

**Industrial, Manufacturing, & Systems Engineering
College of Engineering**

**Systems Engineering Project Practicum
Summary**



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| Project Title: | Online Program Service System – UTEP Connect and Library |
| Team members: | 1. Miguel Carrera 2. Eira Chico 3. Elizabeth Delgado 4. Patricia De La Rosa 5. Alejandra Salaices |
| Semester, year: | Spring, 2016 |
| Type of project: | Individual project at students work () Team project assigned by instructor (X) Project proposed by team () |



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INTRODUCTION

The System Engineering Project Practicum provides the opportunity to apply System Engineering concepts in developing a real system and create documents that formally describe the system. Students review documents and validate them with clients and customers through formal presentations. Teams are self-managed and assign roles to control planning, quality, requirements, design, and implementation.

System Overview

As System Engineers, we are called to bring stability and simplicity to real life complex systems. This project was not an exception. Although the systems offered were very well implemented in the University for a long term, they were not initially designed with an online system mindset. As a result, there were several services offered that were very complex to implement in in this new abstraction without new definitions.

These are the problems we faced were lack of structure and consistency within the 'Online Programs Service System' at UTEP. There was not architecture, product development process, or defined roles for the entities that are part of the program. This keeps UTEP from launch Online Degree Programs that meet the highest standards of higher education.

In order to address the comparison between institutional and online systems differences, we started to put hands-on and real world activities such as stakeholder interviews, peer reviews, presentations, requirements acquisition, checklists and reports. All of this activities helped us to achieve a noticeable improvement on the Online Service System for UTEP Connect and Library services.

At the end, we were able to represent processes that relied on experience and unwritten procedures, with a developed system architecture structure that represents graphical and written information in a clear and simple format. This information can be now used to standardize the current institutional practices for the creation of online education courses and services.

System Description

UTEP Connect is a unit within the Department of Extended University. UTEP Connect offers fully online programs to nontraditional students. This department is responsible for recruiting online students, assist them in the admission process and provide support once they are registered in online classes.

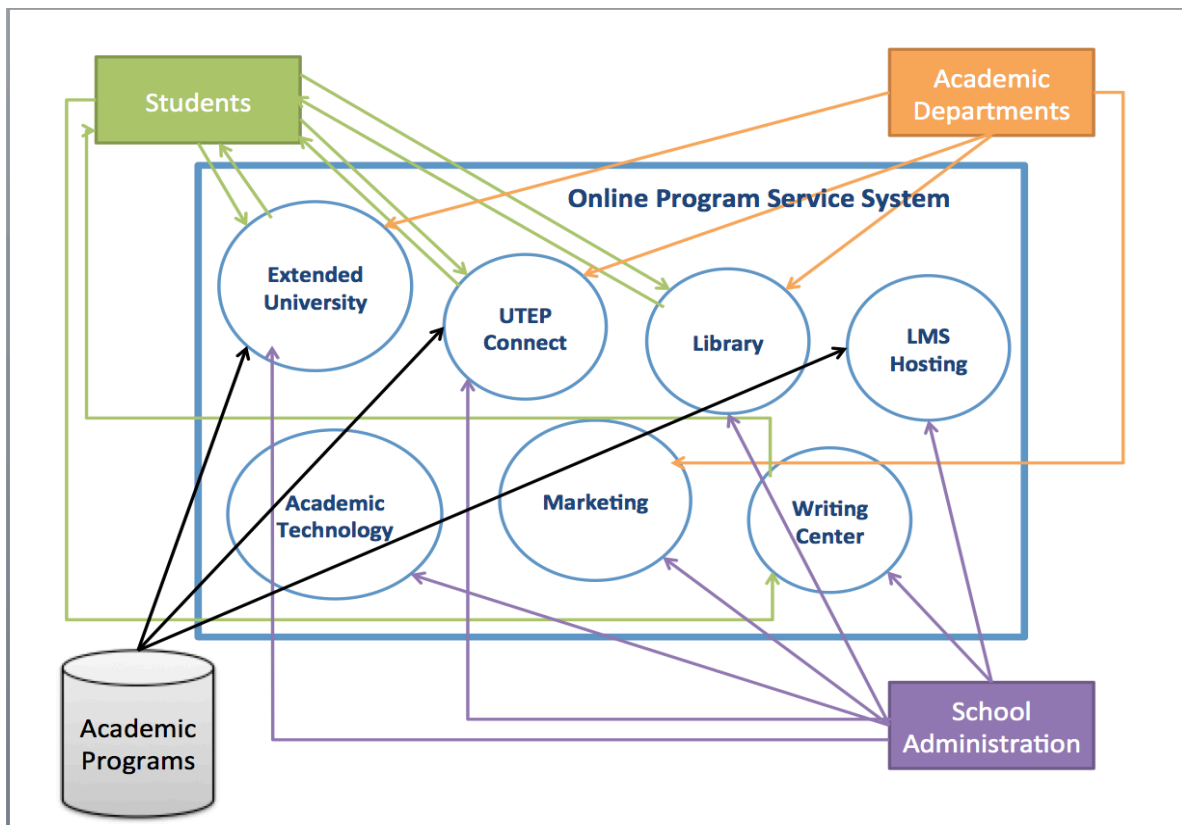
As part of the Library services, students can access a service called LibGuide, which is a virtual place where they can find databases, readings, online resources and journals of the specific



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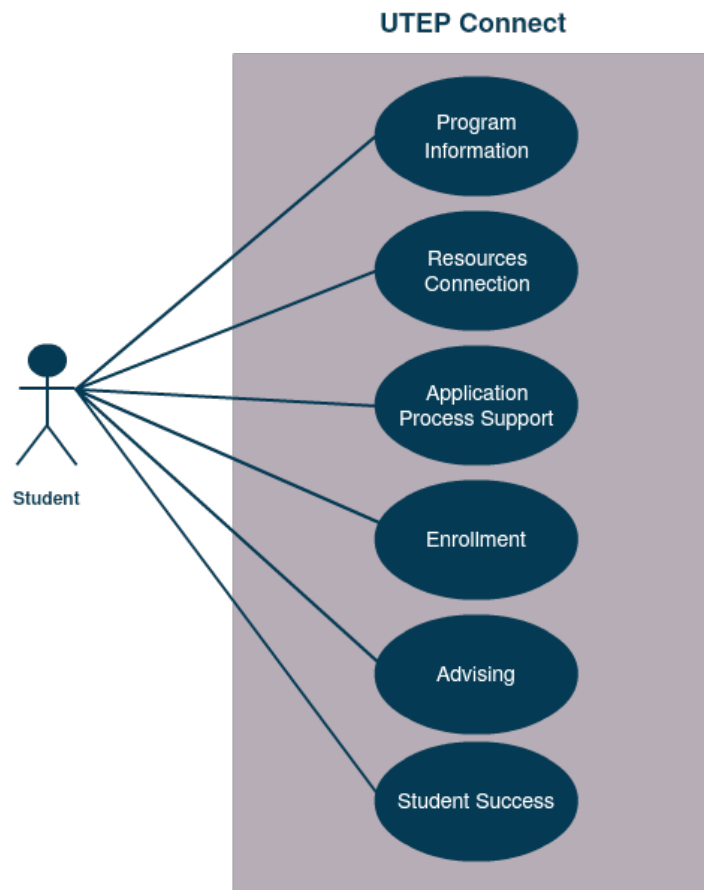
course they are taking. Another service offered for the online course students is a virtual communication link called Ask a Librarian, where students can contact a librarian to assist them with any problem they may have regarding the library services, for example whenever they cannot find an article or a book online.

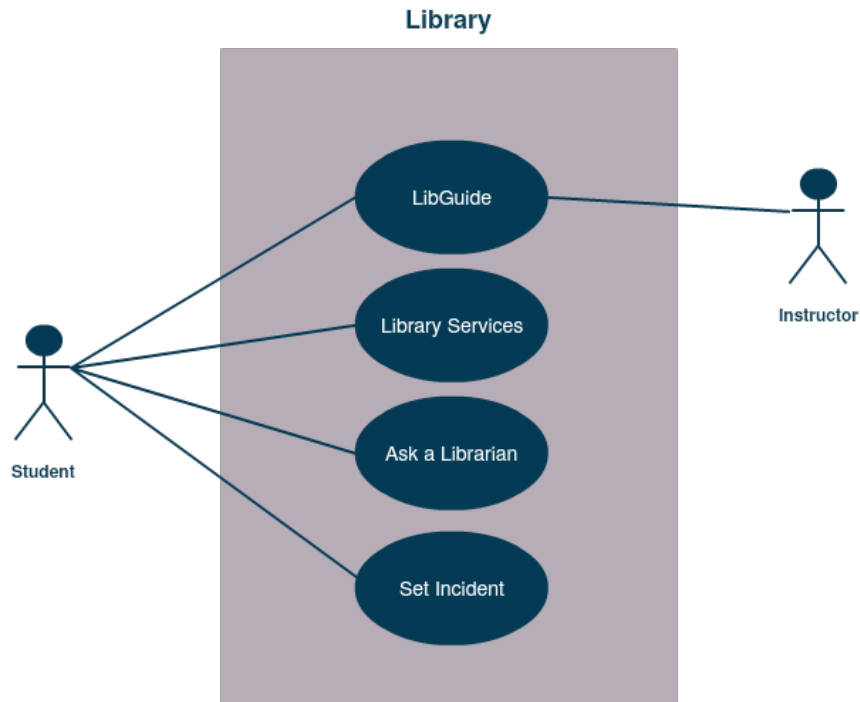
The following diagram is the External Entities to System Components diagram. It connects all the external entities to the subsystems, the lines indicate the exchanges occurring between the elements. For this particular case the two components the team was focusing on were UTEP Connect and the Library.





The following diagrams are known as Use Cases. A use case is a list of actions or event steps, typically defining the interactions between an actor and a system, to achieve a goal. For this service system two use cases were created, one for UTEP Connect and one for the Library.





Actors:

Students (S): Any person that inquires, applies, and/or enrolls in the University Online Program.

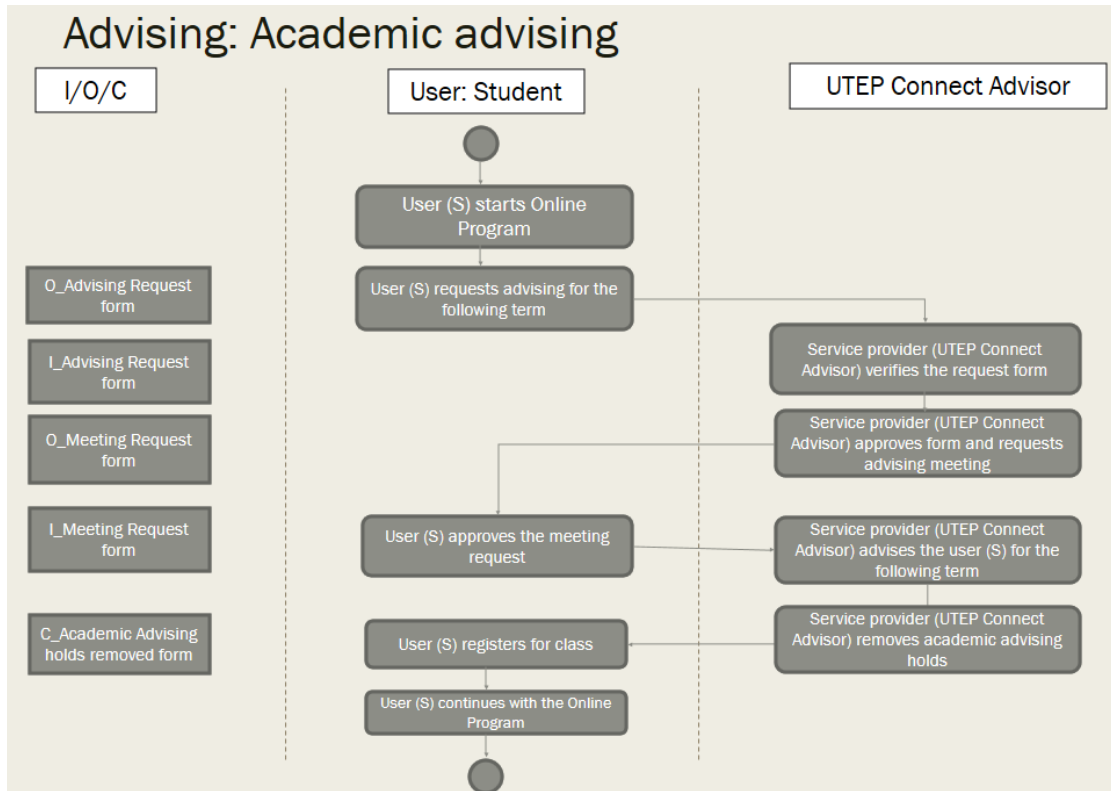
Instructors (I): The person in charge of teaching a course.

From the Use Cases the Operational Scenarios are now derived. Each one contains a series of steps that need to be performed in order to provide the service. The Operational Scenarios can be presented as flow diagrams and in turn these can be enhanced by Activity Diagrams.

The following diagrams are Activity Diagrams for one service of each service system.

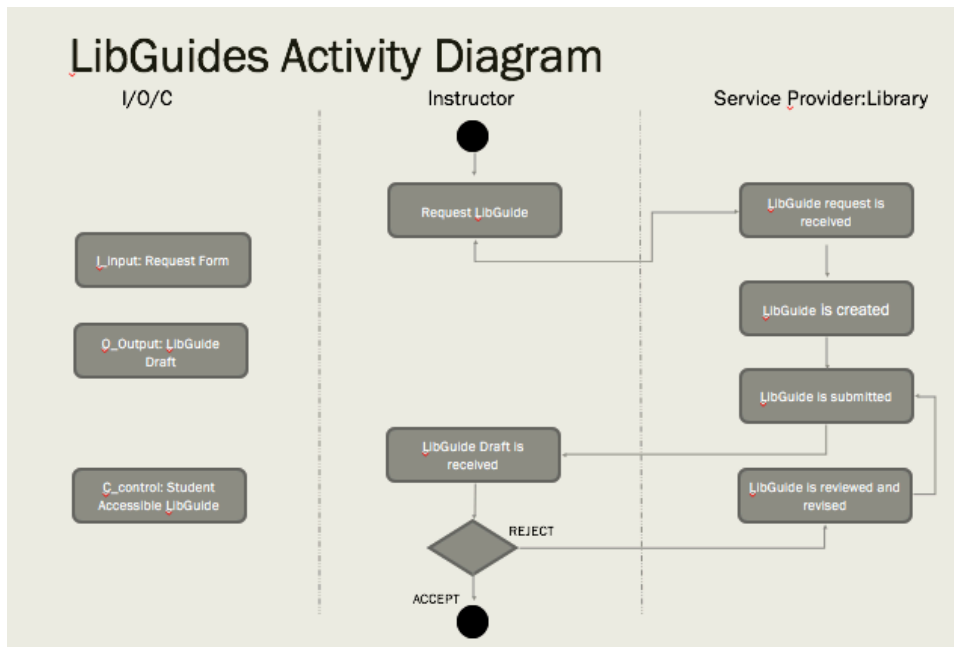


Service System: UTEP Connect
Service: Advising





Service System: Library
Service: LibGuides

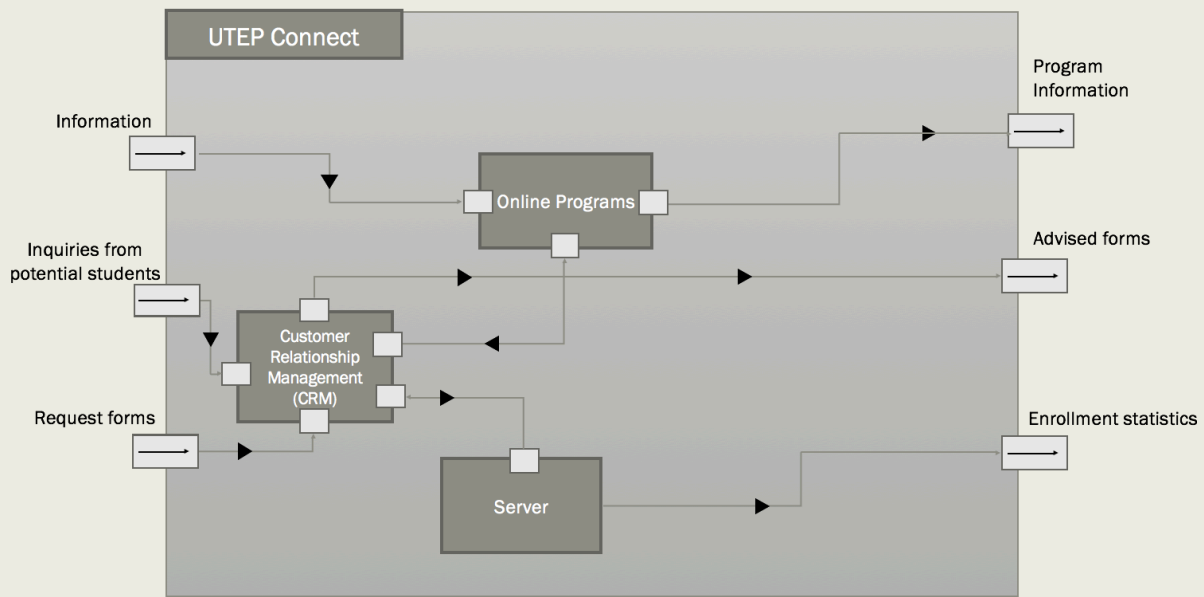


The following diagrams are Internal Block Diagrams. They are a visual representation of the



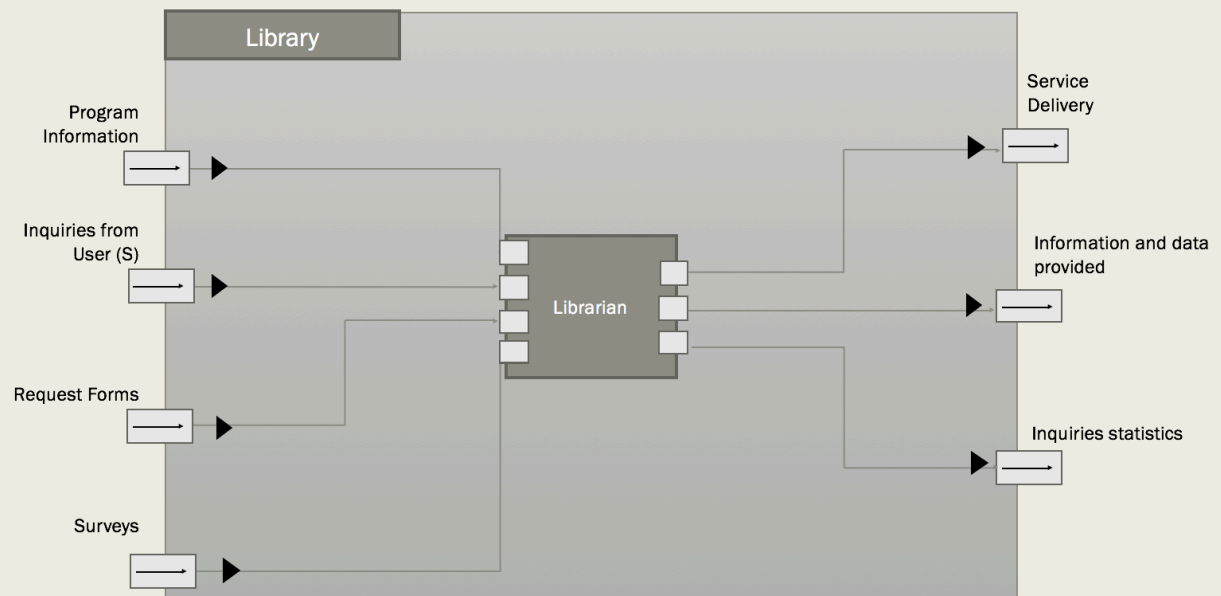
inner workings of the system.

UTEP Connect Internal Block Diagram





Library Internal Block Diagram



PROJECT OUTCOMES

The deliverable of this project seeks to provide more clarity on the interaction and impact of UTEP Connect and the Library as part of the Online Program Service System. Moreover, through the development of this project we attempt to standardize and help to drive process improvements in the online education service arena.

One of the success factors for managing project quality is constant review. The plan, do, evaluate, act concept is key to achieving project quality. Throughout the development of this project we constantly conducted reviews against the time schedule and the different system specification elements.

Overall, we believe the review mechanism we had in place helped us to take corrective action on issues identified early in the development phase as opposed to later, when it would have been more complex and time consuming. Addressing inconsistencies right away is always best

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and we believe it worked for us and the success of the project.

By the same token, thorough and regular reviews allowed us to inadvertently learn and improve other skills. The individuals drafting the initial copies of the different project phases were not reviewing their own work but someone else in the team. Why? We believe a second set of eyes is able to catch defects easier and faster than the one that injected them. This method not only made our reviews faster but also helped in driving discussions, which in turn enhanced our communication skills as well as our ability to resolve problems as a team.

What impact had this class in your job?

Moreover, this hands on experience opportunity allowed us to think of ways to use and implement concepts covered in this class outside the classroom. Everyone in the team has a different area of expertise, yet we were all able to apply a variety of verification approaches such as checklists and peer reviews. In general, this program encouraged us to apply concepts and build a systems engineering foundation at our full time jobs.

MASTERS OF SCIENCE IN SYSTEM ENGINEERING PROGRAM ASSESSMENT

Studying the Masters in Systems Engineering has prepared us to use system processes and frameworks to define, develop, implement, and test complex systems. We have learned to create and read requirements for a system and the importance of testing a system. We have had the opportunity to interact with real customers for architecting, designing and engineering large and complex systems. During the two-year program we also had the opportunity to attend summer internships. Mr. Oscar Salcedo has great connections with international and national companies looking for interns. If you are planning to get an internship he is the right person to contact.

Overall, the MSSE program is a very complete program where you will learn techniques and tools associated with requirement analysis and definition; verification and validation methods during development; and technical management to support team structures, time and cost estimates and cost control, resource allocation and resource management.