Capstone Project Material

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Project Name: YOUth Mentoring System

Introduction to the Capstone Preview for Leap FSE Tracks

Leap Participant Goal

Fidelity's objective for its Leap program is to allow participants to obtain an early introduction to the knowledge and skills that will be acquired through the curriculum during Leap. The solutions demonstrated cover a broad spectrum ranging from requirements, design, coding, testing, etc. Through early exposure to these areas, the participant will gain a better appreciation of context of material as it is presented in detail later in the program.

Fidelity Goal

Fidelity's management team goal is to better prepare the participants for the detailed technical material to be covered in the curriculum.

Instructor Goal

The instructor will use this Capstone Preview material both as an artifact to demonstrate a variety of concepts and techniques as well as provide the base material for exercises relevant to the topic.

YOUth Mentoring System: Project Overview

Introduction to Mentoring Unlimited: Program Background

Mentoring Unlimited (MU) is a medium-sized, for profit organization, which has been operating for about ten years. They provide mentoring services for individuals (called "scholars") between 10-15 years of age. MU only maintains administrative staff. Mentors are hired on a session basis (normally equal and synchronized with the school semesters). They also use a variety of local volunteers to help with the onboarding experience for new scholars and mentors at the start of each new session.

They currently have approximately ten full-time staff (3 Executives and 7 Administrators). They average approximately 200 scholars and 80 mentors per session. Last year, they had operating revenues of approximately $10 million.

The company is now raising capital to start franchising the concept to other cities around the United States. They recognize that to succeed, they will have to automate a variety of processes that are currently being done via a manual approach. They have hired a group of IT consultants to assist with this process, since their current level of IT knowledge is weak.

This particular case will focus on two subsystems: 1) The YOUth Mentoring Matchmaking system, which will be responsible for assigning mentors to scholars, and 2) The YOUth Mentoring Executive Information System, which will be responsible for providing the managers and executives with both standard and ad hoc reports.

Mentoring Program Objective

The YOUth Corporate Mentoring Program seeks to actively engage and positively influence academically at-risk scholars in grades 5 through 8 through one-on-one mentoring sessions in core academic topics of Math, English, and Science. The slogan for the program is "Success is All About YOUth!"

Project Deliverables

The project deliverables are analyzing, designing, and implementing the YOUth Mentoring System (YMS).

YMS will consist of two major subsystems:

1) **YOUth Mentoring Matchmaking System (YMMS)**: An automated version of the current manual matchmaking process including:
    – Online input by Scholars of Placement Exams and Preferred Match Surveys
    – Online input by Mentors of Availability Matrix and Preferred Match Surveys
    – Electronic notifications (emails) to Scholars and Mentors of their matching
    – Matchmaking process as defined by Emma (Senior Administrator)

2) **YOUth Mentoring Executive Information System (YMEIS)**
   – Standardized regular reports (to be defined)
   – Ad hoc reports as required
   – Remote/mobile access for managers and executives

Program Metric

Mentor Unlimited's CEO is insisting that the new system show measurable scholar performance improvements over time and has conditionally committed to the program for two years to create a performance improvement window.

No other metrics have yet been specified.

Background Documentation

The following section contains background material that has been collected by the IT consultant team over the last few weeks.

User Acceptance Testing

The following pertains to UAT for the Mentor Matchmaking System.

1. *Demonstration is an appropriate technique* for UAT (User Acceptance Testing). If not acceptable to stakeholders, Execution would be second choice.

   - The users (mentors, scholars, administrators) will visually confirm the system is behaving according to expectations.
   - Many facets of the system require direct user interaction, but since this is a new interface, it will be easier to demonstrate than train.
   - Will limit the probability of any errors occurring during UAT and, therefore, better promote acceptance.
   - Will allow the testing to be competed in a shorter period of time.

2. *Black box testing would be an appropriate test method for the selected methodology*.

   - Users are not interested in the inner workings of the system.
   - Black box testing focuses on behavioral testing.
   - No errors are anticipated so no need for other methodologies.
   - Limits the number of things which can be evaluated.

Methods
   - Scenario, manually scripted, or functional could all be used.
   - Since this will be Demo/black box, these methods would allow a selection of functions to be demonstrated which will assure the stakeholder that the system is fit for purpose.
   - While this will create more up-front work for the System Analyst, it will keep the stakeholders focused on the functionality they have requested, rather than simply discovering errors in the system.

3. User Acceptance Test: *Metrics of Quality*

System Performance
   - Response time: All functions must execute in 700 msec or less 90% of the time. This will be tested using a machine-based timer. Clock will start when any function is selected with a mouse click and end when screen is fully repopulated with results. NB: This can only be used for updates, not suitable for reporting functions.
   - Mobile support: Demonstrate system available on IOS and Android platforms.
   - Throughput/reporting: All reports must execute in 5 seconds or less when using a database of no more than 10,000 entries. Use an onboard timer, and test database to prove during demonstration.

System Benefit
- User Satisfaction: A survey of satisfaction will be conducted at the end of the UAT. A variety of categories will be evaluated on a 1-5 scale. Minimum acceptable threshold will be 4.2 for all categories.
- Reporting: We will demonstrate the ad-hoc reporting feature. This is currently not available in the manual system so should prove to be an "exciting" new function. No supporting data has to be captured.

4. *UAT Entry Criteria*
- System testing signoff was obtained.
- Business requirements have been met or renegotiated with the Business

Sponsor or representative.
- UAT test scripts are ready for demonstration.
- The testing environment is established.
- Zero Severity 1 defects, no more than two Severity 2 defects.
- All support staff documentation created to be reviewed.

5. *UAT Exit Criteria*
- Stakeholders signoff on acceptance.
- System meets metrics of quality.
- All support documentation is accepted.
- Any outstanding defects (from entry criteria) have been negotiated and accepted.

Executive Information System Requirements and Test Case

User Story	Story	MoSCoW	Explanation	Functional/NF and Type
US-101	Administrative Staff Users may view all of the scholars currently registered	Must	It is necessary for Admin Users to access scholar information	Functional User Requirement
US-102	Administrative Staff Users may view all of the mentors currently registered	Must	It is necessary for Admin Users to access mentor information	Functional User Requirement
US-103	Administrative Staff Users may select different criteria for ad hoc reports	Must	The whole point of an ad hoc report is to look at specific criteria; therefore, it is necessary that Admin Users be able to specify what that criteria is.	Functional User Requirement
US-104	The YOUth System shall allow unlimited ad hoc report creation	Must	It is necessary that the system allow the generation of ad hoc reports for administrative purposes, and since the criteria per ad hoc report can change each time, it is necessary to allow the user to generate as many ad hoc reports as they require.	Functional System Requirement
US-105	The YOUth System shall validate all User access	Must	This deals with the security of report generation and helps to ensure that only users with proper access have the ability to access the report sub system.	Non-Functional System Requirement

Mentors Unlimited: Entity Relationship Diagram (ERD)

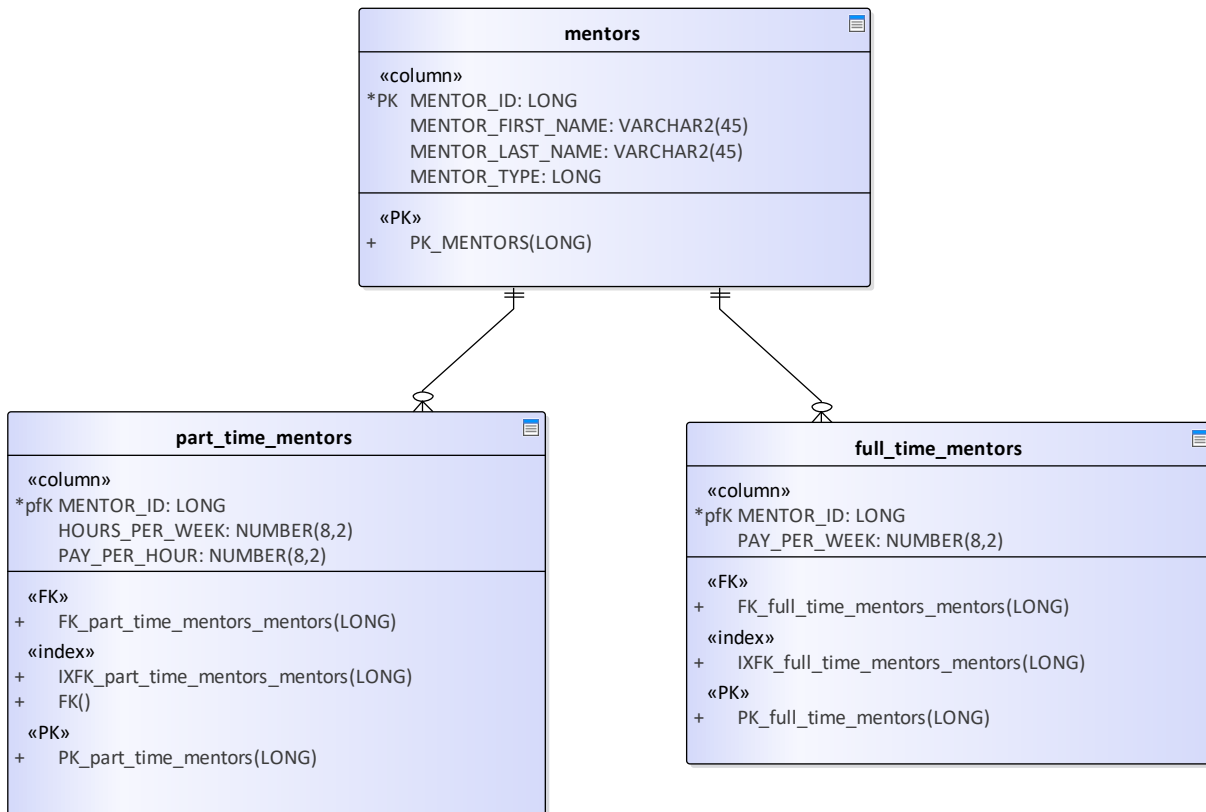The following are the entity relationship diagrams that describe the schema of the Mentors Unlimited database.
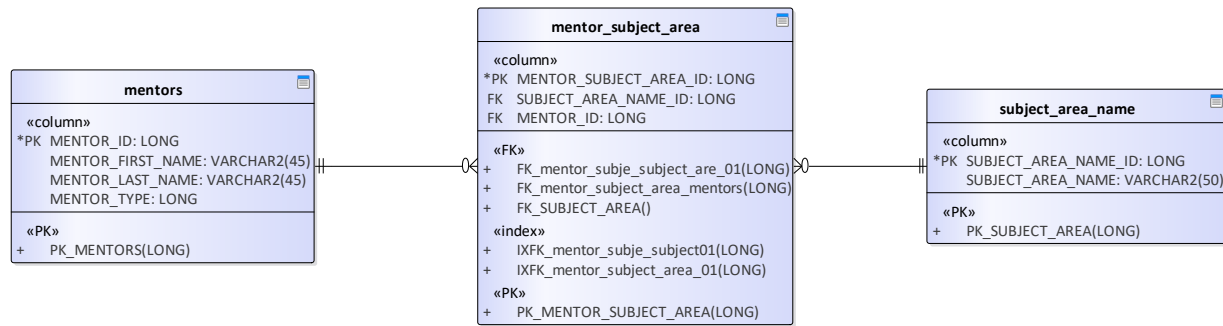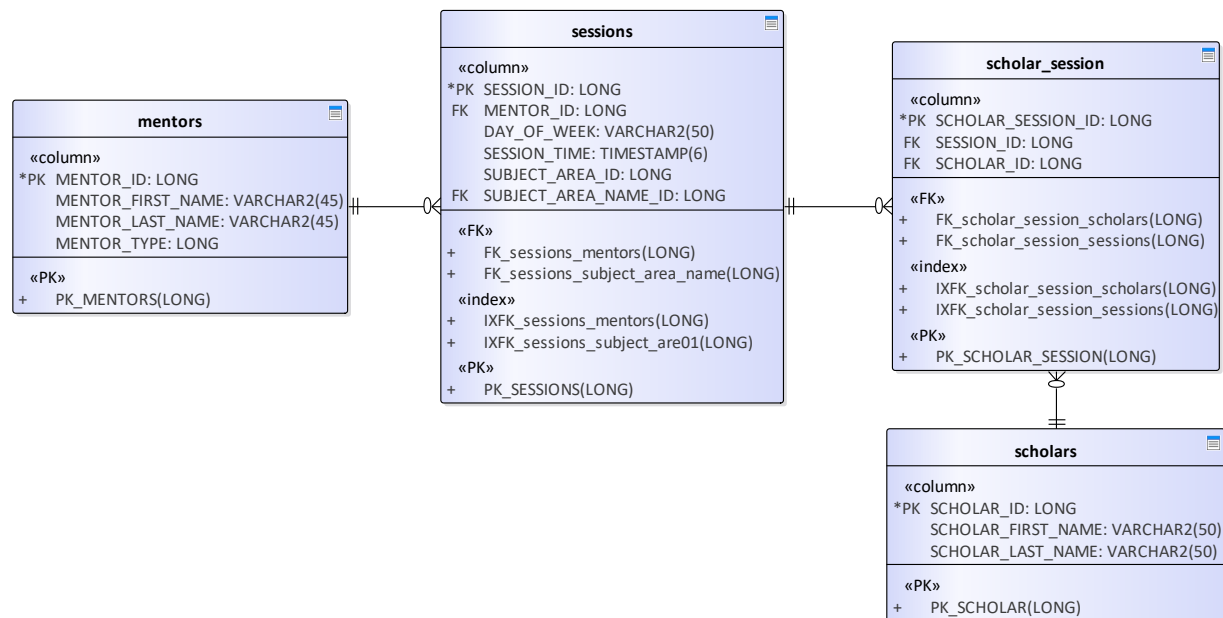

Figure 1. The Mentor Tables

Figure 2. The Mentor Subject Areas

Figure 3. The Session Tables