Clinical Competency Calculator

Software Requirements Specification
Draft Document

Dylan Colburn
Jacq Lee
Tyler Muessig
Tyler Price

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1 Introduction

1.1 Purpose

The purpose of the software requirements document is to create a comprehensive outline of the Clinical Competency Calculator (CCC), for the development team, project advisors, faculty advisor(s), stakeholders, and the Hershey Medical team. The target audience is expected to know technical terminology related to software development.

1.2 Scope

Our software is designed to be used by raters and students at Hershey Medical. It will contain a feedback form that is filled out by raters after sessions with a student. The feedback form responses are analyzed by an AI model and summarized for review in accordance with EPAs. If the free-form responses are detected to be too vague, the responder is prompted to add additional detail. Using these feedback forms, the software will use an AI model to suggest actions to take based on aggregated feedback.

1.3 Client information

Anthony Dambro (adambro@pennstatehealth.psu.edu)

1.4 Users

Our intended audience for the CCC would be the students undergoing clerkship, raters providing feedback on the students' performance, and administrators of the entire system and its data.

1.5 Definitions

Term	Definition
EPAs (Entrustable Professional Activities)	A competency-based framework defining 13 key tasks that medical students are expected to perform independently prior to entering residency.
Rater	Any individual providing feedback about a student. This encompasses faculty, nurses, clerkship advisors, and patients.
Student	The medical student that is being accessed through the Clinical Competency Calculator (CCC).

Term	Definition
Feedback Form	The digital form used by **Raters** to input assessments of **students**.
Competency	The measurable ability of a **student** to perform a specific task, assessed along a developmental continuum (e.g. **EPAs**).
Must	This specification is absolutely required.
Must Not	This specification is absolutely prohibited.

1.6 References

Association of American Medical Colleges, “Core entrustable professional activities for entering residency: Faculty and learners’ guide,” Association of American Medical Colleges, May 2014. [Online]. Available: https://store.aamc.org/downloadable/download/sample/sample_id/66/%20

2 Overall description

2.1 Product perspective

The software is a grading tool to be used to assess the capabilities of students. Raters will be able to provide feedback for the students via the feedback form. The students will have the ability to review their own feedback forms and reflect upon the feedback. **{{ administrators }}** will have the capability to review every submitted form. All of these options will be implemented to allow students, raters, and administrators to access them via any device that has a modern web browser, such as smartphones, laptops, and desktop computers.

2.2 Product functions

2.2.1 Rater functions

The rater must be able to fill out new feedback forms by accepting requests from students. Additionally, they must be able to view past feedback forms that they have submitted.

2.2.2 Student functions

Students must be able to request a specific rater to fill out a feedback form for themselves. **{{ Confirm actual mechanism of requesting, re: anonymity, scope of request, etc. }}** Students must also be able to view a full report of their performance, which displays where they land along the EPAs and allows the student to view specific comments or other relevant feedback that supports the specific assessment.

2.2.3 Administrator functions

Administrators must be able to view all feedback forms submitted, along with the rater who submitted the forms. Administrators must be able to view the full report of any student.

2.3 User characteristics

The users of this webpage will have a basic sense of computer literacy including minimal keyboard skills and experience interacting with a browser application prior. No advanced knowledge of computer systems is needed. A user should be able to learn the user interface swiftly. Additionally, raters must be able to understand the questions that are asked in the feedback form and students must be able to understand the feedback and analysis given.

2.4 Constraints

The software is to be built using JavaScript/HTML. Any device with access to a modern web browser will be able to access and run this application assuming that the device has a monitor/screen to view/interact with the GUI. An internet connection is required to access the web application.

2.5 Assumptions

The students, raters, and administrators are assumed to always have the correct information to access their respective accounts and the hardware capability to input that information. It is also assumed that the database being used is or will be heavily adopted and will likely have support in the near future to ensure an up-to-date system. The application is also assumed to be deployed in an environment with a stable network.

3 Specific requirements

3.1 External interface requirements

3.1.1 User interfaces

{{ TBD }}

3.1.2 Hardware interfaces

The hardware interface will be any device, such as a computer or equivalent, capable of accessing the internet through a modern web browser.

3.1.3 Software interfaces

1. *User authentication and authorization*

The system must allow user authentication and authorization features to ensure proper access. **{{ The system will interface with the Penn State authentication system for user role validation, which includes password access and two-factor authentication. }}** Users will only be able to view data and perform functions as permitted by their authorization level.

2. *Database management system*

{{ Exact architecture TBD }} The database MUST be able to retain data for a minimum of two (2) years.

3. *Web application framework*

{{ TBD }}

4. *Server*

{{ TBD }}

3.2 Functional requirements

3.2.1 Student Functions

ID	Description	Deps.	Imp.
s1	The system MUST be able to generate an analysis (a “full report”) of all feedback forms for each specific student.	r3	HIGH

ID	Description	Deps.	Imp.
s2	The student MUST be able to request a rater to fill out a feedback form.	r4	HIGH
s3	The system MUST notify students when a rater has completed a form for them.	r4	LOW
s4	Students MUST NOT be able to view any other students' full reports.	r4	HIGH
s5	Students MUST NOT be able to view the rater	r4	HIGH

3.2.2 Rater Functions

ID	Description	Deps.	Imp.
r1	The system MUST provide a feedback form for raters to input observations.	sw3	HIGH
r2	The system MUST integrate AI to generate supplemental questions based on gaps in student feedback.	r1	HIGH
r3	The system MUST store submitted feedback in a database for future access.	r4	HIGH
r4	The Rater MUST be able to submit feedback for students via a form.	r2	HIGH
r5	The system MUST notify raters when a student requests feedback.	s2	MED
r6	The system MUST remind raters if forms are not completed within a specified time.	r5	MED

3.2.3 Administrator Functions

ID	Description	Deps.	Imp.
a1	The Administrator MUST be able to view all submitted feedback forms.	r3	HIGH
a2	The Administrator MUST be able to view who submitted each feedback form.	a1	HIGH
a3	The Administrator MUST be able to view individual students’ full reports.	s1	HIGH

ID	Description	Deps.	Imp.
a4	The Administrator MUST be able to to manage user roles for students, raters, and other administrators.	sw3	HIGH
a5	The Administrator MUST be able to view raters flagged by the AI module.	sw2	LOW

3.2.4 Software Functions

ID	Description	Deps.	Imp.
sw1	The software MUST have PDF and Excel export options.	r3	LOW
sw2	The system MUST have an AI module that will detect rater bias and flag problematic raters and notify administrators.	r3	LOW
sw3	The system MUST allow each user to authenticate and log in under their role-based permissions.		HIGH

3.3 Performance requirements

The system should have a response time of less than two seconds for all user interactions, including loading pages, submitting maintenance requests, and retrieving historical data. The system should also be able to handle concurrent usage by at least 100 guests without significant degradation of performance. The system should be designed to have an uptime of 99.9%. In the event of unforeseen issues or system maintenance, the system should be able to inform guests of the system status and an estimated resolution time. Finally, the system should utilize system server resources efficiently, ensuring that CPU and memory usage remains within acceptable limits under normal operating conditions.

3.4 Design constraints

The system should be accessible via all common web browsers such as Google Chrome, Firefox, Safari, and Microsoft Edge. The system should also be accessible from a wide range of devices such as laptops, smartphones, and tablets. Finally, Data privacy standards such as GDPR (General Data Protection Regulation) from the EU or CCPA (California Consumer Privacy Act) must be followed in order to be compliant with all regulations/standards.

3.5 Other requirements

3.5.1 Regulatory Compliance

The system must comply with all privacy regulations at Hershey Medical Center and Penn State Health as a company. The system must also comply with all relevant regulations set forth by the US government.

3.5.2 Backup and recovery

The system should have a backup and recovery plan to protect data integrity in the event of system failure or data loss. Regular automated backups should be scheduled, with clear procedures for data restoration.

3.5.3 User training/documentation

User training and documentation should be provided to ensure that all users, including students, raters, and administrators, can navigate and use the system. This may include user manuals, FAQS, and/or training manuals.