The Team

CMMI LEVEL 2 DEFINITION

E-Tendance - Facial-Recognition Based Attendance Taking System

The Team

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1. Executive Summary

1.1 Purpose

Capability Maturity Model Integration (CMMI) is a framework containing characteristics of good and effective Software Engineering processes. Therefore, the purpose of this document is to assess maturity and improve the quality of processes, by recommending different practices to achieve both generic and specific goals.

1.2 Summary of Definition

The CMMI model contains 5 maturity levels:

1. Initial
2. Managed
3. Defined
4. Quantitatively Managed
5. Optimizing

This document will focus on the process areas under CMMI Level 2 [Managed]:

a) Requirements Management
b) Software Project Planning
c) Software Project Tracking and Oversight
d) Software Quality Assurance
e) Software Configuration Management
f) Software Subcontract Management

2. Level 2 Key Process Areas

2.1 Requirements Management

Requirements Management is a process to establish a common understanding between the customer and the software project of the customer's requirements to be addressed by the project. This agreement with the customer is the basis for planning and managing the software project.

2.2 Software Project Planning

Software Project Planning is a process to establish reasonable plans for performing the software engineering and for managing the software project. The Project Plan should consist of reasonable plans based on developing realistic estimates for the work and it should establish necessary commitments to perform the work. It should begin with the Statement of Work (SOW), followed by the constraints and goals that define and bound the project.

2.3 Software Project Tracking and Oversight

Software Project Tracking and Oversight is a process to establish adequate visibility of actual progress so that management can take effective actions when the software project's performance deviates significantly from the software plans. It is about the management of the project based on the software development plan.

2.4 Software Quality Assurance

Software Quality Assurance is a process to provide management with appropriate visibility into the process being used by the software project and of the products being built. Visibility is achieved by reviewing and auditing the software products and activities to verify that they comply with the applicable standards and procedures.

2.5 Software Configuration Management

Software Configuration Management is a process to establish and maintain the integrity of the products of the software project throughout the project's lifecycle. It is used to identify the configuration of the software at given points in time, systematically control changes to the configuration, and maintain the integrity and traceability of the configuration throughout the software life cycle.

2.6 Software Subcontract Management

Software Subcontract Management is a process to select qualified software subcontractors and manage them effectively. The subcontractors are selected on their ability to perform the work. Other factors such as strategic business alliances, process capability and technical considerations also play a part in selecting them.

3. Generic Goals and Practices

3.1 Commitment to Perform

3.1.1 Organizational Policies

Establish and maintain the organizational expectations for planning and performing the process and communicate this policy to those in the organization who are involved. This will act as a guiding principle and provide a clearer picture of how the work will be carried out, and thus create a sense of urgency and importance to perform their respective work.

3.2 Ability to Perform

3.2.1 Resources

Provide adequate resources (such as funding, facilities and tools) for performing the work, and ensure that the resources are freely available for the workers when they are developing the software product. This will thus maximize the productivity of the workers, resulting in a lower amount of time to develop the software components required.

3.2.2 Training

Ensure that the workers possess the necessary skills and expertise to perform or support the process adequately by offering appropriate training as required. This includes management training for the higher officials, so that they will be able to manage their teams efficiently. Therefore by imparting the necessary skills and knowledge to the workers, their ability to perform in their respective areas will improve drastically.

3.3 Activities Performed

3.3.1 Plans and Procedures

Establish a plan for performing the process, determining what exactly is needed to achieve the established objectives, as well as containing all the detailed process descriptions. The documented plan should also include other relevant information such as cost estimates and risk management methods. This will clear any confusion among the workers as everyone knows what needs to be done by when and how to go about doing the work.

3.3.2 Taking Corrective Action as Necessary

Maintain the descriptions of the defined processes and align them with the organization's set of standard processes. This process definitions should be frequently changed to suit the ever-changing system requirements due to customer demands. With a clearly defined process, variability in how the processes are performed across the organization is reduced and accounted for. This will result in the integration process of different software components to be less complicated.

3.4 Measurement and Analysis

3.4.1 Determine Status and Effectiveness of the Activities Performed

Perform day-to-day monitoring of the process against the Project Plan and take appropriate corrective actions as required. Monitoring and controlling the process involves measuring appropriate attributes of the process or the project deliverables produced. This will minimize the possibility of the process diverting too much away from the originally intended plan since it will be closely monitored.

3.5 Verifying Implementation

3.5.1 Reviews and Audits by Management

Provide higher level management with appropriate visibility of the process and allow them to review the activities, status, and results of the process. These reviews can be both periodic and event-driven, allowing them to step in and resolve crucial issues along the way. Different managers have different needs for information about the process and hence, they tend to focus on different aspects of the project individually. Thus, these reviews should be conducted by the senior management collaboratively so that informed decisions on the planning and the performing of the process can be made after consulting one another.

4. Specific Goals and Practices

4.1 Requirements Management

4.1.1 Manage Requirements

a) Reach an understanding of requirements with requirements providers so that project participants can commit to them
b) Assess the impact of requirements on existing commitments
c) Document all requirements and requirements changes that are given to or generated by the project
d) Maintain requirements traceability from a requirement to its derived requirements and allocation to work products
e) Review project plans, activities, and work products for consistency with requirements and make changes to them

4.2 Software Project Planning

4.2.1 Establish Estimates

a) Define the work packages in sufficient detail so that estimates of project tasks, responsibilities, and schedule can be specified
b) Use appropriate methods to determine the attributes of the work products, and tasks to estimate resource requirements
c) Develop lifecycle phases for each project
d) Estimate effort and cost using models, historical data, or a combination of both

4.2.2 Develop a Project Plan

a) Establish and maintain the budget and schedule
b) Identify risks
c) Establish requirements and procedures to ensure the privacy and security of data
d) Determine process requirements
e) Identify the knowledge and skills needed to perform the project
f) Develop stakeholder involvement plan
g) Develop overall Project Plan

4.2.3 Obtain Commitment to the Plan

a) Review interrelated plans that affect the project
b) Revise schedules when necessary
c) Document all organizational commitments, both full and provisional, ensuring the appropriate levels of signatories

4.3 Software Project Tracking and Oversight

4.3.1 Monitor the Project Against the Plan

a) Monitor progress against the schedule
b) Regularly review commitments (both external and internal)
c) Periodically review the documentation of risks in the context of the project's current status and circumstances
d) Periodically review data management activities against their description in the Project Plan
e) Periodically review the status of stakeholder involvement
f) Regularly communicate status on assigned activities and work products to relevant stakeholders
g) Conduct milestone reviews with relevant stakeholders at meaningful points in the project's schedule, such as the completion of selected phases

4.3.2 Manage Corrective Action to Closure

a) Analyze issues to determine the need for corrective action
b) Determine and document the appropriate actions needed to address identified issues
c) Analyze results of corrective actions to determine the effectiveness of the corrective actions

4.4 Software Quality Assurance

4.4.1 Objectively Evaluate Process and Work Products

a) Establish and maintain clearly stated criteria for evaluations
b) Evaluate selected work products at selected times

4.4.2 Provide Objective Insight

a) Resolve each non-compliance issue with the appropriate members of the staff if possible
b) Record process and product quality assurance activities in sufficient detail so that status and results are known

4.5 Software Configuration Management

4.5.1 Establish Baselines

a) Select configuration items and work products that compose them based on documented criteria
b) Provide access control to ensure authorized access to the configuration management system
c) Create or release baselines only from configuration items in the configuration management system

4.5.2 Track and Control Changes

a) Initiate and record change requests in the change request database
b) Control changes to configuration items throughout the life of the product or service

4.5.3 Establish Integrity

a) Record configuration management actions in sufficient detail so that the content and status of each configuration item is known and previous versions can be recovered
b) Confirm the completeness, correctness, and consistency of items in the configuration management system

4.6 Software Subcontract Management

4.6.1 Establish Subcontractor Agreements

a) Determine type of acquisition
b) Identify potential subcontractors and distribute solicitation materials and requirements to them
c) Ensure that all parties to the subcontractor agreement understand and agree to all requirements before implementing the agreement or any changes

4.6.2 Satisfy Subcontractor Agreements

a) Monitor subcontractor progress and performance (e.g., schedule, effort, cost, technical performance) as defined in the subcontractor agreement
b) Verify that the acquired products satisfy their requirements
c) Ensure that acquired products are stored, distributed, and integrated according to the terms and conditions specified in the subcontractor agreement or license