

Operational Concept Description (OCD)

Student Scheduling System

Team #06

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Version History

Date	Author	Version	Changes made	Rationale
10/03/12	Alex Tregubov, Mihir Daptardar, Zheng Lu, Doug Kinnes	1	Initial Creation of document, filled information known for VC Package delivery.	Created initial document For VC Package
10/08/12	Alexey Tregubov	1.1	Fixed bugs 7075, 7073, 7080, 7069, 7070, 7072, 7078, 7077, 7068 Updated table of contents Updated section A1.1 – all missing stakeholders were added. Updated diagram in section A2.3	Improved document consistency
10/13/12	Alexey Tregubov	1.2	Added document property – version. Fixed document formatting defects (footers, headers, styles, section numeration) Updated section A2.1 (TA comments considered). Updated sections 3.1.2 and 3.1.3. (TA comments considered).	Improved document consistency (formatting) Fixed some defects found by TAs Suggested changes for sections 3.1.2 and 3.1.3.
10/15/12	Doug Kinnes	1.3	New diagram for A.2.1.3 Filled in A.2.2, A.2.3, A.2.4	Improved understanding of current system led to new Business Workflow Diagram Completed sections needed for capabilities for Core FCP
10/16/12	Doug Kinnes	1.4	Fixed bug 7070, 7077, 7085, 7066, 7073, 7087	Improved document accuracy and consistency
10/22/12	Mihir Daptardar	1.5	Updated the current workflow (Fig: 3) Added the element relationship diagram (Fig 4) Added sections 3.4.1 and 3.4.2	Detailed current workflow
10/24/12	Doug Kinnes	1.6	Fixed Bugs 7073, 7077	Added paragraph to Shared Vision
10/29/12	Alexey Tregubov	1.7	Fixed bugs: 7073, 7077, 7085, 7086, 7082, 7407, 7319, 7407, 7408, 7409, 7410, 7411, 7413, 7415, 7416, 7417, and 7418.	Fixed defects pointed out by TA.

Date	Author	Version	Changes made	Rationale
10/31/12	Alexey Tregubov	1.8	Element relationship diagram and current business workflow were updated.	Diagrams were updated according to the recommendations given by TA.
11/3/12	Mihir Daptardar	1.9	Study Plan component in Figure 4 had the spelling mistake.	Updated the diagram according to the defects pointed in the ARB.
11/14/12	Alexey Tregubov	2.0	Fixed defects: 7587, 7588, 7589	Headers were properly formatted.
11/26/12	Mihir Daptardar	2.1	System boundary (Figure 2) needed to be more precise	Updated the support infrastructure in the system boundary diagram
12/07/12	Alexey Tregubov	2.2	Fixed defects: 7917 and 7918	Updated version and current status of the document.
04/26/12	Mihir Daptardar	2.3	Fixed defects: 8163, 8208, 8209 and 8210	Updated version, footer, name and removed team member

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1. Introduction

1.1. Purpose of the OCD

This document describes the shared visions of the success-critical stakeholders of the project, Student Scheduling System. This project will be used by Stevens Institute of Technology Computer Science Department. The main success-critical stakeholder is Professor David Klappholz who is the project owner and adviser at Stevens. All other success-critical stakeholders include:

- Undergraduate students of Stevens (undergraduate CS, IS, and CyS majors)
- Course directors
- Advisers
- Administrators
- Software maintainers
- Developers

This OCD will be used constantly throughout the project's life cycle as developing on the new operational concepts.

1.2. Status of the OCD

The status of the OCD is the version in the transition phase. This document gives our current understanding of the project within the transition phase. All sections are complete and finalized.

2. Shared Vision

The vision for this system is to create an easier and less complicated way for students to be able to create schedules in order for them to graduate in the time frame they desire. As shown in Table 1, this is achieved by the system being planned with the cooperation of Steven's Institute staff, faculty and students.

Table 1: The Program Model

Assumptions:			
<ul style="list-style-type: none"> • Students and advisor will use the new system. • Available courses and degree requirements will be kept up to date. 			
Stakeholders	Initiatives	Value Propositions	Beneficiaries
<ul style="list-style-type: none"> • Developers • Undergraduate students of Stevens (undergraduate CS, IS, and CyS majors) • Course directors • Advisers • Administrators • Software maintainers 	<ul style="list-style-type: none"> • Deliver the system. • Fill the data base with initial data. • Inform new students about the systems. • Hold training sessions for students. • Move server from USC hosting to Stevens hosting and maintain the server. • Enhance the system. 	<ul style="list-style-type: none"> • Save advisers' and students' time • Reduce students' frustration • Reduce number of mistakes in a schedule made by students 	<ul style="list-style-type: none"> • Stevens' students (undergraduate CS, IS, and CyS majors) • Stevens' advisors (undergraduate CS, IS, and CyS majors)

2.1. Benefits Chain

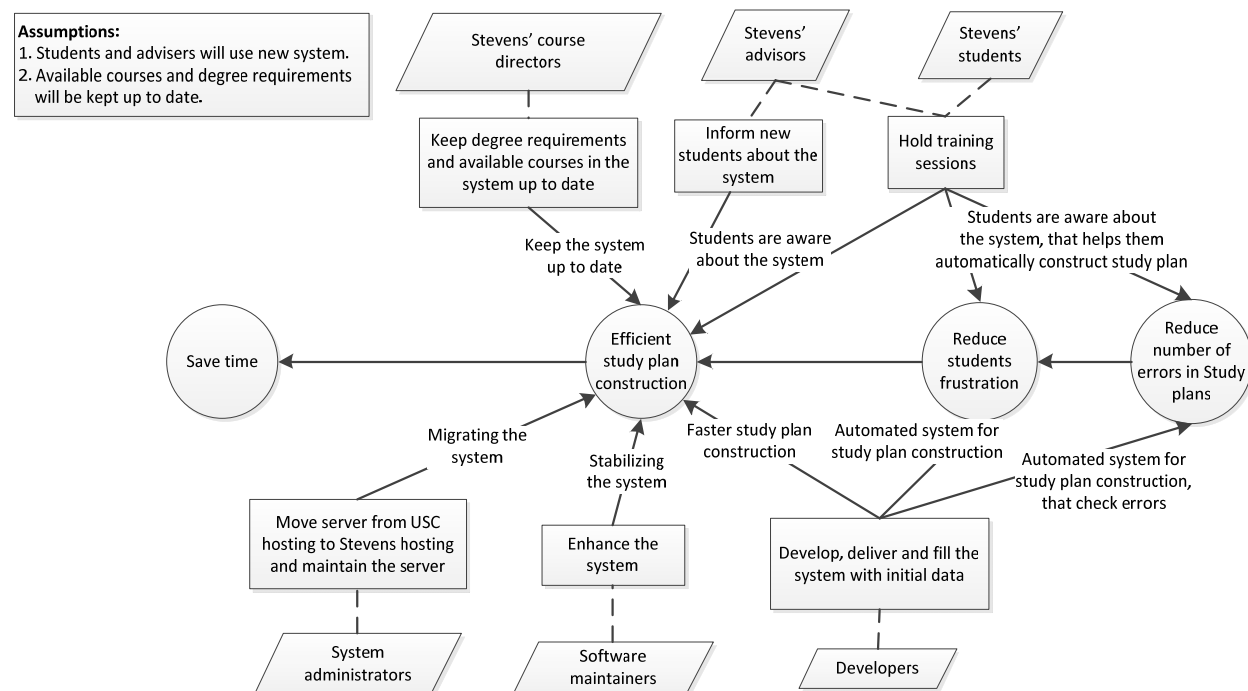


Figure 1: Benefits Chain Diagram of Student Scheduling System

2.2. System Capability Description

Student scheduling system is a web information system which main purpose is to save students' and advisers' time construction study plans. Today this process takes a lot of time, sometimes up to 1-2 days. The System intends to solve this problem by automating the construction of the study plan. Course directors and advisers of Stevens Institute of Technology Computer Science Department, which is the customer of the system, will benefit from using this system because it will reduce frustration of their students and save great deal of their valuable time.

Most of the existing solutions such as Rutgers University Course Scheduling System and Student Class Scheduling by College Scheduler LLC are usually aimed to construct class schedule not course scheduling for study plan. Even those systems which provide such capabilities for students are very limited in functions specific for certain university. From that prospective Student scheduling system for Stevens University is quite unique. Moreover, most of the existing solutions that can potentially solve similar task are commercial and quite expensive.

The distinguishing features of the Student scheduling system for Stevens University are the following:

- The System will allow course administrators to specify wide range of degree requirements for a specific program (Computer Science, Cyber Security) through the web user interface,
- Students will be able to enter constraints for their study plan (such as preferred courses, semester of graduation, etc.)

- Students will be able to construct the study plan satisfying the degree requirements and their desires.

Unique feature of the system is that it will consider all possible types of degree requirements which exist in Stevens University. Existing competitors does not provide enough flexibility to cover all the cases of degree requirements in Stevens University.

2.3. System Boundary and Environment

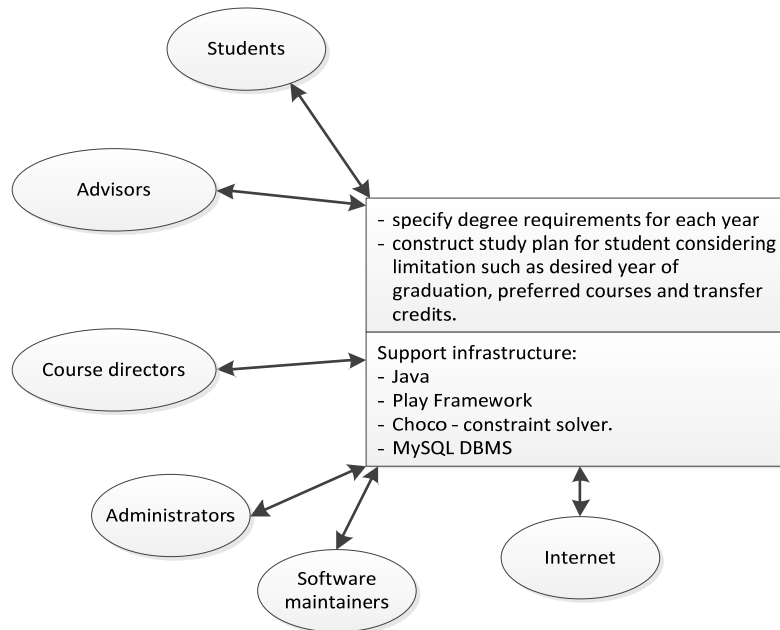


Figure 2: System Boundary and Environment Diagram of Student Scheduling System

3. System Transformation

3.1. Information on Current System

3.1.1. Infrastructure

1. No current system exists.
2. All the scheduling and course planning are done manually by advisors with students.
3. If the students cannot find schedule that satisfies their desires on their own, they ask their advisor to help them in study plan construction. That part of the process consumes a lot of time.

3.1.2. Artifacts

Current process is manual, and it uses the artifacts provided in Table 2.

Table 2: Artifacts

#	Artifact	Description
1	Description of the degree requirements.	Description is available in a set of documents, which contain list of mandatory courses, and rules that describe how elective courses can be selected.
2	Recommended sequence of courses for students.	For freshmen students, who do not have transfer credits or other individual requirements, university provides recommended sequence of courses to be taken for each degree. That helps such students to fill in study plan without spending a lot of time.
3	List of the courses available on the department website.	Plan unstructured list of available courses and general information about them (semesters when it is offered, instructors, etc.) is provided on the website.
4	Study plan template with list of mandatory courses.	Study plan template is a document that students have to fill in and submit to the department.

3.1.3. Current Business Workflow

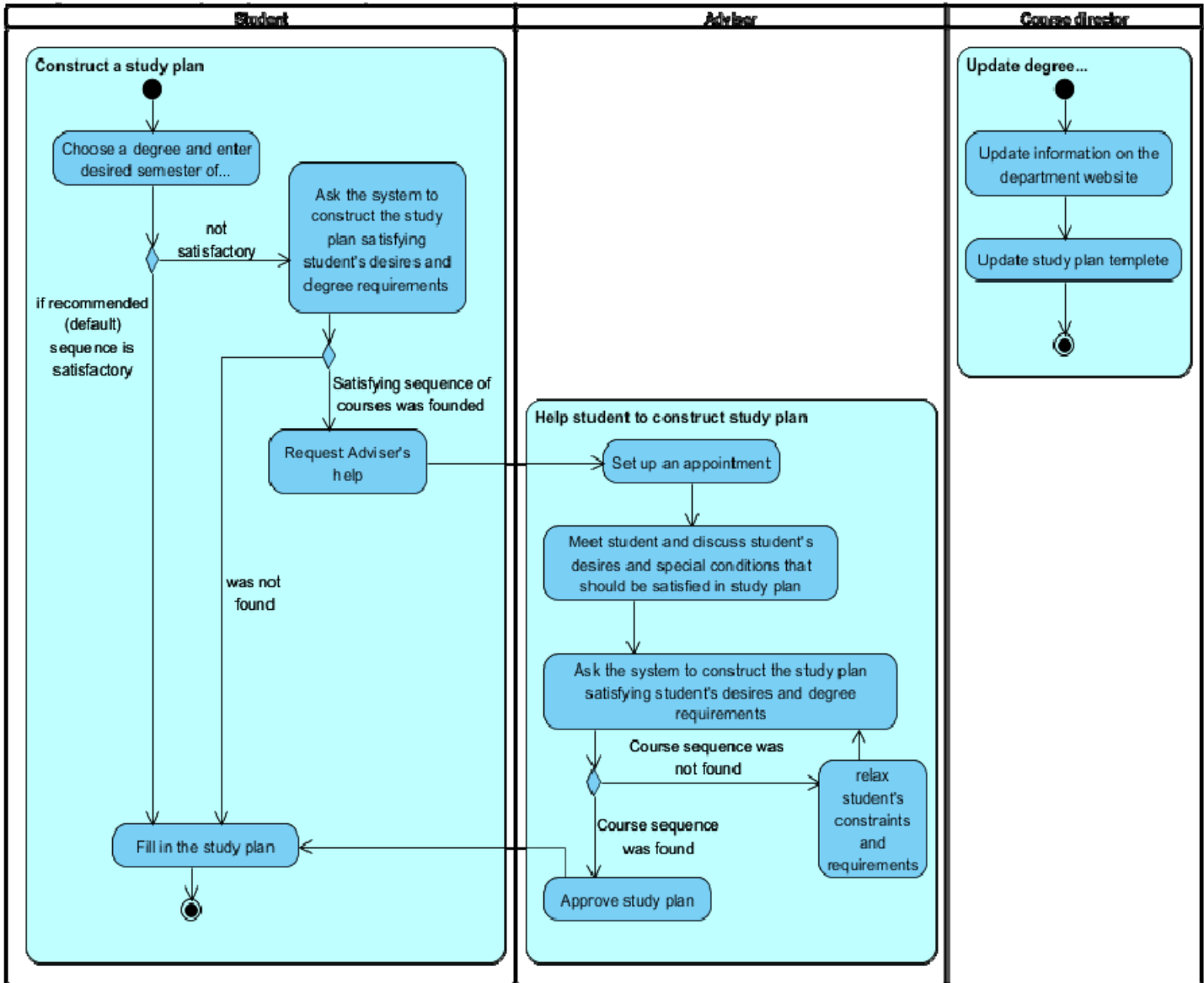


Figure 3: Current Business Workflow

3.2. System Objectives, Constraints and Priorities

3.2.1. Capability Goals

Table 3: Capability Goals

Capability Goals	Priority Level
OC-1 Schedule Construction: The system calculates the best possible study plan (if it exists), which satisfies student's desires and degree requirements.	Must Have
OC-2 Degree Requirements Input: The system allows course director to enter degree requirements as complex as all existing requirements including those which were used in previous years.	Must Have
OC-3 Student's constraint's input: The system allows the student to enter all necessary desires for study plan, such as semester of graduation, preferred elective courses, transfer/obtained credits, and etc.	Must Have

3.2.2. Level of Service Goals

Table 4: Level of Service Goals

Level of Service Goals	Priority Level	Referred WinWin Agreements
LOS-1 Returned Results: System will return results in a response time in the same order of its algorithms complexity	Could Have	WC_1357

3.2.3. Organizational Goals

OG-1: Eliminate frustration of the advisors when creating student schedules.

OG-2: Save time by allowing students to create schedules on their own time.

OG-3: Reduces mistakes in choosing courses.

3.2.4. Constraints

CO-1: No monetary budget.

CO-2: The system must use technological infrastructure that can be maintained by client.

CO-3: The system must calculate study plan faster than it is done manually.

3.2.5. Relation to Current System

There is no automated system now. The process is completely manual. Proposed system intends to save students' and advisers' time by eliminating time-consuming activity "Help student to construct study plan" (figure 3).

3.3. Proposed New Operational Concept

3.3.1. Element Relationship Diagram

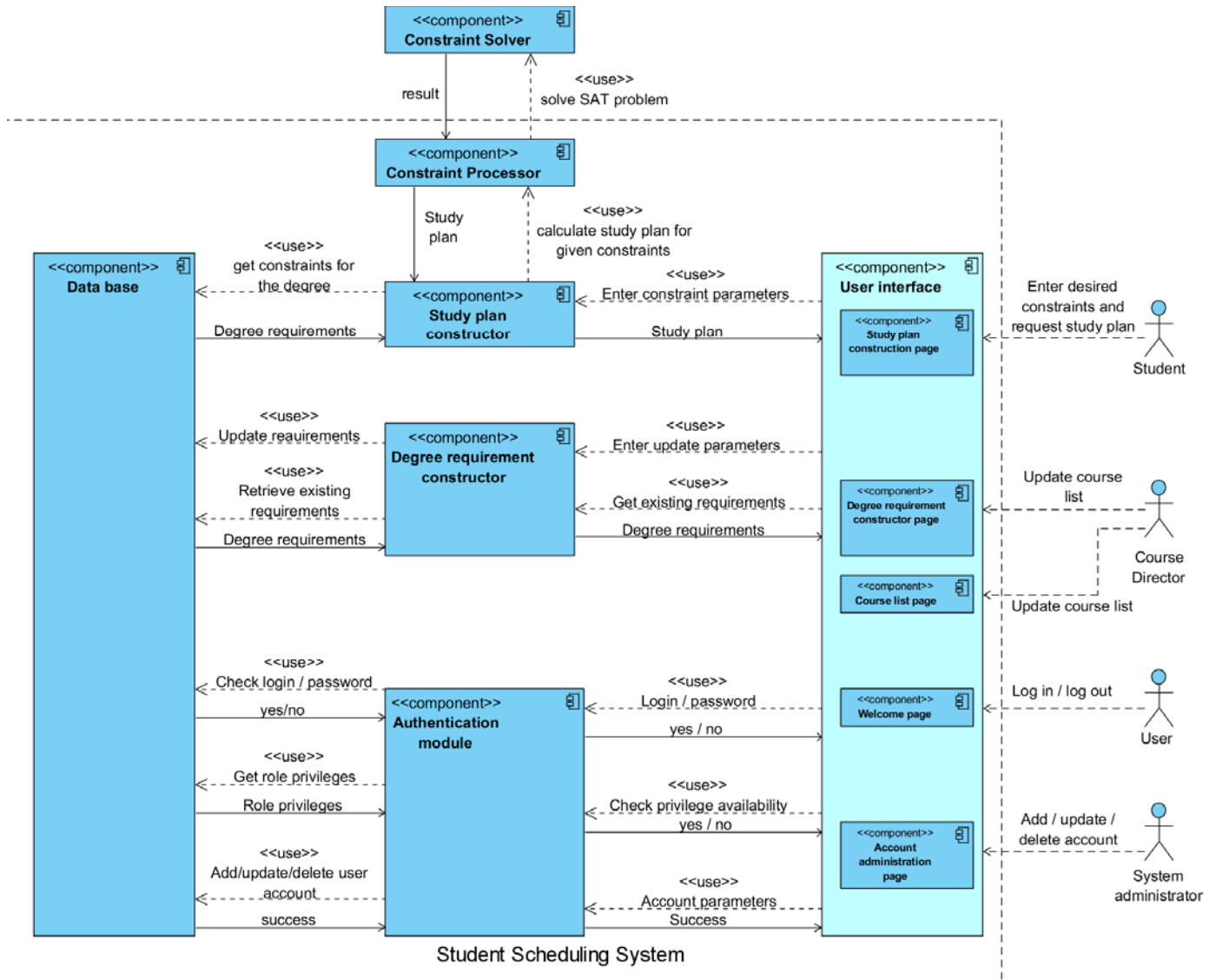


Figure 4: Element Relationship Diagram

3.3.2. Business Workflows

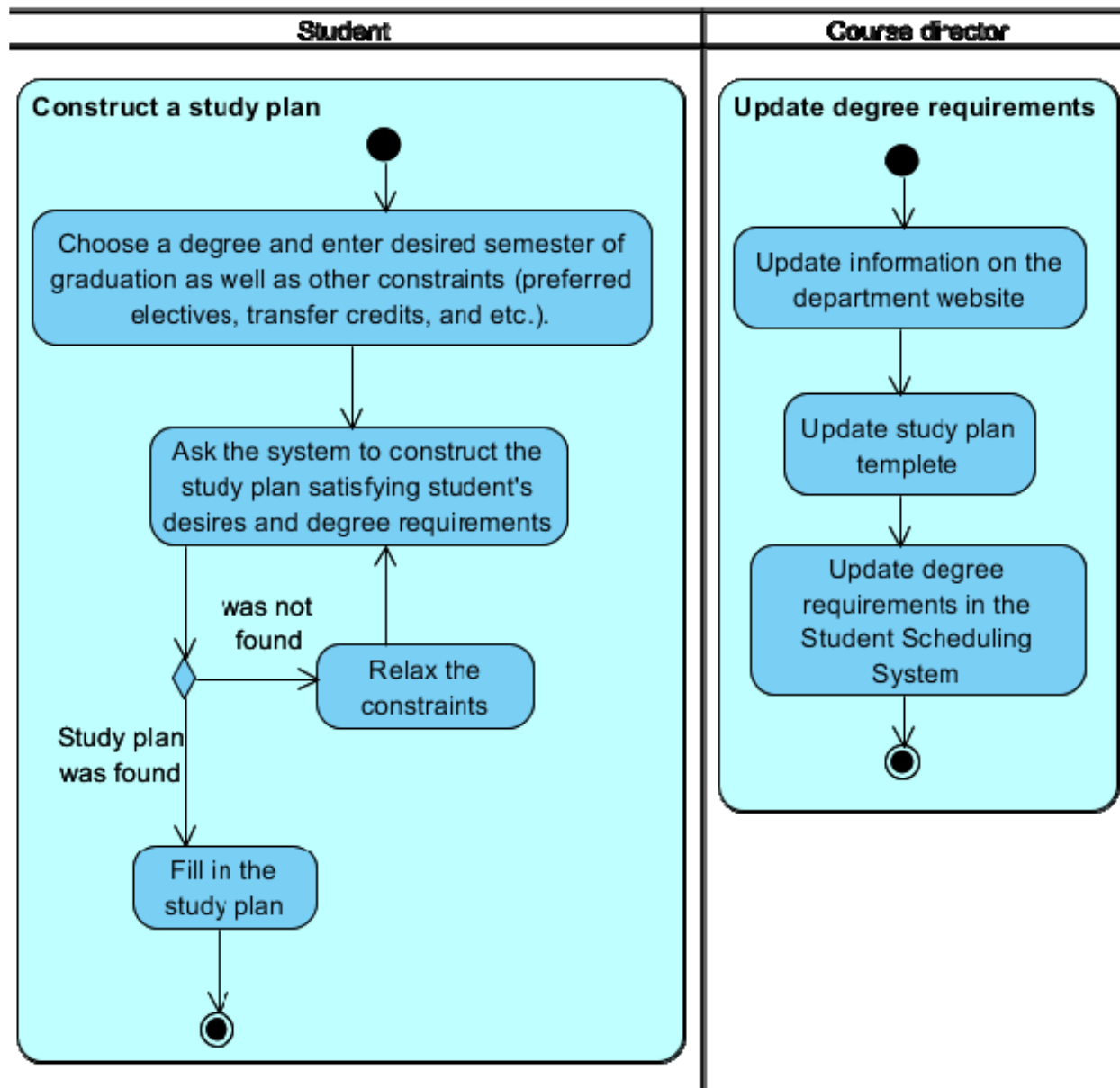


Figure 5: Business Workflows Diagram

3.4. Organizational and Operational Implications

3.4.1. Organizational Transformations

- There would be an added responsibility for the current system admin. It is his responsibility to troubleshoot any problems in the system and to make sure that the system is running smoothly.
- The course directors would have to update the degree requirements. This can be as minor as adding or updating a course in the current degree requirement or as major as adding a new degree and its corresponding requirements. They may also authorize any other employee (ex: a student worker, part time employee) to update degree requirements.
- The major stakeholders affected by the changes are system admins, course directors and students
- The new system would save the students' and advisors' time. In addition to time saving, there would be a lot less stress for students as well as advisors.
- This would allow students to plan effectively, in terms of their goals other aspects and would help them achieve their aspirations and goals.

3.4.2. Operational Transformations

- There was no earlier automatic system. This automatic system compared to the current manual system would be more robust and efficient.
- With the new system, the student would have the convenience of being anywhere (with a computer and an internet connection) and chalk out a custom schedule with all the desired courses. Also, if there are some changes, in terms of course requirements, he can go back and construct another one with the new changes
- Also, the course director can focus on other high priority activities and get them out of the way. This would result in an increase in productivity.