

Microeconomics Online Learning
Through
Web Application

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Microeconomics Online Learning Through Web Application

by

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DEDICATION

To my family and friends for their encouragement and support in very step of my life

ABSTRACT

Faculty of Economics and Administrative Science

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Technology has become a significant part of our daily lives and humans are strongly connected to it. It has a great impact in everyone by helping us in our daily work, in our communication, in school, entertainment and many other things.[1] Everybody seems to be in touch with technology, also students who need to find different kind of information related to their school assignments or extending their knowledge. Some student or even adults who want to learn something new for taking extra knowledge or just for fun may be able to use online learning, which is an electronic learning by the use of a computer or even a mobile phone. This seems a great opportunity to different people of any age who want to take extra courses and at the same time doing something else, but is most appropriate and with a great help to the people who don't have the capability to walk.

During this thesis, has been done a full analyze, structure and design of a microeconomics web application for online learning. The main focus is to make this web system more flexible in order to keep the end-user as top priority. The system will enable the admin to

put or change information at any time and any place, while the students/guests will be able to view microeconomics information, test their knowledge and submit different assignments through email. The purpose of the system is to help students find microeconomics much easier and understandable. The students can access the system through a log in form, using

a web-page interface.

It was discovered, during the analyze and design, that also teachers may use and access the system differently from the admin, which is and will remain the system maintainer. But the implementation part related to these user has been let as future work. The phase of the implementation was focused only in the main member whose the student/guest.

Fakulteti I ekonomisë dhe Shkencave Sociale

Udhëhëqës: Igli Hakrama

Teknologjia është bërë një pjesë e rëndësishme e jetës sonë të përditshme dhe ne si qënië njerzorë jemi shumë të lidhur me te. Ajo ka një ndikim tek te gjithë duke na ndihmuar në punët tona të përditshme, në komunikim, në shkollë, në zbavitje dhe në shumë gjëra të tjera. [1] Gjithkush është në përdorim të teknologjisë , kjo përfshin edhe studentët të cilët kanë nevojë të gjejnë informacionë të ndryshme në lidhje me çështje të ndryshme mësimore gjithashtu dhe për zgjerim njohurish. Studentët por edhe të riturit të cilët duan të mësojnë dicka të re, të shtojnë njohuritë apo qoftë edhe për të marrë një informacion sado të pakët apo thjesht për zbavitje mund të përdorin mësimet online. Mësimdhenia online është një mënyrë e elektronikë e të dhënit mësim nëpërmjet përdorimit të kompjuterave apo telefonave. Kjo është një mundësi mjaft e mirë për persona të të gjitha moshave dhe kategorive të cilët në pamundësi për të kapur oraret e mësimdhenies nëpër universitete mund të përdorin faqet të ndryshme online të cilat u japin të njëjtat mundësi sikur të ishin në shkollë. Mësimdhenia online është dicka tejet e rëndësishme për personat të cilët nuk kanë mundësi ekonomike për të ndjekur shkollën osë thejshat kanë probleme me përshtatjen me individë të ndryshëm, por mbi të gjitha është një mundësi tejet e rëndësishme për personat me pamundësi për të ecur.

Përgjatë tezës është bërë një analizim, strukturim dhe implementim i plotë për Microeconomics Web Application për mësim online dhe fokusimi kryesor është në bërjen e kësaj faqeje interneti sa më shumë fleksible. Sistemi I lejon administratorit të ndryshojë të

dhënat në cdo kohë ndërkohë që studentët do të jenë të aftë të shohin informacionet mikroekonomike gjithashtu mund të zhvillojnë dhe teste të ndryshme të cilat janë të disponueshme tek faqja e internetit.

U zbulua gjatë analizave dhe implementimeve se gjithashtu edhe profesorët mund të aksesojnë sistemin në një mënyrë krejt ndryshe nga administratori i cili mirëmban sistemin. Por implementimi i kësaj pjese mbetet pjesë e punës në vazhdim ose në të ardhmen. Faza e implementimit është e fokusuar vetëm tek studentet.

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I would like to express my deepest respect and gratefulness to all of the professors, whom I had the privilege and honor to know through these three years of University. Inside my thesis and lines of code it's the knowledge that I have gained from each professor. I would like to thank you Mrs.Alba Kruja and Mr.Mukremin Ozkul for their support and advices during the my bachelor studies.

And at last, I would like to give a special thank you to my supervisor Mr.Igli Hakrama ,for all the support and every and each advise that he gave to me during my thesis work and especially because being able anytime that I had problems and questions and also for his capability to make me work harder. Thank You!

DECLARATION

I declare that the thesis is based on my original work and that it has not been previously submitted for any other degree at Epoka University or other institutions.

Elona Medolli

8 June 2014

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LIST OF NOTATIONS

App- short word used for Application

ICT(IT) – Information and communication technology

MySQL- My structured Query Language

HTML- HyperText Markup Language

XML-Extensible Markup Language

PHP- HyperText Processor

Chapter 1

Introduction

Nowadays it is found that technology is an important asset in our lives. It's an area that grows really fast and has a great impact in the people and companies life. It's main purpose is to help humankind that aid in solving problems and extending human capabilities. Humans use technology for different reasons and purposes and one of them is to share or distribute the information among each other using internet. This information may be an essay, a discovery, a research paper, a video; it can be everything and by the use of internet all the people in the world are able to view it. But, there is no possibility to view these information if we there are no web sites.[7]

Generally, a web site is a collection of different web pages representing a business, a company or just an idea. These web sites are used to store different kind of information and are used for different purposes that may include marketing, selling and buying, communicating, sharing knowledge and also learning and are accessed every day 24/7 from different people of any ages. We can divide people into different categories and one of them includes the students. The students may require different information but they can also learn online by the use of online learning web applications.[8]

Online learning refers to the use of computing and telecommunication technologies in education. In other words, online learning or e-learning is a technique to deliver educational information through internet and access it from a computer or other technological devices instead of going to a class. So, as long as you have internet access the class can be any place. You may learn or work in the comfort of your home, have no need to

travel to the college and pay fees such as parking or babysitting and you may be able to fit the courses with your family or work life because you'll have access 24/7 to the course.[7]

Literature Review

As it's mentioned even before, by the passing of each day the usage and importance of technology increases exponentially as it evolves day by day. An important section of technology are also online learning web applications which nowadays are becoming more popular and are increasing in number. [2] These websites are more useful for students that don't have the capability to go to collages(those who can not walk) giving an online education but they are also useful to every student that don't like the interaction with other students or just don't have time to go and follow collage course schedules. This chapter provides an overview of key concepts found in the field of online learning web applications as well as the effect of using online learning in our daily life.[7]

2.1 Impact of Information Technology

Human beings ,since the very beginning have count on machines for solving and handling our problems and work. Tools for almost everything are being invented; tools for playing, calculating, traveling, communicating and even for fighting. Each of these has become to light by the human desire for seeking, learning, improving and benefiting from resources by which are surrounded. Information Technology(ICT) is part of technological tools and it's success and impact has been exponentially increasing. It has become a really important tool especially for companies and organizations. The success and the failure of a company is strongly related to the way that ICT is used in order to manage the information or different tasks. We can say that human society will be improved by using the information and communication technologies and it will extend its knowledge further more.[4]

2.4 Web Applications

Since the advent of internet, every aspect of our life has become easier. There can be done shopping, selling ,advertising and many other activities in only a few minutes. The new technology has made it possible to interact business and people online which has increased the number of web applications(websites). A web application refers to an program that runs inside a web browser and is accessed through network connection using HTTP but they can also run without the web browser. The development of a web application refers to getting the website in the way that is required and desired. There exist a different bunch of companies so the requirements also differ from web site to web site. What really makes special a web site is the way that is designed and its affect to the end user. [5]

The internet is used and browsed online everyday, so each time it's browsed it's opened a website and view it's information. Web applications can be used for different purposes; they can be used for entertainment,marketing, shopping and selling,making money,communicating and learning.[5] But not all web sites include appropriate or legal information, some web sites are not used for good purposes, instead they may have been created to steal people's money , passwords and some include different kinds of viruses. Although the online security for surfing different web sites has been increased, some of these web sites are still running online.

2.3 Education and IT

As it is mentioned even in the previous sections, the influence of information technology is present everywhere in the human life. It has great importance in business success, hospitals, personal usage, entertainment and workplace. Even the educational area has been infected by the power of information technology. IT increases the students activities and it also contributes in a constructive learning. By the usage of its facilities the students can search online and find extensive amount of information related to different necessary topic and also follow different courses online provided by some universities. But beside this, there have been built a lot of platforms for professors and students. The major part of these platforms are web based thanks to the possibilities for better interaction and facilities provided by the web. [6]The students can access information online regarding to their courses, grades, attendance while the professors can now get rid of old graded books and update and maintain the students data online. To conclude we can say that the usage of information and communication technologies increases the education system efficiency and performance.

2.4 Educational Approach

The range of online learning replacing other learning and teaching methods is variable. There exist a multiplicity of descriptive terms which have been engaged to categorize the range to which technology is used. We can take into considerations 'hybrid learning' which refers to classrooms aids and laptops or to the class time reduction but not elimination and replacement with online learning.[8]

2.4.1 Synchronous and Asynchronous

Online learning may be synchronous or asynchronous. A synchronous learning happens in real-time which means that all participants should interact at the same time. It includes the information exchange with one or more participants at the same period of time, these involves Skype conversation, virtual classrooms or chat rooms.

In asynchronous learning the participants are independently from each other which mean that they can exchange information without being necessary for other participants to be involved at the same time. It involves emails , discussion boards,blogs, web-supported textbooks, wikis, video courses, audio and social networks.[9]

2.4.2 Linear Learning

Linear learning or Computer-based learning involves the self-based online learning activities which are distributed on a computer or other devices such as a smart-phone or tablet. The content is usually delivered via CD-ROM and the content is presented in a linear fashion like reading an online book, that's why CBL is more often used for static process teaching. [9] This learning is similar to web based learning and the main difference is that the content of WBL is delivered via internet by the use of web browser. CBL can be seen as a good option for printing learning materials since rich media including animations and videos can be imprinted easily to increase learning.[9]

2.4.3 Collaborative Learning

Collaborative learning (CL) in concept is similar to e-learning 2.0 and network collaborative learning, it refers to the use of instructional methods that are made in purpose of encouraging students to work together on different learning tasks. Here the instructor is the main source of information which include knowledge and skills and uses blogs, wikis, Google Docs and Drop-box to distribute the information.[10] With the Web 2.0 advances it has become more easy to share information between multiple people in a network and the uses has increased. The use of Web 2.0 in the classrooms helps the teachers and the students to collaborate with each other, to share and discuss ideas and promote information.

2.4.3.1 Classroom 2.0

Classroom 2.0 involves the online multi-user virtual environments which connects different schools across different geographical frontiers. In other words, it allows schools from different places to communicate and interact with each other.[10] In these way they exchange knowledge and different cultures among each other.

2.4.3.2 E-learning 2.0

This is a type of CL system which was developed with the help of Web 2.0. E-learning 2.0 includes the uses of different blogs or wikis by which teachers and students exchange information. [11]This is a kind of a secondary social learning life, which assumes that knowledge is socially constructed and distributed.

2.5 Technology

Different types of technologies are used to distribute the courses information online. [12]Most of e-learning uses a combination of these methods such are e-Portfolios, virtual classrooms, blogs and collaborative software. However some of the main methods used to facilitate e-learning are listed below:

- Audio(teaching through radios)
- Video(these allows teachers to distribute information to student that just want to learn by seeing the material. These videos can be uploaded online instead of relying on DVDs)
- Computers,tablets and mobile devices(these allow students and teachers to access the web sites and other programs such as for example Microsoft Word).
- Blogging(blogs permits students and teachers to post their ideas and comments on a web site).

- Webcams(the web cams have had a great impact in the creation of virtual classroom. Through web cams the student may be able to be virtually in a class although in a different continent,state or place).

2.6 Advantages and Disadvantages

As any other things even e-learning has its own advantages and disadvantages. For a lot of student, e-learning is the most appropriate way to attend a degree in higher education. Most of these students are attracted to the method of self-paced learning to attain their degree. E-learning take a great advantage to the people not being able to walk or not having time to attend the class hours because of other occupation. However e-learning is a good way for saving time, money and also different conflicts found in a real classrooms. It may a way to avoid stress. But online learning narrows the possibilities to learn practice as well as increases the possibility to cheat during different exams. That's why e-learning is a good for learning theory but not a good for practicing things and even can make the students not having a good social life in reality as far as they are only concentrated in a virtual social life.

Chapter 3

Software Analysis And Design

In the previous chapter the importance of the online learning was brought into attention. Both sides, user or teacher have the necessity to find online fair and good information according to different requirements or courses subjects. For these purpose I thought to construct an online web application for online learning of microeconomics.

This website will help students to easily understand some of the main microeconomics topics, especially graphs. They will be able to see themselves how the curves in graphs may change and also test their knowledge with some self quizzes about microeconomics topics covered in the sections. Some microeconomics research papers will be provided for the students just to help them understand micro further and also some assignments are going to be posted online together with the deadlines and email address where to submit it.

Each user/student will have a profile, user-name, password and other privileges. Each graph will have the x and y-axis, and the formula stored in the database and will be accessed by the user/student which can manipulate the data and read the output. Simple guests can sign up and create a profile by giving details such as name, surname, email address and school name. The information is confirmed and verified by the administrator. There will also be a back up server that every 24hr will back up the system, in order to protect the data.

3.1 Functional Requirements

3.1.1 Administrator Functionalities:

a) Administrator Log in:

The administrator has full privileges that allow him to access directly the database and can log in with the user-name admin and a password.

b) Test System Functionality.

The admin test all the system functionality when the system is updated.

c) Edit,add or remove the graph, data and inside contents.

d) Change User Privileges.

3.1.2 Student Functionality:

a) Student log in

b) View account information

c) Search data

d) View graphs and explanations

e) Edit some graphs

f) View research papers and assignments

g) Take self quizzes

h) Contact administrator

i) Edit Personal Information

3.1.3 Guest Functionality:

a) Sign up/Register

3.2 Non-Functional Requirements:

3.2.1 *Product Requirements:*

a. Reliability

- Multiple requests should be handled by the system at the same time
- The backup server should be employed when the main server is down

b. Usability

- For beginners the Graphical User Interface(GUI) should be easy to understand and friendly
- Must be available a demonstration of the usage
- Must be available a help menu with details that explains all functionality.
- The undo button should be available for most of the actions.
- There must be relevant error messages on how to proceed/continue.

c. Performance

- The response time of the server must be under 2 seconds

d Security

- The database can not be accessed by the user/guest.
- After 5 times of entering a wrong password or user-name a use verification code is sent to the email address.

3.2.2 Organizational Requirements

- a) Users of Microeconomics Educational Tool(MET) shall authenticate themselves using a user-name,e-mail and password
- b) A reset code is sent to the user/student email if the user forget the password or user-name.

3.2.3 External Requirements

- a) Before submitting signing up for a student account and user-name the guest is asked to confirm the MET policy terms
- b) The user information's are only used for completing the system functionality , they are not published anywhere.

3.3 User Profile

This section will be dedicated to two of the main actors of the application; the student and the administrator. There will be explained the use case diagrams related to these two actors together with the functionality that each of them will have respectively. The rest of diagrams related to further work in the future are going to be attached under Appendix 1. The student (figure 1) is one of the main factors who will use this web application and the most important parts of a student are the registration, viewing different topics, research papers and assignments, taking self quizzes, view and edit account information and also contacting the administrator. He/She won't be able to change the assignments contents and deadlines.

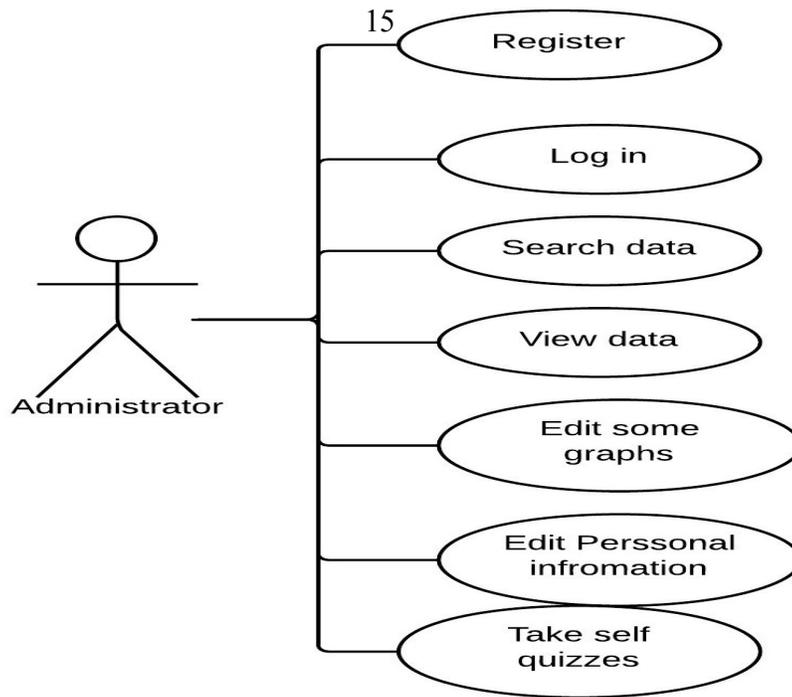


Figure 1 Student Use Case

The next main actor is the administrator (figure 2), who's the one that is related to the entire data maintenance. The administrator can test system updates, manage user privileges, edit add or remove data from database and HTML code.

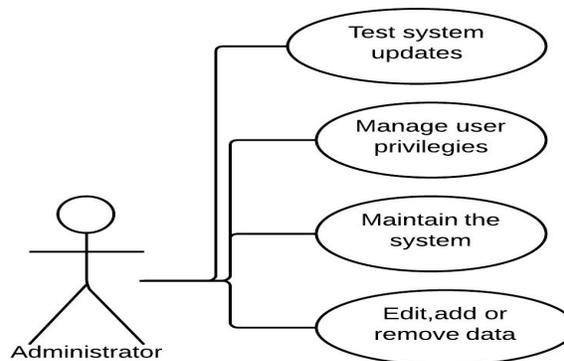


Figure 2 Admin Use Case

3.5 System Design

Here we focus in some of the main software engineering diagrams of microeconomics web site. The rest of the diagrams for a future work will be available at the Appendix A section.

Activity diagram shown in Figure 3 provides the main student activities in the web system while using the application. The user will access the website only by having internet access and will be able to open the web site in a web browser.

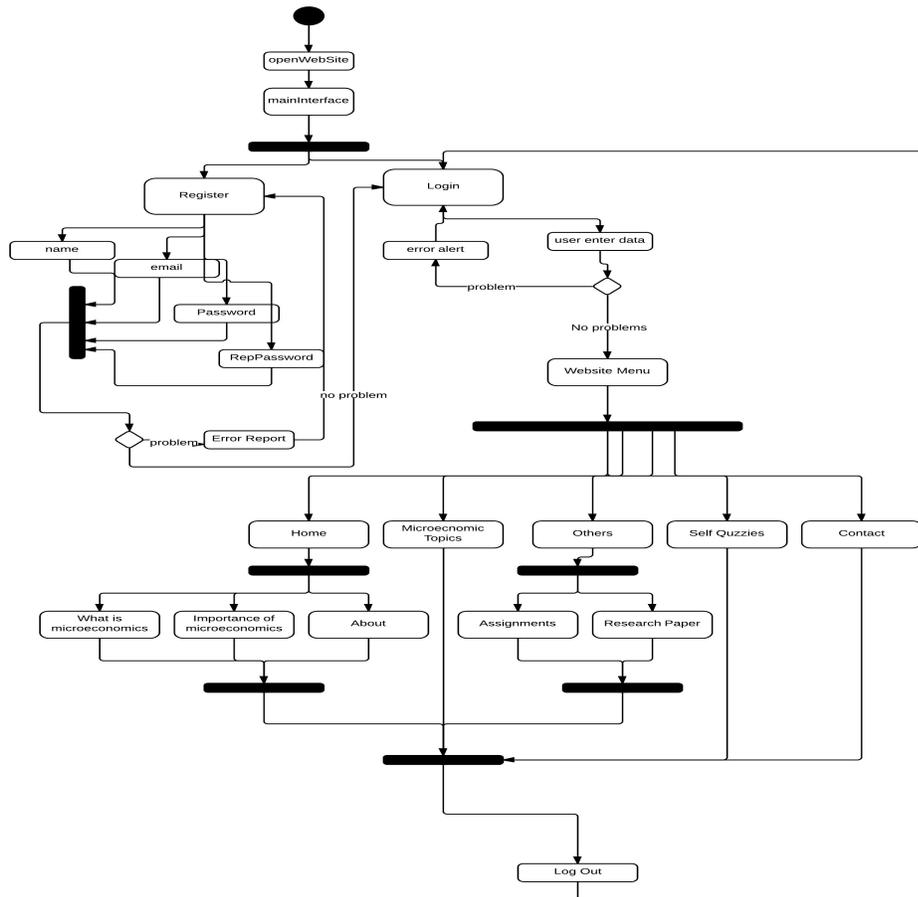


Figure 3 Student activity Diagram

Class Diagram

In the Figure 7 above, it is presented a general view of system classes and how they are going to interact with one another. The main classes are Student, Session and Graph. While updateGraphs and updateStudent are the classes that realize the connection between main classes.

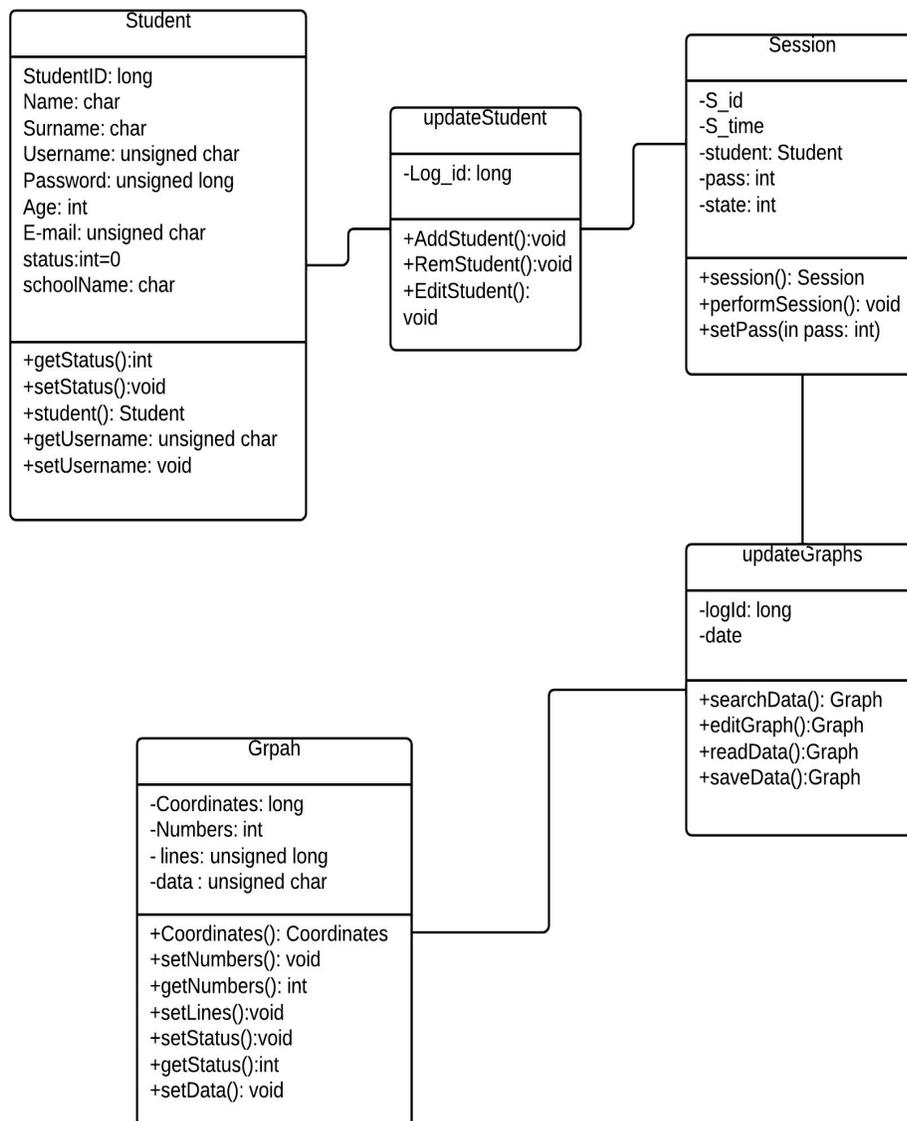


Figure 4 Class Diagram

Collaboration Diagram

This diagram (figure 5) shows the co-operations between different objects for performing tasks through methods.

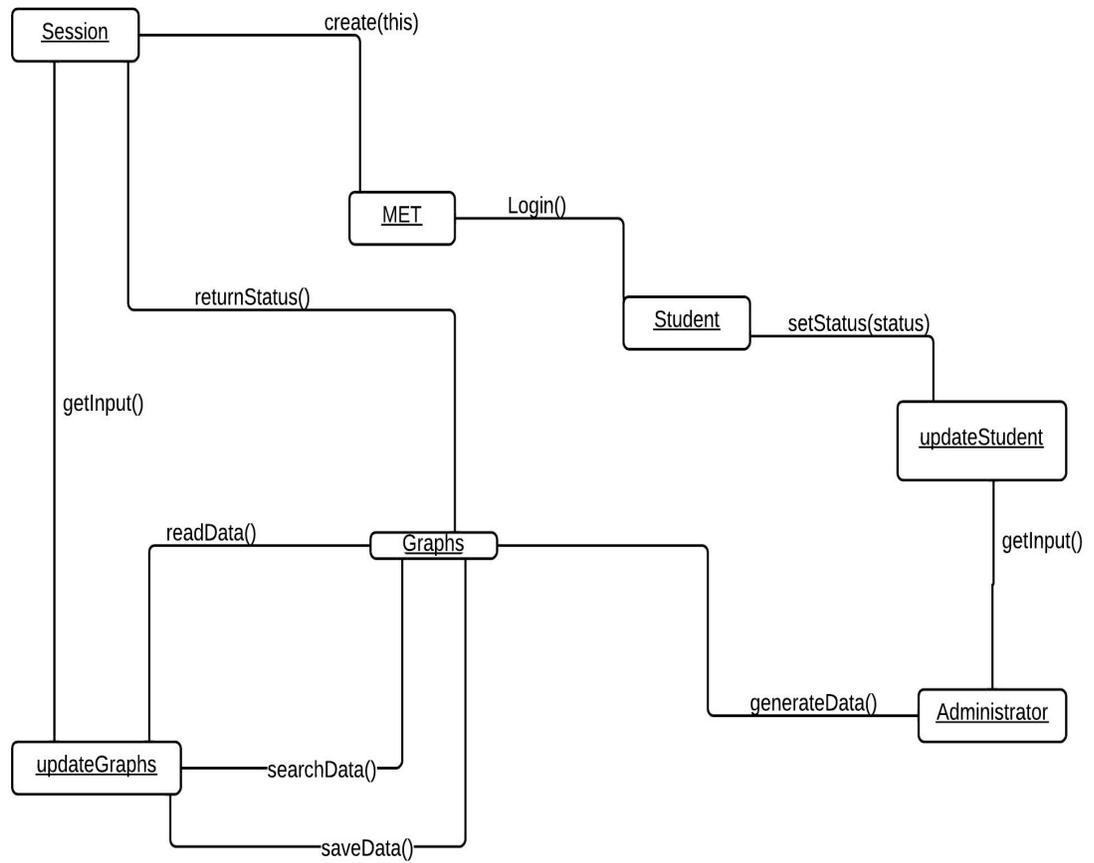


Figure 5 Collaboration Diagram

Component Diagram:

This models the system architecture(interfaces between high-level software components). Thus it also shows the privileges and the roles of different users.

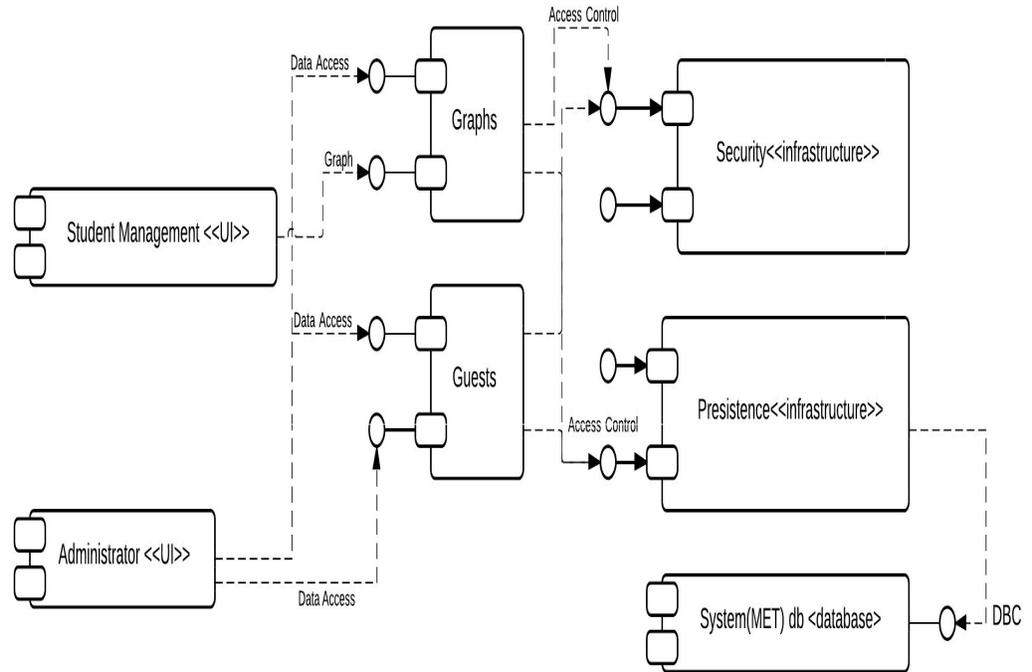


Figure 6 Component Diagram

IMPLEMENTATION

Nowadays we are part of a world where people are getting so close more and more to technology and new inventions. We require for things to be done in a fast and easy way. Every institution is in touch with technology, even schools where students and everybody working there use technology tools. But not all the students have the opportunity to go to colleges , for different reasons that are mentioned even before. Selecting the most proper technologies it's something really important in order to solve this issue represented in the thesis. In this chapter we will provide information according to methods and technologies that are used during the phase of microeconomics online learning web site implementation.

Technologies

As we mentioned even before, choosing the proper technologies place a very important role for the system implementation. In order to give life to the web application for Microeconomics Online Learning it's required to use programming languages such as PHP, HTML, MySQL, XML and JavaScript. Each of these programming languages should not be used separated from one another, because it's something which brings no results and no benefits. MySQL databases are combined with PHP properties and these combination is something that's strongly required because we can not connect to our databases without PHP functions. XML, HTML and Java-scripts files are strongly related with one another, but in order to get the web site done properly we should combine each of these pieces, all the files, together.

Database Structuring

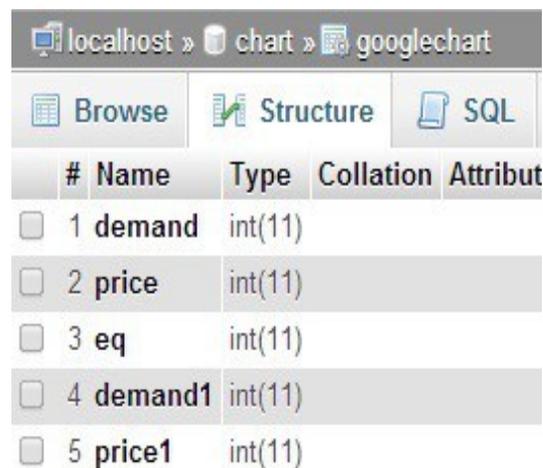
Databases store the most important parts of the application information and data which makes databases the most important part of the today's system. This makes the database structuring a part which should be done carefully otherwise the whole system performance and functionality will be affected.

In the figures below it is shown an overview of databases used so far in the system.



#	Name	Type
<input type="checkbox"/> 1	id	int(11)
<input type="checkbox"/> 2	name	varchar(25)
<input type="checkbox"/> 3	surname	varchar(25)
<input type="checkbox"/> 4	username	varchar(25)
<input type="checkbox"/> 5	email	varchar(30)
<input type="checkbox"/> 6	password	varchar(100)
<input type="checkbox"/> 7	date	date
<input type="checkbox"/> 8	randnumber	varchar(20)
<input type="checkbox"/> 9	activ	tinyint(1)

Figure 7



#	Name	Type	Collation	Attribut
<input type="checkbox"/> 1	demand	int(11)		
<input type="checkbox"/> 2	price	int(11)		
<input type="checkbox"/> 3	eq	int(11)		
<input type="checkbox"/> 4	demand1	int(11)		
<input type="checkbox"/> 5	price1	int(11)		

Figure 8

These are the two main databases used in the system the first one (figure nr.7) is for storing the user data such as name, password and email while the second one (figure,nr.8) is for storing some of the graph information. There will be even two more databases one for the searching function and the other for storing the quiz results. Beside the database structuring and designing it's also important to be careful with the use of queries. I have learned from my experience that even placing AND condition in the wrong way inside the WHERE statement effects the proper functionality of the system.

Chapter 5

CONCLUSION AND RECOMMANDATION FOR FUTURE WORK

Nowadays technology it's an area that has been grown really fast and has a great impact in the humans life. It's main purpose is to help humankind that aid in solving problems and extending human capabilities. Everybody seems to be in touch with technology , especially students who need to find different kind of information related to their school assignments or just for general knowledge. But some students are not capable to go to schools and some of them don't like interaction with other people or don't have time to go to collages. For this reason we came to a solution, the usage of online learning.

Online learning is an electronic learning by the use of a computer or even a mobile phone. This system is useful for anyone who wants to learn no matter the age or state or race, everybody can use the system . However, online studying is not always a suitable way for taking courses. Some students do not find it convenient to study independently but has the necessity of face to face interaction with the course teacher and students. And in some cases is really necessary that students to be tested under strict exam conditions and also is necessary for students to practice and not only learn theory, that's why online learning is a good way for students to learn but it also should be combined with physical practice and interaction.

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APPENDIX A

DIAGRAMS

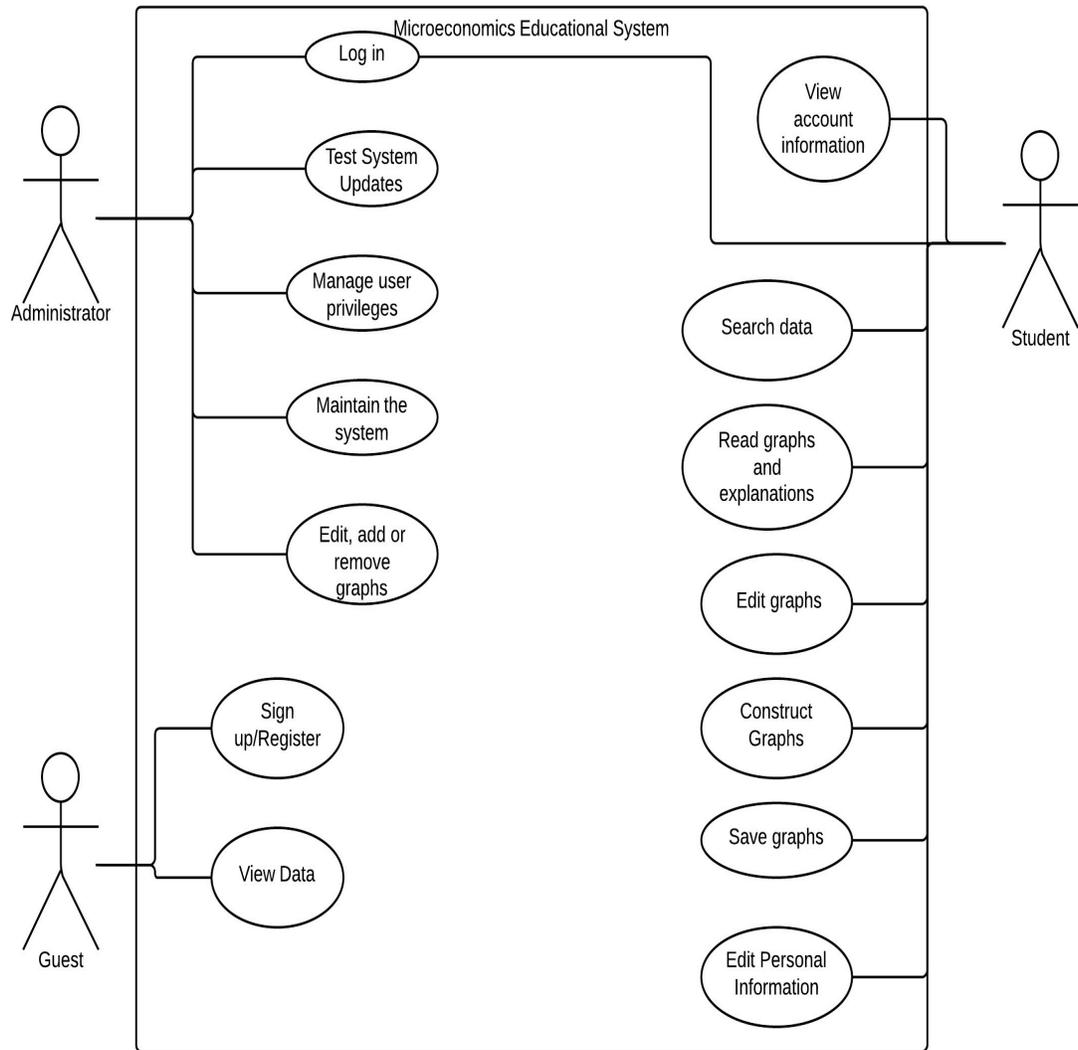


Figure 9 Use case Diagram

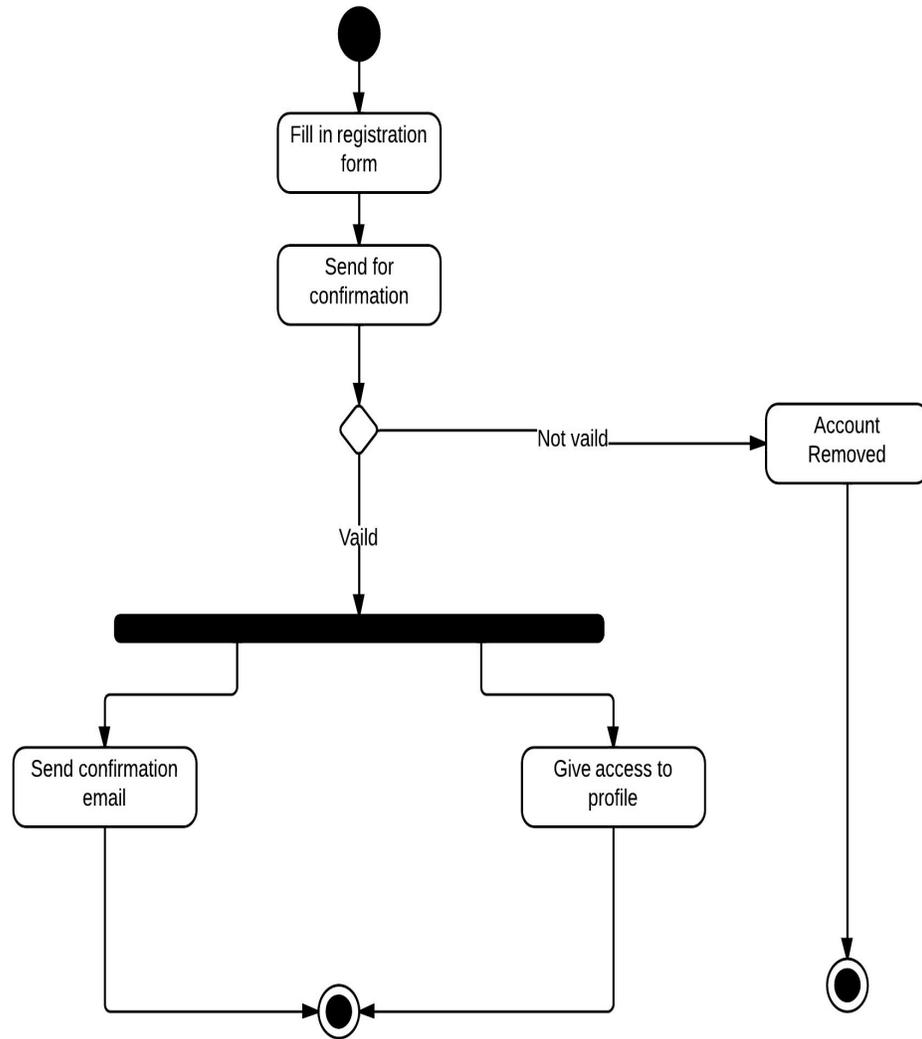


Figure 10.Registration Activity

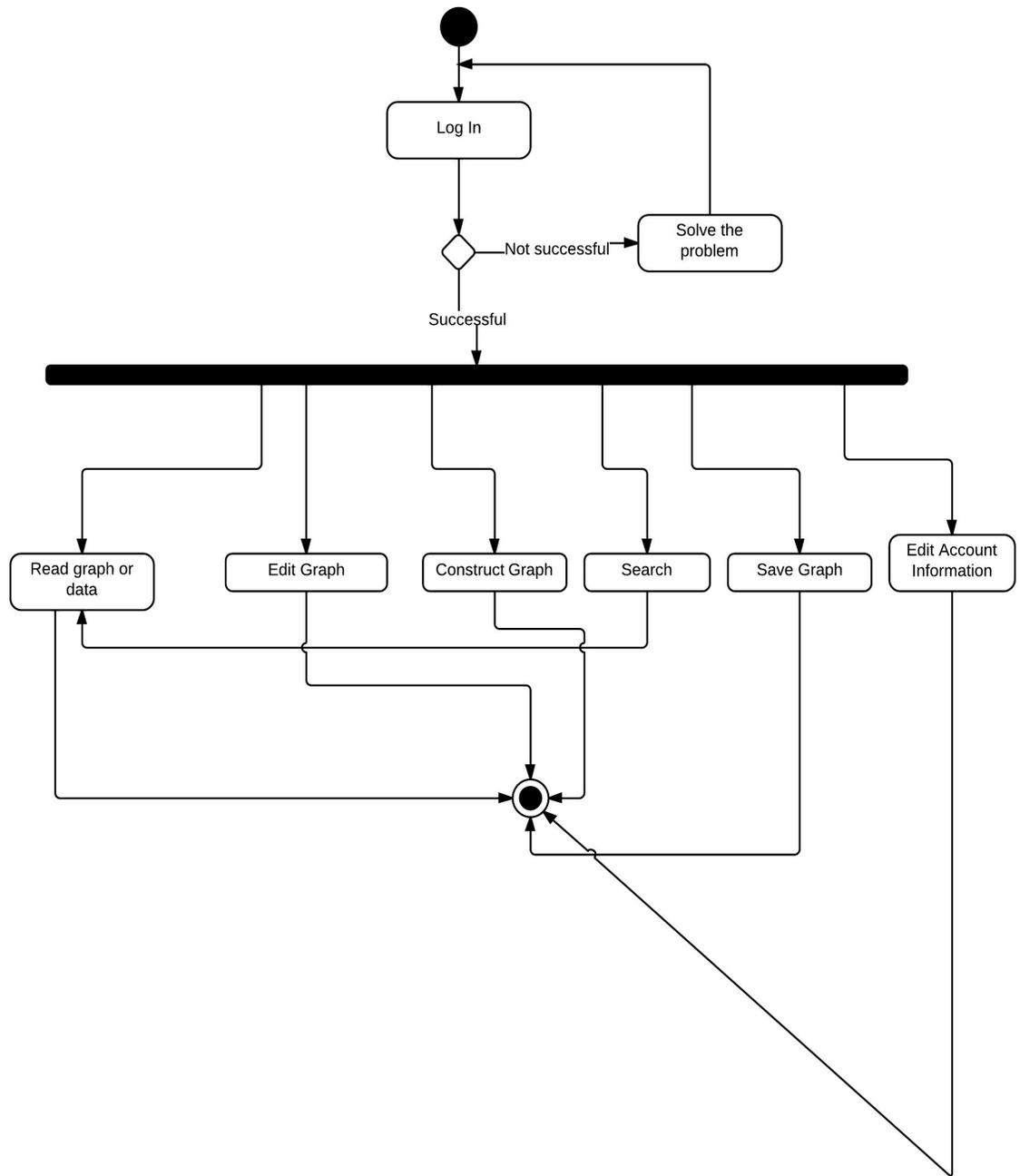


Figure 11.Student Activity

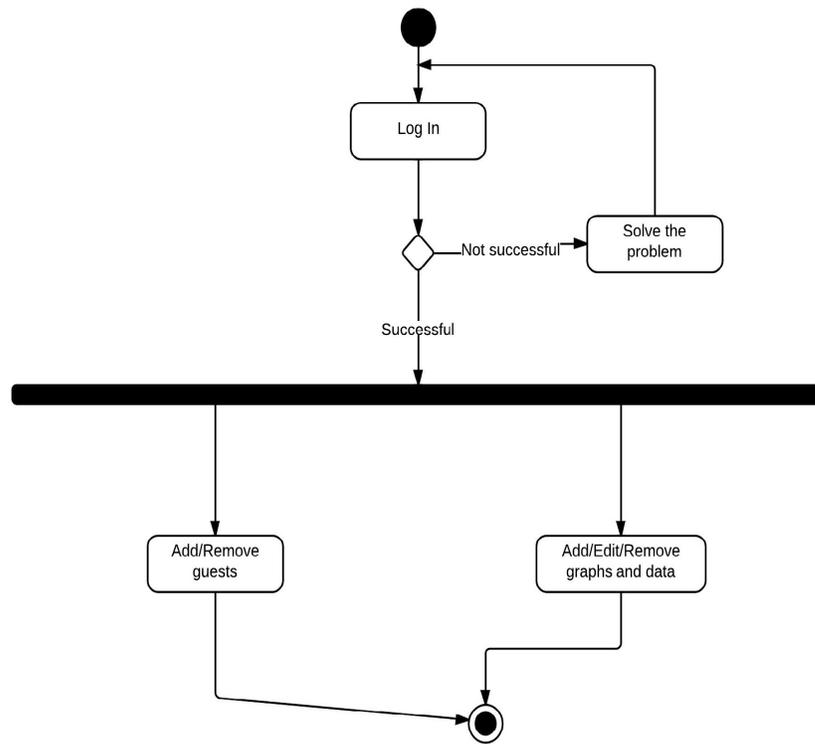


Figure 12. Administrator Activity

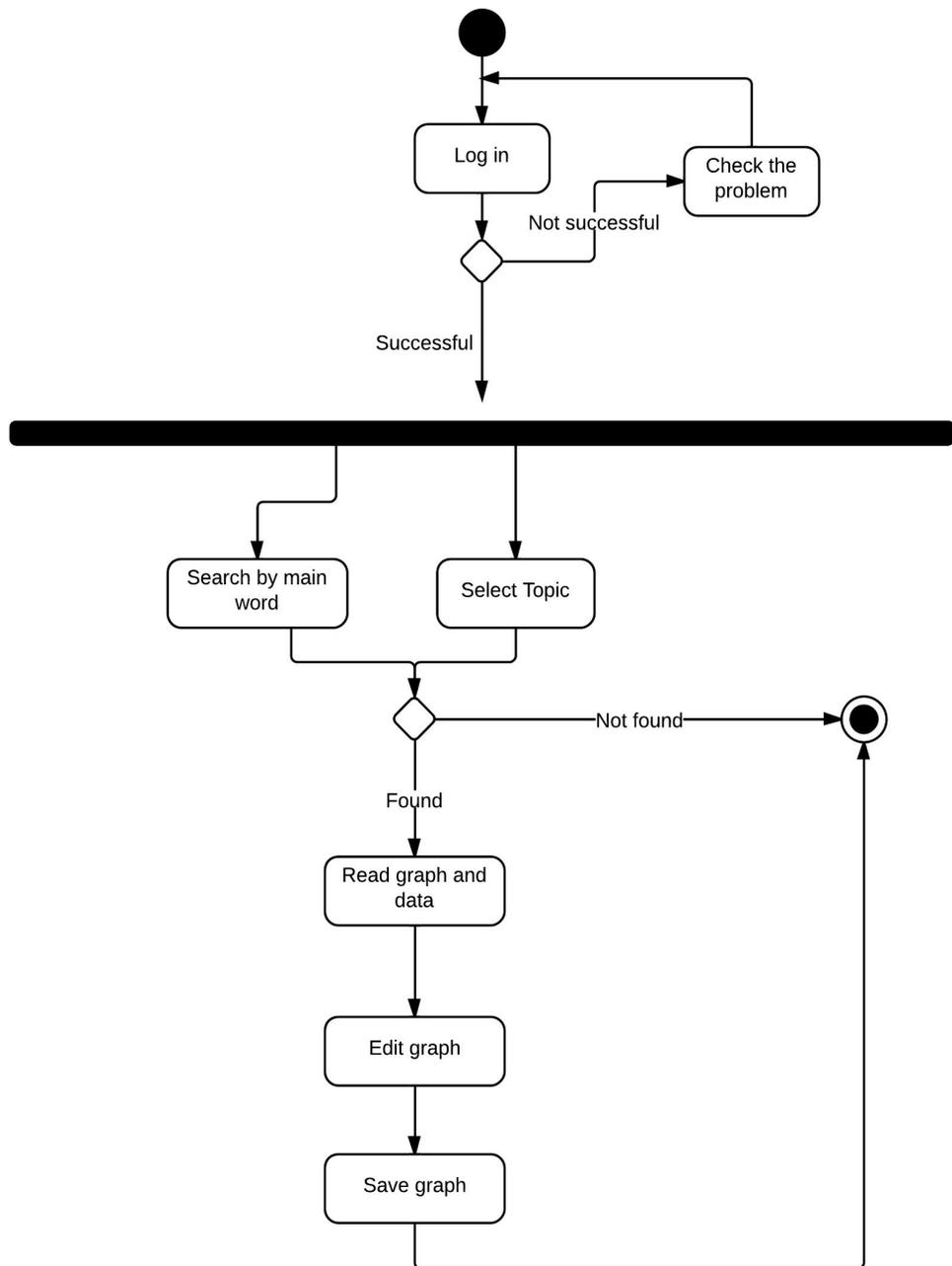


Figure 13.Graph Activity

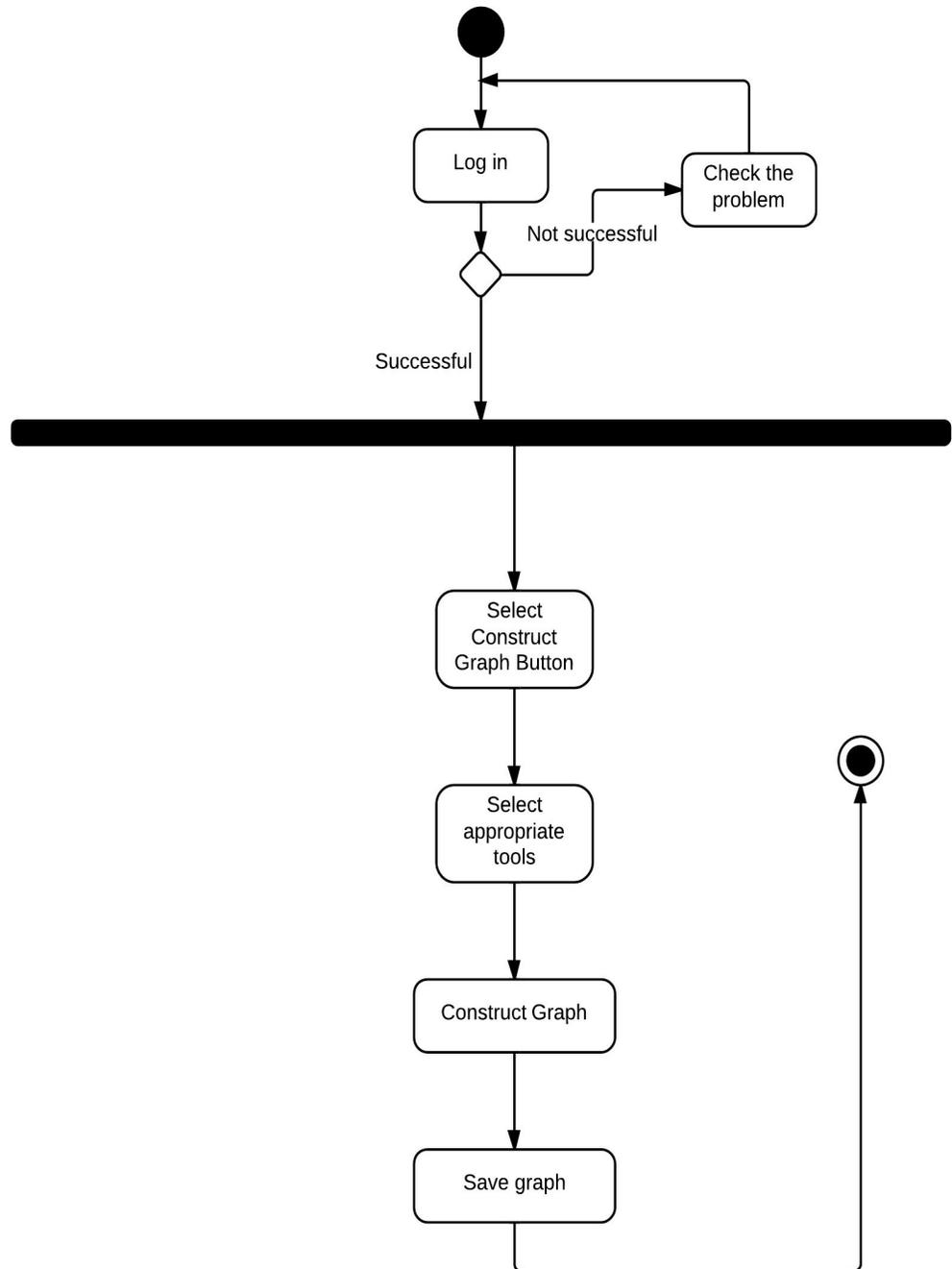


Figure 14. Construct Graph Activity

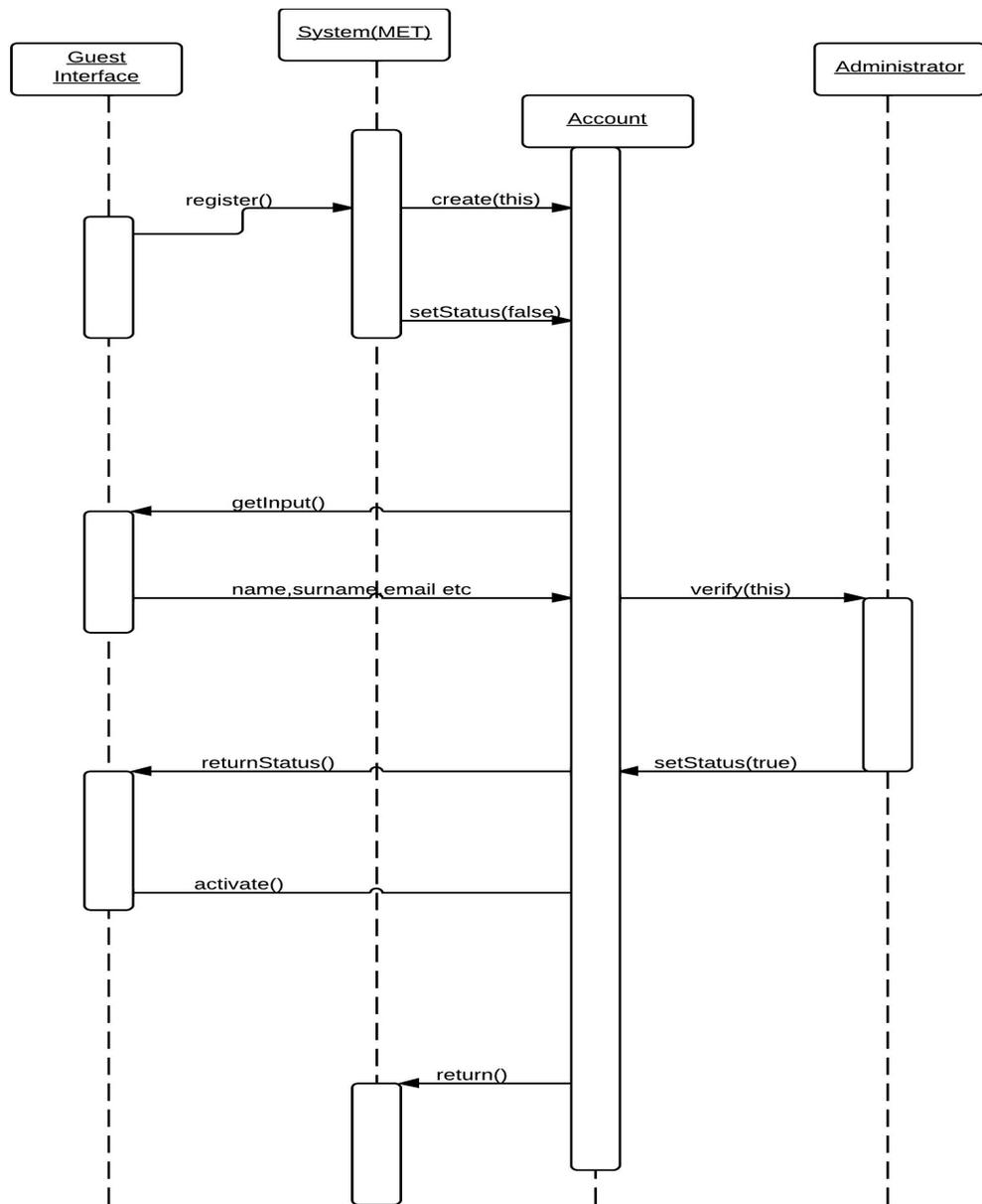


Figure 15. Sequence Diagram: Customer Registration

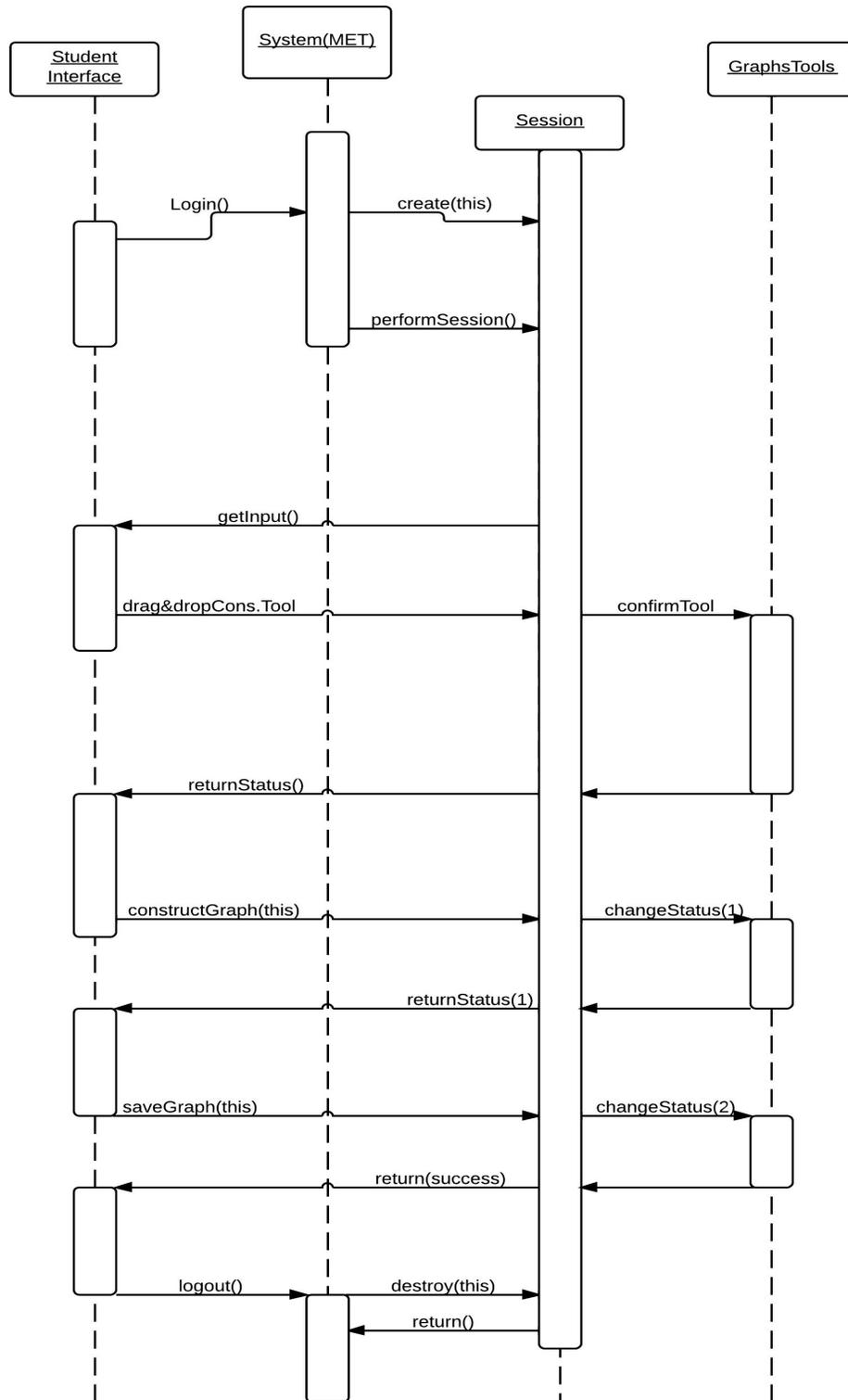


Figure 16. Sequence Diagram: Construct Graph

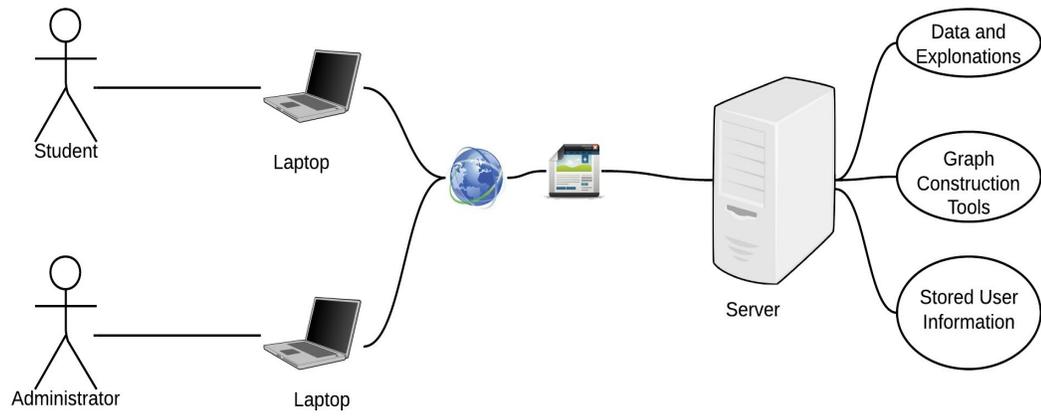
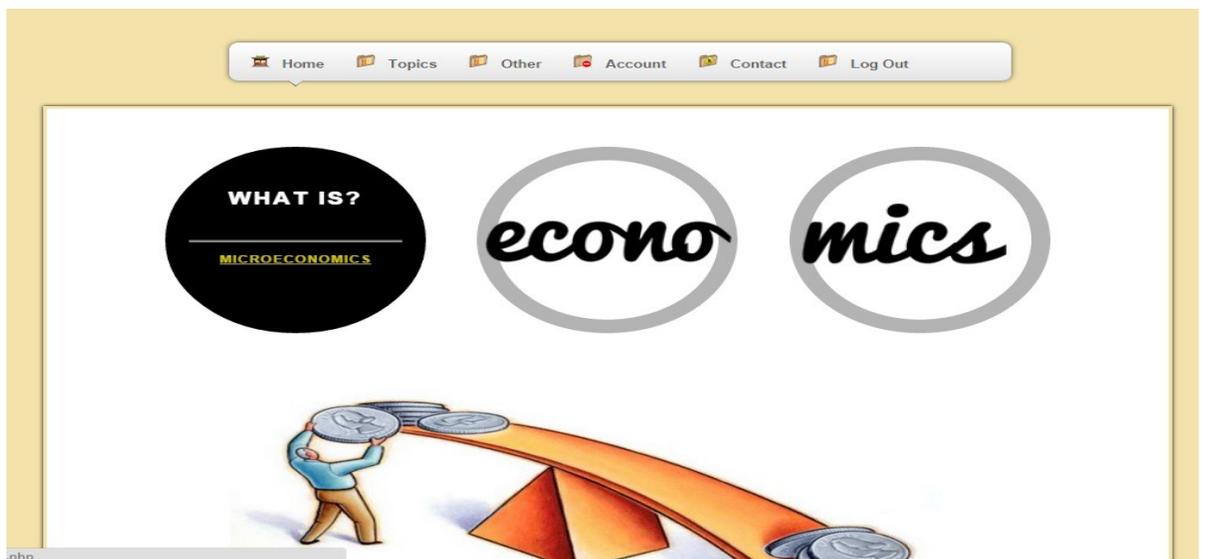
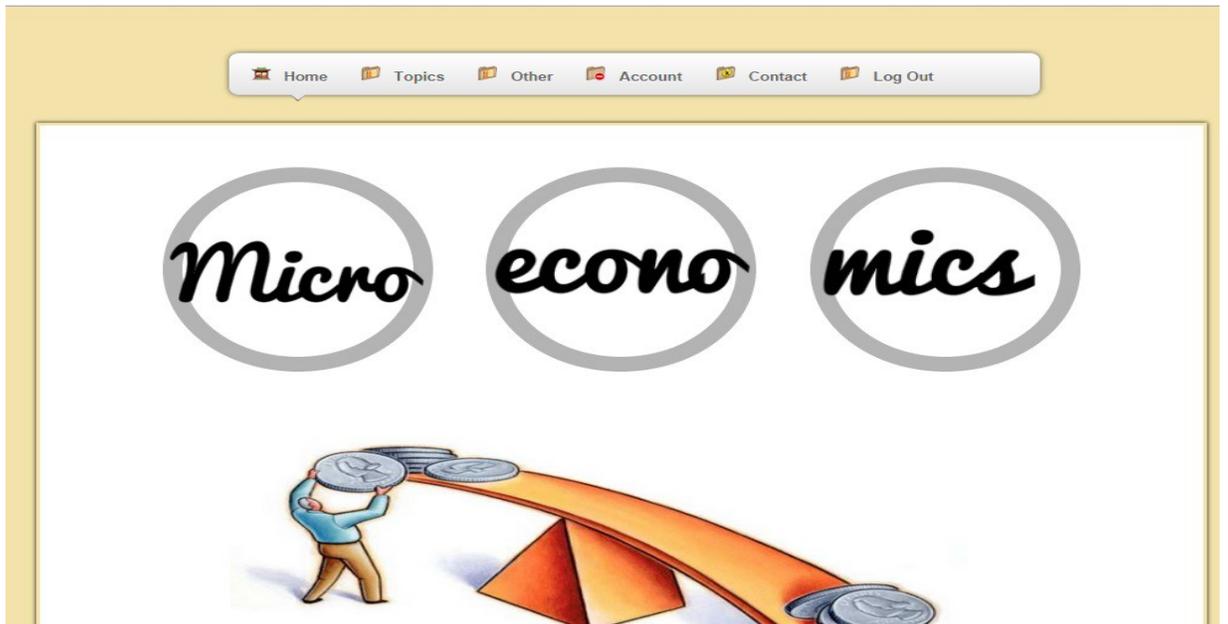
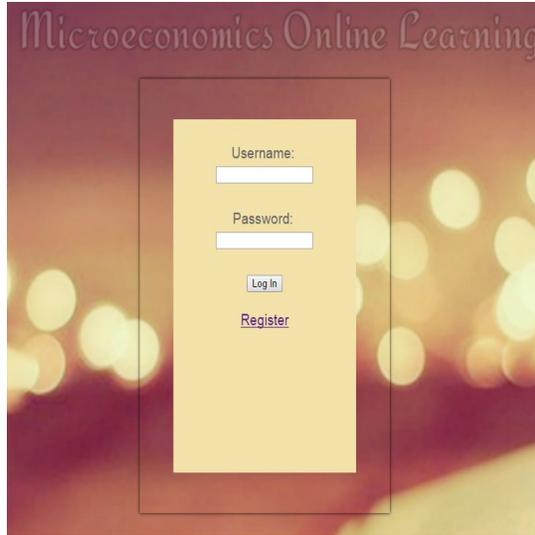
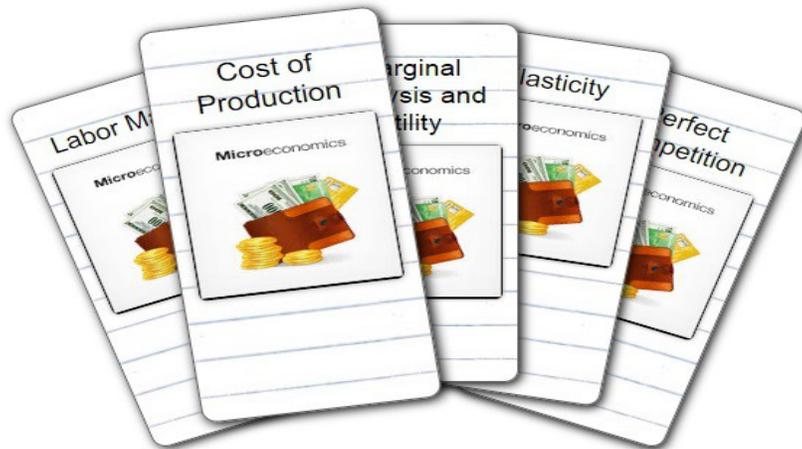


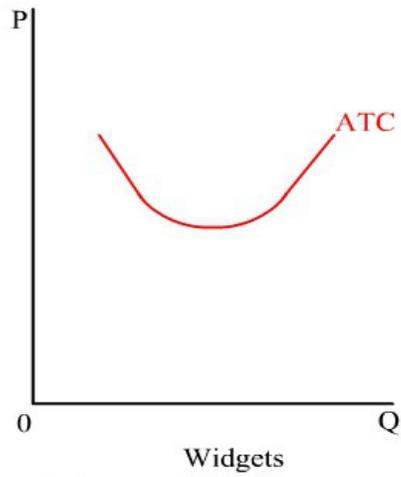
Figure 17. Deployment Graph

Application Screen-shoots



MICROECONOMICS IS
the study of economics at the level of individual consumers, groups of consumers, or firms... The general concern of microeconomics is the efficient allocation of scarce resources between alternative uses but more specifically it involves the determination of price through the optimizing behaviour of economic agents, with consumers maximizing utility and firms maximizing profit





Remember in the previous lesson on costs, the average total cost curve (ATC) looks like a smiley face.



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