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Study of Requirement Analysis using General Purpose Modeling Language for Academic organization: UML

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Abstract: **The work presented in this dissertation focused on developing a technique of requirement analysis of software engineering part of a software project management. A case study of academic organisation is considered as an example.**
A systematic environment for learning is a need of academic organization. Time is ever changing and their rate of change has accelerated to a very high level recently. Social, economic, political as well as cultural changes in the environment are undergoing developments at a higher rate. Academia cannot be isolated from these changes and hence the same is the context for academia organizations.

Requirement analysis of academic organization require thorough investigation regarding the current requirement of academic standards, the problems based in reaching those standards, deriving procedures of quality achievement and major and non-major conformances of the same in academic organizations.

To improve the performance of academic organization there is a need to study the requirement analysis of academic organization. Although requirement analysis is acknowledged as a critical success factor of information system development for organization, mistakes are frequent at the requirement stage. Two of these mistakes are lack of understanding by requirement engineers and miscommunication between user and system analysts. As a result of these problems, information system may not fulfill organizational needs. To prevent these problems, UML models are useful for understanding the problems and communication with people involved in a project

Through these applications some errors will be detected in the existing requirement of an academic organization. Further in this work through the comparison of our proposed method with the conventional inspection, we will be concluding that our method can complement the limitations of the inspection.

Keywords: Requirement Analysis, UML, Academic, Software, UGC etc

I. INTRODUCTION

Every organization has to utilize resources so as to achieve the organizational goal, which can be accomplished by thorough investigation, .One should know requirement of academic organization.

Requirement research and reflection on practice in last ten years have transformed the field. Both the overall process and the detailed techniques that go into it are far better understood and are known to improve the performance.

The aim of the requirements workflow is

1. To improve performance of academic organization.
2. To determine the needs of the user.
3. To understand the application domain i.e. the environment in which the target software product is to operate

4. The task of the developer at this stage is to determine exactly what the organizations need are and to find out what constraints exist such as deadline, reliability and cost.

The preliminary investigation of the user needs sometimes called concept exploration. The functionality is successively refined and analyzed for technical feasibility and financial justification.

Many UML diagrams of the unified process assist the client in gaining the necessary detailed understanding of what needs to be developed.

On Requirement analysis is the process of understanding the organization needs and expectations from a proposed system or application and is a well defined stage in the software development life cycle model.

The software requirements analysis process covers the complex task of eliciting and documenting the requirements, modeling and analyzing requirements and documenting them as a basis for system design. The requirement analysis function may also fall under the scope of project manager, program manager or business analyst, depending on the organizational hierarchy.

Software requirements analysis and documentation process are critical to software project success. Requirements engineering so an emerging field which deals with the systematic handling of requirements

A. Requirement analysis in software Engineering

The Software process is the way we produce software. Different organizations have different software processes. For eg Consider the issue of documentation . Some organizations consider the software they produce to be self documenting , that is , the product can be understood simply by reading the source code. Other organizations , However are documentation intensive . They draw up specifications and check them methodically , then they perform design activities, check and recheck their design before coding commences and give extensive descriptions. Once the product has been delivered and installed on the clients computer any suggested change must be proposed in writing , with detailed reasons for making the change.

The preliminary investigation of the client's needs sometimes is called concept exploration. In subsequent meetings between members of the development team and the client team, the functionality of the proposed product is successively refined and analyzed for technical and financial justification. When the product finally is delivered to the user, perhaps a year or two after the specifications have been signed off on by the client, the client may say to the developers, "I know that this is what I asked for, but it isn't really what I wanted , " what the developers thought the client wanted was not what the client actually needed.

To avoid such misunderstanding between the client and developers and to understand the requirements the unified process was been developed. The many UML diagrams of the unified process assist the client in gaining the necessary detailed understanding of what needs to be developed.

II. PROBLEM DEFINITION

The present study is entitled "Study of Requirement analysis using General Purpose Modeling language for academic organization: UML" is taken as a topic of research for following reasons.

To go through the process of software development for an academic organization, the first step is requirement analysis. It has been found through last research that due to improper requirement analysis, many projects fail or need of organization is not fulfilled. Therefore it's necessary to do detailed requirement analysis of an academic organization right from getting proper certification to the student getting admitted to a particular course.

A.Problems

1) Customers don't really know what they want: customers only have a vague idea of what they need. it is necessary to perform requirement analysis to turn this amorphous vision into formally –documented software requirements specification that can , in turn, be used as the basis for both a project plan and an engineering architecture.

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Solution:

1 Understand the objectives, deliverables and scope of the project.
2 Evaluate risks involved in the project.
3 Write a concrete vision statement for the project .
4 Both the software engineer and the customer or the user should have the clear understanding of the deliverables.

2).Requirements change during the course of the project

Requirements of academic organization can change as the project progresses and the user can make necessary corrections .It may also occur because changes in the external environment require reshaping of the original problem. Good software engineer are aware of these possibilities and have backup plans to deal with these changes.

Solution: -

1. Should have clearly defined process for receiving, analyzing and incorporating change request.
2. Set milestone for each development phase beyond which certain changes are not permissible.
3. Ensure that change request are clearly communicated and the master plan is updated accordingly.

3) Customers have unreasonable timelines.

A common mistake is to agree to such timelines before actually performing a detailed analysis and understanding both of the scope of the project and the resources necessary to execute it. It ‘s quite likely that the project will either get delayed or suffer from quality defects .

Solution:

1 Convert the software requirements specification into a project plan, detailing tasks and resources needed at each stage and modeling best case, middle –case and worst-case scenarios.
2 Ensure that the project plan takes account of available resource constraints and keeps sufficient time for testing and quality inspection.

4) Communication gap exist between customers/users, engineers and project managers.

Often customers and engineers fail to communicate clearly with each other because they come from different worlds and do not understand technical terms in the same way. This can lead to confusion and severe miscommunication, and an important task of a project manager; especially during the requirement analysis phase is to ensure that both parties have a precise understanding of the deliverable and tasks needed to achieve it.

5) The development team doesn’t understand the politics of the customer’s organization

Understanding user requirements is an integral part of information system design and is critical to the success of interactive systems .It is now widely understood that successful systems and products begin with an understanding of the needs and requirements of the users.

To prevent the problem related with the requirement, UML models are useful for understanding the problem and communication with people involved in a project. Textual requirement specification is difficult to develop, understand, review and maintain- graphical modeling is widely recognized as a more effective analysis tool. UML works as defecto standard in software modeling.

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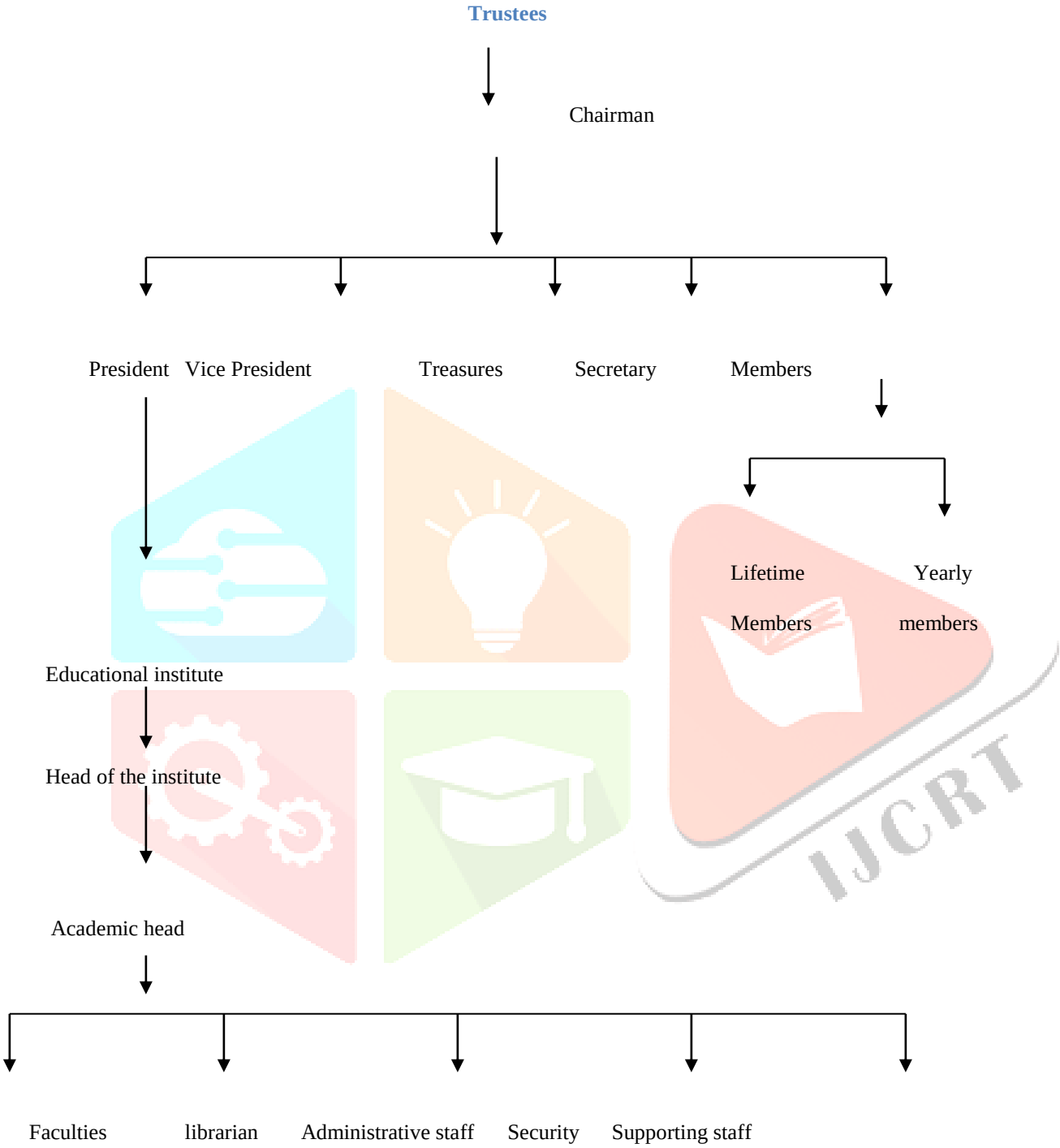
Organization chart



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III. NECESSITY OF UML MODEL

To improve the performance of academic organization there is a need to study the requirement analysis of academic organization. Although requirements analysis is acknowledged as a critical success factor of information system development for organizations, mistakes are frequent at the requirement stage. Two of these mistakes are lack of understanding by requirement engineers and miscommunication between user and system analysts. As a result of these problems, information system may not fulfil organizational needs. To prevent these problems and communication with people involved in a project.

Communicating the vision is of utmost importance. Before the advent of the UML, system development was often a hit-or-miss proposition. System analysts would try to assess the needs of their clients, generate a requirements analysis in some notation that the analyst understood, give that analysis to a programmer or team of programmers, and hope that the final product was the client wanted.

The power of the unified modeling language is not limited to object oriented software development . More and more, the UML is being applied to other areas of software development , such as data modeling , enhancing practioners ability to communicate their needs and assessments to the rest of the team.

A. Advantages of using UML

- To provide student with designing software as a team .
- To model the communication problems that are typical in software projects
- To demonstrate how UML helps overcome communication problems.

UML is not restricted to modeling software. UML is also used for business process modeling, System engineering modeling and representing organizations structures. The systems modeling language (SYSML) is a domain – specific modeling language for system engineering that is defined as UML 2.0 profile. UML has been a catalyst for the evolution of model-driven technologies which include model-driven development (MDD), Model driven Engineering (MDE), and Model driven Architecture (MDA).UML has allowed software developers to concentrate more on design and architecture.

UML diagrams for requirement analysis for Academic organization

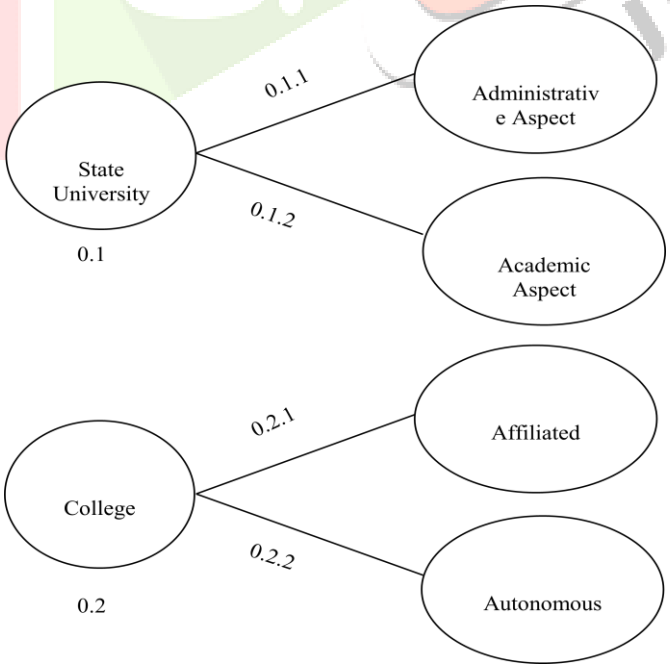

Fig 1 Level 0 UML Diagram

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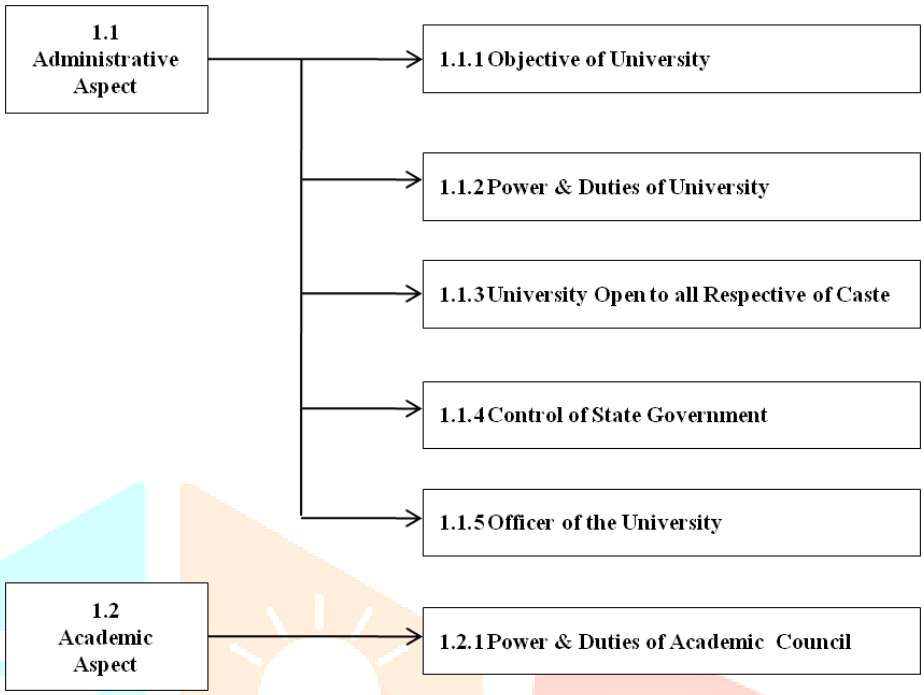
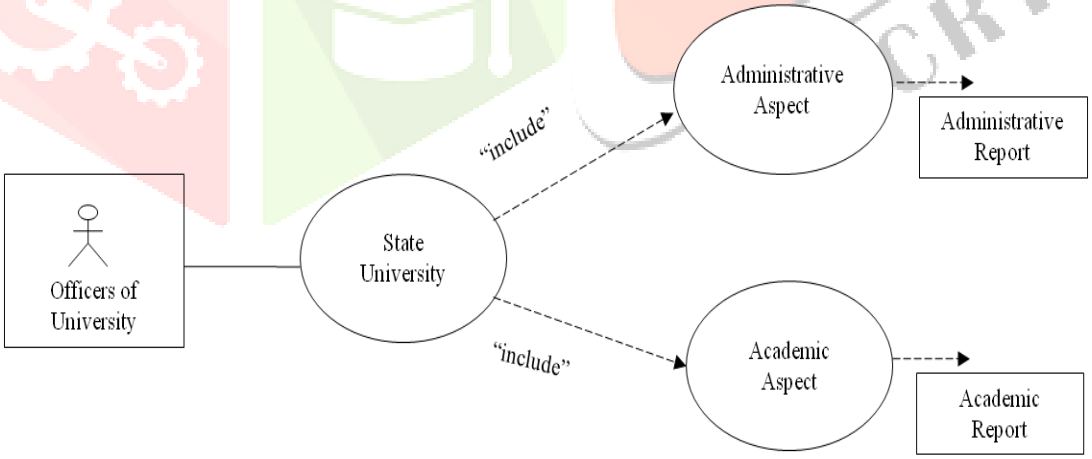


Fig 2. Level 1 UML Diagram Of State University



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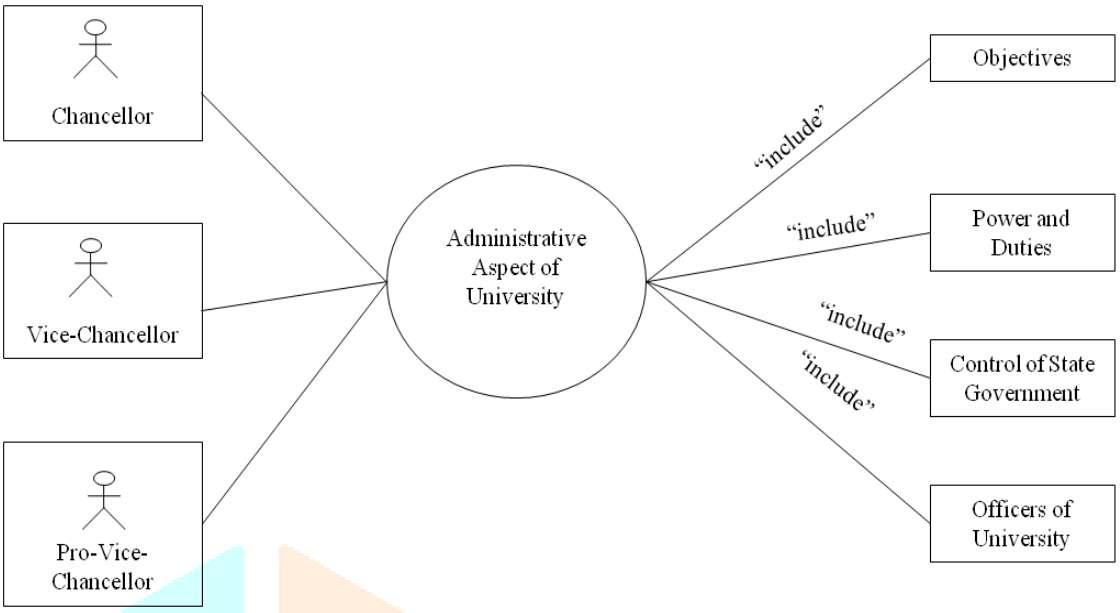

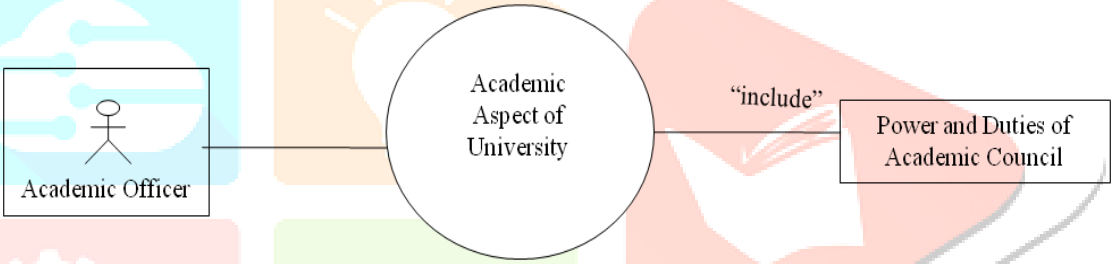

Fig 3 Use Case Diagram

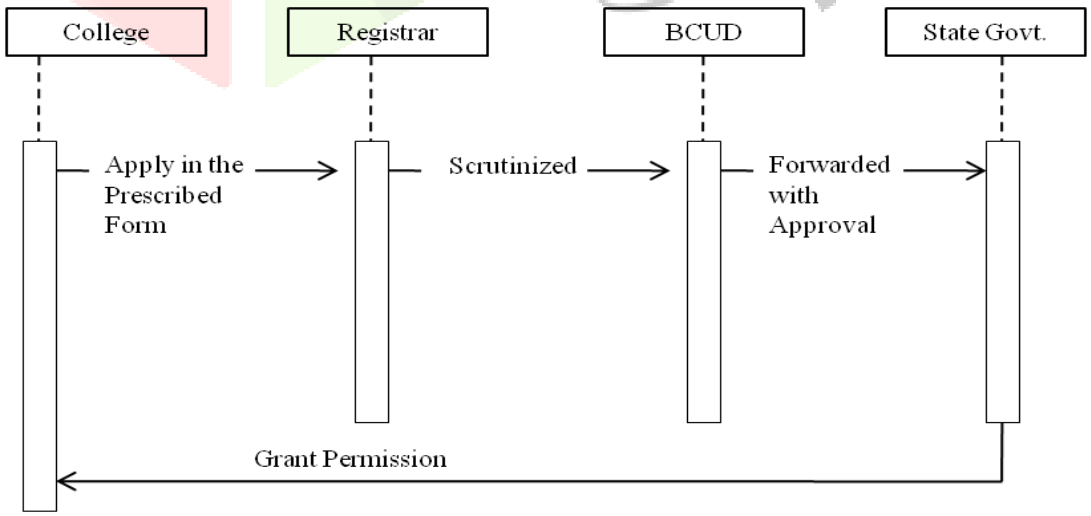

Fig 4 Procedure for Permission

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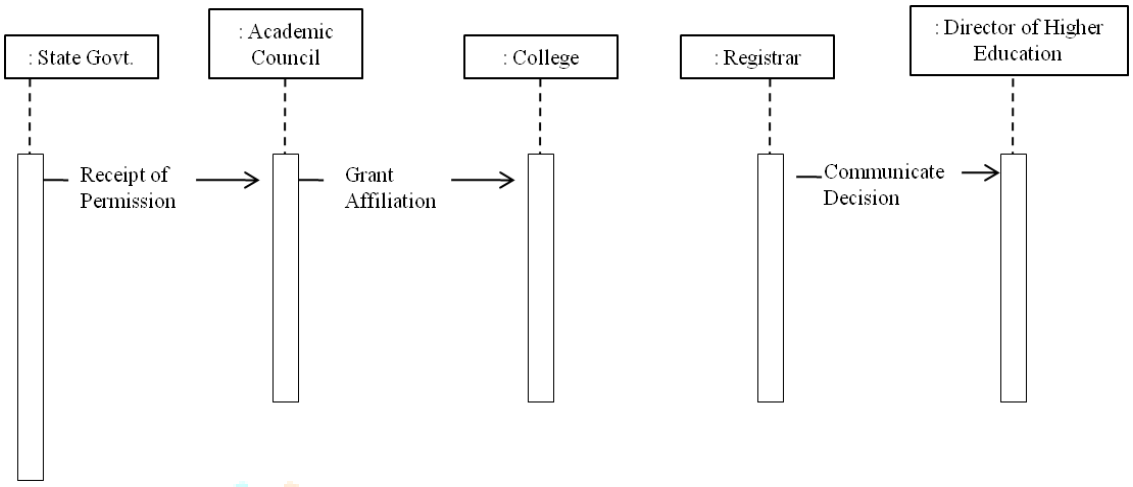

Fig 5. Procedure for Affiliation

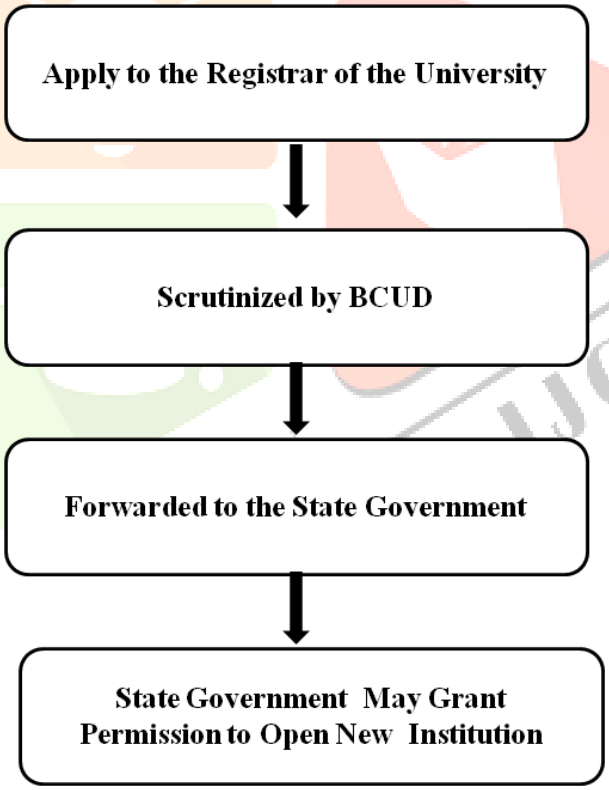

Fig 6 Activity Diagram

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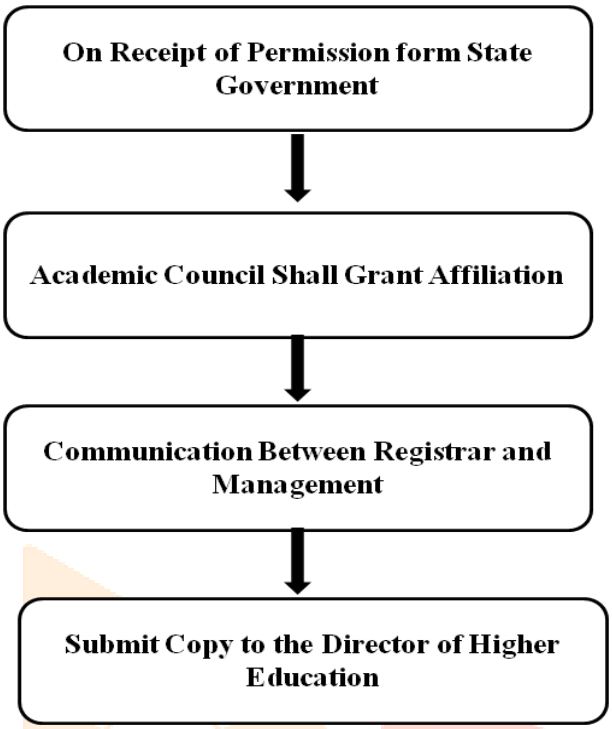

Fig 7 Activity Diagram

IV. CONCLUSION

The work presented here carries out the requirement analysis of academic organization considering a modeling process of requirement engineering, which is a part of software engineering project management.
The requirement analysis of the organization is carried out in this dissertation considering current requirement of academic standards .The problems based in teaching the standards, deriving procedures of quality achievement and major issues in academic organization. The requirement analysis carried out is presented in form of standard model using UML.
The UML representation then used to develop software model. The process indicates the way of successfully carrying out of requirement analysis of any organization through UML modeling and converting it to the successful software module.

V. LIMITATION

The process of work carried out in this dissertation indicates that for any organization requirement analysis must be carried out through understanding of the needs and expectations of the proposed system. It must cover complex task and documenting the requirement of the organization.

VI. SCOPE

Requirement analysis and the requirement engineering process are the important steps from software engineering which leads to successful software project management.

1. Requirement engineering is an engineering field which deals with the systematic handling of requirements.
2. It can be carried out for any type of organization for successful implementation of software project management.

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