Application of CMMI process in the project:

SRHC – Smart Robot House Cleaner

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CMMI level	Project area	Specific objective	Specific rules	Description of rule application in the project to date, possible improvements, references to other documents
1	Requirements initialization			This project's intent is to design and develop software and hardware for autonomous robot whose purpose is to clean and maintain the floors in houses instead of people. Also, it will be able to clean other surfaces above the floor level, maintain its own garbage bag, and go to the charging station when needed.
	Requirements Management	Managing requirements	Obtain requirements agreement	It's needed to generalize customer requirements and our ideas. (uniformly)
			Obtain commitment towards requirements	Enabling all functionalities of the SRHC and website.
			Managing requirements changes	Notice timely, and react on time to all changes of conditions and environment.
			Maintain bidirectional traceability of requirements	Enable requirement traceability between prototype product and final work products.
			Ensure Alignment Between Project Work and Requirements	It's needed to notice all contradictions timely, with the least possible cost, and resolve them.
		Standardize managing process	Establish organizational rules	Design a set of guidelines and instructions so that managing is as good as possible.
			Plan the processes	Write a detailed plan in ProjectLibre.
			Ensure resources	Ensure work places and equipment for employees.
			Assign responsibilities	Decentralize tasks on all team members.
			Train staff	Organize seminars to perfect the knowledge that will be used in system realization.
			Manage configurations	Organize meetings after every phase to ensure agreement and manage the consistency of configurations.
			Identify and include valuable participants	Make reports and needed documentation for all stakeholders so that they see the progress.
			Process control and monitoring	Introduce mini test on meetings after end of each phase of project to determine if all requirements for that phase are met.
			Objectively evaluate ideas	Consider ideas of all stakeholders, objectively and unbiased.
			Perform a status revision with higher level management	Realize financial inspection and checkup of state of resources, as well as the flow of system development.
	Project Planning	Establish estimates	Define project domain	Project will be defined on a global level.
			Define estimates of working products and tasks	Determine the evaluation criteria of all artifacts created in previous phases
			Define the project's lifespan	Lifespan of the project is while it is profitable and useful, evaluated at 15

				years, and more with added improvements.
			Define evaluation of the necessary effort and price	Defined in conceptual solution.
		Develop a project plan	Consolidate budget and schedule	Budget that is defined in conceptual solution needs to be distributed on all phases and teams.
			Identify project risks	Risk of oversaturation, cost of goods
			Data management plan	Collected data are delivered to data manager.
			Project resource plan	Create a call center with customer support operators that will be available 24/6, as well as needed space, resources and conditions for the staff.
			Plan for needed knowledge and skills	Knowledge and skills of a candidate are determined whilst interviewing.
			Participation plan	Division of roles.
			Determine project plan	Based on conceptual solution, the project plan is written with more detail.
		Obtain a commitment to the plan	Carry out a revision of project's plan	Include in the new version of project plan every idea that is accepted.
			Reconcile work activities and available resources	Ensure maximal use of all available resources and arrange them chronologically by needs of all teams.
			Outline the obligations prescribed by the plan	Strictly adhere to the defined project plan in order to avoid defects.
	Project Monitoring and Control	Monitor the Project Against the Plan	Monitor Project Planning Parameters	Localize the changes of project plan, for the sake of its improvement.
			Monitor Commitments	In ProjectLibre, monitor all activities of project participants.
			Monitor Project Risks	Monitor all risks and document them.
			Monitor Data Management	Monitor if database is in a consistent state and if all data is valid.
			Monitor Stakeholder Involvement	In ProjectLibre, also monitor activities of stakeholders.
			Conduct Progress Reviews	Hold meetings after the completed model to exchange impressions and to identify potential changes.
			Conduct Milestone Reviews	At the turning points, document all revisions.
		Manage Corrective Action to Closure	Analyze Issues	All obstacles in the development of the system should be immediately reported to the supervisor.
			Take Corrective Action	In the shortest possible time, correct the obstacles found above.
			Manage Corrective Actions	Document those corrections.
	Configuration Management	Establish Baselines	Identify Configuration Items	Establish a type of system development. In this case incremental.
			Establish a Configuration Management System	Name a person to be a coordinator, to supervise all teams, work, and development.
			Create or Release Baselines	Test the modules as soon as possible.
		Track and Control Changes	Track Change Requests	Coordinator should notify team leaders about the changes in other teams.
			Control Configuration Items	Coordinator will keep track everything in documentation.
		Establish Integrity	Establish Configuration Management Records	Provide the necessary resources.
			Perform Configuration Audits	Estimate system configuration and record it in documentation that will be later delivered to team leaders.

	Supplier Agreement Management	Establish Supplier Agreements	Determine Acquisition Type	Acquire hardware components needed for the prototype.
			Select Suppliers	Find the best sellers and deals for all needed components.
			Establish Supplier Agreements	Make a legal obligation with the selected suppliers, including reduced prices for buying in bulk later.
		Satisfy Supplier Agreements	Execute the Supplier Agreement	Send a team of legal entities that will draft contracts for both parties.
			Accept the Acquired Product	Verify that the acquired products satisfy their requirements.
			Ensure Transition of Products	Transport is supervised by the supplier.
	Measurement and Analysis	Align Measurement and Analysis Activities	Establish Measurement Objectives	Prioritize information needs and objectives.
			Specify Measures	Define exact standards for measures and analysis.
			Specify Data Collection and Storage Procedures	Create data collection mechanisms. Data will be stored in a database.
			Specify Analysis Procedures	Design ways of measuring and analyzing the project.
		Provide Measurement Results	Obtain Measurement Data	Document all results and save them In appropriate DB tables
			Analyze Measurement Data	Compare results with standards and measures and verify.
			Store Data and Results	In the database.
			Communicate Results	Results are understandable, and easily interpretable.
	Process and Product Quality Assurance	Objectively Evaluate Processes and Work Products	Objectively Evaluate Processes	All processes must comply with the prescribed standards.
			Objectively Evaluate Work Products	Evaluate selected work products at selected times.
		Provide Objective Insight	Communicate and Resolve Noncompliance Issues	Identify the risks and means how to resolve them.
			Establish Records	Revise the status and history of quality assurance activities as necessary.
3	Risk Management	Prepare for Risk Management	Determine Risk Sources and Categories	Source of risk is Uncertain or inadequate supplier capability.
			Define Risk Parameters	The most important parameter is the ratio of supply and demand of components.
			Establish a Risk Management Strategy	Ensure resources beforehand by making a contract with suppliers.
		Identify and Analyze Risks	Identify Risks	Not enough resources to meet the demand and keep growing.
			Evaluate, Categorize, and Prioritize Risks	Physical components are essential for manufacturing the product.
		Mitigate Risks	Develop Risk Mitigation Plans	Making alternative products using alternative components.
			Implement Risk Mitigation Plans	Implemented by tracking resources and alternatives.

	Product Integration	Prepare for Product Integration	Establish an Integration Strategy	Set a deadline for integrating all modules into one, and ensure the quality of integrated module.
			Establish the Product Integration Environment	Provide a workshop and testbed.
			Establish Product Integration Procedures and Criteria	Documentation of each module as a part of integration process.
		Ensure Interface Compatibility	Review Interface Descriptions for Completeness	If the initial requirements are changed, update all out of date interfaces.
			Manage Interfaces	Stick to the system design specification.
		Assemble Product Components and Deliver the Product	Confirm Readiness of Product Components for Integration	Perform unit tests before integration.
			Assemble Product Components	Execute the integration process.
			Evaluate Assembled Product Components	Carry out thorough integration tests.
			Package and Deliver the Product or Product Component	Only done when the newly finished product is obtained, or in the case of software update for existing products.
	Verification	Prepare for Verification	Select Work Products for Verification	Integrated system and initial project plan.
			Establish the Verification Environment	Provide the resources necessary for the verification process.
			Establish Verification Procedures and Criteria	Verify that the resulting system complies with the requirements of the initially defined plan.
		Perform Peer Reviews	Prepare for Peer Reviews	Assemble a team for this phase.
			Conduct Peer Reviews	That team needs to evaluate the developed system.
			Analyze Peer Review Data	Analyze those evaluations and draw conclusions.
		Verify Selected Work Products	Perform Verification	Conduct planned verification.
			Analyze Verification Results	Document all noticed irregularities in verification and envision possible corrections.
	Validation	Prepare for Validation	Select Products for Validation	Integrated system and initial customer expectations.
			Establish the Validation Environment	Provide the resources necessary for the validation process.
			Establish Validation Procedures and Criteria	Verify that the resulting system complies with the requirements of the initial customer expectations.
		Validate Product or Product Components	Perform Validation	Conduct planned validation.
			Analyze Validation Results	Document all noticed irregularities in validation and envision possible corrections.
	Organizational Training	Establish an Organizational Training Capability	Establish Strategic Training Needs	If needed, provide additional training for a given team member.
			Determine Which Training Needs Are the Responsibility of the Organization	Correct use of the product must be ensured. Indirect training for customers is needed for their best use of the product.
			Establish an Organizational Training Tactical Plan	Team members will undergo specialized courses. Customers will have indirect training in the form of video tutorials and booklets.
			Establish a Training Capability	Find workshops or online courses.
		Provide Training	Deliver Training	Those people will be able to train new employees.

			Establish Training Records	Document training efforts and award employee progress.
			Assess Training Effectiveness	Determine the attendance and productivity of training
	Organizational Process Definition	Establish Organizational Process Assets	Establish Standard Processes	Assign participants to teams and select team leaders.
			Establish Lifecycle Model Descriptions	Select lifecycle models based on the needs of projects
			Establish Tailoring Criteria and Guidelines	Adapting the process to a new product line or work environment.
			Establish the Organization's Measurement Repository	Ensure the required quality of the system and make comparisons during development.
			Establish the Organization's Process Asset Library	
	Organizational Process Focus	Determine Process Improvement Opportunities	Establish Organizational Process Needs	Define the look and feel of the end product.
			Appraise the Organization's Processes	Establish a strategy to improve the system.
			Identify the Organization's Process Improvements	Document each idea as it is considered correct and approved by the rest of the team.
		Plan and Implement Process Actions	Establish Process Action Plans	A detailed plan for executing and validating actions for improvement needs to be made.
			Implement Process Action Plans	Conduct said plan
			Use improvements and favorable actions	Apply found possible improvements.
			Incorporate Experiences into Organizational Process Assets	Every experience gained is shared with other teams so that they can also get the benefit and avoid the same mistakes.
	Integrated Project Management	Use the Project's Defined Process	Establish the Project's Defined Process	Coordinator will inspect all teams.
			Use Organizational Process Assets for Planning Project Activities	Send team leaders to exhibit team progress in team meetings.
			Integrate Plans	Form a structured set of all plans.
			Manage the Project Using Integrated Plans	Stick to the defined plan.
			Contribute to Organizational Process Assets	Find important things to add to the organizational process assets, and add them.
		Coordinate and Collaborate with Relevant Stakeholders	Manage Stakeholder Involvement	Keep documentation of all stakeholders.
			Manage Dependencies	Provide advertising depending on the size of the sponsorship.
			Resolve Coordination Issues	If there are problems in coordination then identify the causes and remove them in a timely manner.
	Decision Analysis and Resolution	Evaluate Alternatives	Establish Guidelines for Decision Analysis	Determine ways to change decisions in relation to changes in system development.
			Establish Evaluation Criteria	Criterion is productivity of the product and customer satisfaction.
			Identify Alternative Solutions	Model with different components but similar functionalities.
			Select Evaluation Methods	The assessment is based on a sample of people, potential users.
			Evaluate Alternatives Solutions	Perform system evaluation.
			Select Solutions	Determine which solution is best for improving the old solution.

	Organizational integration Environment	People management	Establish balancing mechanisms	Set the responsibility that each team leader has to respect.
			Select processes	Develop strategies to motivate team members.
			Establish process performance measures	Introduce sanctions for non-compliance with plans and agreements.
4	Organizational Process Performance	Establish Performance Baselines and Models	Select Processes	Select a set of processes and subprocesses to which to apply techniques.
			Establish process performance base lines	Determine baselines of selected organization's process performance
			Establish process performance models	Establish the process-performance models based on the organization's set of standard processes and the organization's process-performance baselines.
			Establish Quality and Process-Performance Objectives	Define the organization's quantitative objectives for quality and process performance.
			Establish Process-Performance Measures	Select measures that provide appropriate insight into the organization's quality and process performance
	Quantitative Project Management	Prepare for Quantitative Management	Establish the Project's Objectives	Write a document to establish and maintain the project's quality and process performance objectives.
			Compose the Defined Process	Using statistical and other quantitative techniques, create a defined process that enables the project to achieve its quality and process performance objectives.
			Select Subprocesses and Attributes	Select subprocesses and attributes critical to evaluating performance.
			Select Measures and Analytic Techniques	Identify common measures from the organizational process assets that support quantitative management.
		Quantitatively Manage the Project	Monitor the Performance of Selected Subprocesses	
			Manage Project Performance	
			Determine the cause of defects	
			Perform Root Cause Analysis	
5	Causal Analysis and Resolution	Determine Causes of Defects	Select Outcomes for Analysis	Determine which outcomes to analyze further and formally define the scope of the analysis.
			Analyze Causes	Analyze what led to those defects, and if that cause is repeated thoroughly change those functionalities.
		Address Causes of Selected Outcomes	Implement Action Proposals	Analyze the action proposals and determine their priorities. Then select action proposals to be implemented.
			Evaluate the Effect of Implemented Actions	Measure and analyze the change in process performance of the project's affected processes or subprocesses.
			Record Causal Analysis Data	Document done work and analysis data.
	Organizational Performance Management	Manage Business Performance	Analyze Process Performance Data	Perform a thorough analysis on gathered process performance data.
			Identify Potential Areas for Improvement	Identify potential improvement areas based on the analysis of process performance shortfalls, their documentation, and apply them.

			Maintain Business Objectives	Maintain business objectives based on an understanding of business strategies and actual performance results.
		Select Improvements	Elicit Suggested Improvements	Collect all potential improvements to the system and pass it on to the proper team.
			Analyze Suggested Improvements	The corresponding team will analyze performance suggestions, how much will the requirements change, and how much will it help improve the system.
			Validate Improvements	Establish whether the user's request changes significantly compared to the initial one.
			Select and Implement Improvements for Deployment	Choose which ideas will be realized and distributed to the teams that will do this.
		Deploy Improvements	Plan the Deployment	Plan a newly obtained system with all improvements, and prepare it for deployment.
			Manage the Deployment	For all improvements, it is necessary to keep proper records in the form of documentation.
			Evaluate Improvement Effects	Assess how much these improvements have contributed to the system.