application should assist the sanctioning authority for exactly calculating the amount to be sanctioned by providing interfaces to view rates concerned with individual and category of medicines with ease. The account head concerned should automatically be selected according to the context. Under no circumstances, an authority is allowed to sanction an amount beyond his/her financial powers. Consequent to the sanctioning process of the claim, a sanction order, after confirmation, should be generated.

There should be a facility for digitally signing the sanction order by the sanctioning authority.

After the sanctioning process, the claim should be forwarded automatically to the lowest authority in the hierarchy to proceed to the next process.

The lower and upper delegation of sanctioning may be changed time to time according to the Policies of the Government as well as that of Department.

4.10. Claim Bundle management

Each sanctioned claim needs to be generated with a bundle number and claim serial number inside the bundle number for each of the sections in the organization for keeping the physical documents in a systematic way. Normally, 25 claims are to be arranged in each bundle. However exceptions should be allowed for special situations to increase or decrease the number of claims in each bundle.

The lowest authority or custodian of the claim should be allowed to reassign claim serial numbers inside bundle and also rearrange claims among the bundles.

4.11. Claim sanction list

There must be facility for generating list of sanctioned claims of each bundle for each section in an organization. The fields in the list should be customizable. Exporting the list in pdf, spreadsheet, .xml and .json format is required. Once the list is generated, no modification is allowed in sanction, claim edit etc. However option should be given to cancel the bundle list for reverting the sanction order and allow edit claim before locking the claim sanction list.

4.12. Create claim payment list

Payment list is the list of claims to be disbursed at a particular event for the whole organization. The list should be generated by adding sanction order list as well as adding individual claims to the payment list. The fields of the list should be customizable and sortable. There should be facility for unlocking the list by the authority concerned for regenerating sanction order list. The list should be exported in .pdf, .csv, spreadsheet, .xml and .json format.

Payment confirmation.

The payment to one payment list is a single transaction where payment confirmation information such as date of payment, voucher number, treasury where payment has been made etc. should be marked against each payment list. However since money is paid into each insured person's bank account individually for a payment list, there should exist option for excluding individual claims whose transaction failed .

4.13. Account Management

It should deal with the Bank accounts of Insured persons as well as the master data of Banks and Branches.

Facility should be there to Add, update, drop Banks and their branches and also to add accounts to the Insured persons. Multiple bank accounts are permissible to each IP, provided only one account is the default one. The admin authority of the attached Dispensary should have power to change the default account of the IP. The Branch and Bank data needs to be uploaded by batch insert through .csv, .xml and .json data format.

4.14. Backup and recovery Management

4.14.1. System migration backups

There should a module for handling the backup and recovery options, privileged to the System user. There should be two backup files one for the source-code and configuration data and another for the database backup of the whole system. If entire system is installed/migrated to a

new environment, the whole domain setup of Insurance Medical Services of the backup instance should be implemented by simply uploading the database backup (though there may be configuration updations).

4.14.2. Periodical backups

There should be option for taking periodical backup of database on periods such as yearly, monthly, weekly and daily. There should be secure folders representing these categories and should have interface requirements to download these database files from the internet.

Regarding daily backups, old backups should be replaced by new ones keeping at least 2 backups 2.0 and 2.1 – 2.1 being the latest.

4.15. Reports required

MRC Register

It is the register keeping physical claims received in an organization. The register should be organized according to organization wise, authority wise and section wise where there are multiple authorities and sections in each organization. The status of the claim like ‘registered’, ‘processing’, ‘sanctioned’ and ‘paid’ should be dynamically updated in each report. That is the report which should be live representing the live state of claims received till date. The report should be viewable without needing to generate the report.

Checklist of documents attached

Bundle list

List of claims included in each bundle of the concerned section’s user. The section custodian/section clerk may be allowed to view the bundles of section he is in charge. Higher authorities should have access to all the section bundles under their charge.

Payment list

List of claims included for payment to a particular organization irrespective of the authority sanctioned.

Claim summary statistics

1) Department summary

Total claims received

under processing

Sanctioned

Returned

Payment made

2) Organization wise summary

The same structure should be followed regarding organization wise summary. An option should be there in the form of drop down list or link of lists for selecting the organization.

3) Department detail

Departmental summary with all organizations in tabular form

4) Pendency report

Pendency report of claims for each organization sanctioning and payment year wise and month wise .

IP profile report

Bio data of IP in printed format

Payment made report of each organization for each month

fields : IP No, IP Name, claim receipt no, amount paid

The reports should be downloadable as .pdf, .csv, .xml and .csv.

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CLAIM PROCESSING WORKFLOW

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5. INTERFACE REQUIREMENTS

5.1. Layout

The application should have 3 template layouts

a) Portal view accessible to all users: Only generalized statistics and general information, manuals for download etc. should be available in this view. The Insured persons as well as Domain users need to login from this interface to access the web portal administration functionality.

b) Profile view of the login user: Only links/buttons according to the roles and permission levels need to be displayed.

c) Administration interface : Only Superuser, System User should have access to this interface.

Links and buttons according to permission level should be displayed here.

All the page layouts should have

- Search bar
- Login / Logout button
- Language switching button
- Dashboard view button
- Help button

User Registration:

- The system should provide a user registration process for new users.
- New users should be required to provide necessary information, such as personal details, contact information, and professional credentials, depending on their role in common.
- The system should validate and verify the provided information during the registration process.
- **Insured Persons** should be able to **register themselves** as users, but the identity should be verified by against the data from Hospital Information System software of ESIC. The following fields must be verified to ensure the identity of the user.
 - a. Name of IP
 - b. Date of Birth
 - c. IP Number
 - d. Mobile Number (OTP verification during registration is also a must.)
 - e. email
 - f. Local Office
 - g. Dispensary attached

Account Lockout:

- The system should implement an account lockout mechanism to prevent unauthorized access or brute-force attacks.
- After a certain number of failed login attempts, the user account should be temporarily locked, and appropriate notifications should be sent to the user and administrators.

Session Management:

- The software should manage user sessions securely to ensure active user sessions are properly maintained and expired sessions are terminated.
- User sessions should have a timeout mechanism to automatically log out inactive users after a specified period of inactivity.
- The system should prevent multiple login attempt for a user who logged in already.

Audit Trail:

- The system should maintain an audit trail of user login activities, including successful and failed login attempts, to track and investigate any suspicious or unauthorized access attempts.
- The audit trail should include details such as the timestamp, IP address, and user agent information.

Dashboard Interface Requirements

Here are some the requirements for the dashboard: This interface should be available to all users and no matter whether they have login credentials or not.

1. **Summary Statistics:** Display summary statistics related to medical reimbursement claims. This summary should include the total number of claims processed, pending claims, approved claims, rejected claims, and average processing time.

2. **Claim Status Overview:** Present an overview of the status of claims, including the number of claims in different stages (submitted, under review, sanctioned, rejected, paid, returned) and their respective percentages.
3. **Financial Summary:** Provide a summary of the financial aspects. This should include total reimbursement amount processed, the average reimbursement amount per claim, and any outstanding payments.
4. **Claim Processing Time:** Show the average processing time for claims, categorized by different stages, such as Submission to review, review to approval, and review to rejection. This helps identify bottlenecks and areas for improvement.
5. **Claim Trends:** The system should display charts or graphs showing trends in claim Submission over time, highlighting patterns, peak periods, and any seasonality.
6. **Reimbursement Distribution:** The system should illustrate the distribution of reimbursement amounts using visualizations like histograms or pie charts. This can help identify common reimbursement categories and outliers.
7. **Notifications and Alerts:** The developer should include a section for important notifications and alerts related to claim status updates, pending actions, or any system-wide announcements.
8. **Search and Filter Functionality:** Allow users to search and filter claims based on criteria like claim ID, date range, claim status, employee name, or medical service provider. This enables quick access to specific information.

5.1.1. Claim Submission Interface

Here are some detailed requirements for the claim Submission interface:

1. **User-friendly Interface:** The interface should be intuitive and easy to navigate, ensuring that users can submit their claims without any confusion or difficulty. Use clear labels, instructions, and visual cues to guide users through the process.
2. **Claim Information Entry:** Provide a structured form or set of fields where users can enter all the necessary information related to their claim. This may include personal details, such as name and contact information, as well as specific medical details, such as diagnosis,

treatment, and healthcare provider information. Refer manual MRC processing document for claim details required.

3. **Document Upload:** Allow users to upload supporting documents related to their claim, such as medical bills, prescriptions, receipts, and any other relevant documentation. Support various file formats and ensure that there are clear instructions on file size limits and acceptable formats. pdf, jpeg, jpg formats should be supported for document upload.
4. **Validation and Error Handling:** Implement validation checks to ensure the accuracy and completeness of the entered information. Perform real-time validation to catch common errors, such as missing required fields or invalid data formats. Clearly highlight any errors or missing information and provide helpful error messages to guide users in correcting them.
5. **Claim Tracking and Status Updates:** Provide users with a way to track the status of their submitted claims. This may include displaying a reference number or claim ID, along with information on whether the claim is pending, under review, approved, or denied. Users should also be able to receive notifications or updates regarding the progress of their claims.
6. **Submission Confirmation:** Once the claim is successfully submitted, display a confirmation message to the user, indicating that the claim has been received and is being processed. Consider providing a printable or downloadable receipt for their records.
7. **Save and Resume Functionality:** Allow users to save their progress and resume the claim Submission process later if they need to gather additional information or encounter any interruptions. This feature can enhance user experience and reduce frustration.
8. **Mobile Compatibility:** Ensure that the claim Submission interface is responsive and compatible with various devices, including desktops, laptops, tablets, and smartphones. Optimize the interface for mobile devices to accommodate users who prefer to submit claims using their mobile phones.

5.1.2. Claim Tracking Interface

A claim tracking interface, a crucial component of the medical reimbursement claim management system software, should enable users such as administrators, system and domain users to efficiently monitor and manage the status of medical reimbursement claims. Here are the detailed requirements for a claim tracking interface:

1. **Dashboard:** The interface should feature a user-friendly dashboard that provides an overview of the claim tracking process. The dashboard should display key metrics, such as the number of pending claims, approved claims, rejected claims, and average processing time. Refer Dashboard interface requirement described in detail above.
2. **Claim Search:** Users should be able to search for specific claims based on various parameters, such as IP Number, Registered Mobile number, IP name, claim number, patient name, date of service, or provider name. The search functionality should be intuitive, allowing users to quickly find the desired claims.
3. **Claim Status Updates:** The interface should provide real-time updates on the status of each claim. Users should be able to see whether a claim is pending, approved, rejected, or under review. Additionally, the interface should display the current stage of processing and any actions required from the user.
4. **Reporting and Analytics:** The interface should provide comprehensive reporting and analytics capabilities. Users should be able to generate reports on various aspects, such as claim status, processing time, reimbursement amounts, and patterns of claim denials. These reports can aid in identifying bottlenecks, analysing trends, and making data-driven decisions to improve the overall reimbursement process.
5. **Customization and Personalization:** The interface should allow users to customize their views and preferences based on their roles and responsibilities. This could include configuring dashboard widgets, setting up notifications, and selecting preferred display formats. Personalization features enhance user experience and productivity.

6. **Integration:** The interface should be designed to integrate with other systems and databases, such as Health Information System (HIS) of ESIC, SPARK and financial systems such as Bill Information Management System by Treasury Department Govt of Kerala. This integration enables seamless data exchange, reduces manual data entry, and improves overall efficiency.
7. **Mobile Access:** The interface should have a responsive design that supports access from various devices, including desktop computers, laptops, tablets, and smartphones. This allows users to track and manage claims on-the-go, enhancing accessibility and flexibility.

5.1.3. Document Upload Interface

Here are the detailed requirements for the document upload interface:

1. User-friendly Design:

- The interface should have an intuitive and user-friendly design to ensure ease of use for all users, including non-technical individuals.
- Clear and descriptive labels should be used to guide users on how to upload their documents.
- Visual cues, such as icons or progress indicators, can be used to indicate the status of uploaded documents.

2. Multiple Document Types & Size of the document:

- The interface should support uploading various types of documents commonly required for medical reimbursement claims, such as medical bills, prescriptions, diagnostic reports, and insurance forms.
- It should allow users to upload multiple documents simultaneously or one at a time.
- Support for different file formats, including **.PDF, .JPEG, .PNG, and .TIFF, should be provided.**

- **The interface should provide an option to the users to zoom document to desired level.**

3. Document Validation:

- The interface should include validation mechanisms to ensure that only valid documents accepted for upload.
- **File size and format restrictions should be enforced to prevent uploading of unsupported or excessively large files.**
- Validation checks, such as verifying the file integrity and ensuring it is not corrupted, should be performed.

4. Document Metadata:

- The interface should allow users to enter relevant metadata for each uploaded document, such as the document title, description, date, and category (e.g., medical bill, prescription, etc.).
- Users should be able to edit or update the metadata associated with their uploaded documents, if necessary.

5. Progress Tracking:

- The interface should provide users with a clear indication of the progress of their document uploads, such as a progress bar or a visual representation of the number of documents uploaded.
- Users should be able to cancel or pause the upload process if needed.

6. Error Handling:

- Clear error messages should be displayed when document uploads fail or encounter errors, along with appropriate guidance on how to resolve the issue.
- If an error occurs during the upload, the interface should allow users to retry the upload without losing their progress.

7. Security and Privacy:

- The document upload interface should adhere to strong security measures to protect sensitive information.
- Data encryption should be implemented to ensure the confidentiality of uploaded documents during transmission and storage.
- User authentication and access control mechanisms should be in place to restrict document access to authorized personnel only.

8. Notification and Confirmation:

- Once a document upload is successfully completed, users should receive a confirmation message or email indicating the status and any additional steps required.
- In case of any issues or delays in processing the documents, users should be notified promptly through appropriate communication channels.

9. Mobile Responsiveness:

- The document upload interface should be responsive and optimized for mobile devices to enable users to upload documents from smartphones or tablets.
- It should adapt to different screen sizes and orientations while maintaining usability and functionality.

5.1.4. Communication and Notification Interface

Here are some detailed requirements for the communication and notification interface:

1. **Notification Types:** The system should support various types of notifications to accommodate different scenarios. Common notification types include claim Submission confirmation, claim status updates, request for additional information, claim approval/rejection notifications, payment notifications, and general announcements.

2. **Notification Channels:** The system should provide multiple channels for sending notifications, allowing users to receive information through their preferred communication channels. Common notification channels include email, SMS/text messages, in-app notifications, and push notifications on mobile devices

3. messages, in-app notifications, and push notifications on mobile devices.

USER	NOTIFICATION TYPE	NOTIFICATION CHANNEL
Insured Person	Claim Approval/Rejection, Claim Sanction and Payment against claim, Payment failure	SMS to Registered Mobile Number
Clerk, Head Clerk, JS, SS, IMO, RDD, JD	Claim application reaches the in box of the respective user, claim rejection from the higher authority, payment credit / failure.	email & in app
Clerk, Head Clerk, JS, SS, IMO, RDD, JD	Login from new device User account locked after three unsuccessful login attempts. Successful password reset.	Email & in app

4. **Customization of Templates:** The software should allow administrators to define and customize notification templates.

5. **Automated Notifications:** The system should have the ability to send automated notifications based on predefined triggers or events. For example, when a claim is submitted, an automated confirmation notification should be sent to the claimant. Similarly, if a claim is pending approval for an extended period, a reminder notification can be sent to the approved.

6. **Real-time Updates:** The interface should provide real-time updates on the status of reimbursement claims.

7. **Notifications Tracking:** The software should track all notifications sent and received, including the date, time, content, and recipient. This audit trail helps in maintaining a record of communication for future reference and accountability.
8. **Integration with External Systems:** The communication and notification interface should be capable of integrating with external systems such as email servers, SMS gateways, and messaging services. This enables seamless delivery of notifications through various channels.
9. **Notification Preferences:** The system should allow users to set their notification preferences, such as selecting their preferred communication channels, frequency of updates, and the types of notifications they wish to receive. This helps personalize the notification experience for individual users.
10. **Multilingual Support:** The system should support multilingual notifications. This ensures that notifications are delivered in the user's preferred language, enhancing user experience and accessibility. Malayalam and English should be supported by the system.
11. **Notification Archive:** The software should maintain an archive of all notifications sent and received, accessible to authorized users. This allows users to retrieve past notifications, review the history of communication, and refer to previous information if needed.

5.1.5. Search & Filtering Interface

Below are the detailed requirements for the search and filtering interface:

1. Search Functionality:

- Enable users to search for medical reimbursement claims based on different criteria, such as patient name, claim ID, date of service, diagnosis, treating physician, or specific keywords.
- Include an advanced search option that allows users to combine multiple search criteria using logical operators (e.g., AND, OR) for more complex queries.
- Provide auto-complete or suggestion features to assist users in entering search terms accurately and efficiently.
- Implement search result highlighting to make it easier for users to identify the matching terms within the search results.

2. Filter Options:

- Include a range of filtering options to refine the search results based on specific attributes or characteristics of the claims.
- Common filters may include claim status (e.g., pending, approved, rejected), claim type (e.g., hospitalization, medication, laboratory tests), claim amount, claim Submission date, or provider network.
- Allow users to apply multiple filters simultaneously to narrow down the search results based on their requirements.
- Provide predefined filter presets or saved filter options to enable users to access frequently used or customized filters quickly.

3. Sorting:

- Enable users to sort the search results based on various criteria such as claim date, claim amount, claim status, or provider name.
- Allow ascending or descending sorting options to facilitate easier identification of relevant claims.

4. Performance and Scalability:

- Design the search and filtering functionality to handle a large volume of claims efficiently, ensuring quick response times even with extensive data.
- Optimize the search and filtering algorithms to minimize the processing time required for retrieving and displaying the results.
- Consider implementing pagination or lazy loading techniques to manage large result sets and improve performance.

5. Advanced Features:

- Include advanced features such as saved searches, allowing users to store and access frequently used search criteria for future use.

- Provide export options to download search results in various formats (e.g., CSV, Excel) for further analysis or reporting purposes.

5.1.6. Reporting and Analytics Interface

Here are some detailed requirements for the reporting and analytics interface:

1. **User-friendly Dashboard:** The interface should have a visually appealing and intuitive dashboard that displays key metrics, summaries, and charts. It should provide a quick overview of the system's performance, such as the number of claims processed, average processing time, pending claims, and financial summaries. It is required to refer the “**User Requirement Specification**” document to see which are the reports that are essential in the **MRCMS** application for the department.
2. **Customization of Reports:** Users should be able to generate customized reports based on specific criteria, such as date range, claim type, provider, or location. The system should offer a range of ready-built report templates and allow users to create ad-hoc reports as needed.
3. **Claim Analysis:** The interface should provide detailed analytics on claim trends and patterns. It should include reports on the types of claims being submitted, denial rates, reimbursement amounts, and average processing time. These insights can help identify potential issues, fraudulent activities, or areas for improvement.
4. **Financial Analysis:** The reporting interface should offer comprehensive financial analysis reports. This can include reports on claim reimbursements, payments to providers, revenue generated, cost analysis, and profitability. The system should also support trend analysis, budget comparisons, and forecasting capabilities.

5. **Compliance Reports:** The interface should provide reports to ensure compliance with regulatory requirements and internal policies. These reports may include documentation of adherence to coding standards, audit trails, compliance with billing regulations, and any other relevant compliance metrics.
6. **Data Visualization:** The reporting interface should leverage data visualization techniques such as charts, graphs, and heat maps to present information in a visually appealing and easy-to-understand format. This allows users to quickly grasp trends, patterns, and anomalies in the data.
7. **Export and Sharing Capabilities:** Users should be able to export reports in various formats, such as PDF, Excel, or CSV, for further analysis or sharing with other stakeholders. The interface should also support scheduled report generation and distribution via email or other communication channels.
8. **Role-Based Access:** The reporting interface should enforce role-based access control, ensuring that users only have access to the reports and analytics relevant to their responsibilities and permissions. This helps maintain data security and confidentiality.
9. **Real-time and Historical Data:** The reporting interface should provide real-time data updates for current claim processing statuses, but also allow users to access historical data for trend analysis and comparison over time.
10. **Performance Monitoring:** The interface should include performance monitoring features to track system performance, such as response times, resource utilization, and report generation speed. This information can help identify bottlenecks and optimize system efficiency.

5.1.7. Help, Support and Feedback Interface

Here are some detailed requirements for the Help and Support interface:

1. **Comprehensive Documentation:** The interface should include comprehensive documentation that covers all aspects of the software. This documentation should provide detailed instructions, explanations of various features, and troubleshooting tips. It can be in the form of a user manual, a knowledge base, or an online help system.
2. **Context-Sensitive Help:** The system should provide context-sensitive help, which means that users can access relevant information based on their current context within the software. This can be achieved by providing help options that are specific to the page or feature the user is currently interacting with.
3. **Search Functionality:** The Help and Support interface should include a search functionality that allows users to search for specific topics or keywords. The search results should be relevant and provide links to the appropriate sections of the documentation or knowledge base.
4. **Frequently Asked Questions (FAQs):** The interface should feature a section dedicated to frequently asked questions. These FAQs should cover common issues and provide concise answers or solutions. Organizing the FAQs into categories or topics can further enhance usability.
5. **Contact Information:** The Help and Support interface should prominently display contact information, such as a phone number, email address, or a dedicated support portal. This enables users to reach out to the support team for further assistance or to report any issues not covered by the documentation.
6. **Feedback Mechanism:** It is beneficial to include a feedback mechanism within the Help and Support interface. This allows users to provide feedback on the documentation, report any inaccuracies or gaps, and suggest improvements. Feedback can be collected through forms, surveys, or direct email communication.
7. **Multi-channel Support:** The interface should offer support through multiple channels to cater to different user preferences. This may include online chat, phone support, email

support, or a dedicated support portal. Each channel should clearly indicate the availability and expected response times. An in app mechanism must be required at least in the **MRCMS**.

8. **Training Resources:** The Help and Support interface can provide additional training resources, such as video tutorials or interactive demos, to help users better understand the software's features and functionalities. These resources should be easily accessible and complement the written documentation.
9. **Updates and Announcements:** The interface should feature a section for updates and announcements, providing users with information about new software releases, bug fixes, and important system-related news. This helps users stay informed and ensures they are using the most up-to-date version of the software.

By incorporating these requirements, the Help and Support interface in the medical reimbursement claim management system software can offer users a comprehensive and user-friendly resource to address their queries, resolve issues, and enhance their overall experience with the software.

6.0. Hardware Interfaces of MRCMS

Hardware interfaces of a software refer to the mechanisms or connections through which the software interacts with the physical hardware components of a computer system or external devices. These interfaces enable the software to communicate with and control hardware resources. Here are some common examples of hardware interfaces in software:

1. **Input/Output Interfaces:** These interfaces facilitate the exchange of data between the software and external devices. For example, a software application may have input interfaces to receive data from a keyboard, mouse, or touch screen, and output interfaces to display information on a monitor or send data to a printer.
 - a. PS2 /USB/ Wireless Keyboard and mouse
 - b. Scanners and Camera support
 - c. Speakers
 - d. Microphones

2. **Network Interfaces:** Software often requires network interfaces to communicate over a network, such as the internet or a local area network (LAN). These interfaces enable data Transmission and reception using protocols like Ethernet, Wi-Fi, or Bluetooth. Network interfaces allow the software to interact with other systems, access remote resources, or send/receive data over the network.
3. **Storage Interfaces:** Software often needs to read from or write to storage devices like hard drives, solid-state drives (SSDs), Cloud or external storage media. Storage interfaces provide the necessary protocols and drivers to access and manage data stored on these devices. **MRCMS** software should be hosted on cloud-based storage.
4. **Communication Interfaces:** In some cases, software may require communication interfaces to establish connections with external devices or systems, such as serial ports, USB ports, or specialized interfaces like RS-232. These interfaces allow the software to communicate and exchange data with devices like bar code scanners, sensors, or medical equipment.
5. **Audio/Video Interfaces:** Software that deals with multimedia, such as video editing software or media players, relies on audio and video interfaces. These interfaces enable the software to capture, process, and play audio and video content through devices like microphones, cameras, speakers, or headphones.
6. **Sensor Interfaces:** Software that interacts with sensors, such as in IoT (Internet of Things) applications, requires interfaces to collect data from various sensors like temperature sensors, motion sensors, or GPS receivers. These interfaces enable the software to gather real-time data from the physical environment.
7. **Graphics Interfaces:** Software applications that involve graphics rendering, such as computer games or graphic design software, require interfaces to interact with graphics hardware. Graphics interfaces provide access to features like 3D rendering, shader programming, or hardware acceleration to enhance graphics performance.

These hardware interfaces provide the necessary bridges between software and physical components, allowing the software to control, receive input from, or output to the hardware resources of a computer system or external devices. Proper implementation and

utilization of these interfaces are crucial for software to effectively interact with the underlying hardware and provide the intended functionality.

7.0. Software Interface Requirements of MRCMS

A medical reimbursement claim management system typically consists of various software modules that interact with each other to process and manage claims. The software interfaces between these modules play a crucial role in ensuring smooth communication and data exchange. Here are some common software interfaces requirements in detail for such a system:

1. **User Interface (UI):** The UI is the interface through which users interact with the system. It should be intuitive, user-friendly, and provide all necessary functionalities for users to submit claims, track their status, and perform other relevant tasks. The UI should have appropriate forms, screens, and controls for users to enter claim details and upload supporting documents.
2. **Claim Submission Interface:** This interface enables users to submit reimbursement claims to the system. It should provide a means for users to input claim details, such as patient information, diagnosis codes, treatment information, and supporting documents (e.g., medical bills, receipts). The interface should validate the entered data, ensure its completeness and accuracy, and perform any necessary data transformations or conversions before forwarding the claim to the next module.
3. **Claim Validation Interface:** The claim validation module verifies the correctness and compliance of submitted claims. This interface receives the claim data from the claim submission module and performs various checks, including eligibility verification, duplicate claim detection, and adherence to reimbursement policies and regulations. The interface should communicate the validation results back to the claim submission module, indicating whether the claim is accepted or rejected, along with any error messages or required modifications.

4. **Claim Adjudication Interface:** After validation, the claim adjudication module determines the reimbursement amount for accepted claims based on predefined rules and policies. This interface receives validated claims and performs calculations, such as deductibles, co-payments, and coverage limits. It may also interact with external systems, such as insurance provider databases or fee schedules, to retrieve relevant information. The interface should return the adjudication results, including the reimbursement amount, back to the claim validation module.
5. **Claim Payment Interface:** Once a claim is adjudicated, the payment interface facilitates the processing of reimbursement payments to the claimants. It may interact with financial systems, such as payment gateways or banking systems, to initiate fund transfers. The interface should transmit the necessary payment details, such as recipient information, reimbursement amount, and payment instructions, to ensure accurate and timely payments.

8. NON FUNCTIONAL REQUIREMENTS

Security

- The developed application resources such as Source code, configuration files, third party libraries and resources if any and all resources as part should be sanitized and be free from all types of malware.
- Latest security patches should be applied to resources , framework and libraries.
- Session limits must exist for the application. For each session type there shall be time limits.
- The system should be capable of providing automatic time out for the logged-in user.

Performance:

- The system must be able to handle minimum 10,000 concurrent users without any degradation in performance. However, if the number of users exceeds, appropriate message indicating load status should be displayed instead of displaying infinite waiting stage. That is load inconsistency and delays in one module should not be affected to the performance of accessing other modules for the same user.

- System response of the accessing user should not exceed 3s for process intense tasks.
- The application should respond to a query within 3 seconds maximum.
- The application should maintain a high availability rate, i.e., 90% up-time, to ensure continuous service. The MRCMS should maintain a high availability rate, i., 99.9% up-time, to ensure continuous service.
- The system should be capable of handling bulk data imports/exports within an acceptable time frame.

Durability

- The system should perform well minimum 5 year from the time of moving into production mode. For the same, long supported, maintained libraries and modules or bundles should be used. Modules/packages without proper license, maintainability and durability should not be utilized for acquiring the functionality. The system should ensure performance well for the said period even if it is run a local environment without access to internet resources for updapate.

User interface

- The user interface should be neat and clean in all respects and should meet W3C and W3CAG standards and guidelines.
- There should be appropriate display proportions according to the device which user selected such as mobile tablets, laptops and Desktops.

Standards

- The application should be compatible with W3C and W3CAG and should follow all the standards and guidelines issued by Government of Kerala/Government of India.
- The application should be inter-operable in all respects. There should be customizable interfaces for generating reports in spreadsheet, .csv and .json format.

Portability:

- The system must be able to run on different platforms with minimal changes.

Scalability:

- The system must be able to scale up or down as needed. Scaling operation should be possible without performing core code modification (except configuration changes).
- It should be capable of delivering high performance even at high transaction volumes without compromising on the response time.
- The system should scale seamlessly to accommodate growth in data volume and user count.
- Scaling operations, whether horizontal or vertical, should be possible with minimal downtime.

Compatibility:

- The system must be compatible with all other government applications such as SPARK, BIMS, BAMS and Bank applications.

Availability:

- The application should be available 24/7 to allow all users to access anytime.

Inter-operable

- System should be capable of exchanging data with other systems. For the same, API with dynamic field should be present for every report.

Access Management :

- The system should provide role based access to functions within modules restricted to authorized users.
- The system shall notify the security administrator/competent authority of unauthorized access or attempted access and record in a log with a reporting.
- The system should provide with a repository of all identification and access management. Users should not be allowed to access the database directly.

Backup and Recovery:

- Backups should be performed daily without affecting system performance, completing within a set window (**MRCMS should perform a backup in every 8 hours**).
- Recovery operations, in case of failures, should restore the system to its last consistent state within a predetermined period.

Data Throughput:

- The system should handle data transfer operations, both read and write, at a specified rate without data loss or corruption.

Network Performance:

- Network latency should be minimized to ensure smooth communication between different components of the system.
- The system should handle interruptions in network connectivity gracefully, ensuring data integrity and minimizing service disruptions.

Storage Capacity:

- The system should have sufficient storage capacity for data, logs, backups, and future growth.
- Storage performance should be optimized for rapid data retrieval and storage.

Security Overheads:

- Security measures like encryption and decryption should not introduce significant performance overheads.

Integration Performance:

- The system's performance should not degrade when integrating with external systems, like hospital management systems or payment gateways.

Load Handling:

- During peak load times, the system should maintain consistent performance levels without crashes or significant slowdowns.

Fail over and Redundancy:

- In case of component failures, fail over mechanisms should activate swiftly to ensure system availability and performance.
- When setting performance requirements, it's crucial to consider both the current needs and future growth potential. Regular performance testing and monitoring can help in ensuring that the MRCMS meets or exceeds these requirements over time.

Training :

In a digitized claim management process, IT professionals manage the system, ensure its smooth functioning, troubleshoot issues, and assist in training staff to use the software.

Other Requirements MRCMS

- The World Wide Web Consortium (W3C) sets standards for web technologies to ensure the long-term growth of the web. For a Medical Reimbursement Claim Management System (or any web-based system), considering W3C standards and recommendations is vital to ensure accessibility, compatibility, and internationalization.

Here are the pertinent W3C standards and recommendations for such a system:

1. Web Content Accessibility Guidelines (WCAG):

- Ensure the system is accessible to people with disabilities, including visual, auditory, physical, speech, cognitive, and neurological disabilities.
- Consider text alternatives for any non-text content.
- Make sure the system is adaptable and can be presented in different ways without losing information or structure.
- Use sufficient contrast ratios for text and background.
- Design controls that are easy to navigate using a keyboard.

- Provide users enough time to read and use the content.
- Avoid designing content in a way that is known to cause seizures.
- Include ways to help users navigate, find content, and determine where they are.

2. **HTML and CSS Standards:**

- Adhere to the latest versions of HTML and CSS specifications to ensure that your website functions correctly across all browsers.
- Semantic HTML: Use HTML elements for their given purpose to ensure proper accessibility and better SEO.

3. **Mobile Web Best Practices:**

- If the system is accessible via mobile devices, follow best practices for mobile web applications to ensure optimal performance and user experience on smaller screens.

4. **Internationalization (i18n) and Localization (l10n):**

- If your system is to be used globally, ensure that it supports multiple languages and regional differences in dates, times, numbers, etc.
- Use the Unicode standard for character encoding.

5. **Web Services:**

- If your system offers web services (APIs, etc.), they should adhere to W3C standards like SOAP or recommendations for restful services.

6. **Privacy and Security Protocols:**

- Implement W3C standards for secure transactions, data privacy, and protection.
- Web Cryptography API can be considered for cryptographic operations.

7. **Web Compatibility:**

- Ensure compatibility with various browsers and devices by following W3C's guidelines. This is especially important given the myriad of devices and browsers in use.

8. Scalable Vector Graphics (SVG):

- If using vector graphics in the system, SVG is the W3C recommended standard.

9. ARIA (Accessible Rich Internet Applications):

- Use WAI-ARIA to improve the accessibility of web content, especially dynamic content and advanced user interface controls developed with Ajax, HTML, JavaScript, and related technologies.

10. XML Standards:

- If your system involves data exchange in XML format, ensure it's compliant with W3C XML standards.

11. OWL (Web Ontology Language):

- If your system uses semantic web or requires representing information about categories of things, relationships between them, and their properties, consider adhering to OWL standards.

Glossary

DIMS	Director of Insurance Medical Services
DDA	Deputy Director Ayurveda
DDH	Deputy Director Homoeo
RDD	Regional Deputy Director
ESID	ESI Dispensary
JD	Joint Director
SS	Senior Superintendent
JS	Junior Superintendent
MRCMS	Medical Reimbursement Claim Management System
IP	Insured Person
MRCMS	Medical Reimbursement Claim
ESI	Employee State Insurance
IMS	Insurance Medical Services
AIMO	Assistant Insurance Medical Officer
EC	Entitlement Certificate
DDO	Drawing and Disbursing Officer
BiMS	Bill Information and Management System
CB	Contingent Bill
DSC	Digital Signature Certificate
SS	Super Specialty
CGHS	Central Government Health Scheme
NABH	National Accreditation Board for Hospitals
SPARK	Service and Payroll Administrative Repository Kerala
Symfony	Symfony is a set of reusable PHP components and a PHP framework to build web applications, APIs, microservices and web services.
Yii2	A Yii2 behavior designed to simplify the process of uploading and managing files and images associated with ActiveRecord models. exocet/yii2-chart-widge
Laravel	Laravel is a PHP web application framework with expressive, elegant syntax.
Cakephp	CakePHP is an open-source web, rapid development framework that makes building web applications simpler, faster and require less code.
Python	Python is a popular programming language. Python can be used on a server to create web applications
Django	Django is a high-level Python web framework that encourages rapid development and clean, pragmatic design.
Flask	Flask is used for developing web applications using python, implemented on Werkzeug and Jinja2.
Frappe	Framework Frappe is a fully featured, low code framework, and the world's best free and open source ERP ERPNext.
RBAC	Role-based Access Control
DEO	Data Entry Operator

API	Application Programming Interface
WCAG	Web Content Accessibility Guidelines
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheet
i18n	Internationalization (i18n) is the process of designing and developing software so it can be adapted for users of different cultures and languages
l10n	Localization (l10n) involves adapting product or content to particular locales.
W3C	W3C is an international establishment organization for the WWW (World Wide Web).
SOAP	Simple Object Access Protocol
SVG	Scalable Vector Graphics
ARIA	Accessible Rich Internet Applications
Ajax	JAX allows web pages to be updated asynchronously by exchanging data with a web server behind the scenes.
XML	Extensible Markup Language
OWL	The W3C Web Ontology Language (OWL) is a Semantic Web language designed to represent rich and complex knowledge about things, groups of things, and relations between things.