Product Requirements Document

Company Name: Cisco
Product Name: Digital Campus
Date: 11.07.2020

DATE	REVISION	REVISED BY
18.07.2020	**PRD Summary**	**Team-1**
22.07.2020	**PRD Summary**	**Team-1**
25.07.2020	**PRD Summary**	**Team-1**
28.07.2020	**Changes in 4.8, 3.2**	**Team-1**

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INTRODUCTION

1.1. Document Objective

The objective of this product requirement document is to design a proposal that will enable the transition of classes and labs from offline to online mode within 3 months. It is intended to provide extensive solutions that are cost-effective, timely, and ease of use to faculty and students.

1.2. Market Problem

The upheaval caused by the pandemic has an adverse effect on the educational institutes to function in their regular way. Students are unable to physically attend classes due to the social distancing norm to be followed. Due to this, the government has mandated all the educational institutes to move online.

1.3. Market Opportunity

This massive pandemic outbreak has brought in a great opportunity for digital education. The Increasing use of the internet and smartphone penetration accompanied by the government initiative to develop digital education infrastructure has brought in huge demand for online education.

1.4. Product Concept

The proposed product enables students to remotely access classes and labs conducted by their respective faculty through online mode. Setup of video/audio-based live theory classes supported with screen sharing, availability of recorded classes, and a virtual whiteboard for pointers. Attendance and schedule of classes are done through the system. Various labs can be carried online through animation, simulation, remote access to machines, or recorded videos of the demonstration of the experiment by the teacher.

1.5. Sales Axioms

A reliable web-based application which works efficiently anywhere and anytime provided there is good internet service. Assurance of high-quality service with ensured security. Availability of compressed recorded videos that can be downloaded and watched in case of poor connectivity. Ease of performing preventative maintenance of the application, and repair services when faults are diagnosed.

1.6. Unique Selling Proposition

Digital Campus has multiple tools for the administration of the institution to utilize in furthering communicating with their students – labs, automated attendance specifically designed for educational purposes.
The proposed application takes care of both theories as well as lab classes and encourages comprehensive learning in all the fields.

PRODUCT PROJECT OVERVIEW

2.1. Section Objective

This section provides macro information about the environment into which the product will be introduced.

2.2. Target Market Description

The proposal is extensively designed for higher education institutions in India. They are broadly divided into 3 categories: universities, colleges, and stand-alone institutions. The 900 plus universities, 39,000 plus colleges, and 10,000 plus stand-alone institutions are the target market of Digital Campus.

2.3. Target Customer Description

The educational institutions opting for online higher education for their students are the target customers of Digital Campus.

- The aforementioned institutes are the buyers of the Digital Campus.
- The users of the application are teachers (age group 30-65) and students (age group 18-23).
  Link: http://aishe.nic.in/aishe/viewDocument.action?documentId=262

PRODUCT ENVIRONMENT

3.1 Section objective:

This section provides macro information on the constraints and assumptions that guide and limit the product's scope, functionality, and impact on its future design.

3.2 General constraints:

1. The language that the software has to be written in and whether the software has to be developed for a specific OS. If a specific language is required, then it'll reduce flexibility and can end up being costly and the choice of the operating system can affect the speed of development of the software.
2. Whether a specific framework has to be used. Selecting a framework is a critical design decision because the selected framework will dictate the application architecture. Once the development has started, changing the selected framework may require the redesign and reprogramming of the application.
3. The kind of databases to be used for storage. All databases have different specifications. Trying to make a certain database work for a project can add unnecessary complexities.
4. Budget Constraints - Product should be developed using a limited budget as set by the college.
5 . Time Constraint - Product should be available for deployment within 3 months from incubation.

3.3 Assumptions and Dependencies:

1. Students and teachers should have the required bandwidth available and good network connectivity at their place.
2. Funding of licenses will be provided by various departments as needed and the use of 3rd party applications will be dependent on the operating system, the application server, and the database server.
3. The project scope will not change once the stakeholders sign off on the scope statement

PRODUCT REQUIREMENTS

4.1 Section Objective:

This section describes the functional and feature requirements of the product.

4.2 External Interface Requirements

- The solution must be compatible with all platforms
- Must offer ease of use, seamless experience
- Lag-free UI and a customized meeting room

4.3 Functional Requirements

Students

- Should be able to attend classes
- Should be able to check attendance
- Should be able to check schedule
- Should be able attend labs / submit lab work
- Should be able submit tests

Teachers

- Should be able take classes
- Should have automatic attendance and class scheduling
- Should be able take labs/ view submissions grade them
- Should be able view test submission and grade them

Administrators

- Should be able assign students and teachers to classes
- Should be able schedule classes / labs
- Should be able make exam schedules and declare results

4.4 Performance Requirements

- Low latency and considerable bandwidth
- Scalable
- High traffic management
- Low computation at end users for an error free experience

4.5 Safety and Security Requirements

- Role based access control
- Authorised access to data
- End to end encryption
- Prevent data leaks and protect sensitive data

4.6 Software Quality Attributes

- Adaptability - is made adaptable to take into account all types of users.
- Availability - will be open to use by everyone.
- Flexibility - made flexible enough for future changes.
- Robustness - program is made to suggest many different types of use cases.
- Maintainability - versions of the software can be rolled out in the future with the updates having changes suggested by the users.

4.7 Hardware requirements

- Computer and processor-Minimum 1.6 GHz (or higher) (32-bit or 64-bit).
- Memory-2.0 GB RAM
- Hard disk-3.0 GB of available disk space
- Display-1024 x 768 screen resolution
- Graphics hardware-Minimum of 128 MB graphics memory
- Video-USB 2.0 video camera
- Devices-Standard webcam, microphone, and speakers

4.8 Documentation requirements

- Live Classes - Basic workflow and features to be highlighted for users.
- Attendance - To highlight how the attendance system works and how it could be checked
- Schedule of classes - For admin to understand how to schedule classes for a given campus
- Test/ Lab submissions - Basic workflow for submission of tests and retrieval/grading.
- Labs - Detailed overview of how submission based labs, simulation labs and remote access labs would work.
- Cloud storage- Using cloud storage for access to academic files.

Supporting Data:

5.1. Section Objective:

This section provides data in support of claims, assertions, assumptions, and statements made throughout this document.

5.2. PRD Assumptions:

1. All people using the software have sufficient bandwidth capabilities for file sharing and video/audio conferencing taking into account the conferencing and storage optimizations incorporated into the software.
2. The webcam and speaker should be in a working condition.
3. Funding of licenses will be provided by various departments as needed and the use of 3rd party applications will be dependent on the operating system, the application server, and the database server.
4. The project scope will not change once the stakeholders sign off on the scope statement.

5.3. Research Information

We conducted two Surveys. In the first survey, we asked college faculty what features are lacking in the current learning platform, for which we found two common problems: ATTENDANCE and LAB CONDUCTION. In the second Survey we gave faculty two options:

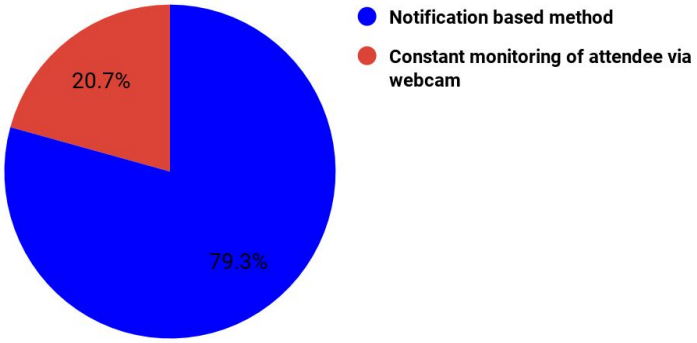
For attendance tracking:

1. Notification based method (using pop up a dialog box which student has to respond to)
2. Constant monitoring of attendee via webcam (using facial recognition algorithm)

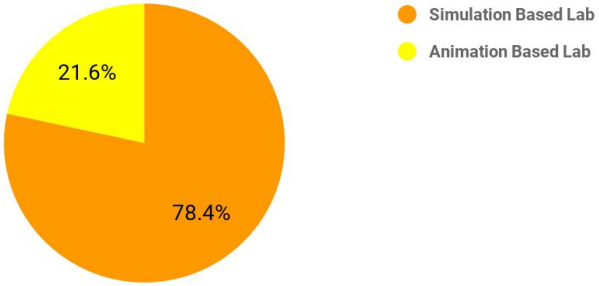
For lab conduction:

1. Animation Based Lab.
2. Simulation-Based Lab.

Result is as follows:



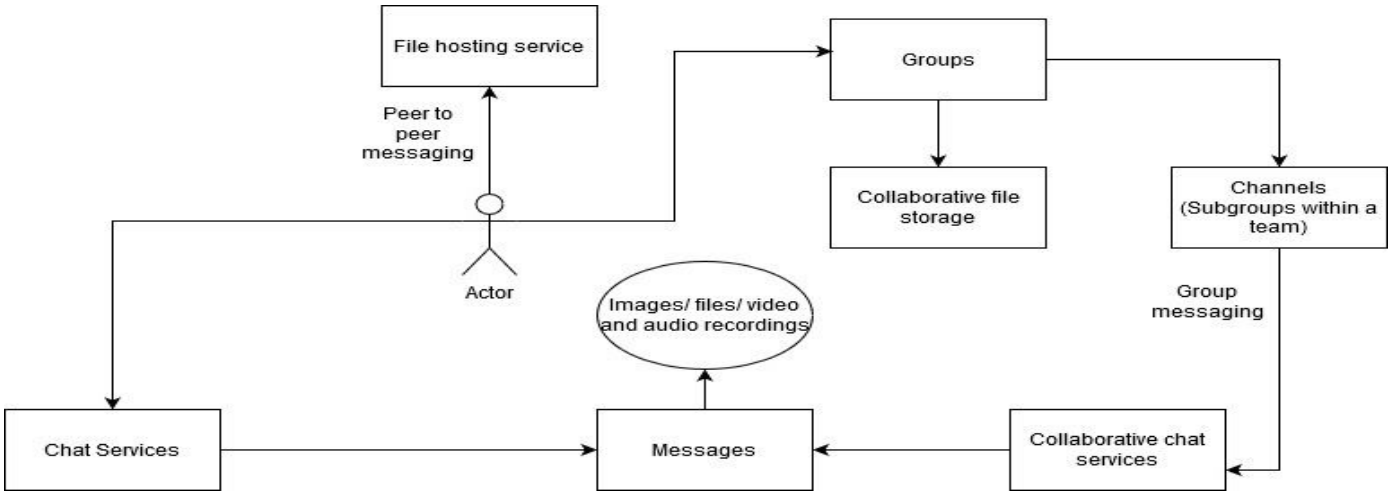
Out of 111 responses, 88 faculty choose option 1; Notification based method.



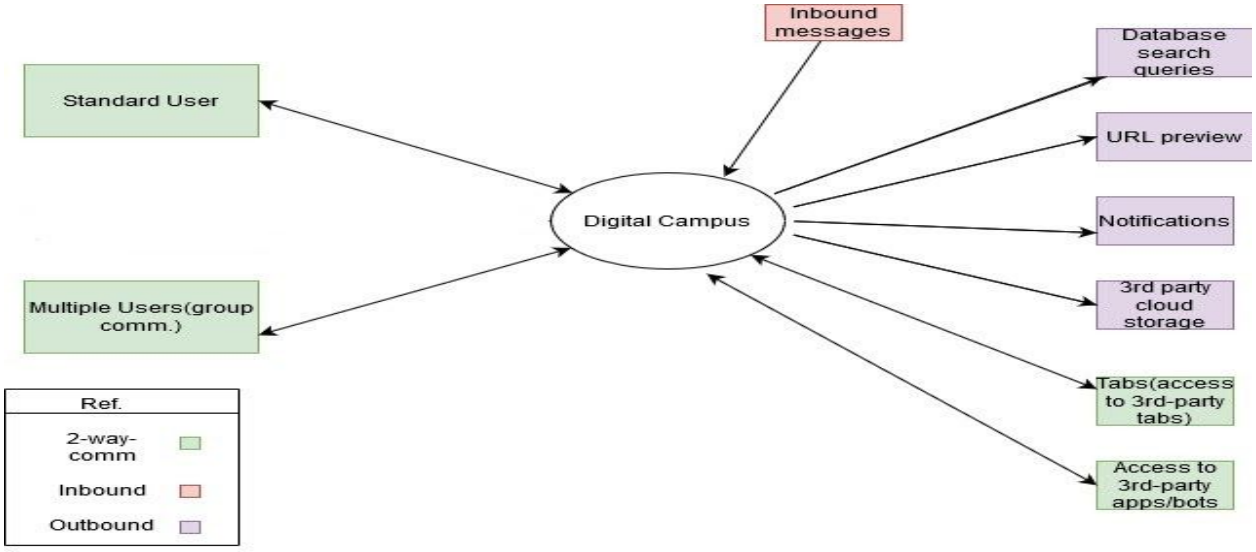
Out of 111 responses, 87 faculty choose option 1; Simulation-Based Lab. But we'll incorporate both types of the lab because Animation Based Lab can help in teaching basic lab techniques, the step-by-step procedure of an experiment and prepare students to operate equipment correctly through animation.

5.4. Product Diagram/Architecture

5.4.1 Logical Architecture:



5.4.2 Dataflow Architecture:



PR Identifier	Directive	Constraints	Category	Priority
4.2.1	Platform Independent- The solution should be accessible on all kinds of devices- Android, iOS, Windows, Web Browsers(Chrome, Firefox, Edge)	Segmented Market - Division of market into various platforms like Android, iOS, Windows, Web Browsers(Chrome, Firefox, Edge)	External Interface Requirement	1
4.2.2	Lag-free UI and a customized meeting room(details of class going on, teacher's guidelines, etc)	Adequate Bandwidth (10-15 Mbps) and the framework optimization	External Interface Requirement	2
4.2.3	Ease of Use and Seamless Experience	Adequate bandwidth (10-15 Mbps) and framework optimization	External Interface Requirement	2
4.3.1.1	Should be able to attend classes	Standard camera and microphone, Lab Resources, Network	Functional Requirement	1
4.3.1.2	Should be able to check attendance - in all subjects being taken up	Must be a registered student	Functional Requirement	2

4.3.1.3	Should be able to check the schedule - must check the entire timetable of the class and receive emails when a class is scheduled	Must be a registered student	Functional Requirement	2
4.3.1.4	Should be able to attend labs / submit lab work - lab work can be done on a personal system, or remote access to college equipment or access to simulation resources	Availability of licenses/open source software on personal systems. Sufficient Bandwidth for remote access and simulation resources.	Functional Requirement	1
4.3.1.5	Should be able to submit tests - in the required formats	Sufficient bandwidth for timely upload	Functional Requirement	1
4.3.2.1	Should be able to take classes with access control	Standard camera and microphone, Lab Resources, Network	Functional Requirement	1
4.3.2.2	Should have automatic attendance and class schedule - the teacher should not have to worry about manually taking attendance and schedule will be taken care of by administration	Administrative constraints	Functional Requirement	2
4.3.2.3	Should be able to take labs/ view submissions to grade them	Student submits in the required format, provides required documentation	Functional Requirement	1
4.3.2.4	Should be able to view test submit and grade them	Student submits in the required format, provides required documentation	Functional Requirement	1

4.3.3.1	Should be able to assign students and teachers to classes	All students and teachers must be registered with the system with required details	Functional Requirement	1
4.3.3.2	Should be able to schedule classes/labs - care should be taken to avoid clashes and maintain sufficient time(20-30 mins) between consecutive classes to allow a smooth transition	Number of working hours for a faculty member and number of credits for each subject taken by a student	Functional Requirement	1
4.3.3.3	Should be able to make exam schedules and declare results	Exam results are provided by the faculty	Functional Requirement	2
4.4.1	Scalable - Should handle 5 campuses(at least 10000 concurrent users)	Sufficient server bandwidth and database access latency.	Performance Requirement	1
4.4.2	High traffic management - Should function when multiple users try to access a resource at a particular time	Sufficient server bandwidth, database access latency, Sufficient memory and computation resources	Performance Requirement	2
4.4.3	Low computation at end-users for an error-free experience	Offload most computation to the server, by ensuring a high-performance server is available	Performance Requirement	1
4.5.1	End to End encryption - Secure the traffic between the users and servers without adding	Communication protocols used and the algorithm used for encryption	Security Requirement	2

	additional overhead in bandwidth (asymmetric E2EE)			
4.5.2	Role-Based Access Control - ensure the students don't access the functionality of teachers and teachers don't have admin access.	Administrative constraints and well-defined list of teachers and students	Security Requirement	1
4.6.1	Adaptability - is made adaptable to take into account all types of users.	Segment market - users of different kinds of devices, etc	Software Quality Attributes	1
4.6.2	Availability - will be open to using by everyone.	Users must be affiliated with the university and must be actively seeking education	Software Quality Attributes	1
4.6.3	Flexibility - made flexible enough for future changes.	Framework and database constraints	Software Quality Attributes	1
4.6.4	Robustness - the program is made to suggest many different types of use cases.	The number of features specified by the customer at the elicitation phase	Software Quality Attributes	2
4.6.5	Maintainability - versions of the software can be rolled out in the future with the updates having changes suggested by the users.	The maximum tolerance level of the system dependencies	Software Quality Attributes	2