



SWE30010

# HRM PROPOSAL FOR GEMADEPT

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## What is Quality?

Based on Petrasch (1999) and ISO's definition of quality, we can rule out that quality the existence of characteristics of a product, which can be assigned to requirements, and we can also determine the quality of a system by measuring the degree to which it satisfies the stated and implied requirements of its various stakeholders, ultimately providing value.

To determine the requirement needed for this HRM application, we can follow the simple framework outlined here:

### ✓ **Technical requirements**

- Appropriate framework and the hosting server.
- Responsive user interface.
- User accessibility.
- Data security.

### ✓ **Functional Requirements**

- User registration and account management.
- Employee management and tracking
- Time, pay, performance calculations.
- Review/Rating system.
- Feedback mechanism.
- Notification and Alert settings.

### ✓ **Non-functional Requirements**

- Have user-friendly UX/UI
- Integrate appropriate security techniques and comply with data protection regulations.
- Integrate with existing system, i.e., ERP, database, timesheet, etc.
- High scalability

## Software Requirements

Using the S.M.A.R.T guidelines that indicate that goals and achievement should be Specific, Measurable, Achievable, Realistic, and Time-bound (Lawlor, 2012). It is logical to pursue and align the HRM's application's quality definition on the ISO 25010 standard, which indicates the following objective to ensure the quality of a given software:

- **Functional Suitability:** Ensuring that the HRM software provides all necessary functions to support HR processes such as recruitment, employee onboarding, performance management, and training.
- **Performance Efficiency:** Ensuring that the HRM software performs tasks such as data processing and report generation within acceptable time frames and with minimal resource consumption.
- **Compatibility:** Ensuring that the HRM software can integrate with existing systems such as payroll software, time-tracking systems, and enterprise resource planning (ERP) systems.

- **Usability:** Ensuring that the HRM software is user-friendly and intuitive, allowing HR professionals and employees to easily navigate and perform tasks within the system.
- **Reliability:** Ensuring that the HRM software operates reliably without frequent crashes or errors, especially during critical HR processes.
- **Security:** Ensuring that the HRM software protects sensitive HR data such as employee personal information, payroll details, and performance evaluations from unauthorized access or modification.
- **Maintainability:** Ensuring that the HRM software can be updated and modified efficiently to accommodate changes in HR policies, regulations, and business requirements without introducing bugs or issues.
- **Portability:** Ensuring that the HRM software can be deployed across different hardware and software environments, such as on-premises servers or cloud platforms, with minimal effort and modifications

With ISO 25010 as the reference, we create the detail requirement as the definition of done for our project as follow:

- **Core functionalities development:** The platform must be constructed with all of the essential features listed in the project proposal. Both automated test cases and manual tests can be used throughout the testing process.
- **Usability and Scalability:** Consider factors like reaction time and resource usage while assessing the software's performance under workloads. Verify that the system is capable of handling an unexpected increase in workload.
- **Code Quality and Conventions:** Verify that the code complies with the requirements for readability, maintainability, naming conventions, and code structure.
- **Security:** Verify if the platform followed the necessary data protection and authentication guidelines. Performing security testing, reviewing protocols, and reviewing IT policies and documentation are all part of this process.
- **Testing and Documentation:** Conduct unit testing to verify individual components, integration testing to validate interactions between modules, and user acceptance testing (UAT) involving end-users.
- **UX/UI Testing:** Make that the UI is responsive, easy to use, and visually consistent. It ought to satisfy every design criterion listed in the proposal.

### DEFINITION OF DONE CHECKLIST

The following checklist is prepared based on the ISO25010 Model with 8 main characteristics to measure the 'Quality' of the HRM application.

No	(Sub) Characteristics	Description	Y/N
<b>1. Functionality Suitability</b>			
1.1	Functional Appropriateness	Deploy the platform on the cloud-based hosting server	<input type="checkbox"/>
1.2	Functional Appropriateness	The platform allows user creation for 2 account types: business account and user account	<input type="checkbox"/>

1.3	Functional Appropriateness	The platform allows users to switch between different languages. All content, messages, and alternative text are	<input type="checkbox"/>
1.4	Functional Appropriateness	The employee report module can generate reports with meaningful insights from the data.	<input type="checkbox"/>
1.5	Functional Appropriateness	The platform's core functionalities can integrate with external systems, such as ERP, database, timesheet.	<input type="checkbox"/>
1.6	Functional Correctness	The number of errors of each core functionality of the e-commerce platform should be less than 5% of total automated	<input type="checkbox"/>
1.7	Functional Correctness	During the account registration process, important fields such as name, password, and email are required	<input type="checkbox"/>
1.8	Functional Correctness	Employee information (base and daily/monthly report) correctly appear on the screen	<input type="checkbox"/>
1.9	Functional Correctness	The searching and filtering options return the correct result	<input type="checkbox"/>
1.10	Functional Correctness	99% of the daily/monthly process are completed and recorded in the databases at the end of day or at the time of generating report.	<input type="checkbox"/>
1.11	Functional Completeness	The app can display well-organized daily employee report with time, leave check, name, title/dept.	<input type="checkbox"/>
1.12	Functional Completeness	The platform can send notifications via email to remind users to check the timesheet of their work time daily at 3 o' clock.	<input type="checkbox"/>
<b>2. Performance Efficiency</b>			
2.1	Time Behaviour	<p>The following actions have a response time of less than 2 seconds:</p> <ul style="list-style-type: none"> <li>Return searching results after users search the employee's name or functions of the app.</li> <li>Display a list of employees.</li> <li>Display the base employee's information when clicking on employee.</li> <li>Record employees check in to time calculation module.</li> <li>Login/Logout</li> </ul>	<input type="checkbox"/>
2.2	Time Behaviour	The loading time of pages is less than 5 seconds	<input type="checkbox"/>
2.3	Resource Utilization	The CPU utilization when running the platform is below 80% and memory consumption is below 70%	<input type="checkbox"/>
2.4	Capacity	A simulated workload of 1,000 employees is used for testing. Could the platform handle this simulated workload without reducing the performance by at least 30%	<input type="checkbox"/>
<b>3. Compatibility</b>			
3.1	Co-existence	The platform can operate simultaneously with at least 2 other software in an operating system without conflicting	<input type="checkbox"/>
3.2	Interoperability	95% of record (reports, module's calculation) shows up correctly on third-party system	<input type="checkbox"/>
3.3	Interoperability	The operational data of the platform can be displayed on the data analytics tool in real-time with a maximum delay of 1 minute.	<input type="checkbox"/>
<b>4. Usability</b>			

4.1	Appropriate recognizability	Users complete the following tasks in less than 3 minutes: <ul style="list-style-type: none"> <li>▪ Register a new account.</li> <li>▪ Complete their timesheet.</li> <li>▪ Managers can search for employees.</li> </ul>	<input type="checkbox"/>
4.2	Learnability	90% of users (employees and manager) can complete basic tasks to serve their needs on the first day of the testing period	<input type="checkbox"/>
4.3	Operability	The average number of errors that test users encountered during a 15- minute testing session is less than 2 errors	<input type="checkbox"/>
4.4	User interface aesthetics	The platform is responsive on desktop	<input type="checkbox"/>
4.5	User interface aesthetics	This condition is evaluated based on feedback survey  The minimum average satisfaction score of 20 users about the UX/UI of the platform, including webpage structure, text font, color palette, languages, navigation, information display, buttons, etc. is 8 out of 10	<input type="checkbox"/>
4.6	User error protection	90% of test users can understand the content of the confirmation dialog box displayed when they: <ul style="list-style-type: none"> <li>• Submit timesheet.</li> <li>• Update their information.</li> <li>• Change the HRM settings.</li> <li>• Generate report generation</li> </ul>	<input type="checkbox"/>
4.7	Accessibility	80% of non-text content (video, images) have alternative text descriptions	<input type="checkbox"/>
<b>5. Reliability</b>			
5.1	Maturity	Mean Time Between Failures (MTBF) metrics of the platform is at least 30 days	<input type="checkbox"/>
5.2	Fault Tolerance	Mean Time to Recover (MTTR) takes less than 2 hours to recover platform data from errors or failures	<input type="checkbox"/>
5.3	Recoverability	All functionalities of the platform can be fully restored from the backup within 5 hours after the failure	<input type="checkbox"/>
5.4	Availability	The platform is accessible for 99.9% of operating hours	<input type="checkbox"/>
<b>6. Security</b>			
6.1	Confidentiality	Block at least 95% of unauthorized access attempts and send alerts to users	<input type="checkbox"/>
6.2	Confidentiality	Data encryption and secure authentication protocols are integrated	<input type="checkbox"/>
6.3	Integrity	100% of data is stored and transmitted correctly. Data in the databases is reflected correctly on the user interface and data analytics tools	<input type="checkbox"/>
6.4	Integrity	The platform follows data protection regulations	<input type="checkbox"/>
6.5	Non-repudiation	Implement non-repudiation measures for at least 95% of user actions	<input type="checkbox"/>
6.6	Accountability	100% of user interactions on the platform and the platform events are recorded in the logbook	<input type="checkbox"/>

6.7	Authenticity	95% of user authentication processes are successful	<input type="checkbox"/>
<b>7. Maintainability</b>			
7.1	Analyzability	Reduce time taken to diagnose and resolve reported issues to less than 1 hour 30 minutes	<input type="checkbox"/>
7.2	Modifiability	New change/enhancement is integrated into the platform 1 week after the change request is made	<input type="checkbox"/>
7.3	Testability	Maintain a code coverage of at least 80% through automated test cases	<input type="checkbox"/>
7.4	Modularity	The platform architecture is designed with at least 5 modules	<input type="checkbox"/>
7.5	Reusability	All codes have naming conventions, and comments to modify when needed without affecting other parts (Low coupling – High cohesion)	<input type="checkbox"/>
7.6	Reusability	A minimum of 80% code is reusable	<input type="checkbox"/>
<b>8. Portability</b>			
8.1	Adaptability	The time to deploy the platform on a new hosting server (on-premises or cloud server) is less than 7 days	<input type="checkbox"/>
8.2	Installability	The time to complete the installation and configuration of all platform components in an environment is less than 8 hours	<input type="checkbox"/>
8.3	Replaceability	Could we replace a component of the platform with a migration time of less than 1 week without impact on other components?	<input type="checkbox"/>

## References

Petrasch, R. (1999, November). The definition of software quality: a practical approach. In *Proceedings of the 10th International Symposium on Software Reliability Engineering* (pp. 33-34).

Lawlor, K. B. (2012). Smart goals: How the application of smart goals can contribute to achievement of student learning outcomes. In *Developments in business simulation and experiential learning: Proceedings of the annual ABSEL conference* (Vol. 39).