ONLINE UNIVERSITY COURSE APPLICATION SYSTEM

(A case study of self-sponsored student technical university of Mombasa)

SIMON MWANZIA MUMO

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A Project proposal submitted to the institute of computing and informatics in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Information and Communications Technology Technical University of Mombasa

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DECLARATION

I **SIMON MWANZIA MUMO** hereby declare that the proposal is my original work and has not been presented for a degree in any other university or taken from other sources.

Signature _____

DECLARATION BY SUPERVISOR

This project has been submitted with the approval of the University

Name: _____

Sign:_____Date_____

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ABSTRACT

ONLINE UNIVERSITY COURSE APPLICATION SYSTEM is system which will enable student to apply their preferred course online ,replacing the currently manual application system which is tedious and time consuming .currently student have to come to school and collect the application form ,the system is cutting down the expense student incurred by travelling to collect application form. Student will be able to apply their preferred courses online and pay the application fee online using Mpesa or Visa Card and submit the application online. Then the applicant will be notified of their application status on their phones and emails account. Applicant will be notified in advance the reporting date .this will make it possible for student to prepare on how to join campuses. The system also addresses the challenges and experienced problems in the currently and mostly used manual system in application of courses. The school is provided with a range of reports on how many student have applied in each course and faculties and departments. This system has an integrated messaging and emailing system which will notify student the real time state of application. The proposed system will use HTML, CSS, JAVASCRIPT, JSPs for the presentation layer, java technologies for the business logic and MySQL database server for data layer.

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Chapter 1

1.0 INTRODUCTION

This chapter introduces the proposed project.

1.1 BACKGROUND INFORMATION

Every year, every university in Kenya is tasked to select those student who wish to study their preferred academic courses .This exercise is usually extensive because of large number of qualified student compared to limited number of slots in the institution. Minimum requirement exist in every course and only student having the prescribed grade in specific subjects are eligible to join that course. Due to this student are often admitted to course they consider irrelevant to their career prospects and not their preferred choices. This process is tiresome, costly, expensive, prone to bias, and favour leading to disadvantaging some student. Therefore this proposal examines the potential use of online course application at university for process of selecting and admitting self-sponsored and undergraduate student for university courses.

This system is likely to motivate the student, making them work harder and leading to improved performance and improved completion rate. This application also reduces the cost spend on the application processing and the time the applicant have to wait for the outcome. The system could further increase the chances of high quality applicants getting admission to career courses for which they qualify.

1.2PROBLEM STATEMENT

With the increase in number of student applying for various courses in university , the current manual method of applying for courses is cumbersome, expensive since applicant have to travel to main campus to get application form in the university, Applicants have the problem of tracking their application, whether it was successful or not. The university is also experiencing a challenge in fulfilling its mission of becoming a world class university by reaching many student since it cannot reach to those students.

1.3 GENERAL OBJECTIVE

The general objective was to develop a web based information system for the Technical University of Mombasa that automates all the processes that are involved in managing courses.

1.4 SPECIFIC OBJECTIVES

i. To analyze current manual existing system in order to obtain the requirement for the new System to be developed.
ii. To develop a system that will enable student view and apply courses online.
iii. To develop a system that will provide information to student about the courses they apply.
iv. To test the validity of the system and check if it meets the system requirement.

1.5 JUSTIFICATION

The automation of the current manual system of applying of courses will enable student to apply their preferred courses online from any ware in the world. Students will be able to fill all the information required by the university to ease of keep track of student courses. The company will benefit from the website by advertising to the public and also reaching out to more people especially students across the country. The company will also reduce the expense incurred in producing brochures, and labour .

1.6 PROJECT SCOPE

The work that has to be done in order to deliver the final product features and functions includes analyzing the current manual system used at Technical University of Mombasa and come up with

the system requirements for the new system. The researcher will design the new system based on the system requirements, develop the system and then test the system to check whether it conforms to the set goal objectives and user requirements.

1.7 TARGET USERS

The main users of this proposed system are the students, staff for advertisement and also the administration for making major decisions.

CHAPTER 2

2.1 INTRODUCTION

This chapter provides the literature review that is related with the system that will be developed later. This chapter comprises two sections: The first section reviews about the existence of other systems. The second section describes the review on method, equipment, and technology. The reference of source is taken from books, articles, journals, magazines, conference paper, interview and also sources from Internet.

2.2 LITERATURE REVIEW

Selection of university by high school student is rational and highly complicated process affected by many factors, choosing a university is a challenge for both students and families since university selection is considered one of the decision that affect and change life. This decision determine the direction of future life of individual by influencing culture and career (Polat, Arslan, & Yavaş, 2016) . Selection of student for profession is typically a very competitive process that need reliable and valid assessment measures. Since most of universities and government uses cluster points to admit student to higher learning education. Student with grades above just above threshold for admission eligibility at large public university in Florida are much more likely to attend any university than below thresh hold student (Lawrence F. Katz, Alan B. Krueger. 2017). Since course requirement for university are dynamic and keep fluctuating each year depending on the overall performance of students. Course requirement have to be revised every year in order to scale the number of student admitted, this activity is tedious and call for a system that is also dynamically changing to manage the task (Walsh & Cullinan, 2017). Student start with aspiration, followed by a search process, which tend to end up with final set of alternative to apply to. Finally being successful student are placed and enrolled to one of preferred alternatives (Sá & Tavares, 2017). The opportunity to choose the university for the students results in competition among the schools in student applications. Universities compete with each other actively and search for the way to attracts the high-skilled student to their school and fill up their quota (Polat et al., 2016).Therefore since many universities are experiencing a challenge in full filling its mission of becoming a world class university by reaching many student who want to achieve their educational goals. university must become more aggressively in marketing their

institution in order to increase their market share in terms of student number and quantity of those enrolling (Bowen & Gogo, 2014).Since academic institution are faced with growing budgetary constraints, to remain competitive in this challenging environment, it is important to understand what issues discerning student consider when selecting colleges program (Brian P. An, 2013). Students are required to choose courses they are interested in for the coming semester. Due to restrictions, including lack of sufficient resources and overheads of running several courses, some universities might not offer all of a student's desirable courses. Universities must know every student's demands for every course prior to each semester for optimal course scheduling (Winn, Leach, Erwin, & Benedict, 2014).Student experience such as motivation, rewards, social inclusion and value for money would is likely to influence their loyalty behavior with respect to chosen course of study (Douglas, Douglas, McClelland, & Davies, 2015).

2.3 System Review

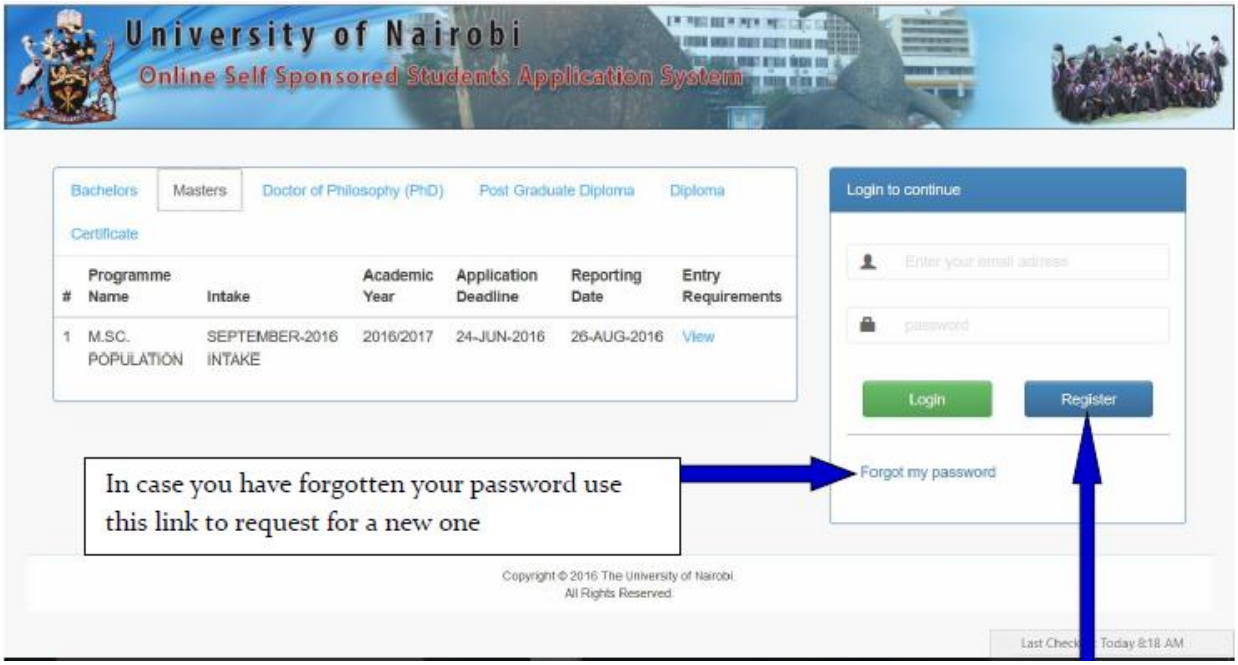
A review of existing system similar to the proposed course application system was undertaken, evaluating the strength and weakness of these system enabled a better design of the proposed system, since relevant aspects and problems could be implemented and addressed respectively.

2.31 Existing System

2.32 Case Study 2: University of Nairobi

The case study is based on observation and researching in University of Nairobi site ,this online system can be used by student to apply courses they wish to undertake online and pay the application fee through online payment such as Masters and Visa cards, Mpesa or via direct

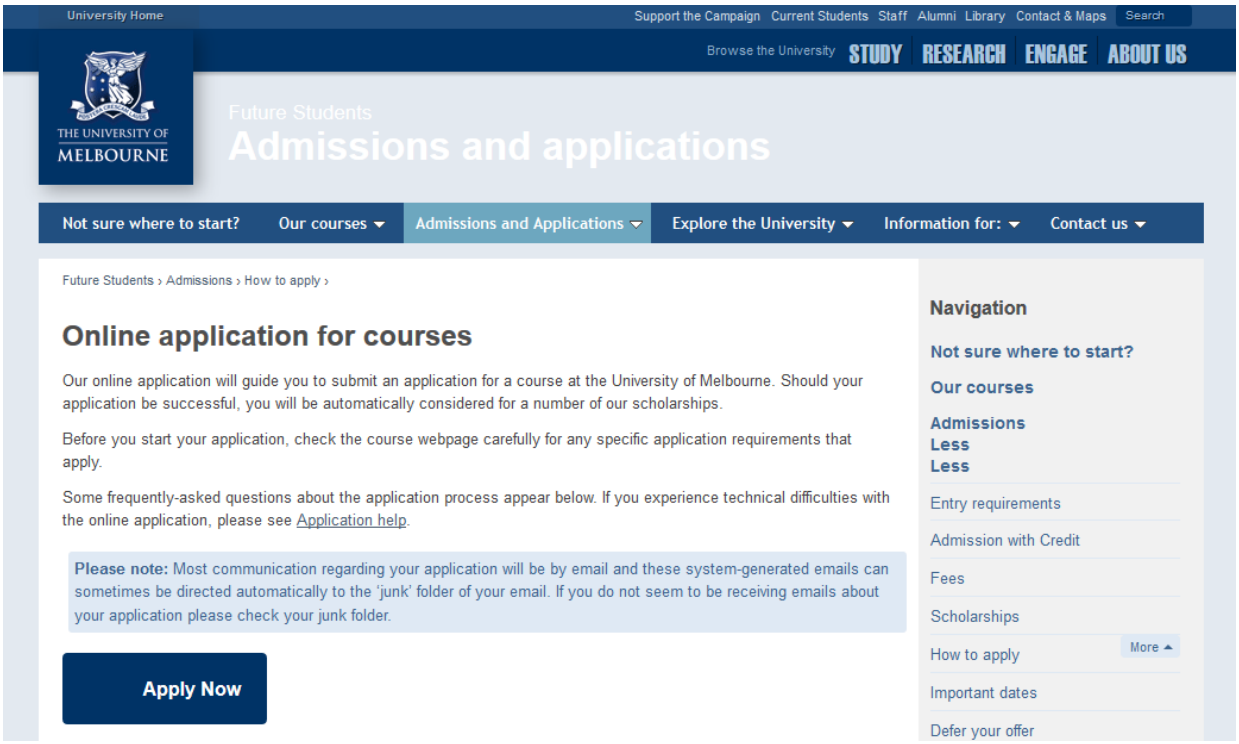
banking, in each case the system will issue an applicant a reference number which should be used as account number when making payment, then student can download payment result generated after process. student are required to provide their area of residence ,education background, contact information ,working experience and references, the student will be able to submit the application form once he or she has completed the application form, uploaded all the necessary scanned supporting document ,and paid the application fee, then the student will be informed through SMS and Email what the allocated reference number is, and send other important procedure on how to check the progress and application result on email. The system also take care of people with disabilities, that is, it provides the facility for applicant to disclose his or her disabilities status. Applicant are encouraged to make use of this facility to to disclose their disability status at this point of application process. Disclosing your ability status enables the University to better anticipate the needs arising from these disabilities. The university staff logs in to the site admins section and process student application, view student details and check whether he or has qualified for that course. On approving the student, the system then send a SMS message to their mobile phones and also send an emails to student.



2.33 Case Study 2: University of Melbourne

University of Melbourne is an international university offering admission to both locally and international student .student need to create an account and provide his personal details and then the system send temporary log in details through emails. Once the student logs in to the system he/she searches for the course he wants to undertake and then submit the details. The application fee is paid online by credit cards, student can print out the application fee payment form to pay by bank(bank cheque).if the student choses to over bank draft then he/she is required to save the application and then submit again once he has been that your bank draft has been received by international admissions. When the application is successfully submitted, he/she receives two emails from the university, the first email is sent upon saving of personal details and the other one is upon payment of application fee, The email will confirm successful submission of your

application, summarise your application and provide you with details of where additional application documentation can be submitted.



2.4 SYSTEM CRITIQUE

2.41 Case study 1: University of Nairobi

The University of Nairobi allows student to apply for courses they prefer on the site from most parts of country and can pay application fee online. The problem noted with this system is that the sessions of student visiting the site is also not controlled and could lead to a large server load when students start sessions and they are not terminated. They are considered to still be applying

for courses and thus their sessions are not destroyed leading to congestion and slowing down the entire system hence leading to performance degradation.

This system has also a limitation in the way student applies for courses such that student is not notified when the application is successful. Also the system does not inform the students whether he qualifies for that course or not.

2.42 Case study 2: University of Melbourne.

University of Melbourne is has site where student can apply their courses over the internet and carry out transactions. The problem noted with this system is that, it is not flexible in terms of payment, the system support two mode of payment, credit cards and use of bank drafts. This is not flexible especially for student or parents who does not know how to use bank drafts.it also support one mode of communication ,that is ,email to communicate to the student upon successful of submission of details and payment. The system also gives user a lot of work of finding courses they want to undertake ,instead of displaying all courses and thus student can select which course he/she want to pursue, This is a limitation considering that there is a large number of student in the country who have access to internet and would be interested in online course application.

2.5 Summary

From the above findings, online university course application system caters for the above drawbacks. The system allows the application of all types of courses and payments are made via Mpesa, use of credit cards, direct banking or PayPal especially for international student where they don’t use of Mpesa as mode of payment. The system has provide many communication

channel such as use of SMS and emails to alert the applicant upon successful payment of application fee, use of emails to confirm applicant students logs in details and sending payment receipt to the applicant. The system has reduced the server load by destroying sessions of student who have not submitted their courses, this has been enhanced by the use of session timeouts and use of cookies to track student who have logged in, and the system has also enabled access control mechanisms to secure the system against security threats such as repudiation and DOS attacks. This has been made possible by the use of java programming language which is a good rich language in security control.

CHAPTER 3

3.0 ANALYSIS AND DESIGN

3.1 Introduction

This chapter touches on the tools and methodology used to design the proposed system. The logical and functional design of the proposed system will also be illustrated through relevant diagrams and tables.

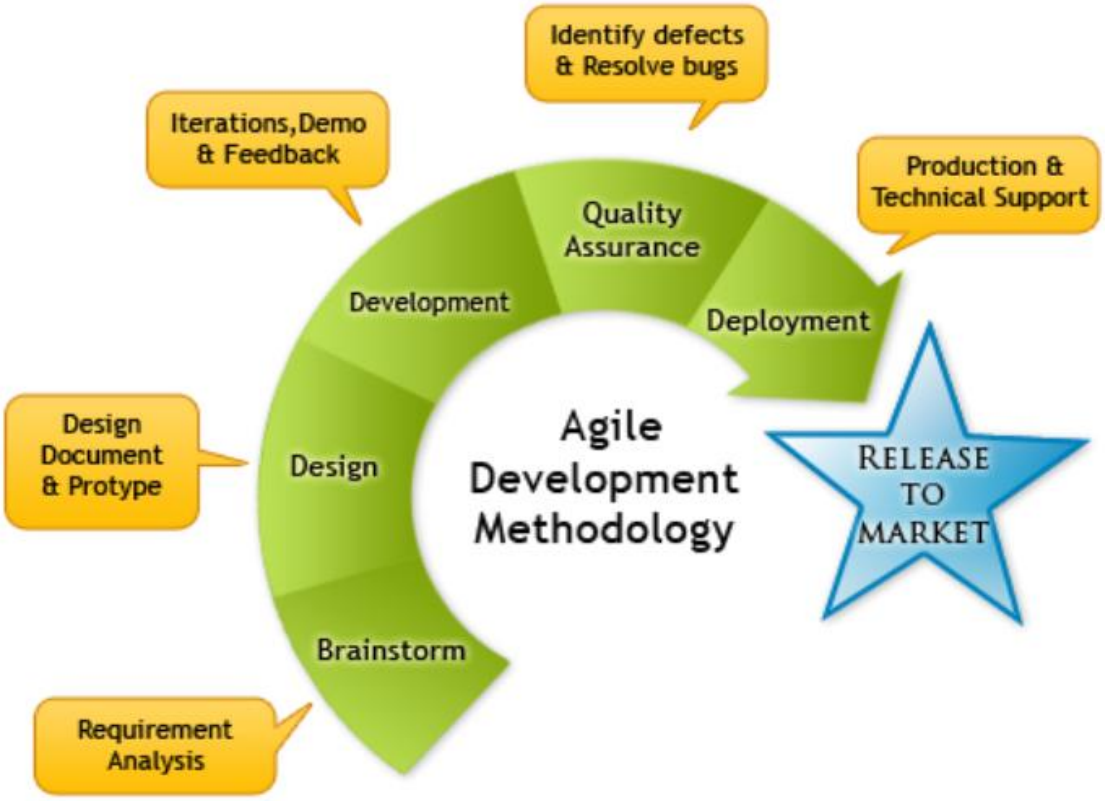
3.2 Development Approach

3.2.1 System Design

System design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements.

3.2.2 System Design Method

For the system design I used the agile method. The tasks that were carried out in development of project are as follows: (www.agile.com)



1. Brainstorming/Requirement analysis.

Business requirements were gathered in this phase. This phase was the main focus of the project managers and stake holders. Meetings with managers, stake holders and users were held in order to determine the requirements like; who is going to use the system? How will they use the system?

What data should be input into the system? What data should be output by the system? After requirement gathering these requirements were analyzed for their validity and the possibility of incorporating the requirements in the system to be developed were also analyzed.

2. Design.

In this phase the system and software design was prepared from the requirement specifications which were studied in the first phase. System Design helped in specifying hardware and system requirements and also in defining overall system architecture. The system design specifications served as input for the next phase of the model.

3. Development.

This stage is not distinct. It involved several iterations during the phase. There is a backlog in which adjustments and new requirements were added during the development phase. First initial functionality was delivered where the system was reviewed by the stakeholders in order to identify any inadequacy and incorporate changing requirements. This was made possible by the flexibility of the agile methodology.

4. Testing.

In system testing the behavior of whole system/product was tested as defined by the scope of the development project. It included tests based on risks and/or requirement specifications, business

process, use cases, or other high level descriptions of system behavior, interactions with the operating systems, and system resources. System testing also investigated both functional and nonfunctional requirements of the testing.

5. Deployment.

After the system has passed the testing phase and is operationally satisfactory it will be released to the Technical University of Mombasa.

3.2.3 Justification of the System Design Method to be used

The methodology has various advantages that suits this project. The methodology greatly emphasizes collaboration with stakeholders. Stakeholders were engaged in the development process before, during and after a project was done. Through this the developer was able to understand a client's actual needs. On focusing around the needs of the student, there was more value addition to the development process. The methodology was also very flexible and allowed for change even on the middle of the development process. Changing backlog features could be incorporated in the following iteration. It had the ability to respond to changes quickly while reducing risks.

3.3 Fact finding approach

This section discuss the research design, target population, sample size and sampling technique, research instruments, data collection procedures and various methods of Data collection instruments that is being used in the course of the project

3.3.1 Research Design.

The type of research for this system was structured interview and unstructured interview. Structured research interview is the type of research where all questions are asked in a predetermined order from a prepared schedule and all the interviewers involved strive to ask each question in the same way and same emphasis. Unstructured interviews are undertaken in a question-and-answer format. This is of a much more flexible nature than the structured and can be very rightly used to gather general information about the system.

3.3.2 Population.

The target population is the Kenyan student and international student who want to study at technical university of Mombasa. It also targets the management especially registrar who admits student.

3.3.3 Sample and Sampling Techniques.

Prior phone calls were made to the management of technical university of Mombasa asking for some time to have a small conversation with the top management concerning their mode of operation as far as the admission of students are concerned

The top management was engaged in a face to face conversation with the analyst where they explained all their functionalities that they would wish the system to have such that the level of paper work could significantly reduce and the security of data could also be guaranteed, All that the management said was put in writing and a clear evaluation and analysis of the stated requirements was made and a clear picture of the system was drawn.

3.3.4 Data collection Tools

Interview is a very important data gathering technique as in this the analyst directly contacts system and the potential user of the proposed system.

One very essential aspect of conducting the interview is that the interviewer should first establish a rapport with the interviewee. It should also be taken into account that the interviewee may or may not be a technician and the analyst should prefer to use day to day language instead of jargon and technical terms.

The advantage of the interview is that the analyst has a free hand and the he can extract almost all the information from the concerned people but then as it is a very time consuming method, he should also employ other means such as questionnaires, record reviews, etc. This may also help the analyst to verify and validate the information gained. Interviewing should be approached.

3.4 Requirement Analysis.

3.4.1 Functional Requirement

Functional requirements are observable tasks or processes that must be performed by the system under development. They include:

1. Users (administrators/student/manager/) must be authenticated before accessing the system.
2. Employees should be able to view courses applied by student
3. System admin should be able to update user's i.e. Staff members and managers and assign appropriate authorizations.
4. Student should be able to view all courses and apply course he/she want to undertake
5. Student should have an account with the system.
6. Employees should be able to process courses applied by the student and send confirmation emails and SMS to the student.
7. System administrators should be able to view different reports depending on their needs.

3.4.2 Nonfunctional Requirements

Non-functional requirements are qualities or standards that the system under development must have or comply with but which are not tasks that will be automated by the system.

The following is a list of the non-functional requirements:

Security: the system must be protected from all kinds of network attacks (i.e. sniffing, hacking,) and virus attack.

Hardware constraints: the system requires a database in order to store persistent data. The database should have backup capabilities.

Software constraints: the development of the system was constrained by the availability of required software such as database and development tools.

Software quality attributes: The quality of the database is maintained in such a way so that it can be very friendly to all the users of the database.

3.5 Use Case Diagram

The Figure 3.4 below shows a use case diagram that captures the interaction between the system, users and the administrator. Since the system contains private data , a secured user login is required. The admin who is in charge of managing the overall data can either login or logout of the system, view applicant details, courses applied and also add and update courses.

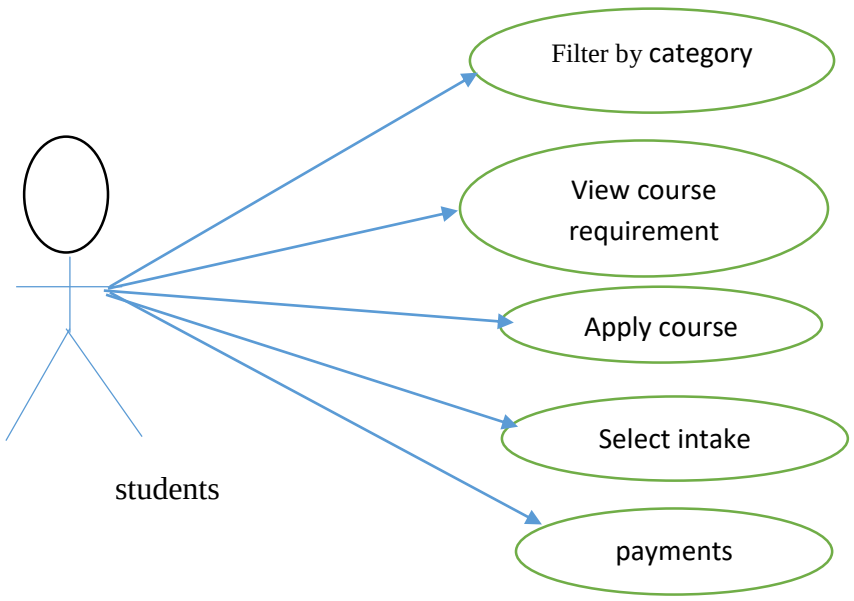


Figure 3. Showing the use case diagram.

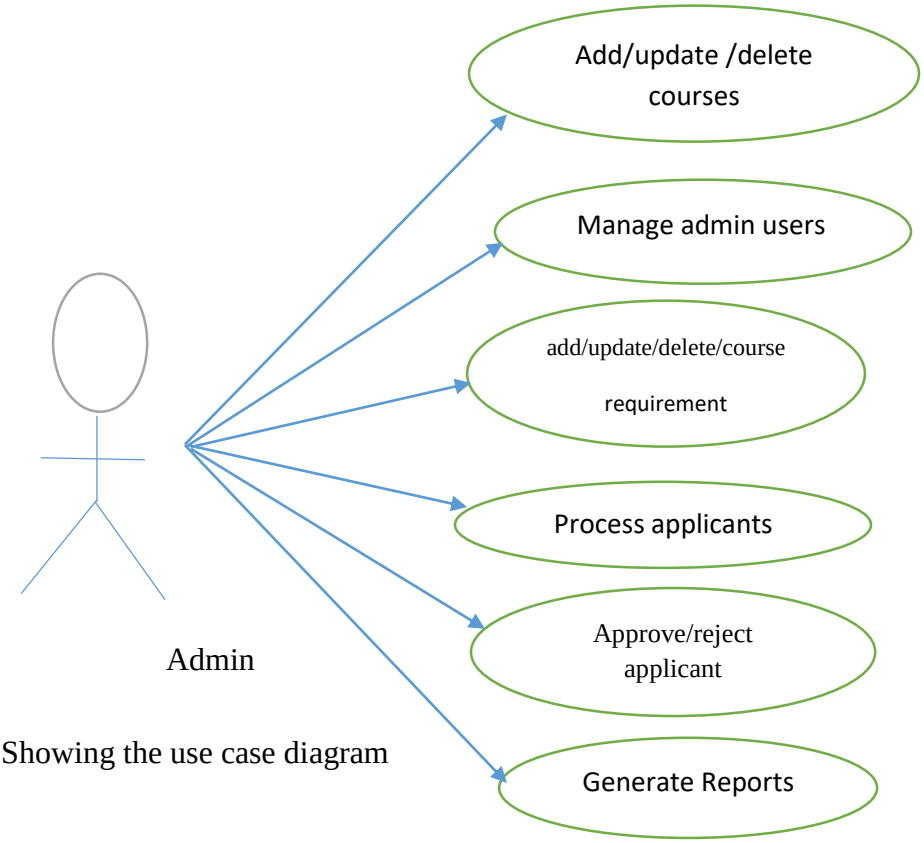


Figure 3. Showing the use case diagram

3.6 Specific platform

3.61 Hardware Specifications

The system requires the following in order to function effectively:

- RAM Size at least 128 MB
- A printer for printing the output
- Processor speed of above 200 MHz
- Hard Disk of at least 15 GB. Free space at least 100MB

3.62 Software Specifications

The project will use Netbeans as the IDE, Jdk 1.8 will be used to provide for libraries necessary for processing of java language. Bootstrap which is a css library will be used for designing the interface, It also uses apache-tomcat 8.2.4 as the web server as well as servlet container, MySQL server as the database server.

3.7 System Budget

ITEM	**COST**
Cost of transport during research	10,000
Feeding during research	8,000
Cost of software's	Free open source software
Online research	5,000
HP laptop	45,000
TOTAL	**68,000**

3.8 Summary

Of all the methodologies, Agile Development methodology is the feasiable and practical way to implement this project since its an interactive web applications . As a result the design of this project will take this route to implement the project inorder to come up with online course application system for technical university of mombasa.The agile methodology, due to its flexibilty will ensure that the project is completed within the required time. The agile iterative nature will also ensure that specification and quality of the product is not compromised in any way.

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