Software requirements Specifications of a Vocational Training Management System for the Ministry of Labor

1 Contents

1. Introduction

1.1 Purpose

The purpose of this document is to specify the functional and non-functional requirements for a Vocational Training Management System (VTMS) to manage governmental and private vocational training centers in the West Bank and Gaza Strip. The system will streamline, manage, and automate operations processes for private and public centers like licensing and renewal, training courses, student enrollment in public training courses, supervision of government training centers over private centers, supervision of general directorate of vocational training over government and private training centers and certificate issuance for both type vocational training centers within the Palestinian Ministry of Labor, and improve data management, enhance transparency for the defined stakeholders (funders, partners, trainers, trainees, training centers and Administrators).

1.2 Scope

The VMTS shall:

- Automate and manage licensing, renewals, location and ownership transfers, change trainer of training course.
- Support training course creation, scheduling, registrations and enrollment, certifications, exams scheduling.
- Enable real-time supervision by public (governmental) centers and General Directorate of Vocational Training (GDVT) at the Ministry of Labor (MoL).
- Provide role-based dashboards with (analytics, approvals, notifications)
- Handle complaints, funding partnerships and ensure SEO visibility.
- Implement SEO best practices to significantly improve organic search presence and performance.
- Serve as a centralized platform for managing trainer evaluations, and administrative oversight. It will also facilitate communication between stakeholders, including students, trainers, center owners, supervisors, and administrators.

1.3 Intended Audience and Document Use

- Ministry Officials: Managing regulations and approvals
- Training Centers (Private/Public): Licensing, supervision, field visit scheduling and results, workflows initiation and training course management.
- Students: Course enrollment and certification tracking, profile developing.
- Supervisors & Instructors: Performance assessment
- IT & Development Teams: System implementation

1.4 Definitions, Acronyms, and Abbreviations

Acronym/Term	Definition
MoL	Ministry of Labor (Palestine)
VMTSVTMS	Vocational Training Management System
SRS	Software Requirements Specification – A document detailing functional and non-functional system requirements.
TVET	Technical and Vocational Education and Training
DL	Deliverable – A tangible outcome per project phase (e.g., DL1.1 = Deliverable 1.1).
ERD	Entity-Relationship Diagram – A visual representation of database structure.
ToR	Terms of Reference – Defines project scope, deliverables, and roles.
API	Application Programming Interface – Enables system integration.
Enabel	Belgian Development Agency (Project funder/partner).
CV	Curriculum Vitae – A summary of a trainer's qualifications.
VAT	Value Added Tax
IT	Information Technology
FAQ	Frequently Asked Questions
CMS	Content Management System
RBAC	Role-Based Access Control

PVTC	Private Vocational Training Center: Licensed independent training institution
GVTC	Governorate Vocational Training Center
GDVT	General Directorate of Vocational Training
UI/UX	User Interface/User Experience
UXP	Unified eXchange Platform (Governmental data exchange system)
LTS	Long Term Support
RTL	Right to left
LTR	Left to Right
FR	Functional Requirement
NFR	Non-Functional Requirements
TC	Training Course
DB	Database
PVTC Supervisor	Is an employee in GVTC whose job is PVTC supervision
WWBL	Work-Based Learning
GDPR	General Data Protection Regulation
Glossary	
Workflow	Is a series of sequential and interrelated tasks, activities, or processes that are performed to achieve a specific goal or outcome
Escalation	Is the process of elevating an issue, task, or problem to a higher level of authority or expertise when it cannot be resolved or delayed at the current level
Field Visit	An on-site inspection or assessment conducted outside the office environment to fill out a reporting form.

Should, Shall, and must	All of these indicate that the requirement is mandatory.
Manage	It is a set of actions (view, add, edit, delete, copy, cancel, archive, enable/disable, activate/ deactivate, merge, suspend/continue, approve/reject)

2. Overall Description

2.1 Product Perspective

This system is a centralized web-based platform that streamlines training center licensing, course approvals, and student management. It replaces manual paper-based processes with automated workflows, real-time tracking, and integrated reporting, it also integrates with existing governmental databases (such as national ID verification systems) and support external API integration with other ministries via UXP, when available.. It supports multi-role functionality (e.g., students, trainers, GVTC owners, PVTC owners, GDVT supervisors). The system is modular, allowing for future scalability and feature expansion.

The following System Context Diagram provides a high-level overview of the system's interactions with external entities, including users, external systems. It illustrates the system boundaries, input and output flows, and the main external actors that interact with the system. This diagram helps to define the scope of the system by identifying all external interfaces and their relationships with the system.
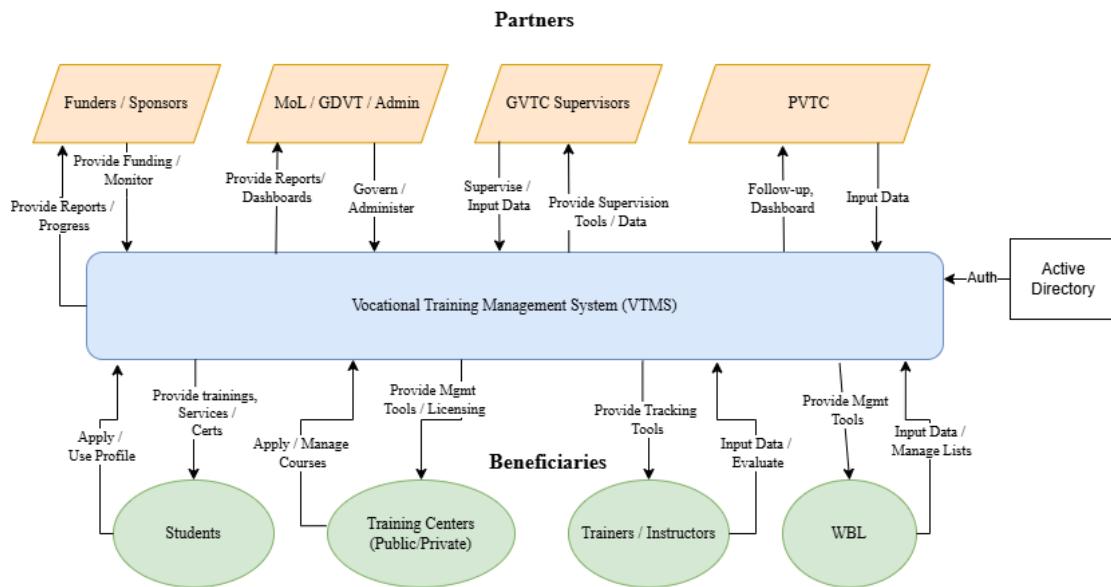
Figure 1: context diagram for VTMS

2.2 Product Functions

The system will enable the following key functions in addition to dashboards and reporting:

- General Administration
  - Define user roles, accounts and permissions.
  - Define mandatory/optional attachments per application/form type.
  - Define the templates that will be used to export documents.
  - Approve/reject exceptional course capacities for GVTC.
  - Define training course categories, topics, outlines, and configurations.
  - Evaluate, reject, and return to modify the outlines, trainers, and requirements of training courses.
  - Evaluate, reject, and return to modify production applications, and other applications.
  - Track workflows, complaints and audit trials.
  - Printing certificates, issuing replacements for lost ones, and auditing receipts.
  - Design and implement graduation tracking surveys.
  - Design, manage and Generate reports.
- Governorate (Public) Vocational Training Center Operations

- Supervise PVTC applications.
- Annual course planning (with MOL approval).
- Student interviews/enrollment (prevent overlapping courses).
- Distributing and following up on trainees among private sector institutions.
- Manage PVTS field visits and reports.
- Schedule exams and track attendance.
- Manage courses (creation, enrollment, certification issuance, capacity imiting, and handling exception requests).
- Follow up on graduate tracking forms by encouraging their students to complete them, or by filling them on their behalf when necessary.

- Private Vocational Training Center Management
  - Submit licensing/renewal applications (after inspections)..
  - Manage administration changes: ownership, manager, trainer, or center location..
  - Manage courses(creation, enrollment, certification issuance, capacity limiting, and handling exceptions requests.).
  - View financial notifications for certificate issuance.
  - Follow up on graduate tracking forms by encouraging their students to complete them, or by filling them on their behalf when necessary.

- Students(Trainees)
  - Login, registration and profile creation/viewing.
  - Training course applications submission.
  - Certificates reissuance.
  - Answer to graduation tracking surveys.

- Trainers
  - Students follow up (attendance, exam, …etc.)

- WBL
  - Students' attendance and evaluation follow-up

- Stakeholder & Funding Management
  - Partner/funder portals (view funded course progress).
  - Sponsor logos on certificates (configurable).

2.3 User Classes and Characteristics

Primary users include:

User Role	Description & Responsibilities
Admin (Ministry Officials)	Manage system settings, define policies, user roles, and permissions and oversee all platform operations
GVTC Supervisors	Monitor private training centers, approve requests, and conduct field visits Oversee private centers, approve/reject requests, and ensure compliance. update staff information, and monitor center performance manage exam and training attendances
Training Center Owners	Apply for licensing, course approvals, and manage training activities update staff information, and monitor center performance manage attendance
Instructors (Trainers), supervisors	evaluate students, manage attendance Evaluate students, track their attendance, and manage course delivery and results.
Students	Apply for courses, attend training, and receive certifications and training courses administration notifications
Partners & Funders	Monitor funded courses, track progress, and viewing reports
Complaint Handlers	Manage and resolve user complaints submitted through the platform
WBL	Manage students list and fill out evaluation

2.4 Assumptions and Dependencies

- All centers shall comply with MoL regulations.
- Internet connectivity is required for all users.
- Integration with government databases over restful APIs or SOAP (if available via UXP)

2.5 Operating Environment

- Platform: Web-based, responsive UI
- Browsers: Chrome, Firefox, Edge, Safari, ...etc.
- Database: Microsoft SQL Server 2022

- Backend: RESTful APIs will follow OpenAPI/Swagger standards, developed using .NET Core, utilizing the latest stable Long-Term Support (LTS) version.
- Frontend: Angular or React.js, based on the latest stable Long-Term Support (LTS) version available at the time of development. The selected framework shall support modular design, responsive interfaces, and high performance.
- Authentication: OAuth 2.0, Two-Factor Authentication, third party Authentication provider or apps.

Hosting: On-premises within the MoL infrastructure, running on Windows Server 2022 Standard Edition.

2.6 Design and Implementation Constraints

- Shall comply with Palestinian government security policies
- Data storage shall comply with GDPR requirements by ensuring the encryption of personal data at rest and in transit, implementing strict access controls, maintaining audit logs for all data access and modifications, enforcing data minimization and retention policies, and supporting data subject rights such as access, rectification, and erasure.
- The system must not rely on third-party libraries or components that require periodic license renewal or incur ongoing licensing fees. All utilized components must be either open-source or covered under a perpetual license provided by the consulting firm.
- The system shall support Arabic and English languages with fully RTL, LTR support.
- The system shall be designed to support 24/7 high availability.
- DB Shall enable full backup.
- Development shall be completed within the allocated budget and timeline.

3. Specific Requirements

3.1 Functional Requirements

2.1 General System Functions

FR.1 The system shall process user inputs according to defined rules and logic, including email addresses, phone numbers, identity numbers, and other specified formats (Input validation with informative messages).

FR.2 All user actions shall be governed by roles and permissions, ensuring proper access control (Role-based access control).

FR.3 Dashboards shall dynamically adapt based on user roles and preferences.

FR.4 Authorized users shall be able to customize their dashboard.

FR.5 Dashboards shall display charts, figures, and numerical data updated in real time.

FR.6 The system shall validate user input to maintain data accuracy and consistency

FR.7 The system should be able to integrate with external APIs to exchange data or utilize external services, including both consume and provide APIs.

FR.8 System Lookups should be exportable and importable.

FR.9 System Lookups should have code field to fill out the ministry codes (Ministry lookups compatibility).

FR.10 System grid views shall be exportable into (excel, CSV, JSON, pdf, and word) with and without filters.

FR.11 The system shall support data import and export functionalities using standard file formats, including but not limited to JSON, CSV, and Excel, to facilitate interoperability and data exchange with external systems.

FR.12 The system shall support secure and accurate migration of existing data from the MoL systems into the new platform, ensuring data integrity and minimal service disruption.

FR.13 Number of displayed records in grid view shall initially by 15 records, and configurable to 20,25,30,50, 100,200,250, all)

FR.14 Each system grid view page shall have in-row filters and a search box to search in all grid columns values.

FR.15 All grids' rows shall be initially ordered descending over insertion date. In addition to reorder and filter records and columns.

FR.16 The system shall provide an interface to define the rich html header and footer templates, define default template for GDVT and GVTC, PVTC.

FR.17 Both the PDF and Word files that are exported should contain headers and footers that are based on pre-made templates. Authorized users can choose which one to use or leave the default.

FR.18 The default header and footer template shall be marked when the user would like to select one.

FR.19 The system should have a notification module.

FR.20 The system should have an internal and email notifications module.

FR.21 The system shall enable users choose to receive notifications by email, SMSor not, from not limited to: workflow status changed, login from new device, new

training period opened, new training course opened, training course enrollment request status, …etc..

FR.22 The system should have a search engine to search for all content by roles and deliver results within 5 seconds.

FR.23 When necessary, the system should guide users through workflows.

FR.24 The system shall support Arabic and English languages, enable or disable multilingual shall be configured by admin.

FR.25 The system shall provide breadcrumb navigation and Menu.

FR.26 The system should have a newsletter module to send email and notification for subscribed users and institutions.

FR.27 The system shall record detailed log for all user activities such as login, logout, data creation, update, export, and deletion in an audit log with IP, location, browser, timestamp and user ID in addition to old and new values, and also record system events to a separate log DB and it shall be exportable

FR.28 The system shall enforce access restrictions based on the assigned role's permissions for each action such as add, edit, delete, preview, print, and others.

FR.29 The system shall support multiple role assignments per user to allow flexible and granular access control based on the combined permissions of all assigned roles.

FR.30 The system shall assist in the selection process of students for public training courses by applying predefined admission criteria. It shall also display the percentage match between each student's questionnaire responses and the admission criteria to support transparent and data-driven decision-making.

FR.31 After license approval the VTC is not allowed to edit any information, until a change request approval.

FR.32 Every defined training course from the GVTC administrator shall not be editable after it has been used from public and private training centers.

FR.33 Inactive training courses should not be visible to enroll students, but they stay visible for view only, for example: in students' profiles in the list of their training courses.

FR.34 All initially defined training courses should be invisible for private and public training centers until the visibility status changed.

FR.35 The system should notify GDVT, GVTC and PVTC when a license expires within a month via email, and system notifications module and send reminder every week until PVTC or GDVT and GVTC decide to stop the renewal or renewal process started.

FR.36 The system shall take into considerations, the official vacation days in calculating the workflow delays (like weekends, Holidays and occasions, general strike) which may need integrations with Human Resources System.

FR.37 The unlicensed PVTC shall be enabled only to complete any process that was initiated while it was licensed, and it shall be disabled from all other processes except the renewal process.

FR.38 The system should validate the PVTC training course creation before saving it, like the minimum number of training hours.

FR.39 The system must handle cases of dropout and re-enrollment requests from training courses.

FR.40 The system must handle cases of absence and eligibility for obtaining the certificate.

FR.41 The system must handle the possibility of a student receiving an exception to obtain the certificate, after approval from the certificate officer and the general manager.

FR.42 The system shall control the start and end of training course enrollment based on specific times of the day rather than just dates.

FR.43 Once the follow-up process for any request begins in the system after it has been submitted, it becomes non-editable by the previous entity. Any modification requires the current entity in the workflow to explicitly return the request for editing to the previous entity. The system shall log all actions and maintain a comprehensive audit trail of modifications and status changes.

FR.44 The system shall prevent scheduling conflicts for training courses or classrooms based on the course timetable. Overlapping schedules shall not be allowed unless an explicit exception is granted (configured)

FR.45 The system shall enable authorized users from both PVTC and GVTC centers to upload and attach relevant documents at any stage or module where documentation is required.

2.2 Administration

FR.46 Admin shall be able to set Password length and strength.

FR.47 The system shall enable admin to set application-specific file types and sizes.

FR.48 The system shall allow administrators to configure and test SMTP settings and third-party authentication providers via the interface.

FR.49 Admin shall be able to configure the maximum upload size, allowed extensions, and profile picture type and dimensions.

FR.50 Admin shall be able to define the mandatory and optional attachments for all forms and profile types.

FR.51 Admin shall be able to configure optional and mandatory attachments per form.

FR.52 The following templates should be defined by the administrator, and they will be automatically filled in when requested:

  a. GVTC certificates forms (Arabic, English, Arabic and English).

  b. Terms and Conditions Pledge Form (Arabic, English).

  c. Commitment to Conditions (Arabic, English).

  d. PVTC certificates content.

FR.53 The administrator shall be able to configure the number of working days the workflow shall wait util escalation for the not limited to the following:

  i. Complaint

  ii. Field visit response

  iii. Exam scheduling approval

FR.54 Admins shall be able to enable/disable login to system using active directory.

FR.55 Admins shall be able to grant permissions using roles or individual permissions and disable user accounts.

FR.56 Administrators shall have the ability to manage and translate all system labels, email and notification templates, as well as report headers and footers, to support multilingual system operation.

2.3 User Registration & Authentication

FR.57 Users shall be able to register using email, mobile number, and other 3rd party authentications providers like Facebook and others.

FR.58 Admin shall be able to create user accounts and users' credentials will be delivered by email with a one-time password (must be changed after the first successful login).

FR.59 Admin can send password reset link for any account, can set new password for any account and the account shall be notified by when and who reset the password.

FR.60 The system shall allow the administrator to create new user roles and assign granular permissions to each role. These permissions shall control access to various system functionalities on a per-page basis, including but not limited to: Add, Edit, Delete, View, Export, and Search operations.

FR.61 Administrators shall be able to manage system-wide lookup tables and dropdown list values through a dedicated interface. This includes adding, editing, deactivating, or deleting lookup entries.

FR.62 The system shall enable administrators to configure, customize, and manage email templates used for system notifications and user communications. Templates shall support variables/placeholders (e.g., username, date, course title, ...etc.) and allow formatting using rich text or HTML.

FR.63 Admin should be able to add, remove permissions to any role except the main roles.

FR.64 Admins should be able to enforce users to change passwords via rest link.

FR.65 Admins shall be able to deactivate user accounts, without permanently deleting their data

FR.66 Multi-role system where users can be assigned in one or more different roles.

FR.67 Every account should be able to reset the password by email, or mobile.

FR.68 OAuth-based authentication with Two-Factor Authentication (2FA) for admins and supervisors- Optional to activate or deactivate.

FR.69 The system shall allow delegation of permissions, enabling users with appropriate authority to delegate specific roles or permissions to other users for a defined period or scope, while maintaining a full audit trail of all delegated actions.

FR.70 A user account can be either a personal account or an organization account. The system shall distinguish between the two account types and handle their roles, permissions, and related functionalities accordingly.

FR.71 Personal profile shall be allowed to fill out the following sections:

    a. Personal information (First, Second, Third and family name), profile picture, Date of birth, Identity Type, Identity Id, …etc. -Mandatory section-.

    b. Contact Information (List of mandatory and optional contact info) - Mandatory section-.

    c. Education Section

    d. Workplace and Experience

    e. Training

    f. Courses and certificates acquired from VTC (Non-editable sections: after the student enrolled in the training course)

    g. Skills

FR.72 Institutional profile shall be allowed to fill:

    a. Institution information section -Mandatory section-.

    b. Contact Information (List of mandatory and optional contact info) - Mandatory section-.

FR.73 An organization account shall be able to create sub-accounts and assign them permissions within the scope of its own permissions. The system shall ensure that sub-account privileges do not exceed those of the parent organization account.

FR.74 Authorized governmental employees should be able to sign-in using Active Directory.

FR.75 MoL employees shall be able to log in using their Active Directory accounts

FR.76 The system shall ensure that each user can register and maintain only one unique account, strictly based on their national identification number, in order to prevent duplicate account creation and ensure data integrity.

FR.77 The system shall prevent users from deleting their accounts after any data transactions or interactions have been performed, in order to preserve data integrity and maintain an accurate audit trail.

FR.78 The system shall provide real-time email, SMS alerts to the user when the number of failed login attempts reaches a predefined threshold.

2.4 General Directorate of Vocational Training

FR.79 The GDVT administrator should have the ability to define training course categories and training courses titles for all private and governmental centers.

Training course info includes but is not limited to title, category, minimum number of training hours, required equipment, facilities, and training rooms area and conditions as guidelines for submission. In addition to the following:

- o Activate/deactivate for private and/or governmental centers.
- o Show/hide for private and/or public centers.

FR.80 GDVT shall be able to review and approve training courses submitted by GVTC and PVTC. This process shall include the ability to return courses for modification, along with assigning specific tasks that must be completed before resubmission for approval.

FR.81 Accredit/Edit new training programs suggestions from both private and governmental training centers.

FR.82 Approve replacement of trainers or reject with justifications.

FR.83 Create, manage and monitor GVTCs

FR.84 Define partner and funders for all GVTCs or for itself.

FR.85 The system shall allow the supervisory authority of private vocational training centers to be changed from one government entity to another. This process must ensure proper tracking, authorization, and logging of the change to maintain oversight and accountability.

FR.86 The system shall allow configuration of the required response time (in days) for handling applications and requests (per application). It shall send regular notifications to the responsible officers during the response period. If the response period exceeds the defined duration by configured n-days, the system shall escalate the notification to the supervisor of the responsible officers.

FR.87 The system shall allow GDVT to create file templates, reports header and footer to be used during data export operations, for example certificates, reports. It shall also provide the ability to define and manage access permissions for each template, ensuring that only authorized users can view, edit, or use them.

FR.88 The system shall support GDVT approval or rejection of license cancellation requests for training centers, as well as the suspension of license issuance or renewal requests.

FR.89 The system shall enable GDVT to upload a list of students who obtained certificates prior to the system's implementation. It shall also allow updating a

student's status upon receiving a training certificate and optionally attaching the signed certificate.

FR.90 The system shall enable authorized users to review, return with comments, or approve certificate printing requests, only after all workflow participants confirm the accuracy of the data. Once approved, no modifications shall be allowed to student or course info unless editing is explicitly enabled by a designated official at the Ministry for specific students or groups of students.

FR.91 The system shall provide GDVT with a mechanism to verify that certificate authentication fees have been paid before initiating the authentication process and updating student records.

FR.92 The system shall allow GDVT to print certificates for trainees in GVTC using a standardized template selected from the predefined templates related to the training type. It shall also provide options for previewing the certificate and exporting it as a word and PDF files.

FR.93 Certificates shall include a scannable QR code that provides access to the student's core certificate data upon scanning, such as certificate number, student name, training program, and issuance date.

FR.94 The system shall enable GDVT to review, return with comments, or approve a production request, only after all workflow participants have verified the accuracy of the provided data.

FR.95 The GVT should be able to define mandatory and optional sections with clear titles to be filled out by students, and they shall be able to mark the question to let it appear in CV.

FR.96 The GVT shall be able to add mandatory and optional questions to be filled out by students to apply for a training course or Professional Proficiency Exam, and they shall be able to mark the question to let the answer appear in CV.

FR.97 The system shall allow the configuration of a maximum limit for the number of training courses a student can apply for per round. This limit shall be enforced during the enrollment process to ensure compliance with the defined policy.

FR.98 The system shall support the creation and configuration of course groups, where each group contains multiple training courses. Students shall be allowed

to select and apply for only a specified number of courses from each group made available to them.

FR.99 The system shall allow the definition of multiple course groups across different periods. Each group shall consist of a set of training courses offered by public training centers. Selecting courses shall have the option to select all courses within a specific center by clicking on the center name, or to select all courses across all centers using a "Select All" option.

2.5 Governorate Vocational Training Center Operations

General Functions

FR.100 GVTC authorized team should Receive notifications on any modifications to all of his PPVTC oversight.

FR.101 Set PVTC account configurations like:
   a. Allowed for overlapping or not in training course creation.
   b. Limit number of accepted students per training course.

FR.102 View the PVTC list under his direction.

FR.103 View a list of other PVTCs arranged by GVTC supervisor.

FR.104 The system shall allow the GVTC to review all requests submitted by private vocational training centers under its responsibility before forwarding them to the GDVT at the Ministry. The supervising authority shall have the ability to approve, return with comments, suspend, or cancel these requests as needed.

FR.105 Keep track and transmit to GDVT the GDVT responses on PVTC's application.

FR.106 Define partner and funders for itself.

FR.107 The administrator of GVTC should have the ability to monitor and manage team members accounts and authorizations.

FR.108 The administrator account is not personal account.

FR.109 Users affiliated with a government training center shall have permission to follow up on all related requests. These permissions shall be assigned and managed by the center's director, who can customize or elevate access levels as needed.

FR.110 The GVTC administrator should have the ability to create new roles in order to oversee and permit GVTC employees to perform various tasks as well as

complete and adhere to the Center applications and follow up with GDVT, and to follow up PVTC applications.

FR.111 The system shall enable GVTC as well as GDVT to manage student lists for both training courses and workplace-based learning. It shall support adding, updating, and tracking students in both contexts to ensure accurate and comprehensive training records.

FR.112 The GVTC should be able to manage training sessions and schedule the class attendance and mark it as: in person/online/async (Daily, full day, hourly-from to -).

FR.113 The GVTC should be able to request cancellation of PVTC license with letter and optional attachment.

FR.114 GVTC admin should be able to fill in the certificate lost replacement form for a student and mark it as if the student paid the fees or not, and if not, he shall be able to print the payment notice, after the fees are paid then the form should be submitted to GDVT, Payment receipt should be attached.

Follow up the PVTC licensing:

FR.115 Create accounts for PVTC and enroll it into PVTCs' role which will be automatically done by the system when the GVTC user chooses to create a PVTC account.

FR.116 Enroll verified account into PVTC role.

FR.117 Each account created by the GVTC for PVTC will automatically be listed under his supervision.

FR.118 Schedule field visits and fill the report by mandatory and optional requirements and notes.

FR.119 GVTC Admin should be able to fill out the Field Inspection Form, the system shall fill out the form sections by available data and this report will be sent to GDVT alongside with PVTC license/ renewal application.

FR.120 Change the status of the first approval, to allow the PVTC account manager to fill out the remaining license application sections and upload required and optional documents.

FR.121 Review the responses from PVTC on the field visits report until he complies with the requirements. This may involve engaging in a negotiation process.

FR.122 The GVTC should be able to recommend GDVT weather or not to license the center by additional notes.

FR.123 All authorized users shall be able to view and track the history of the licensing procedure, which is a multi-stage workflow process that continues until the PVTC owner complies with GVTC and ministry policies.

FR.124 GVTC supervisor should be able to approve Trainer, Manager replacement and Ownership Transfer forms, and all other applications request and the PVTC information shall be automatically updated after the approvement.

<u>Follow up the PVTC Training Courses:</u>

FR.125 Approve, reschedule and reject dates for training program exams.

FR.126 Print the student list report with a column for signing.

FR.127 Attache the signed document by students.

FR.128 Change the student's exam attendance status.

FR.129 Manage PVTC training courses opening request.

<u>GVTC Training Courses:</u>

FR.130 GVTC Admin should be able to request to add new training course by filling the training course sections (category, title, minimum number of training hours, facilities, equipment, facilities, trainer certificates, trainees' characteristics like (age, gender, school education level …etc.)).

FR.131 GVTC Admin should be able to create new training course by selecting the category and the title from the available list and fille the training course outline, training hours, schedule, public-available for all students for request enrollment - or private- the GVTC admin will fill out the students like the private training centers -, doner, …etc., after it approved by GDVT it will not be editable.

FR.132 The system shall allow the definition and management of acceptance criteria for public training courses. These criteria can be customized for each course.

FR.133 GVTC Admin should be able to start, pause and cancel the training course; pausing and cancelling shall be with justification notes, the suspension or cancellation must then be reviewed and approved by the GDVT before it takes effect.

FR.134 GVTC Admin should be able to schedule attendance, manage trainee's enrollment.

FR.135 GVTC Admin should be able to duplicate training course content while excluding trainees and approving status.

FR.136 The system shall allow TCs admins to request the printing and authentication of certificates for participants of a training course who are eligible to receive them. The request shall include verification of eligibility like attendance and exam taken before submission.

FR.137 The system shall enable tracking of student attendance and absences, recording of trainer comments, and monitoring of logistics related to the training process.

FR.138 The system shall support the assignment of students to training courses and the entry of their official and accurate information. Students can also be added using their username or through approval of an enrollment request. Once the trainee list is finalized, no modifications shall be permitted unless authorized by a designated official.

Other Forms

FR.139 The system shall allow GVTC to fill out, track, and manage production requests application for individuals or organizations, regardless of the type of production. This includes the ability to submit required information, monitor the request status, and perform necessary administrative actions throughout the process

FR.140 GVTC Admin should be able to fill out and print for signing different types of commitment and obligation form.

FR.141 GVTC Admin should be able to fill out the Trainee Evaluation Form (Center-based) which will be accessible for GDVT and optionally for all GTVCs.

FR.142 GVTC Admin should be able to fill out the Trainer Evaluation Form which will be accessible for GDVT and optionally for all GTVCs.

2.6 Private Vocational Training Center Operations

Licensing and renewal:

FR.143 PVTC Admin should be able to initiate the registration/renewal process after having the PVTC Admin role from GVTC, by filling out the initial registration form which will contain not limited the following sections:

    a. Institution Information (name, address, owner, contact, …etc.)

    b. The center facilities and areas.

    c. Funder info and how to continue.

    d. Training courses (title, training hours, plane,

FR.144 PVTC Admin should be able to submit registrations (licensing) and annual renewal applications after GVTC supervisor approval.

FR.145 PVTC supervisor should be able to send the licensing and renewal form to GDVT after payment slip is paid if the fees are greater than zero, otherwise he shall be notified to confirm.

FR.146 PVTC Admin should be able to print the registration/renewal payment slip.

FR.147 PVTC Admin should be notified when applications progress changed.

FR.148 PVTC Admin should be able to review and Repones to the field visits mandatory and optional requirements and notes.

FR.149 PVTC Admin should be able to repones to the field visit report and check all the mandatory requirements/notes, and optionally response to the optional requirements.

FR.150 PVTC Admin should be able to fill all mandatory sections (staff - administrative, instructors and trainers' staff-, full detailed training courses, in addition to initial registration sections, Administrative Equipment and Furniture) and attach mandatory and optional official documents to the registration and renewal forms after the initial approval from the GVTC supervisor, the approval will be after field visit.

FR.151 PVTC Admin should be able to print the whole application with all sections to sign and attach it.

FR.152 PVTC Admin should be able to cancel the licensing/renewal process at any stage.

FR.153 The PVTC Admin should be able to agree to and print the Pledge of the Terms, Commitment to Conditions filled out by its center information and attach them.

FR.154 PVTC Admin should not be able to edit approved information from GVTC or GDVT.

FR.155 PVTC Admin should be able to manage lists of staff members, administrative equipment, furniture, and training room; all editing, deleting and adding new records shall be approved by GVTC.

FR.156 PVTC Admin should be able to manage lists of Funding Sources; all editing, deleting and adding new records shall be approved by GVTC.

Training Courses:

FR.157 PVTC Admin should be able to select the training course from the approved list of training courses, then fill out the mandatory and optional sections which are not limited to the following:
- Title, brief, and number of training hours which shall be equal or greater than the minimum required.
- training course outline,
- training course plan,
- Trainers' info and CVs,
- Trainee acceptance requirements.
- Equipment and facilities
- Evaluation methods and criteria
- Methods and means used.

FR.158 PVTC Admin should be able to schedule dates for the training course exam which shall be approved by GVTC PVTC supervisor.

FR.159 PVTC Admin should be able to manage the student's exam attendance status and support that by signed students' attendance document.

FR.160 The PVTC Admin should be able to submit the Training Course Opening Request Form by selecting one of the approved training courses, filling in the list of trainees (Name in both Arabic and English, Identity Id, Birthdate, Mobile number, …), and selecting one or more of the training rooms. The

system shall not accept overlapping (schedule and room) if the training center is not excluded from the overlapping criteria.

FR.161 The GVTC Admin should be able accept or reject Training Course Opening Request with justification.

FR.162 PVTC Admin should be able to duplicate training course content without trainees and approve status.

FR.163 PVTC Admin should be able to issue certificates approved training course trainees, which shall be reviewed by GVTC then forwarded to GDVT, the admin also shall fix the highlighted mistakes which through the reviewing workflow process. After fixing all mistakes and final approval from GDVT, the system shall notify the PVTC admin (who requested the certificate signing), then the PVTC Admin can print the payment notice by merging the template with the number of requested and approved certificate multiplied by the certificate issuance price.

FR.164 PVTC Admin should be able to pic certificate content template which depends on the training course type to print out the students' certificates on their own certificates' papers.

FR.165 PVTC admin should be able to fill out certificate lost replacement form for a student and print the payment notice, after the fees are paid and Payment receipt attached then the form should be submitted to GDVT.

Other Forms:

FR.166 PVTC Admin should be able to Fill out and submit the Trainer, Manager replacement and Ownership Transfer, Institution Name Change, Institution Relocation forms with additional optional and mandatory attachments to GVTC supervisor, then all information shall be updated after GVTC approval.

FR.167 PVTC Admin should be able to Fill out and submit the Administrative Equipment and Furniture Form, which should be approved by GVTC.

FR.168 PVTC Admin should be able to approve Field visit date, and approve the report after the submission from GVTC admin.

2.7 Students (Trainees)

FR.169 Students should be able to sign in using SSO authenticator.

FR.170 Students should be able to register using the system interface if the SSO authenticator is not available.

FR.171 Students should be able to fill out their mandatory and optional profile sections (profile picture, contact information, address, education, work experience, training courses, and skills, ...etc.)

FR.172 Students should be able to fill out the survey which is selection criteria for enrollment.

FR.173 The system shall allow students to view all available training courses, sorted by proximity to their place of residence. Students shall be able to submit enrollment requests for one or more courses, provided that the training schedules do not conflict.

FR.174 Students shall be able to subscribe and unsubscribe to training courses categories, to be notified when a training course is offered.

FR.175 Students shall have the capability to view and print the acquired digital Certificate.

FR.176 All students' answers and attachments should have a state is not editable, which only changes by admins and who have a reviewer role.

2.8 Trainers

FR.177 Trainers should be able to evaluate students.

FR.178 Trainers should be able to fill out their CVs.

FR.179 Trainers should be able to view his/her classes and enrolled students.

FR.180 Trainers should be able to define the training session schedule (Daily, hourly)

FR.181 Trainers should be able to fill out the trainees' attendance sheet.

2.9 Professional Proficiency Exam

FR.182 The registered student shall be able to apply for Professional Proficiency Exam after filling the mandatory sections.

FR.183 GVT admin shall be able to schedule Professional Proficiency Exam date and mark the students who will attend by the date and time on all contact info (system notifications, email, SMS, and other contact information).

FR.184 The system must be capable of managing the payment stage prior to the exam and the certificate distribution.

FR.185 The Professional Proficiency Exam certificate will be treated like a training course certificate, but the issuer of the certificate would be the student, in addition to GVTC, GDVT or PVTC.

2.10 WBPL

FR.186 The system shall enable WPL supervisors to view a list of students currently undergoing training at their workplaces. Additionally, they shall have access to historical data of previously trained students, including their personal information and performance evaluations.

FR.187 The system shall allow WBL supervisors to evaluate trainees and record their comments. These evaluations and remarks shall be stored in the trainees' profile without students' access and accessible for future reference and reporting.

FR.188 The system shall allow the WPL supervisor to submit a complaint against a student, including detailed information about the complaint. The complaint shall be recorded in the system and linked to the student's profile for review and further action by the appropriate authority.

FR.189 The system shall allow WPL supervisors to write recommendation letters for trainees, specifying a list of skills the student has acquired and excels in. The recommendation letter shall be saved in the student's profile and accessible for future reference.

2.11 Complaints

FR.190 All registered and authorized users should be able to submit a complaint.

FR.191 The complaint workflows depend on the first responsible who have the ability to forward the complaint to the next level.

FR.192 The complaint module should forward the idle complaint within a configured period.

FR.193 The complaint responsible should be able to change its status (New, handling process started, paused for period, handled and closed)

FR.194 GDVT and GVTC should be able to view the list of categorized complaints.

FR.195 The Complainant should be able to follow the progress of his complaint.

FR.196 Complaint Processing Unit or user should be to add updates and attachments, and show hide the update for Complainant.

2.12 Dashboard

FR.197 The GDVT admin should see Realtime analytic dashboard in home page containing the not limited to the following figures (Daily, weekly, monthly, yearly, and date range):
- Number of GVTC,
- Total number of running training courses,
- Total number of enrolled students
- Total Number of trainees in the labor market
- Total Number of PVTC.
- Total Number of PVTC under GVTC.

FR.198 GVTC admin should see Realtime counting in home dashboard containing the not limited to the following figures (Daily, weekly, monthly, yearly, and date range):
- Total number of its running training courses,
- Total number of its enrolled students
- Total Number of its trainees in the labor market
- Total Number of its PVTC supervision.

FR.199 The PVTC admin should Realtime counting in home dashboard containing the not limited to the following figures (monthly, yearly, date range):
- Total number of its running training courses,
- Total number of its enrolled students

2.13 Reporting

FR.200 GDVT and GVTC should be able to view complaints (Daily, weekly, monthly, yearly, and date range) categorized by:
- status
- Plaintiff
- Defendant
- Complaint Processing Unit or user.

FR.201 GDVT and GVTC should be able to view (daily, monthly, yearly, and date range).:

- New registrations applications grouped by region and supervision.
- Number of renewal applications grouped by region and supervision.
- Field Training Report
- Trainee Distribution Table for Field Training
- Vocational Training Course Enrollment
- Training Plan

2.14 Content Management

FR.202 GDVT should be able to change the home page content, which shall have the not limited to the following:

- HTML content module
- Rich html Slider module
- List of available training courses.
- Manage ads and news.

FR.203 GDVT should be able to add new HTML pages.

FR.204 GDVT should be able to change the footer and header links and content.

FR.205 GDVT should be able to customize and reorder the system menu items to reflect institutional preferences and improve user navigation.

3.2 Non-Functional Requirements

3.2.1 General NFR

NFR 1. The system shall be fully responsive across a variety of devices and screen sizes, including smartphones and tablets. The user interface shall adapt fluidly to ensure usability, accessibility, and consistency regardless of the device used.

NFR 2. The system shall conform to the Web Content Accessibility Guidelines (WCAG) 2.1 at Level AA to ensure that all users, including those with disabilities, can access and interact with the platform effectively.

NFR 3. The system shall integrate seamlessly with external APIs for data exchange and synchronization.

NFR 4. The system shall implement fallback mechanisms to gracefully handle failures when interacting with unreliable or external APIs. These mechanisms shall ensure system continuity, maintain a consistent user experience, and prevent complete system outages. The design shall follow best practices such as circuit breakers, retries with exponential backoff, and caching where applicable.

NFR 5. The system shall be designed to support scalability, resilience, and fault tolerance to ensure continuous availability and reliable performance under varying workloads and unexpected failures.

NFR 6. The product has enough flexibility to accommodate the frequent changes and open to customization as required for the future.

NFR 7. Able to run on Intranet when there is no internet connection.

NFR 8. Software should support over one five thousand concurrent users.

NFR 9. The exported files shall be named automatically by the grid view title followed by date or serial number.

NFR 10. The system shall store sensitive data (passwords, phone numbers, SMTP settings, API Keys, …etc.) encrypted by algorithms like AES

NFR 11. The system shall handle all errors that may occur during data entry and processing and display clear and meaningful error messages to users. These messages should be easily understandable, ensuring that users can quickly resolve issues without confusion or hesitation in using the system.

NFR 12. The system shall classify logged errors based on severity levels (e.g., informational, warning, critical). In the event of critical errors, the system shall automatically notify the technical manager through appropriate communication channels (e.g., email and dashboard alert) to ensure timely resolution.

NFR 13. The system shall include a dedicated screen for the technical administrator to view detailed information about system errors, such as the date, user, browser, and stack trace. This screen shall provide sufficient information to troubleshoot and resolve issues effectively.

NFR 14. The system shall automatically delete error logs that are older than one month. This scheduled cleanup process shall run on a monthly basis to maintain system performance and manage storage efficiently.

NFR 15. The system shall have comprehensive documentation for developers,
including code comments, API documentation, and system architecture.

NFR 16. The system shall allow easy customization and extension to
accommodate future requirements.

3.2.2 Scalability

NFR 17. The system shall be designed to support horizontal scalability,
enabling the addition of multiple server instances to efficiently handle
increased user load and transaction volume without service
degradation.

NFR 18. The system shall be capable of vertical scalability, by allowing optimal utilization
of additional computing resources (e.g., CPU, memory, storage) on existing servers
to enhance performance under increased demand.

NFR 19. The system shall comply with Google PageSpeed Insights performance guidelines
to ensure optimal page loading speed and user experience across desktop and
mobile platforms.

NFR 20. The system shall be architected to accommodate up to 100% annual growth in both
the number of users and transaction volume for a minimum of three (3) years from
the initial deployment, without requiring major architectural changes.

3.2.3 Authentication and Authorization

NFR 21. The system shall support multi-factor authentication (MFA) as a mandatory
requirement for administrative accounts and as an optional feature for general users,
to enhance account security.

NFR 22. The system shall enforce strong password policies, including but not limited to:
- A minimum password length of X characters (e.g., 8 or more)
- Enforcement of password complexity (e.g., uppercase, lowercase,
numbers, special characters)
- Periodic password expiration and forced password change upon first
login or password reset.

NFR 23. The system shall implement role-based access control (RBAC) to ensure that user
access to system features, actions, and data is restricted based on their assigned
roles and permissions.

NFR 24. The system shall maintain comprehensive access logs that record all authentication
and authorization events, including login attempts, role changes, and access to
sensitive operations, to enable auditing and incident investigation.

NFR 25. The system shall implement secure session management mechanisms, including the
use of appropriate timeout configurations and automatic session termination after
periods of inactivity, to mitigate unauthorized access risks.

NFR 26. The system shall support OAuth 2.0 and OpenID Connect (OIDC) standards to
enable secure and standardized third-party authentication, where integration with
external identity providers is applicable.

NFR 27. The system shall ensure that all sensitive data at rest is encrypted using industry-standard algorithms, such as AES-256 or equivalent, to protect against unauthorized data access.

3.2.4 Data Protection

NFR 28. The system shall enforce encryption of all data in transit using TLS version 1.3 or higher, ensuring secure communication between all components and external systems.

NFR 29. The system shall implement data masking techniques to obfuscate sensitive information when displayed in the user interface, reducing the risk of data exposure to unauthorized viewers.

NFR 30. The system shall adopt and maintain secure encryption key management practices, including key rotation, storage, and access control, in accordance with recognized security standards.

NFR 31. The system shall apply database-level encryption to specific tables and columns containing sensitive data, ensuring protection at the storage layer in addition to application-layer encryption.

NFR 32. The system shall maintain separate and isolated environments for development, testing, and production, ensuring that test and development activities do not compromise production data confidentiality, integrity, or availability.

NFR 33. The system shall provide clear and accessible privacy notices to users and obtain their explicit consent prior to any personal data collection and processing, ensuring compliance with applicable data protection regulations.

NFR 34. The system shall implement database replication mechanisms to ensure data redundancy and prevent data loss in the event of database failures, thereby enhancing system reliability and availability.

3.2.5 Usability and Accessibility

NFR 35. The system shall ensure a unified and user-friendly interface design across all modules to promote ease of use and consistency in user experience.

NFR 36. The system shall streamline user workflows by reducing the number of steps needed to complete frequent or essential tasks.

NFR 37. The system shall be fully compatible with screen readers and other assistive technologies to ensure accessibility for users with disabilities.

NFR 38. The system shall support complete keyboard navigation for all features, ensuring a logical and intuitive tab order to facilitate efficient user interaction without relying on a mouse.

NFR 39. The system shall maintain adequate color contrast between text, backgrounds, and interactive elements to ensure readability and accessibility for all users, including those with visual impairments.

NFR 40. The system shall automatically detect the user's preferred language based on browser settings, and suggest the appropriate interface language accordingly.

NFR 41. The system shall offer a well-defined and user-friendly onboarding experience for new users, including guided tutorials, tooltips, and initial setup assistance to ensure a smooth introduction to system functionalities.

NFR 42. The system shall support at least the two latest major versions of all officially supported web and mobile browsers, including Google Chrome, Mozilla Firefox, Microsoft Edge, and Apple Safari.

NFR 43. The system SHALL support integration with standard email protocols (e.g., SMTP, IMAP) to ensure compatibility with widely used email clients for the purpose of sending notifications.

3.2.6 Maintainability and Portability

NFR 44. The system shall adopt modular architecture to ensure ease of maintenance, scalability, and streamlined implementation of future updates.

NFR 45. The system shall be developed in adherence to consistent coding standards and industry-recognized best practices to promote code readability, maintainability, and collaboration.

NFR 46. The system shall include complete and up-to-date technical documentation covering all components, configurations, interfaces, and deployment procedures.

NFR 47. The system shall allow configuration changes through an administrative interface or configuration files, without the need to modify source code.
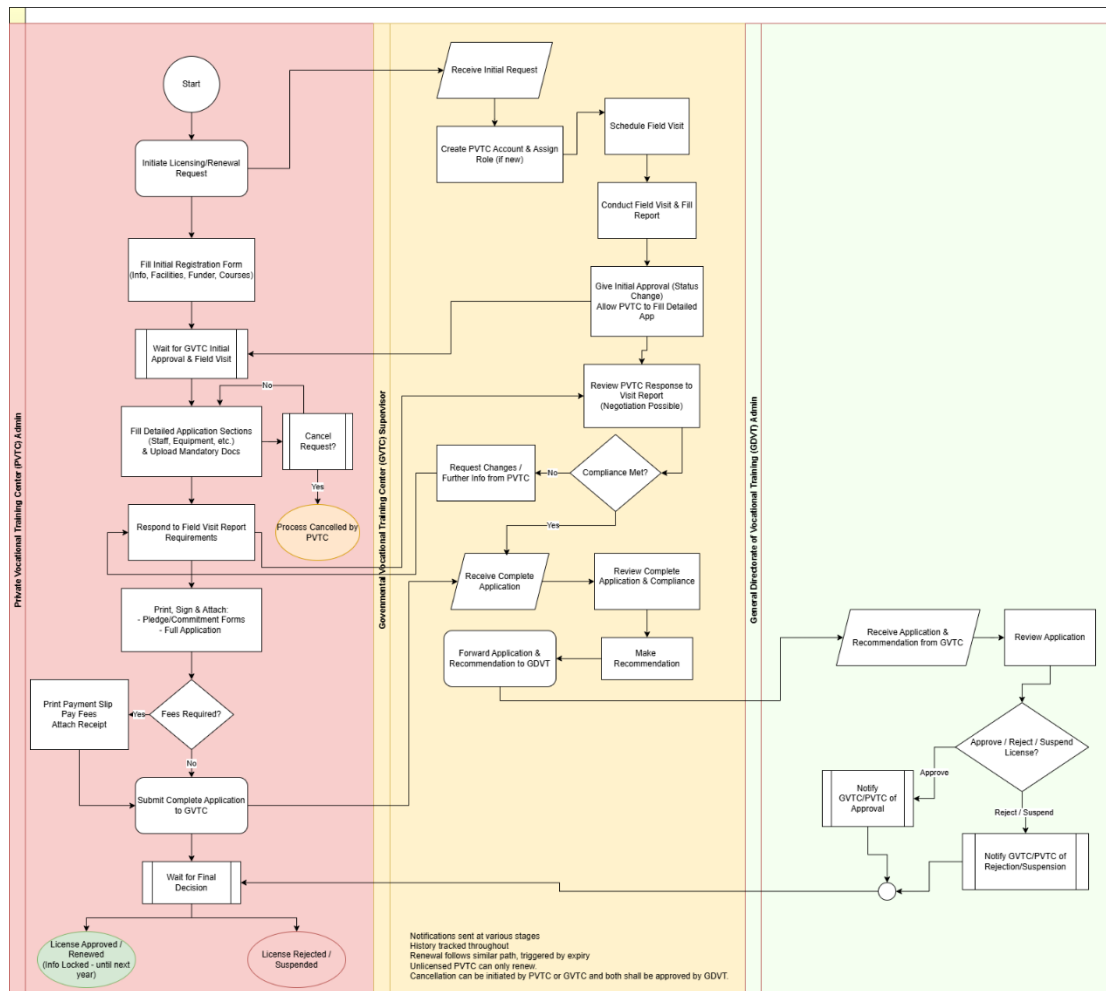
4. Annex 1: Workflows

Figure 2: VTMS licensing renewal workflow

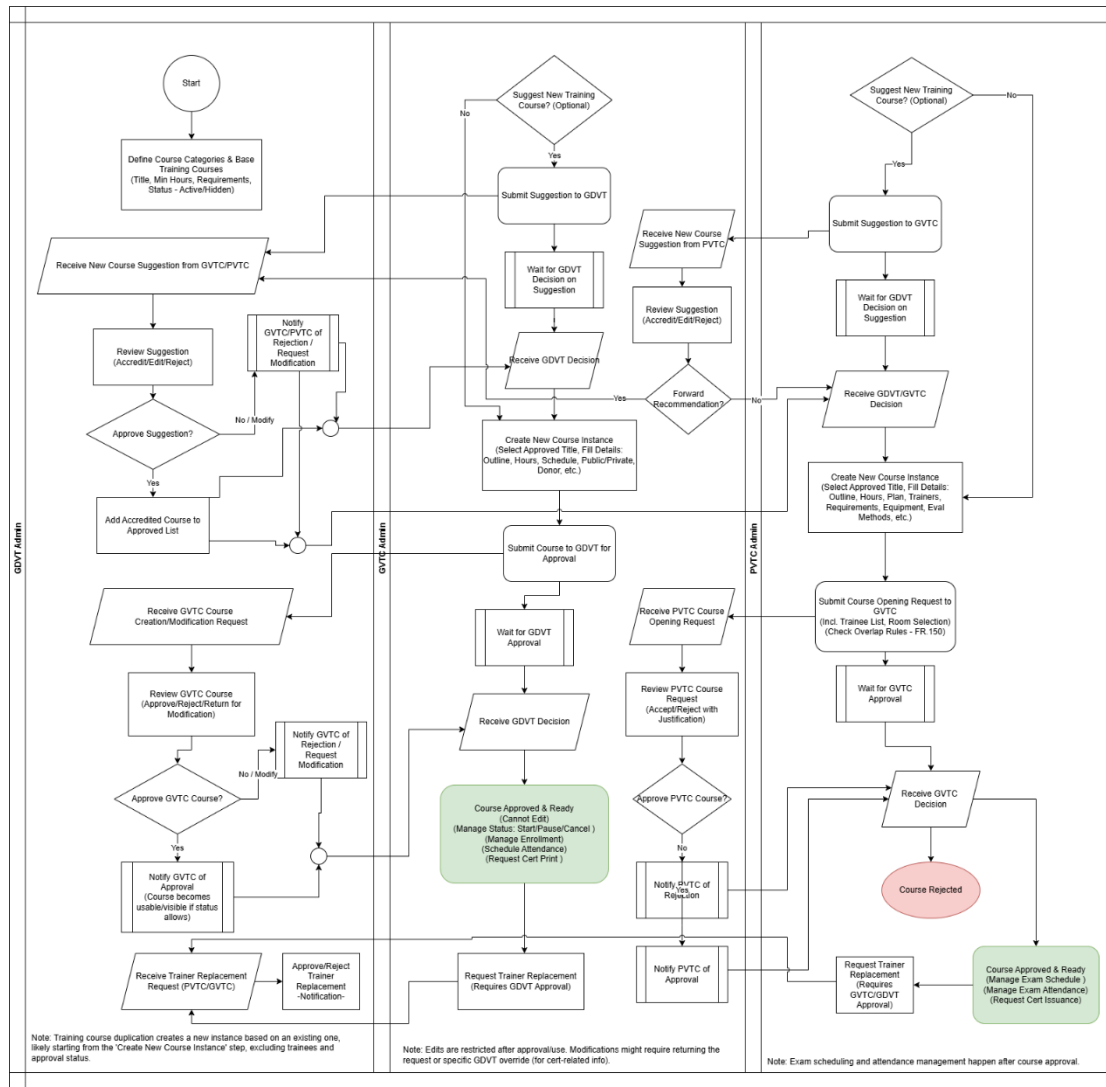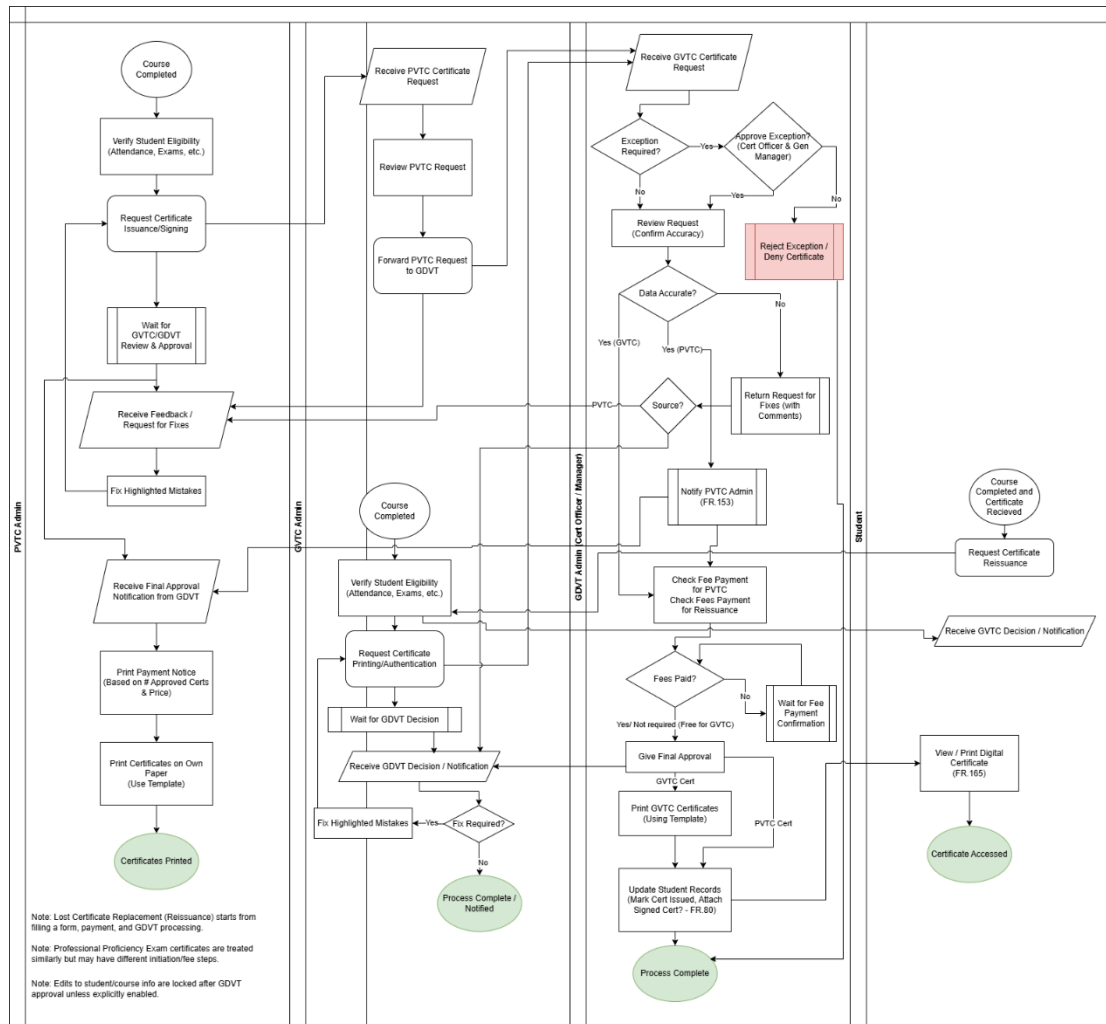*Figure 3: VTMS course management workflow*

Figure 4: VTMS certificate issuance workflow