

TCube - An Effective Education Initiative & Knowledge Content Management

Ekalavya Summer Internship Programme'16

Submitted in fulfilment of internship Project



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Summer Internship 2016 Project Approval Certificate

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Declaration

I declare that this written submission represents my ideas in my own words and where other's ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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NMEICT

The 'Train 1000 Teachers' programme was initiated by IIT Bombay in 2009, under the project 'Empowerment of Students/Teachers,' sponsored by the National Mission on Education through ICT (MHRD, Government of India). This project targets to train teachers of Engineering colleges in India to improve the teaching skills. The basic principle is to create an ideal content which meets the needs for imparting knowledge with minimal physical interaction. Once we have a self explanatory content, the teacher's role is limited to solving difficulties of learners rather than actually imparting knowledge. In 2013, this programme was scaled further, to train up to 10,000 teachers at a time, using 338 established Remote Centers across India. To serve this purpose, NMEICT software has been developed to conduct workshops smoothly.

TCube Software

Introduction:

The TCube Model:

The TCube (train the teacher) model is essentially a bootstrap model. It allows exponentially expanding training of any course. The basic principle is to create an ideal content which meets the needs for imparting knowledge with minimal physical interaction. Once we have a self explanatory content, the teacher's role is limited to solving difficulties of learners rather than actually imparting knowledge.

The TCube model believes that learners who have excelled in a course can take up the responsibility of addressing problems raised by other learners in subsequent offering of the course. The exponential growth of learners can be achieved by 'promoting' such excellent earners into a teacher's role in a MOOC environment. We will call such promoted learner's assistant faculty. Each course has a principal faculty. The principal faculty is responsible for ensuring the quality of learning is maintained even though he/she is not actually running a course. He/she is responsible for monitoring the delivery of courses which are actually managed by the assistant faculty. He/she is also responsible for

ensuring that the quality of assessments is maintained. He/she is also responsible for reviewing the feedback of learners and upgrade the content/assessments accordingly. He/she can actually 'demote' assistant faculty if their performance in answering queries is not satisfactory.

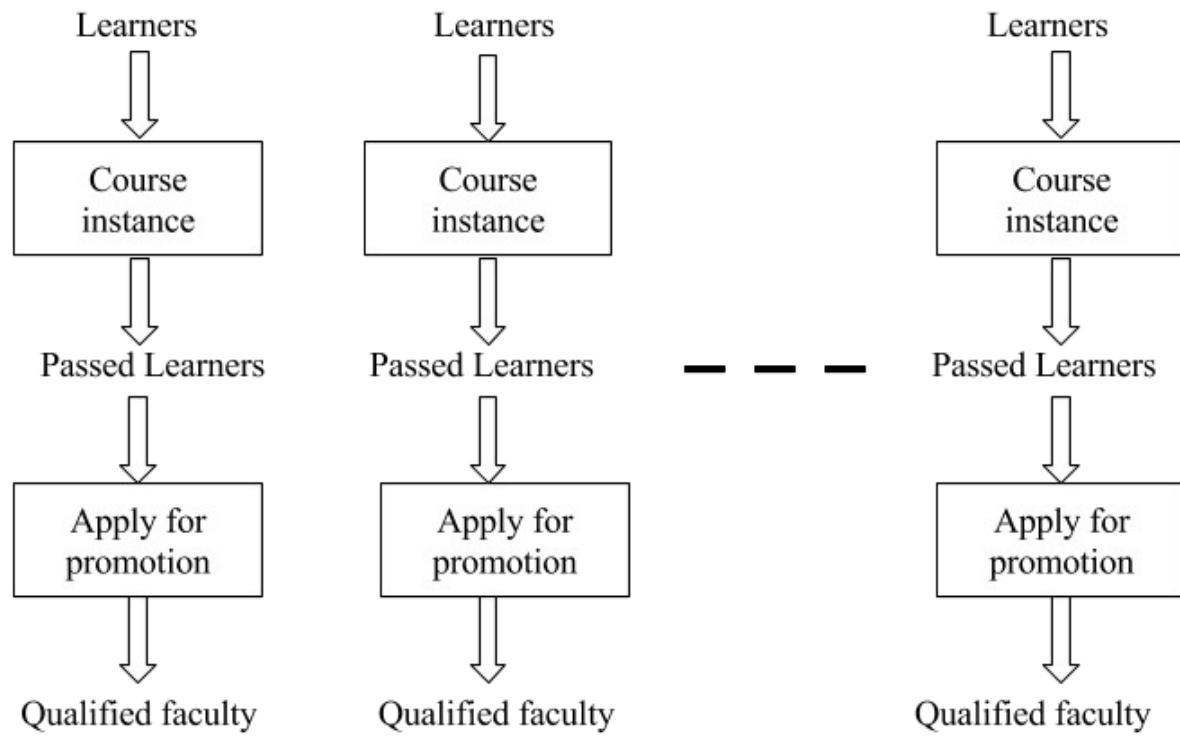


Fig1: The TCube Expansion Model

The TCube Feedback:

It is known that MOOC itself degrades the knowledge delivery to some extent since the teacher is not able to give individual attention. The TCube model is likely to dilute this further by promoting (excellent) learners into an online mentor role. Therefore, we need to implement a very detailed feedback mechanism to continuously monitor the effectiveness of knowledge delivery. Each and every content component will be ‘evaluated’ with learner feedback and improved if necessary. Each and every component (such as discussion forum) will be reviewed through feedback from learners. In fact, it is possible that we will implement some credits for giving useful feedback!

TCubeLibrary:

TCube library is the webpage designed for administrator to handle the backend work and make changes in the content. The most important task of this library is to implement the search feature for general user. The search is given in two different ways. One is simple basic search while other is the advanced search. Both searches are very useful for the general user to have a quick look at the required content.

The TCube Face to Face Interactions:

Apart from the MOOC knowledge delivery, the TCube course also provides for face to face sessions where the learners assemble in various remote centers (nearest to their place of residence) and have meaningful interaction with the course faculty. We expect the face to face interactions as a valuable means of enhancing the effectiveness of MOOC delivery.

The TCube Course definition:

The TCube course is a ‘blended’ course, meaning there is a blend of face to face and online components. It consists of alternating sessions of online and face to face periods. There is no restriction on the number of alternating sessions. Each session can have more than one sub-sections and more than one assessments. While defining the course, the principal faculty(ies) define the duration of each alternating sessions. The duration of the online sessions/components is in calendar days and the start time for each session is defined by the end time of the face to face session (or the beginning of the course). The face to face sessions start time could have restrictions (such as weekends etc.). The course definition is thus ‘portable’ across various instances, each starting on different

dates. Once defined a course definition is saved (for replication) and can be used to instantiate further instances.

The TCube course instantiation:

Definition creates a course template. Once a course template is saved, it can be instantiated for delivery. Instantiation is a simple process of choosing a start date. Once a start date is chosen, each and every session (including tests) get an actual physical date. The dates for the face to face will be determined based on the restrictions (week-end). The dates of face to face sessions can be adjusted (but not the duration). All other dates cannot be adjusted, especially in the first phase of the software. This rigidity is needed to ensure standardised delivery of knowledge.

The TCube course publishing:

The principal faculty will inspect the course details and ‘publish’ the course in two phases. In the first phase, the course would be visible to authorised entities such as remote center coordinators and eligible assisting faculty(ies). These entities will express their willingness to participate in the conduct of the published instance of the course. Once the principal faculty is of the opinion that sufficient interest is generated among the conducting fraternity, the course will be ‘published’ for visibility to the general public. Before final publishing, the principal faculty will appoint course faculty from the eligible faculty interested in conducting the course. The final publishing will lead to two actions. First the registration page will be open for the general faculty pool. Corresponding emails will be sent to all known email addresses and flyers will be sent to known institute heads for circulation among their faculty. Second a copy of the course will be created (automatically) on the sandbox version of IIT BombayX software available with the TCube software. The content of the ‘master’ course (if any) will be added automatically to this course. This ‘course’ will then be validated and exported. This will then be imported on the production IIT BombayX server as an invitation course.

The TCube course registration

The registration process will be similar to the current NMEICT registration. The registration will go through a series of authorization steps till final confirmation. Once participant is confirmed, he will be automatically enrolled in the instance of the course which he/she has chosen.

The TCube course delivery

The online course delivery will be based on repeated content from previous instances. The content once frozen cannot be changed in the initial version to ensure standardization. Standardised assessments will be provided at fixed time. The number of assessment will be exactly the same. Whether the content of the assessments will change depends on the principal faculty. The face to face sessions will be coordinated by the remote centre coordinator. He/she will be responsible for attendance and providing facilities required for conduct of the sessions.

The TCube course monitoring

The TCube software will keep accessing information about the delivery of each instance of the course. The software will access all grades and attendance records. This information will be available to the principal faculty as well as the course management team.

The TCube course certification

Certificates will be issued by the TCube software. The workshop managers will be presented with the data and will make decisions on the issue of certificates. If the principal faculty has defined a rubric for pass/fail, the TCube software will automatically generate the pass/fail criteria. The final call on issuing of the certificates will be done by the principal faculty alone. He/she may take the assistance of the instance faculty if he/she wishes but the responsibility and accountability is his/hers. The principal faculty will also be responsible or assigning a grade to assisting faculty after reviewing his/her performance.

The TCube course faculty pool

The faculty which has cleared any instance of the course can express a desire to conduct future instances of the course. The principal faculty will be responsible for approving such applicants to the faculty pool.

The TCube Roles

TCube software will support the following roles.

1. The Business Head
2. Principal faculty(ies) (for a TCube Course)
3. Assistant Faculties (for a TCube Course instance)
4. Principal Course Delivery Manager (for all TCube Courses)
5. Assistant Course Delivery Managers (for a TCube Course Instance)
6. Principal Course Content Manager (for all TCube content)
7. Assistant Course Content Managers (for a TCube instance content)
8. Remote centre coordinator (for a remote centre)
9. Workshop coordinator (for a TCube course instance at a remote centre)
10. TCube participant (all participants in either NMEICT or TCube courses)

The TCube Business Head

This role is ultimately responsible for all business decisions. He will have access to all the data and reports available in the system. He will formally approve all significant changes. He will also appoint the following (who will report to him):

1. Principal faculty(ties) for a TCube course
2. Principal Course Delivery Manager
3. Principal Course Content Manager

He will periodically review the performance of all the entities he appoints and has the authority to change them. He will have access to review reports of all the other roles. He will have the authority to remove/change the roles, but will not have the authority to overturn the decisions made by the above roles.

The TCube Principal faculty(ies)

This role is ultimately responsible for the quality conduct of all instances of a particular course. His primary role is to create a course structure and content to meet the objectives of a TCube course. In addition, he will monitor the progress of each and every instance and rate the assistant faculty responsible for the conduct of the instance. He is also responsible for promoting course instance participants into assistant faculty role based on their performance on the course. He will have access to all the details of the course (both the online and face to face components). He will review the feedback of the course participants. He will from time to time adjust the contents of the course based on feedback.

The TCube Assistant faculty(ies)

This role is ultimately responsible for the quality conduct of a single instance of a particular course. His primary role is to handle the discussion forum of the online components and conduct the face to face components. He will also be responsible for grading the assignments wherever required. His performance will be assessed through participant feedback obtained at every stage of the course delivery as well as on the performance of the participants of the course other instances. He/she is promoted by the principal faculty on the basis of his performance in earlier instances, after he/she has volunteered for the elevation. He/she will be struck off the list of eligible assistant faculty at any time based on his/her performance.

The TCube Principal delivery Manager

This role is responsible for managing the delivery of all TCube courses. He/she will appoint assistant delivery managers for each course instance. He/she will evaluate the data collected by them and present periodic reports to the Business Head.

The TCube assistant delivery manager

These managers will monitor the online and face to face components. They will gather different metrics such as discussion forum participation, grades in assignments, face to face interaction effectiveness. They will also collect and analyze the participant feedback data on the course content and delivery at various stages. They will be responsible for sending intervention emails whenever required (such as urging participants to provide feedback).

The TCube principal content manager

This role is responsible for managing the content of all TCube online components. He/she will appoint assistant content managers for each course instance. He /she will evaluate the data collected by them and present periodic reports to the Business Head.

The TCube assistant content manager

These managers will prepare the content for online components. They will be responsible for creating the online content and modifying it whenever required. They will be responsible to ensure that the dates for every course instance are approved by the principal faculty(ies). They are also responsible for export from the sandbox (course hosting) edX environment to the production IIT BombayX environment. They will be TAs in the production environment.

The TCube remote centre coordinator

This role has very limited functionality in TCube environment. This mainly consists of expressing willingness to offer the institute facilities for conduct of a course instance. He will also be responsible for ‘clearing’ each participant after receipt of funds due to his/her institute. He will ‘appoint’ a workshop coordinator for each instance of the course.

The TCube workshop coordinator

This role has very limited functionality in TCube environment. This mainly consists of ensuring that adequate facilities exist for successful conduct of a face to face component. He will also be responsible for marking presence/absence of every participant in the system. He/she has no role in knowledge delivery.

The TCube participant

Their job is to register, choose a remote centre, pay fees and learn. They will be graded based on their performance and will receive a course certificate on successful completion.

The NMEICT data

The TCube software will sit on top of existing NMEICT tables. There will be no ‘data conversion’ to new tables. Additional tables will be designed and implemented whenever required.

The edX hosting server

A separate hosting server will be implemented. The edX course content will be hosted on this server first (including dates of modules and assignments). This will be exported and imported into the production environment. In case there are security concerns in directly accessing/modifying production data, this server will be used to collect data required by the TCube system (grades/discussion forum participation etc.).

The show booking environment

Each instance of a TCube course will be treated as a show being hosted at a remote centre. A TCube participant interested in attending a course instance can view the schedules of all the future instances and their availability in various remote centers. He will ‘book a seat’ in an instance at a particular remote centre. The ‘seat’ will be confirmed by the remote centre coordinator. A similar

interface will be available for eligible assistant faculty. They will be able to indicate their availability at all future ‘privately published’ course instances. Remote centre coordinator will be able to indicate their institute’s willingness to participate at any future ‘privately published’ course instances.

The TCube metrics

Each instance of a TCube course will be monitored on a set of metrics. The content metrics would cover quality of content feedback for each component. The discussion forum metrics would indicate the interest shown by participants and the promptness of the assistant faculty in answering queries. The participant feedback will be obtained on the assistant faculty conducting a course instance. Grade metrics will be collected for every course instance. Participants will also provide feedback on remote centre facilities. Lastly attendance metrics will also be stored for each participant.

COURSE DEFINITION, COURSE CREATION

In LMS and INSTANCEIATION

Create/Manage Pilot Faculty Development Programmes(FDPs)

As the title suggests, this page allows the user to create a new pilot FDP or manage an existing one.

Firstly, the below features from the former NMEICT site have been implemented,

- Generation of FDP ID during the form filling process
- Form fields for various characteristics of the FDP like invite-only, presence of online component, whether payment has to be made and where.
- Filling of important dates like start date and end date of workshop and registration.
- Uploading of files like certificate, permission letter, brochure, programme schedule, etc.
- Permission Letter and other verification documents requirements can be entered
- Choice of LMS

Apart from these old features , the new features that has been implemented is:

Custom Fields

In the old NMEICT site , there were many outdated fields in the form that lead to unnecessary columns in the related workshops table in the database.

So, to remove the need of adding new columns in the table for fields that could possibly become unnecessary in the future, a new button for adding custom fields has been added in the form.

For storing these custom fields, table customkeyvaluefields has been added and the columns have been described briefly.

Field	Type	Null	Key	Extra
custom_field_id	int(11)	NO	PRI	auto_increment
display_order	int(11)	YES	NULL	
workshopid	int(11)	YES	NULL	
field_key	varchar(150)	YES	NULL	
field_value	Text	YES	NULL	
is_displayed	tinyint(1)	YES	NULL	

- custom_field_id - autoincrement primary key
- display_order an integer field for taking care of the order of the fields
- workshopid - an integer field referencing the FDP for which the field has been created
- field_key - title of the custom field
- field_value - content of the custom field
- is_displayed - 1 if active and 0 otherwise, for customfield deletion this field is made 0

The required code for dynamic addition and other related activities of the fields is present in the file FDPmanager_main.js

Other than this new feature, form fields have been made more dynamic . For example, If face-to-face interaction is not there, payment at rc field will remain hidden. If payment is not there at IIT-B then course fee field will remain hidden. There are have been other such constraints added like the above to make the user experience better.

New workshop table fields and changes to existing fields

In preexisting workshop table, the following fields have been added with a brief description

- Field workshop_is_pilot is 1 if it is a pilot FDP and 0 if instance
- Field facetofaceinrif_available is 1 if there is face-to-face interaction otherwise 0
- Field online_course_activityif_available is 1 if there is online course component

- Field collegeidcard_ifrequired is 1 if there is a requirement of college id card and 0 otherwise
- Field workshop_by_invite is 1 if the workshop is only by invite and 0 otherwise
- Field iitb_payment_if_required is 1 if payment at IIT-B is to be made and 0 otherwise
- Field rc_payment_if_required is 1 if payment at RC is to be made and 0 otherwise
- Field IITBx_coursekey is of the format “org+course+run” without quotes. This field is required for the final grading of the online component in Certificate module

There has also been a change in how preexisting fields in workshops table are being handled

- Field categorycode is 7 for all new FDPs, though earlier it was used to differentiate what type of workshop it was depending on whether it was self-funded, etc.
- Field permissionletter is "permLetter_%s.pdf" where %s is FDPid without quotes
- Field broucherpath is "brochure_%s.pdf" where %s is FDPid without quotes
- Field certificatepath is "certificate_%s.xhtml" where %s is FDPid without quotes
- Field eligibility is "eligibility_%s.pdf" where %s is FDPid without quotes
- Field mailcontentpath is "regSuccMail_%s.pdf" where %s is FDPid without quotes
- Field schedulepath is "progSched_%s.pdf" where %s is FDPid without quotes

Changes in insertion of existing fields in Announcements Table

- Field link is "workshopContent/%s" where %s is base64 encoded FDPid and string is without quotes
- Other fields have been inserted similar to previous default method

Validation code of the form on submit can be seen in FDPmanager_pilotFormValidation.js

Field	Validation/Test case	Error-message
FDP name	FDP name is either blank or composed of purely whitespace	FDP name cannot be blank
FDP id	While in manage mode, if user does not select a FDP but tries to submit the form	Please choose a pilot FDP to manage before submitting.
Instructions	Instructions is either blank or composed of purely whitespace	Instruction cannot be blank

Custom field title	Custom field title is either blank or composed of purely whitespace	Custom field name is blank
Custom field content	Custom field content is either blank or composed of purely whitespace	Custom field content is blank
Course fee	Course fee is blank or composed of purely whitespaces when payment at IITB is required	Fee amount cannot be blank for IITB payment mode
Date fields	No date has been chosen in the date field	<Date field> has to be filled
Announcement name	Announcement name is blank or composed of purely whitespace	Announcement name cannot be blank
Accommodation details	When face-to-face interaction component is present, but no radio button has been selected regarding Accommodation details	Accommodation details have not been specified
Permission letter	No radio button has been selected regarding permission letter requirements	Permission letter requirements have not been specified
College ID	No radio button has been selected regarding permission letter requirements	College id requirements have not been specified
Moodle Course Name	Moodle LMS has been chosen and moodle course name is blank or composed purely of whitespace characters	Moodle course name has to be filled
IITBx Course Name	IITBx LMS has been chosen and IITBx course name is blank or composed purely of whitespace characters	IITBx course display name cannot be blank

IITBx Course Abbreviation	<ol style="list-style-type: none"> 1. IITBx LMS has been chosen and IITBx course abbreviation is blank 2. IITBx LMS has been chosen and IITBx course abbreviation is composed of special characters or spaces 	No special characters in course abbreviation and it should not be blank
IITBx Course Organisation	<ol style="list-style-type: none"> 1.IITBx LMS has been chosen and IITBx course organisation is blank 2.IITBx LMS has been chosen and IITBx course organisation is composed of special characters or spaces 	No special characters in course organisation and it should not be blank
IITBx Course Run	<ol style="list-style-type: none"> 1.IITBx LMS has been chosen and IITBx course run is blank 2.IITBx LMS has been chosen and IITBx course run is composed of special characters or spaces 	No special characters in course run and it should not be blank

OpenEdX Course Creation API

The TCube website uses OpenEdx (IITBx) as a learning management system (LMS) . This part of the project aims to automatically create a course on the edx platform from a remote website. Though the functionality is already available though edx studio, the objective to remove the manual overhead of defining the course twice(Once at TCube and second at edx studio).

The below approach is based on a search of the codebase starting from the view in edxStudio designed for submitting the form for course creation.

The basic process flow is given:-

1. Creates a new course in the modulestore after checking whether a course with the same course-key already exists
2. Give instructor and staff access to the course creator in the new course
3. Initializing Discussion Forum by seeding its permissions and assigning default roles.
4. Initializes a new course by enrolling the course creator as a student
5. If organisations are enabled, then the course is also tagged along with the appropriate organisation

Step1:-Course creation in Modulestore

The edX Platform uses several different modulestores to store course data.

Modulestore is a class that provides abstraction of how edX stores data in the MongoDB. edX has used the following modulestores: XMLModuleStore, DraftModuleStore and Split Mongo. Split Mongo is being used in the latest version i.e Dogwood

The “split” in Split Mongo refers to how a course is split into three types of information:

- The course identity, referred to as the course index
- The course structure
- The course content, referred to as XBlock definitions

Course Index

Description:-

For a particular course,only one such document exists in MongoDB and it is present in modulestore.active_versions.

This document contains a versions_dict under the key ‘versions’ which contains branch_id’s of the ‘draft-branch’ and ‘published-branch’ . The ‘published-branch’ is basically what the learner can see and the ‘draft-branch’ is what the course-creators use and they can choose when to publish except when the course is initially created. When the course is created, it is published automatically in edX-studio.

The branch_id is the ‘_id’ of the most recent course-structure in the branch. The branch is basically a singly linked list of course-structures with previous version being null for the initial structure in the branch .

Course Structure

Description:-

- Exists in modulestore.structures
- The course structure defines, or outlines, the content of a course.
- A course structure is made up of blocks in a tree data structure. Blocks are objects in a course, such as the course itself, sections, subsections, and units. A block can reference other blocks; for example, a section references one or more subsections. Each block has a unique ID that is generated by the edX Platform.
- So basically the top level root structure in the Tree will have (course, course) as its BlockKey and then it will have many blocks as its children like sections and then sections will have subsections as its children and so on .
- Each block in the course structure points to an XBlock definition. Different blocks, in the same or in different structures, can point to the same definition(using ‘_id’ of the definition).
- Course structures, and each block within a structure, are versioned. That is, when a course author changes a course, or a block in the course, a new course structure is saved; the previous course structure, and previous versions of blocks within the structure, remain in the database and are not modified.

XBlock Definitions

Description:-

- Exists in modulestore.definitions
- Firstly, XBlock is edX’s component architecture. Courses are built hierarchically of pieces called XBlocks. Like HTML <div> tags, XBlocks can represent pieces as small as a paragraph of text, a video, or a multiple-choice input field, or as large as a section, a chapter, or an entire course.

- XBlock definitions contain the content of each block. For some blocks, such as sections and subsections, the definition consists of the block's display name. For components, such as HTML or problem components, the definition also contains the content of the object. A definition can be referenced by multiple blocks.
- XBlock definitions are versioned. That is, when a course author changes content, a new XBlock definition for that object is saved; the previous definition remains in the database and is not modified.

Relationship between the three parts

- All course components are stored in XBlock Definitions .
- These definitions are referenced by the respective blocks in the course structure.
- The course structure is what gives a tree-like structure for the course enabling access to each and every component from the root block.
- The structures are versioned in 2 branches-draft and published that are like singly linked-lists .
- The heads of these linked lists are stored in the version dict of the course index.

So once we get the course-index we can find the rest of the components of a course. But how to find the course-index? For this edX uses a concept of a course-key. I shall not go into the implementation aspect. But in simple terms , a course must have a unique 3-tuple identifier (course, org, run) where course is the course abbreviation, org is the organisation and run is the course run.

So once we have the course key we can explore a course.

So before creating a course , edX checks whether there is no duplicate course. So a similar approach is applied in the API.

The following steps are followed:-

- a) Check for valid connection to the edxapp mysql database

- b) Retrieve user-id of existing user with course creator permissions. This information is retrieved by using the email-id of the user from auth_user table.
- c) Check for valid connection to the edxapp mongoDB database
- d) Check whether a course with same course-key already exists in the MongoDB by querying for a preexisting course index

If all previous steps have occurred without exception then proceed to step e)

- e) Create XBlock Definitions for (course, course) and (about, overview) block and insert the definitions into modulestore.definitions
- f) Using the two definition id's obtained in above step we create two structures of the course identical in all respects other than the id's , one for published-branch and other for draft-branch. Insert them into modulestore.structures.
- g) The definitions are then stored in a versions dict which then becomes part of course index to be inserted into modulestore.active_versions

Step 2:-Give instructor and staff access to the course creator in the new course

Two new rows are inserted into the student_courseaccessrole table, one for instructor and the other for staff access.

Step 3:-Initializing Discussion Forum by seeding its permissions and assigning default roles.

Four new rows are inserted into the table django_comment_client_role, one for each role in the discussion forum of the course

With the above 4 ids , we insert multiple rows into the mysql table django_comment_client_permission_roles for initialising permissions for appropriate role-id

Step 4:-Initializes a new course by enrolling the course creator as a student

Insert a row into both the mysql tables student_courseenrollment and django_comment_client_role_users for enrolling the course creator as a student in the course.

Step 5:-If organisations are enabled, then the course is also tagged along with the appropriate organisation

This step has not been implemented in the API as it depends on whether organisation feature has been enabled or not .

If organisation feature is enabled , only the mysql tables organizations_organization and organizations_organizationcourse will be affected.

The above steps were for the API implemented so far for creation of a course with only mandatory fields.

Other than this, the code for changing certain settings was read and brief observations have been made.

Changing Grading Policy

There is no change in any mySql table and all grading settings like grade range, grace period and grader types are all stored in mongoDB.

Some changes are described(not necessarily exhaustive):-

- "minimum_grade_credit" and "graceperiod" fields have been added in the fields of (course, course) block in the course structure
- "grading_policy" field has been added in the fields of the course definition
- "Previous_version" fields and "last_updated" fields are updated for proper versioning

Changing Schedule Settings

After changing course start date and end date and also course enrollment start and end date , the following changes were observed(not necessarily exhaustive).

- "start","end","enrollment_start" and "enrollment_end" fields have been added in the fields of (course, course) block in the course structure
- New blocks have also been added like (about,description),(about,entrance_exam_id),(about,entrance_exam_minimum_score_pct),(about,entrance_exam_enabled) . The definitions of these xblocks are also inserted.

Adding a Section in the course outline

After adding a section, the following changes were observed(not necessarily exhaustive) :-

- In the children list of the (course, course) block there was an element of the form ('chapter',id) where id is string version of the Usage Key (from OpenedX Opaque Keys(Locators) of that particular xblock.
- Also ('chapter',id) block was added in the course structure and also its xblock definition was also inserted.

Course Grading Policy Definition

After creation of FDP, the course the FDP follows can be defined using this page.

Steps in the policy definition process are the following:-

0. Choose FDP for which grading policy has to be defined
1. Grade range definition
2. Weightage of online and FTF category
3. Specifying Online assessment types
4. Instantiating Online assessments
5. Specifying FTF assessment types
6. Instantiating FTF assessments
7. Submit

On submission of the form , the following tables will be affected and these tables will later on be used by the Certificate Module for the final grading procedure.

Table course_grades

This table contains the definition of the grades of the course. A brief description of each field is given below.

<u>Field</u>	<u>Description</u>
grade_id	Auto-increment integer primary key
course_id	The course id for which this grade is defined
learner_type	Currently “Default”,but can later be used to differentiate between various learner types
grade	The grade name

grade_cutoffs	string of the form “lower_limit-upper_limit”
tag	Remark associated with the grade
display_order	Display order of the grades in the form
is_active	Whether a grade is active if 1 or has been deleted if 0

Table course_grader_types

<u>Field</u>	<u>Description</u>
grader_id	Auto-increment integer primary key
course_id	The course id for which this grader type has been defined
category_code	Value 1 if online category and Value 2 if face-to-face category
grader_type	Title of the grader type
min_count	Total count of instances of the grader type
drop_count	Total count of droppable instances of the grader type
individual_max_marks	Maximum marks that can be obtained in an individual instance of the grader type

total_weight	Total Maximum weightage of all the instances of the grader type considering drop count
short_label	Abbreviation of the grader type
display_order	Display order of the grader types in the form
is_active	Whether a grader type is active if 1 or has been deleted if 0

Table course_assessments

This table contains the actual assessment instances

<u>Field</u>	<u>Description</u>
assess_id	Auto-increment integer primary key
comp_id	comp_id of the component of which the assessment instance is a part of
grader_type	Grader/Assessment type of the assessment instance
display_name	Display name of the assessment instance
display_order	Display order of the grader types in the form
is_active	If value is 1 then assessment instance is active else it is deleted

Table course_components

This table contains the components within a particular category

<u>Field</u>	<u>Description</u>

comp_id	Auto-increment integer primary key
course_id	Course id of the course of which this component is a part of
category_code	Value 1 if online category and Value 2 if face-to-face category
component_name	Title/Name of the component
display_order	Display order of the components in the form
is_active	If value is 1 then component is active else it is deleted

The validation code of the form can be found in FDPmanager_CourseDefValidation.js
A brief idea is given in the following table.

Field	Validation/Test cases	Error Message
FDP ID	Without selecting a pilot FDP in step 0, if user clicks Next button	Please choose a pilot FDP to continue
Grade Definitions	1) Grade ranges don't exhaustively cover range between 0-100 2) Grade ranges overlap	Check grade upper limits and lower limits
Weightage Fields	Sum of weightages of the two categories do not sum upto 100 and user clicks on next button	Weights have to sum upto 100
Assessment Type Name	User enters a type composed of purely whitespaces or blank and user clicks on next button	Assessment Type must have at least one alphabet or number
Assessment Type Weight	Sum of assessment type weights in a particular category is not equal to the weightage of that category and user clicks on next	Sums of weights not equal to total weightage for category

	button	
Assessment Type	User forgets to instantiate all assessments and clicks on next button	Not all assessments have been instantiated yet

COURSE INSTANCE

INSTANCE CREATION AND MANAGEMENT:

- We have a list of pilot workshops that are created by the Principle Course Delivery Manager. These are shown in a dropdown list in the Instance Creation page.
- We can choose one from the dropdown list and create as many instances we require for future use with the help of the add instance button functionality.
- The delete button can be used if we don't want an instance to be added. Once we are sure of all the instances we created we can use the submit button to make entry in the database.
- To be able to manage an instance and make any change to its details we can click on any of the instances which will take us to the page for managing the instances.

Field	Validation/Test Cases	Error Message
Start Date	<ul style="list-style-type: none"> ● If the user clicks on the field and doesn't enter a date. ● If the user leaves the date field blank without even clicking on it. ● If the user enters a date which is greater than the end date. 	Please provide a valid date!

End Date	<ul style="list-style-type: none"> ● If the user clicks on the field and doesn't enter a date. ● If the user leaves the date field blank without even clicking on it. ● If the user enters a date which comes before the start date. 	Please provide a valid date!
----------	---	------------------------------

MANAGING ANNOUNCEMENTS

- The Principal Course Delivery Manager(PDM) can choose a workshop from the dropdown list on the Announcement page. The details of that particular workshop would already get filled like the announcement link, start date, end date, location which is In House by default and visible to public.
- The PDM can change the visibility of the announcement for public accordingly. All the other fields are readonly and cannot be changed.
- There's a new button functionality which helps to create a new announcement and for which the location Out House is selected by default. Other fields like the announcement name, start date, end date, announcement link and visibility have to be filled and submitted.
- The Reset button allows us to clean all fields and select a new announcement afresh.

- We also have a display page for announcements where all the announcements with their name, start date and end date are displayed.

When Creating a new Announcement:

Field	Validation/Test Cases	Error Message
Announcement Name	If the field is left blank	Please fill out this field
Announcement Link	If the field is left blank	Please fill out this field
Start Date	If the field is left blank	Please fill out this field
End Date	If the field is left blank	Please fill out this field
Visible To Public	If none of the radio buttons is checked	Please select one of the options

PROGRAM SCHEDULE

CREATING PROGRAM SCHEDULE:

The Principle Course Delivery Manager(PDM) gets two ways to choose from while creating a schedule:

- Creating Schedule Manually:

The PDM can choose the number of days for which the schedule is to be created. Depending upon the number of days boxes are generated for entering the date and number of sessions. Depending upon the number of sessions , the PDM can fill the time slots for the starting time of a session and its ending time along with any comments. Once he clicks the submit button schedule for all the dates created will be Submitted.

- Creating the Schedule is by Excel Upload:

We first give an option of downloading the excel template which tells the PDM the format for entering data for a schedule. Once that excel file is filled and uploaded it can submitted using the submit button and the schedule would be created.

LISTING THE PROGRAM SCHEDULE:

- The workshops for which program schedules have been created already, have an option of creating a new schedule and all the previous schedules created can be viewed below in a table.
- The workshops for which no schedule has been created show just two options of creating a schedule manually or by excel upload.

MANAGING THE PROGRAM SCHEDULE:

- There's an update button for updating the program schedule where we can change the dates and time slots for the schedule.
- There's also a delete button to remove the schedule which we don't want to display or keep.

While creating schedule manually:

Fields	Validations/Test Cases	Error message
--------	------------------------	---------------

Enter Number of Days	If field is left blank	Please fill out this field
Date	If field is left blank	Please fill out this field
Number of Sessions	If field is left blank	Please fill out this field

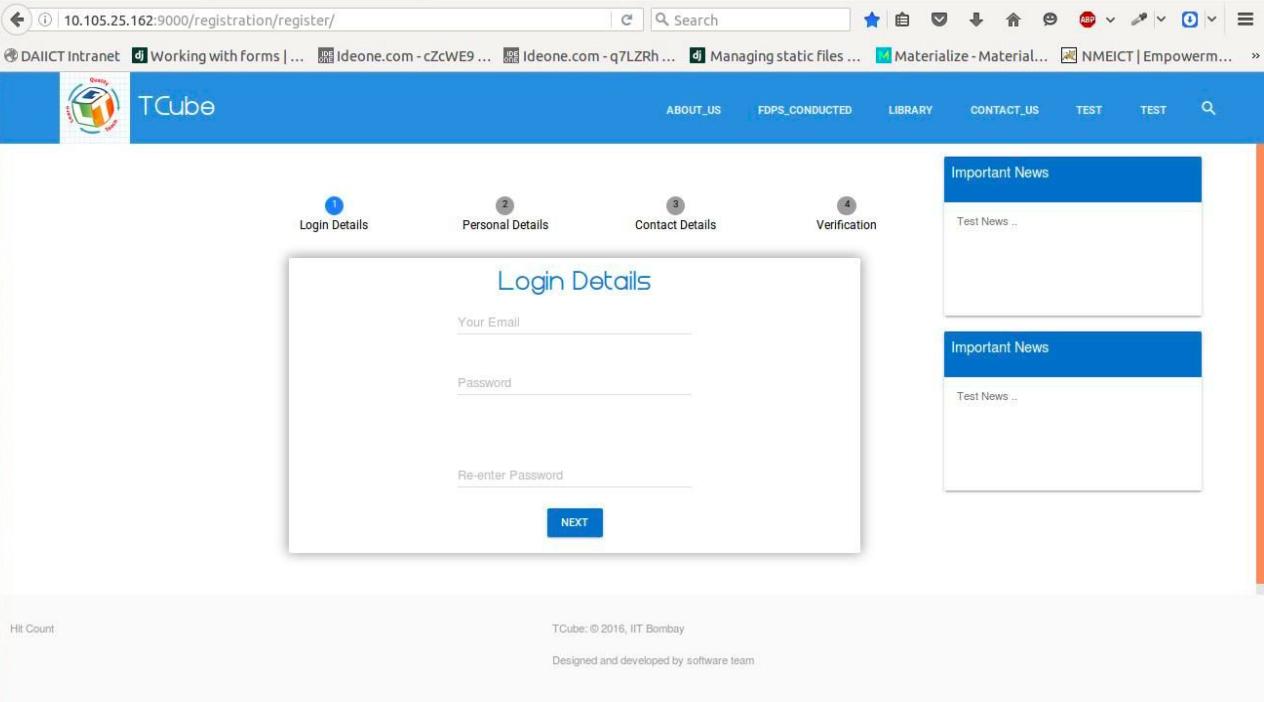
While creating schedule using excel:

Field	Validation/Test Cases	Error Message
Workshopid	<ul style="list-style-type: none"> ● If the field is left blank ● If it doesn't match a number format 	Either Data Entered Is Not In a Correct Format Or Some Field Is Left Blank!!!
Date	<ul style="list-style-type: none"> ● If the field is left blank ● If it doesn't match a date format 	Either Data Entered Is Not In a Correct Format Or Some Field Is Left Blank!!!
Time Slot(from)	<ul style="list-style-type: none"> ● If the field is left blank ● If it doesn't match time format(xx:yy) 	Either Data Entered Is Not In a Correct Format Or Some Field Is Left Blank!!!
Time Slot(to)	<ul style="list-style-type: none"> ● If the field is left blank ● If it doesn't match time format(xx:yy) 	Either Data Entered Is Not In a Correct Format Or Some Field Is Left Blank!!!
Topic	<ul style="list-style-type: none"> ● If the field is left blank 	Either Data Entered Is Not In a Correct Format Or Some Field Is Left Blank!!!
Attendance Counted	<ul style="list-style-type: none"> ● If the field is left blank ● If it something other than the characters 'y' or 'n' 	Either Data Entered Is Not In a Correct Format Or Some Field Is Left Blank!!!

Website Registration

1. User Registration:-

This page allows new users to register at our TCube website. After registering, an email link will be sent to the registered email for confirming the email.



The screenshot shows a web browser window with the URL 10.105.25.162:9000/registration/register/. The page is titled "TCube". At the top, there are four tabs labeled "Login Details", "Personal Details", "Contact Details", and "Verification". The "Login Details" tab is active. Below it, there are three input fields: "Your Email", "Password", and "Re-enter Password". A blue "NEXT" button is located at the bottom of this section. To the right, there are two "Important News" boxes, each containing the text "Test News ..". At the bottom of the page, there are footer links for "Hit Count", "TCube: © 2016, IIT Bombay", and "Designed and developed by software team".

Registration Page

2. Login Page:-

This page allows users to login to our website. If the user is not registered, then a link for registration is present in the same page. If user forgets password, then forgot password button is present in this page.

3.Edit Profile:-

This page allows already registered users to edit their profiles.

Edit Profile Page

4.Invite users:-

This page is for admin purpose. In this page an excel sheet is uploaded by the admin according to a fixed ‘.xls’ template. According to the data uploaded by the admin, the valid entries will be sent a private workshop registration link through which they can register for the specific workshop. If the user is not registered on our website, he is at first asked to register in the website. And then he is redirected to the private workshop registration link which is sent to him through email. If the user is already registered, then he is automatically redirected to the private workshop registration page.

Invite Users Page

If all valid data is entered:

Mail sent to valid data

If invalid data is entered:

10.105.25.162:9000/registration/doreadexcel/

DAIICT Intranet Working with forms | ... Ideone.com - cZcWE9 ... Ideone.com - q7LZh ... Managing static files ... Materialize - Material... NMEICT | Empowerm... »

 TCube

ABOUT_US FDPS_CONDUCTED LIBRARY CONTACT_US TEST TEST

Total Number of Records in file : 2

Total Number of Valid Records in file : 0

Total Number of Invalid Records in file : 2

[CLICK HERE](#)

Sr No	WorkshopId	Email	First Name	Last Name	Institute Name	Errors
1	70002	h3test@test.com	asd	asd	IPS Academy, Indore	Duplicate entry Email blank
2					IPS Academy, Indore	Firstname is blank Lastname is blank Workshopid is blank

Hit Count: 1

TCube: © 2016, IIT Bombay

Invalid Data Errors

5.Change Password:-

This page allows users to change their current password.

Enter your current password

Enter your new Password

Re-enter your new password

SUBMIT

Important News

Test News ..

Important News

Test News ..

Hit Count

TCube: © 2016, IIT Bombay

Designed and developed by software team

Change Password Page

6.Forgot Password:-

This page allows the users to set a password in case , they forget their password.This procedure involves sending a forgot password link to their respective email which is asked at the beginning.Then after the link is opened from their email, the user can set a password.

Forgot Password?

Enter your email-id:

Your Email

SUBMIT >

Important News

Test News ..

Important News

Test News ..

Hit Count

TCube: © 2016, IIT Bombay

Designed and developed by software team

Step -1 : Enter Email id

The screenshot shows a web browser window with the URL 10.105.25.162:9000/registration/passwordForgot/bGFIZGFpaWN0QGdtYWlsLmNvbQ%3D%3D/. The page title is "Forgot Password?". The main content area contains a text input field labeled "Please enter the password which you wish to set:" followed by a "SUBMIT ➤" button. To the right, there is a sidebar titled "Important News" with the text "Test News ..". The footer of the page includes "Hit Count", "TCube: © 2016, IIT Bombay", and "Designed and developed by software team".

Step -2 : Set Password

6.Reset Password:-

This page is for users who were registered on the old website, whose data is not present in our current database. In this case when the user tries to register with such a registered email which was registered on the old website, the user is provided with a link through which the password can be reset.

Workshop Registration

1. Participant Dashboard :

The list of workshops are retrieved from the database and are displayed in the upcoming events if it is yet to start and in the previous events if it is completed.

The screenshot shows the TCube Participant Dashboard. At the top, there is a navigation bar with links for 'ABOUT_US', 'FDPS_CONDUCTED', 'LIBRARY', 'CONTACT_US', 'TEAM', 'TEST', and a search icon. Below the navigation bar, there are three tabs: 'PREVIOUS EVENTS', 'UPCOMING EVENTS', and 'REGISTERED EVENTS'. Under 'PREVIOUS EVENTS', there are two cards:

Test T Abinaya pm	F = ma
None	None
MORE DETAILS	MORE DETAILS

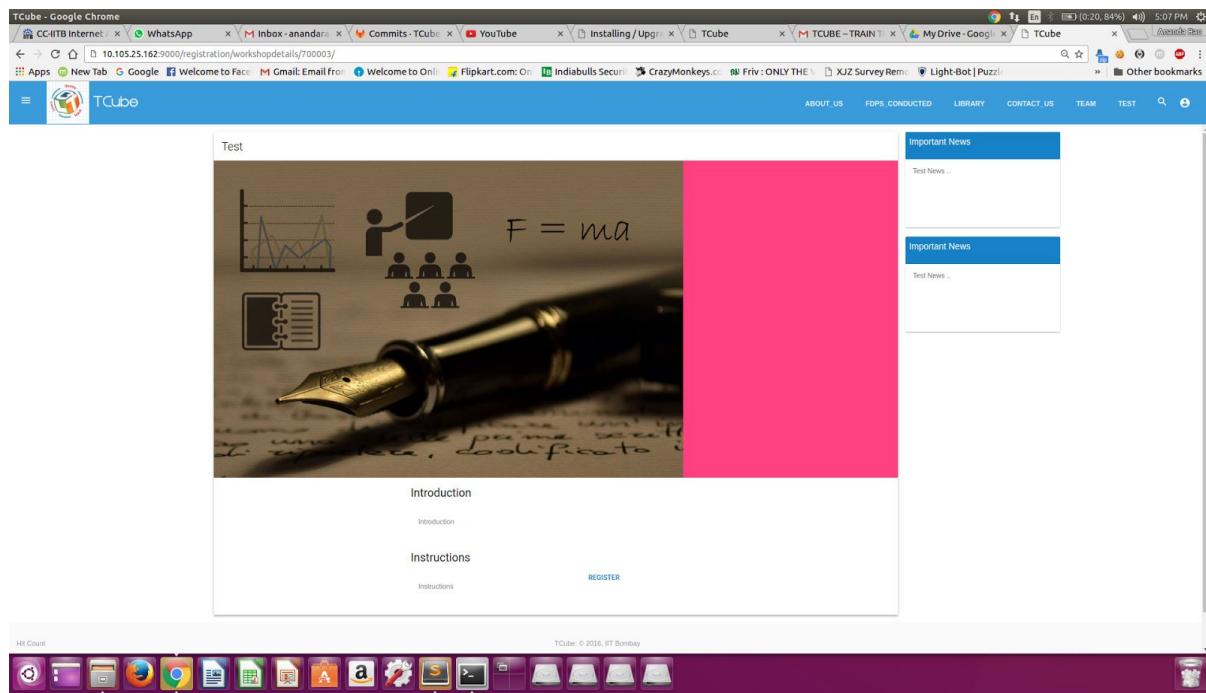
Under 'UPCOMING EVENTS', there are two cards:

Test	F = ma
None	None
MORE DETAILS	MORE DETAILS

To the right of the event grid, there are two 'Important News' boxes, each containing a single link labeled 'Test News'. At the bottom of the dashboard, there is a footer with links for 'Hit Count', 'TCube: © 2016, IIT Bombay', and 'Designed and developed by software team'. A decorative toolbar with various icons is also visible at the bottom.

2. Workshop Details :

Details of the workshop are displayed on this page along with a link to register/update if the registration is open.



Workshop Details

3. Workshop Registration Form :

Form for the registration of the workshop will be displayed. Permission letter should be uploaded if required. Remote center can be selected from the table. Accommodation can be chosen if available.

Personal Details

Name: Vasudev MV
Institute: Nitte Meenakshi Institute of Technology, Yr

NOTE: If your personal details are not correct, please make sure you edit the profile before registering for the workshop.

Permission Letter

Please note that the scan copy of the Permission Letter should be less than 250 KB. Only jpeg/png format is accepted. If you have any problem in registration of your candidature please contact on 022-25764987 if you have any problem in uploading of Permission Letter then please email us at esreach@itb.ac.in with subject as "Problem in Permission Letter upload".

Remote Center Details

ID	Name	City	Accommodation Cost	Food Cost	Seats Left
1350	Rewa Engineering College	Rewa	NA	200	4
1039	IPS Academy	Indore	NA	200	18
1117	Shri Vishwakarman Institute of Technology & Science	Indore	NA	150	18
1222	Chameli Devi Group of Institutions	Indore	NA	150	12
1195	Bansal College of Engineering	Bhopal	NA	NA	6
1110	S.G.S. Institute of Technologies and Sciences	Indore	300	200	7

Workshop Registration Form

You have successfully registered for this workshop.

PAY NOW
[GO TO HOMEPAGE](#)

Important News
Test News ...

Important News
Test News ...

Hit Count
TCube - © 2016, IIT Bombay
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Workshop Success Page

4. Update Registration Page :

Registration for the workshop can be updated in the update registration page. Existing details will be shown on page load.

Personal Details

Name: Vasudev MV
Institute: Nitte Meenakshi Institute of Technology, Yt

NOTE: If your personal details are not correct, please make sure you edit the profile before registering for the workshop.

Permission Letter

Please note that the scan copy of the Permission Letter should be less than 250 KB. Only jpeg/png format is accepted. If you have any problem in registration of your candidature please contact on 022-25764987. If you have any problem in uploading of Permission Letter then please email us at esreach@itb.ac.in with subject as "Problem in Permission Letter upload".

Remote Center Details

ID	Name	City	Accommodation Cost	Food Cost	Seats Left
1350	Rewa Engineering College	Rewa	N/A	200	4
1039	IPS Academy	Indore	N/A	200	18
1117	Shri Vishwamitri Institute of Technology & Science	Indore	N/A	150	18
1222	Chameli Devi Group of Institutions	Indore	N/A	150	11
1195	Bansal College of Engineering	Bhopal	N/A	N/A	6

You have successfully updated your details for this workshop.

PAY NOW
GO TO HOMEPAGE

Hit Count
TCube - © 2016, IIT Bombay
Designed and developed by software team



5. Registered Workshops :

Registered workshops are shown in the registered workshops tab.

REGISTERED EVENTS	
	Four Week ACTE approved FDP by IIT Bombay on - Use of ICT in Education for Online and Blended Learning Prof. Deepak B Phatak MORE DETAILS
	Test None MORE DETAILS

6. Payment Gateway :

Payment for the workshops if to be paid from IITB payment portal can be paid after workshop registration.



... Online Payment System - IIT Bombay :: - Google Chrome
CC-IITB Internet WhatsApp Inbox - anandaraj registration/terms YouTube Installing / Upg... TCube TCUBE - TRAIN My Drive - Google ... Online Paye... Ayeedebabu 0:17, 90% 5:23 PM
10.157.3.21:8080/onlinepay/process.jsp/receivePaymentRequest.jsp Welcome to Onli Flipkart.com: On Indiabulls Secu... CrazyMonkeys.co Friv : ONLY THE XJZ Survey Rem... Light-Bot | Puzz... Apps New Tab Google Welcome to Face Gmail: Email from Welcome to Online Flipkart.com: On Indiabulls Security CrazyMonkeys.co Friv : ONLY THE XJZ Survey Rem... Light-Bot | Puzz... Other bookmarks

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
भारतीय प्रौद्योगिकी संस्थान, मुंबई



Payment Details

User ID	161929
User Name	Vasudev
Payment Description	Payment for workshop 700003
Amount Due	1250
Mode of Payment	-Choose from payment options- ▾

Report Problems / Suggestions [AT] onlinepay@iitb.ac.in



Remote Center Capacity Management

This feature is developed for the Remote Center Coordinator (RCC) to fill the remote center capacity for the workshop. The Principal Course Delivery Manager (PDM) can view/add/update any remote center participating in a workshop. The RCCs can fill the capacity of their remote center, accept/reject participants based on whether they have made the payment to their respective remote centers for the workshops in which payment at remote center is applicable, view program schedule, attendance and participant details for the workshops at their remote center.

1) Functions performed by PDM:

- Send reminder mail to the RCCs who have not filled the remote center capacity.
- Add new remote center.

Test Case	Result
Input not a number.	Error
Any field left blank.	Error
Adding a remote center which already exists in the remote center capacity table.	Error
Adding a new remote center.	Successful. Details added in remote center capacity table.

- View details of all remote centers in the workshop.
- Update the details of a remote center.

Test Case	Result
Input not a number.	Error
Any field left blank.	Error
Update with all fields entered correctly.	Successful. Details updated in remote center

	capacity table.
--	-----------------

- Delete a remote center.

Test Case	Result
Deleting a remote center which still has participants with status other than ‘Cancelled’.	Error
Otherwise	Successful. ‘is_active’ field in remote center capacity is changed to 0 for that remote center and workshop.

2) Functions performed by RCC:

- Managing remote center capacity-

- Filling the capacity information.

Test Case	Result
Input not a number.	Error
Any field left blank.	Error
Nominate fcc field not a proper email-id.	Error
Email-id in nominate fcc field does not exist in login table.	Error
FCC email entered is registered at some other remote center.	Error
Otherwise	Successful. Details added in remote center capacity table and fcc added in workshop coordinator table for that particular remote center and workshop.

- Declining the remote center.

Test Case	Result
Remote center still has participants with status other than 'Cancelled'.	Error
Otherwise	Successful. 'Is_declined' field in remote center capacity table will change to 1 for that remote center and workshop.

- Managing the participants in the remote center.

The RCC can accept/reject participants based on whether they have made the payment to the remote center for the workshops where payment at remote center is applicable. In case, the RCC rejects a participant, he/she is asked to enter the reason of rejection and an e-mail goes to the participant informing him/her about the reason of their rejection.

Test Case	Result
On accepting a participant.	Participant's status changes to 'Accepted'.
On rejecting a participant and not providing the reason.	Participant's status remains the same.
On rejecting the participant.	RCC enters the reason. An e-mail goes to the participant stating the reason and his/her status changes to 'Registration Invalid'.

- View participants' details, program schedule and attendance details.

The RCC can also view the details of participants registered in his/her remote center, the program schedule of workshops and can download the attendance details for a workshop.

Status Management

This module is for the Principle Course Delivery Manager (PDM) to change the status of participants at different stages before the workshop. Status matrix is used to display different status.

The list of participants in the status management page is shown in 2 ways:

- 1) If the value of the field 'facetofaceintrif_available' in Workshops table is 1, then the list is shown remote center wise.
- 2) If the value of the field 'facetofaceintrif_available' in Workshops table is 0, then the list is shown state wise.

In both the cases, the PDM can also see the participants according to their status by clicking the button of required status.

The PDM can also view details of all remote centers in the workshops and can export the table data in excel or print it.

- When a user registers for the workshop, the status is displayed as **request registered**.
- When PDM verifies the documents and other details entered by users, the status changes to either **request approved** or **registration invalid/cancelled**.
- With **Approved** status, user is moved to LMS and the user gets a confirmation mail with their login and password. The status of the user changes to **confirmed**.
- If the status is **registration invalid** then user gets a mail with reasons (document missing/incorrect like photo id, permission letter etc.,). If user again meets the requirements requested by PDM by uploading the correct documents in the registration page, then PDM can change the status.
- When user's status is **cancelled**, then user receives a mail with reasons specified by PDM.

- The status changes to **completed** when participant (with confirmed status) attends the workshop and fulfills all the workshop requirements.

Test Case	Result
On clicking approved button.	The participant's status changes to 'Request Approved' and an e-mail is sent to the participant regarding further process.
On clicking confirmed button.	The participant's status changes to 'Confirmed'.
On clicking invalid button.	The PDM is asked to enter the reason for invalidating the participant and an e-mail is sent to him/her stating that reason. The participant's status changes to 'Registration Invalid'.
On clicking completed button.	The participant's status changes to 'Completed'.
On clicking cancelled button.	The participant's status changes to 'Cancelled' and an e-mail is sent to him/her informing about the cancellation.

The participant, when approved, is enrolled in IITBombayX for that course. Instead of doing it manually, we tried to do that with the help of edX Enrollment API. But in the use cases of the API, it is written that, “The api can be used to enroll the **currently signed-in user** to any course”. So, without the users signed-in, we cannot enroll them in any course and that's why the enrollment will be done manually as before for now.

Attendance Management

Introduction

TCube or Train the Teacher is an initiative by IIT Bombay to train the teachers (of technical education) all over the country with the help of blended MOOC model which includes online course component hosted on iitbombayx.in website and face-to-face component hosted by FDP coordinators at specified remote centres which coordinate with IIT Bombay.

Objective:

1. Maintain the attendance of all the participants for all the FDPs and for all the sessions conducted in MySQL database.
2. Create interfaces for all the possible types of users for eg.: remote centre coordinator, FDP coordinator, Principal Delivery Manager, participant, etc.
3. Perform the database manipulation and generate reports based on the stored data. For this input is taken from the FDP coordinator.
4. Give FDP coordinator a proper interface to update database and to upload the attendance sheet.
5. Attendance report for remote-center coordinator.

Softwares Used:

1. **Python-Django Framework:** The website has been built using the python-django framework. We have specifically used the Python version 2.7.x and django version 1.8.x instead of latest 1.9.x to maintain compatibility with the dogwood version of open edx since the TCube website is also interacting with the iitbombayx.in

2. **MySQL database:** We have used the MySQL version 5.5.x which is the latest and preferred compatible version with django 1.8.x. We have specifically used mysqlclient which is the most appropriate connector (according to official django website) for accessing MySQL database from django.
3. **MySQL Workbench:** This is an external software which has a very important feature known as ER Diagrams. These ER Diagrams are essentially block diagrams which show the MySQL database schema. This software has been immensely useful to us.
4. **Front End:** We have used standard django template which is embedded in HTML5 and used along with latest CSS3 and JavaScript. We have also used the latest web-design technique called “Material Design Lite” to improve the appearance of the website.
5. **JQuery and AJAX:** We have used the latest JQuery 2.2.3 to handle the AJAX calls as well as some other libraries like DataTable.
6. **DataTable:** This is an immensely important library which has been used in almost all the pages to create tables conveniently and to introduce features like paging and searching.
7. **External Libraries:** We have used two main libraries to generate files dynamically based on user input. These include XlsxWriter to generate Excel reports of attendance for Principal Delivery Manager and Remote Centre Coordinator and Reportlab to generate the attendance template which would be used of the FDP coordinator to take the attendance during face-to-face component and later upload back. These two libraries have been carefully chosen after a thorough search for softwares which would be compatible with the django framework and would be easy to use.
8. **Current T10KT/NMEICT website:** We have taken help of this website on numerous occasions. It has helped us in many difficult situations like updating the attendance/database of many participants at once as well as understanding the structure of reports.

Before Starting Actual Work:

The website has been built using python-django framework, mysql database and HTML, CSS, JavaScript along with django template as the front end. This was something new for us since we had not worked with any of the above given softwares and frameworks. To give us a start the IIT Bombay Ekalavya team conducted introductory sessions on all the above software technologies. This helped us very much in getting the basic understanding about the approach we should take while studying these required skill. We started with understanding MySQL database its working. Later on we followed it with HTML, CSS and JavaScript and finally turned to django. As per the advice of some of our team-mates who were comfortable with Django we looked up the official documentation of django. This documentation is enough to give you a head-start for starting development. The next task was to understand how to communicate with MySQL database using django. Django makes it very easy for the user to access, update database with its standard connectors like mysqlclient. Also we studied how to integrate HTML, CSS, JavaScript with django template.

Then we were asked to develop a template for the TCube website using the latest web-design technique “Material Design Lite”. Since we were new to web development, it took some time for us to get hold of all the above things but finally we started understanding the behaviour of all the components. We then built a very basic template from the material design lite. It was not so professional but gave us an idea of how to build web pages. In parallel, we studied the documentation of the project and understood all the modules and all the roles.

Database Structure:

Database is an essential part of TCube project and understanding the current structure of database was the first thing to do before moving ahead. We used the MySQL Workbench to understand the structure of database. The following image shows the block diagram of the database tables that we have used in the attendance module.

Developing Front End:

To make it convenient to navigate, we created an interface which contained the links to all the pages in the attendance module. This included the links to Principal Delivery Manager, Remote Centre Coordinator and Workshop Coordinator pages which are the part of the existing NMEICT website. Alongside this we also created a link to a page where a participant can view his/her attendance. This page is shown in the following image.

Select user to log in



This page was eventually removed during the integration of the website. Then we started with the actual development. We had seen the demo of the present TCube website. We went through all the pages of the website and understood the current composition. Then we started developing the front end for our part. Initially we often took the help of the current website to build the interface. First we started to develop 3 pages - Principal Delivery Manager, Remote centre coordinator and FDP coordinator. By the end of 2nd week, basic template for two of the pages was completed. In these pages the format was common. First it would contain the list of FDPs. Principal Delivery Manager page would contain the list of all the FDPs within the last 90 days. RCC page would have the list of workshops conducted at that remote centre and WSC page would contain the list of FDPs where the user who has logged in is the coordinator. Initially we could not get any idea of how to do it so we decided that we would hard-code the FDPs in the table for the beginning and when we build the details page, then it would be easier to add FDPs dynamically. So after taking two-three sample FDPs, we started designing the detailed attendance pages for different users. As the participant/student attendance was a new part we interacted with ma'am to fix the details of what it should contain. It was decided that the student page should contain the list of all the workshops the student/participant is attending and each of them would have a link which would redirect the student to the page where only that particular student's attendance will be visible. Since this was a new feature, we decided to do it after redesigning the existing pages.

Principal Delivery Manager Page: The Principal Delivery Manager page was important since Principal Delivery Manager is allowed to see all the participants, all the remote centres and all the sessions on all the dates for a selected workshop from workshop table. Furthermore, Principal Delivery Manager is also allowed to edit the attendance of any participant and hence the attendance must be shown in the form of editable checkboxes. Also Principal Delivery Manager has the permission to generate the specific attendance reports based on the given conditions. To start with, we created separate tables for each date containing data of all enrolled participants. We also introduced a feature to filter data based on the date and remote centre. The following image gives an idea about how we filter the data.

The difficult part here was to get the current attendance data stored from the database and update the database based on the modifications by Principal Delivery Manager. It took us around three days to understand and display the current attendance data in the form of checkboxes. This delay was mainly because there were 4 mysql tables from which we had to take the data and hence we had to handle the table joins. The second part was ticking appropriate checkboxes based on the fetched data. The following image show a sample attendance table.

13-10-2015

Participants Info			Sessions				Update		Attendance Details	
P ID	Name	Email	1	2	3	4			Sessions Attended / Total Sessions	
153224	Test One One	test_109568@test.com	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UPDATE		2 / 4	
153225	Testtwo Tes	test_109569@test.com	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UPDATE		1 / 4	

Showing 1 to 2 of 2 entries

PREVIOUS **1** NEXT

FDP coordinator and Remote Centre Coordinator pages: In parallel, we had started work of the RCC and WSC pages. Since the basic template of the three pages was the same it became convenient for us to build these two pages by taking reference from Principal Delivery Manager page. The main difference in these two pages is that, data for only that particular remote centre is shown. Also we segregated data in date-wise manner as shown in image.

Please click on date

13-10-2015

14-10-2015

15-10-2015

We have asked user to choose a date at the start. RCC can only see the data and hence the table must be filled with P for present and A for absent appropriately. This approach was taken for WSC page, the only difference being instead of P and A, there are editable checkboxes since the WSC actually fills out the attendance. Also to verify the attendance the WSC actually takes the signatures of the participants during F2F sessions. For this we need to give a PDF attendance sheet for that particular remote centre and for a particular date which contains names and IDs of all the participants.

Alongside this we also had to give a link to upload this file after the session and a link to see all the uploaded attendance sheets. This is how the page looks after including all these links.

View uploaded scanned copy of attendance in pdf here [VIEW PDF](#)

Please click on date

[13-10-2015](#) [14-10-2015](#) [15-10-2015](#)

[Click here to download pdf of attendance sheet](#)

Upload the Scanned Attendance Sheet Here [UPLOAD](#)

Upload Attendance sheet interface:

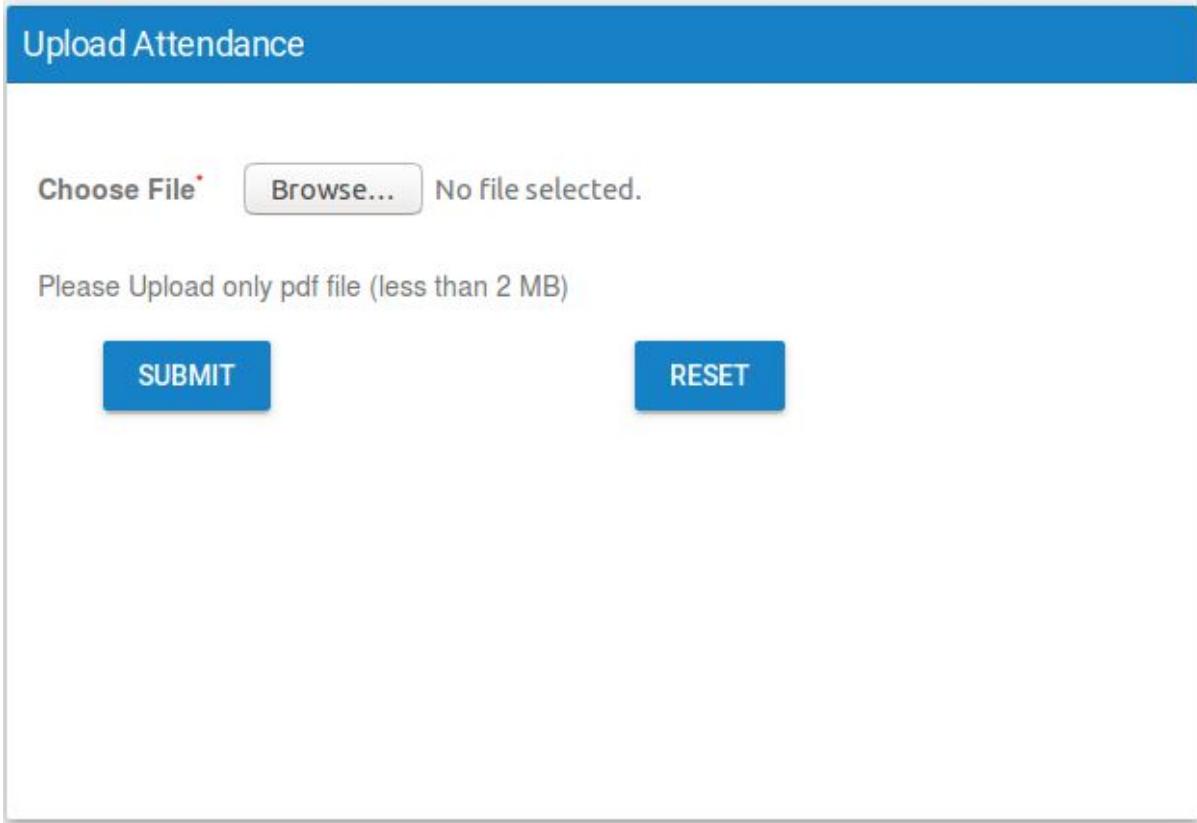
The following page shows a simple interface where FDP coordinator can upload the attendance sheet/

Upload Attendance

Choose File * Browse... No file selected.

Please Upload only pdf file (less than 2 MB)

SUBMIT **RESET**



Student Page: This is a new interface that we have added in the current website. It is based on the RCC page. The difference is that it shows the list of workshops that the student has attended and shows the attendance of only that particular student when a particular workshop is chosen.

Updating Attendance in Database:

This is one of the most important parts of the attendance module. We have given the editable check-boxes to both Principal Delivery Manager and FDP coordinator to update the attendance. When the user clicks on 'update' or 'update all' button, the database is updated correctly and the attendance count also changes. This part took us a lot of time since we had to distinguish all the check-boxes with different id's.

Generating PDF Attendance Sheet:

The FDP coordinator needs to download the attendance sheet template mentioned above to take signatures of participants during face-to-face component. All this is data is written dynamically. The number of sessions and the number of participants are fetched as per the request and written in a pdf file which is given as a response. For this we have used 'reportlab library' which is a Django compatible library to dynamically generate pdf files. Platypus is an advanced package of reportlab which allows us the use the standard page and doc structure to write the pdf with common page sizes like A4, letter, etc. Reportlab has certain rules of how to generate pdf files. We had to understand these conventions in order to make best use of the power of reportlab. The following image is one such template.

Attendance Sheet
700004--Final Testing of Main Self Sustain Model
1001--Maulana Azad National Institute Of Technology
Date: 15 Oct, 2015

PID	Name	Session 1	Session 2	Session 3	Session 4	Session 5
153224	Test One One					
153225	Testtwo Tes					

This has been further integrated with the upload pdf part.

Storing uploaded files in database:

The upload option needs certain constraints of file size (maximum size 2MB) and file type (only pdf files) which needed particular attention. We faced many issues in this part as it had many corner cases.

1. The first problem came up when the filter to check the file size didn't work. We again checked the structure of file size in Javascript and came to know that the file size is given in Bytes with $1kB = 1024$ Bytes. We fixed this problem.
2. The next problem came up when the code to check the type/format of the file didn't work. This was because there was a problem in the code which filtered the file type from the full file name. It was important that the '.' before the 'pdf' extension should be read as well so as to detect the file type correctly.
3. The third problem was that the 'Reset' button failed to work. That is if user tries to upload without including any file or uploads file in wrong format, then an error is displayed but when user again tries to upload a file in wrong format, the error is not handled correctly. This was because after pressing Reset button, the error checking code was not getting called. This was a difficult bug to solve since we had to make changes in two places, in the django code as well as the Javascript code of the template.

As suggested by our mentors, we also did the system side checking of the uploaded files in Django in order to avoid problems arising because of situations like Javascript failure.

To allow for the retrieval of uploaded files, we stored the links of files in the database. This is an important part since for this we don't need to write whole file in database and hence database is not filled unnecessarily.

Generating Excel Reports:

Report generation for Principal Delivery Manager and RCC was a particularly challenging part as it contained creating excel files and putting the data in them according to the request of the user. We used an external library, XlsxWriter to generate Excel files. This library is compatible with django framework and hence can be manipulated with python code. We first created two reports in excel. It was quite difficult since we had to manipulate the data and arrange it in proper rows and columns with python code. The two types of reports are as follows:

1. Report of one Remote centre for all dates of FDP: In this report we get the attendance data for all the participants in a particular date. As per the requirements, this report also contains the attendance in percentage form.

Attendance_Consolidated_Report														
700004--Final Testing of Main Self Sustain Model														
1001--Maulana Azad National Institute Of Technology														
Participant Info			Date											
P ID	Name	Email	13-10-2015				14-10-2015				15-10-2015			
153225	Testtwo Tes	test_109569@test.com	session 1	session 2	session 3	session 4	session 1	session 2	session 3	session 1	session 2	session 3	session 4	session 5
			No	Yes	Yes	No	No	Yes	No	Yes	No	Yes	No	5
			No. of participants present on 13-10-2015 = 1				No. of participants present on 14-10-2015				No. of participants present on 15-10-2015 = 1			41.6666666667

2. Report of a particular date for all remote center: This report contains the attendance data of all the sessions conducted on a particular date in all the remote centre.

Attendance_Consolidated_Report

700004--Final Testing of Main Self Sustain Model

date: 13 Oct, 2015

Participant Info					Date			
RCID	RC Name	P ID	Name	Email	13-10-2015			
					session 1	session 2	session 3	session 4
1001	Maulana Azad National Institute Of Technology	153224	Test One One	test_109568@test.com	Yes	No	Yes	Yes
1001	Maulana Azad National Institute Of Technology	153225	Testtwo Tes	test_109569@test.com	No	Yes	Yes	No
1002	Amal Jyothi College Of Engineering	153229	Testsix Tes	test_109573@test.com	No	No	No	Yes
1002	Amal Jyothi College Of Engineering	153231	Testeight Tes	test_109575@test.com	No	Yes	Yes	Yes
					No. of participants present on 13-10-2015 = 4			

We have calculated the Total number of participants present for each date in both the Excel Reports.

Generate Attendance:

This is the part related to program-schedule. This button is available to the user one week before the start of the workshop and generates the attendance of all the registered participants in the attendance table with all the entries related to isPresent set to 'No'.

Add-Delete Participant in attendance table:

This is a back-up option in case attendance has been generated and then some participant has been confirmed. Similarly if a participant registration has been cancelled then the participant attendance data is deleted with delete button.

Add-Delete Session in attendance table:

We can update or delete attendance related to a particular session.

Testing and other improvements:

During testing of the code on the test server and for corner cases, many bugs were found. We also did some improvements in the code.

1. Earlier we had hard-coded the workshops in the workshop tables of all the pages. Now we changed those and made them dynamic and put the conditions such as the latest workshops within 90 days from current date for Principal Delivery Manager and remote centre specific workshops for RCC and WSC.
2. One major bug that came in during this testing period was that our code was taking too much time to run on the test server which led to test server getting overloaded and the computer would hang. The problem here was the enormous amount of data containing lakhs of entries in the database that needed to be processed for a particular FDP. Initially we thought it would be because of the worse complexity of our code which makes it virtually impossible for any normal computer to process such huge data. So we tried to reduce the complexity but it was too difficult. Finally we decided to load the data remote centre wise and ask the Principal Delivery Manager to choose the remote centre for which the data is required. This drastically reduced the time required to fetch the data and the code started running smoothly.

3. We also completed major documentation part which is the primary objective during any project. This almost completed our attendance module.

Test Cases:

S.No.	TEST CASES	RESULTS
1.	Unchecking the checked attendance boxes	Update button will be visible only from the day when the session is there and will be valid for two days.
2.	Visibility of dates of sessions	The session date button will be blue for active sessions and Gray for past or upcoming sessions. Gray button is disabled.
3.	Report generation when participantid not present in attendance table	The report will be generated only for participants in attendance table
4.	Uploading attendance files	Empty file should not be uploaded. Also we have double checked for filtering conditions of file format and file size.

Fetching the grade report from LMS and Certificate Generation

Objective:

1. Getting the grading policy from MySQL database.
2. Fetching the grading policy of online component and actual grades from iitbombayx.in and display them correctly.
3. Create a certificate template
4. Generate dispatch-slip containing names of those who satisfy the minimum grading criteria.
5. Generate certificates for all participants who have successfully completed the course
6. Create certificate audit to maintain the log of all the certificates generated.

New Softwares Used:

1. pdfkit 0.5.0

Wkhtml to python wrapper to convert html to pdf using the webkit rendering Engine.

Front end:

We have developed all the templates by taking help from the existing NMEICT website. Then, we started with getting the idea of how to generate the pdf of certificate. For generating pdf of certificates first we used 'Reportlab library' which is a Django compatible library to dynamically generate pdf files. Platypus is an advanced package of reportlab which allows us the use the standard page and doc structure to write the pdf with common page sizes like A4, letter, etc. Reportlab has certain rules of how to generate pdf files. We had to understand these conventions in order to make best use of the power of reportlab.

We were able to generate the pdf but there were many things which needed to be changed dynamically according to the future requirements. The main requirement was - The template design may be different for different workshops. For this requirement the pdf for certificate generated using ReportLab can not be modified easily as the code was in django. So to meet this requirement we switched from ReportLab to Pdfkit which directly converts the HTML template to Pdf .

The advantage of using Pdfkit is that only the code in the HTML template needs to be changed according to the requirement . That code will be directly given as input and will be converted to Pdf format .

Whenever any participant successfully completes the course for which he/she has enrolled then they receive the certificate.

Only Principal Delivery Manager can generate the certificates for each remote-center together or separately for each remote-center. Whenever the Principal Delivery Manager logs in he can see the Manage Certificates link on his home page. From that link he goes to a page which contains the list of all the Workshops which are presently running .

Show <input type="button" value="10"/> entries	Search: <input type="text"/>			
Workshop ID	Workshop Name	Start Date	End Date	Details
50008	Computational Fluid Dynamics (Main Workshop)	12 June, 2012	22 June, 2012	Click Here
50009	Introduction to Research Methodologies	25 June, 2012	04 July, 2012	Click Here
60000	DM Workshop for Computer Programming-DMVCS101-1x	02 July, 2015	15 Dec, 2015	Click Here
60001	BW Workshop for Thermodynamics-BWWME209-x	03 July, 2015	15 Dec, 2015	Click Here
60002	BM Workshop for Signals and Systems-BWMEE210x	02 July, 2015	15 Dec, 2015	Click Here
60003	Test2016-On week	05 Jan, 2016	07 Jan, 2016	Click Here
70000	Two-Week ISTE STTP on Technical Communication	08 Oct, 2015	26 Dec, 2015	Click Here
70001	Main -Coordinator Self Sustained dt. 10th Sept.	13 Oct, 2015	20 Oct, 2015	Click Here
70002	Main -Coordinator SS dt. 18th Sept.	01 Jan, 2016	31 Jan, 2016	Click Here
70003	Main CSM 20th Sept_SARIKA	01 Dec, 2015	31 Dec, 2015	Click Here

Showing 11 to 20 of 109 entries

PREVIOUS 1 2 3 4 5 ... 11 NEXT

By clicking on any of the links in Details the Principal Delivery Manager can see the list of all the remote-centers registered for that particular workshop. This page all contains a “Generate All” button . On click of this button, for each remote-center, all the participants who have successfully completed the course for them the certificate will be generated.

Final Testing of Main Self Sustain Model

01 Jan., 2016 to 31 Jan., 2016

[DOWNLOAD TEMPLATE](#) [UPLOAD MARKS](#) [GENERATE MARKS](#)

Total Certificates Generated: 0

Sr. No.	Remote Center ID	Remote Center Name	Click for Dispatch Slip and Certificates	Marks	Certificate Status	Generated Date	Certificate Count	Participant
1	1002	Amal Jyothi College Of Engineering	Click here	Click here	Generated	Date	0	2
2	1001	Maulana Azad National Institute Of Technology	Click here	Click here	Generated	Date	0	2

Show 10 entries Search:

Showing 1 to 2 of 2 entries PREVIOUS **1** NEXT

If the certificates are generated successfully then the “Certificate Status” changes to Generated and turns Green. For each remote-center the generated certificates are saved in a folder.

Other Features:

Principal Delivery Manager can also generate certificate for a particular remote-center. There is a link “Click to generate Dispatch Slip and Certificates” for each remote-center.

Final Testing of Main Self Sustain Model
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Remote Centre:
 Dispatch Slip:
 Click to Generate Certificates:
 Download Certificates for RC (Combined): [Click here to Download](#)
 Download Certificates for RC (zip file): [Click here to Download](#)

S. No.	P ID	Name	Email	RC ID	Remote Center Name	Institute Name	State	Certificate	Status
1	153229	Testsix Tes	test_109573@test.com	1002	Amal Jyothi College Of Engineering	3125	Port Blair	Click here	Confirmed
2	153231	Testeight Tes	test_109575@test.com	1002	Amal Jyothi College Of Engineering	3125	Port Blair	Click here	Confirmed

Showing 1 to 2 of 2 entries

PREVIOUS NEXT

By clicking on this link the list of all the participants for that particular remote-center is displayed. There are 4 different options:

1. **Dispatch Slip:** It contains the list of all the all the participants who have successfully completed the course and for whom the certificates will be generated.

Dispatch Slip

Remote Center ID : 1001

Remote Center Name: Maulana Azad National Institute Of Technology

Date: 2016-06-30 12:40:49.279006

Dear Coordinator,

This is with reference to the Final Testing of Main Self Sustain Model, please note that the below participants are eligible for the certificate.

- 1) Test One One
- 2) Testtwo Tes

Thanks and Regards

TCube Team

2. Generate Button: On click of this button the certificates for all the participants who have successfully completed the workshops are generated.

Final Testing of Main Self Sustain Model
01 Jan., 2016 to 31 Jan., 2016

Remote Centre: 1001–Maulana Azad National Institute Of Technology ▾
Dispatch Slip: [Click here to Download](#)

Click to Generate Certificates: **GENERATE**

Download Certificates for RC (Combined): [Click here to Download](#)
Download Certificates for RC (zip file): [Click here to Download](#)

S. No.	PID	Name	Email	RC ID	Remote Center Name	Institute Name	State	Certificate	Status
1	153224	Test One One	test_109568@test.com	1001	Maulana Azad National Institute Of Technology	3125	Port Blair	Click here	Completed
2	153225	Testtwo Tes	test_109569@test.com	1001	Maulana Azad National Institute Of Technology	3125	Port Blair	Click here	Completed

Show 10 entries Search:

Showing 1 to 2 of 2 entries PREVIOUS **1** NEXT

3. Download Certificates for RC Combined : On click of this one pdf which contains the certificates of all the participants together is generated.

4. Download Certificate for RC ZipFile : On click of this link a prompt is given to download the zip file of all the generated certificates.

In front of each individual participant there is a link so that the certificate for each participant can be verified and downloaded.

Fetching grades from iitbombayx.in

iitbombayx.in is based on the open edx platform. We had to write the code for the latest version of open edx named the dogwood version. The mongo database of the dogwood version is different from the previous versions. It contains three separate collections named active_versions, structures and definitions. The following diagram shows the full structure of the database as has been used to fetch the grades.

The three collections have been connected by the ids. We have done two tasks while getting the complete grades.

1. **Getting the grading policy:** For this we first get the published branch version that is the latest version of the course from active_versions collection. We use this versions to find the structure of course. In structures collection we find the block having block_type named 'course'. This is the actual instance of course. We take its ID and find the definition of that course from the definitions collection. Here we get the grading policy of the online component. It contains all the graded components along with their weightage, number of graded part and the drop count that is the number of graded parts that can be optional in the final grade.
2. **Getting actual grades:** Note here that the grades are stored in mysql database of open edx in a questions-wise format. That is for each participant and for each questions, we have a separate entry in the courseware_studentmodule mysql database table. To identify such entries we need student-id and problem id.

We get the list of enrolled students from student_courseenrollment table. Getting the problem ids is the tedious work.

First the graded components are named as 'sequential' blocks in mongo structures collection. We identify the required graded component sequential blocks by taking their names from the grading_policy that we have fetched.

Each of the graded part under these components is stored as a vertical component and is a child of its parent 'sequential' component.

Each vertical component has 'problems' as its children. These problems have problem ids which are stored in the mysql database while storing the marks.

So in effect, we have to traverse through the chain of sequential blocks, vertical blocks, problem blocks and store the problem ids in such a manner so that we can properly distinguish them while getting marks from mysql.

For this we have used dictionary data structure of python. We have used three tier structure of dictionary.

We have also implemented the drop_count/optional assignments functionality which correctly fetches the best marks among all the graded parts of a particular component.

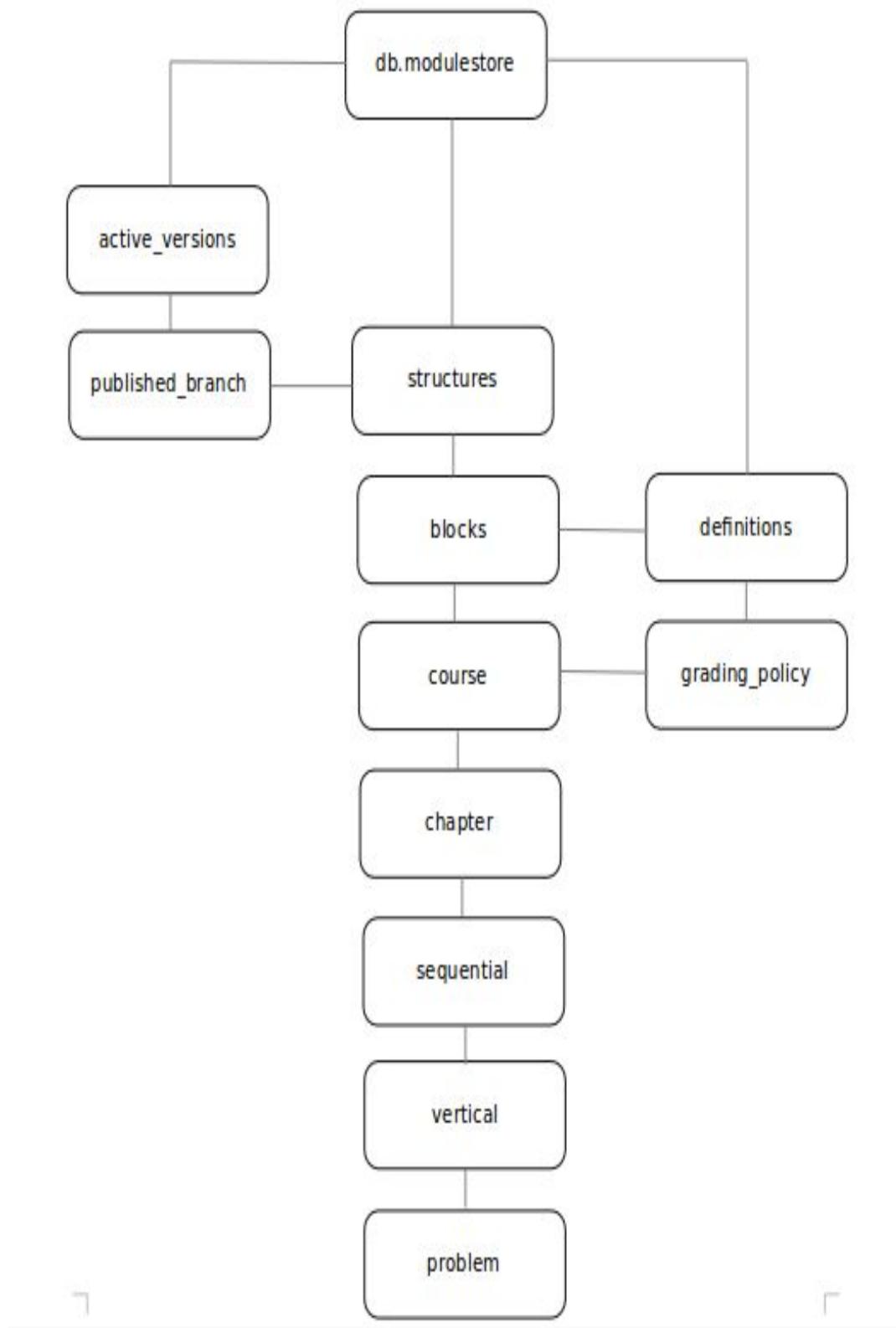
Finally we get the online component marks for all the graded assignments in a percentage form out of 100.

Future Improvements:

Due to lack of time, we were not able to finish the attendance module completely. We have listed the following improvements to the attendance module:

1. Display the marks got from iitbombayx
2. Get the marks of Face2Face component from excel sheet.
3. Add the condition to check final grade for the satisfaction of grading criteria to generate the certificate.
4. Make the certificate template dynamic.

Open edX Mongo Database Structure



Assistant Faculty Pooling

For Assistant Faculty(AF)

Apply for AF Course Pool : The participants who have completed the course and wish to become assistant faculty for the upcoming instance of the course can apply.

- After logging in, click on “apply for AF course pool link”.
- The page will come where dropdown of FDPs (which he/she has attended) will be displayed.
- Participant selects one FDP.
- The criteria for selecting assistant faculty should be displayed with selected FDP name
- Participant presses submit button
- Validate whether he/she is eligible for the position (check if grades meet the criteria)
- If criteria is met, the form should be submitted successfully. Otherwise display message “ Not eligible”.
- On submission, the participant's detail should be stored with the fdp id.
- If he is applied already or selected as AF once, then he cannot apply for that position again.
- Something applies whenever he has been rejected.

The screenshot shows a web application interface for applying to an assistant faculty position. At the top, there's a navigation bar with links for ABOUT_US, FDPS_CONDUCTED, LIBRARY, CONTACT_US, TEAM, and TEST. A search icon and a user profile icon are also present. The main content area has a title "Apply for assistant faculty position". Below it, a dropdown menu says "Choose Workshop: Workshopname 2". There are two input fields: "Workshop ID: 2" and "Name: Workshopname 2". Under "Selection Criteria:", there is a list of four items:

1. Students with experience in programming will be preferred.
2. Students graduating in Computer Science/Engineering, IT, or Electronics.
3. Who will be completing 3rd year in April/May 2016.
4. Students completing 2nd year, with exceptional academic performance and other achievements may also be considered.

At the bottom right of the form is a blue "APPLY" button.

Fig 1: Apply for assistant faculty position

Principal Faculty (PF) Dashboard:

1. Set criteria for AF selection

- On PF dashboard, “ set criteria for AF selection” link will be displayed.
- On click of link, screen will appear where
- List of FDPs which PF is responsible for will be displayed.
- Select the FDP
- Criteria for selection to be filled. If already filled then on select of FDP, criteria should be displayed. Criteria can be editable.
- Submit button

Workshop ID:	1
Name:	Workshopname 1
Selection Criteria:	1. Students graduating in Computer Science/Engineering, IT, or Electronics. 2. Who will be completing 3rd year in April/May 2016. 3. Students completing 2nd year, with exceptional academic performance and other achievements may also be considered. 4. Students with experience in programming will be preferred.

UPDATE

Fig 2: Update Workshop Selection Criteria

2. Select AF for course pool:

- On principal faculty dashboard, select AF link will be there. On clicking of the link, a page should display where List of FDP, which PF is responsible for, should be displayed.
- On click of fdp, a screen should appear where two lists should be displayed
- List1 – list of selected AF will be displayed for that FDP.
- List2 - list of participants who have applied for AF for that FDP will be displayed.
- The fields for List 2 will be: participant name/id, email, grades/marks accept/reject button
- If reject button is pressed, the participant name and info should be removed from the List 2
- If accept button is pressed, participant status will be selected and should move to List 1

Participant Name	Workshop Name	Feedback	Action
Sai Prasad Kousika	Workshopname 1		REMOVE
Ravi Kumar Kadlyam	Workshopname 1		REMOVE

Participant Name	Workshop Name	Final Grade	Action
Sai Prasad Kousika	Workshopname 2	A+	APPROVE REJECT
Rohit Suri	Workshopname 2	A+	APPROVE REJECT

Fig 3: Principal Faculty Dashboard

3. Choose AF for conducting an instance of FDP

- A link “Choose AF for conducting an instance of FDP” will be there in faculty dashboard.
- The assistant faculty from AF course pool can register for upcoming instances of the course.
- On clicking of the link.
- Two list should be displayed.
- List1: selected AF for that FDP
- List 1 will have the following fields - AF name, instance_name, instance date, count of previous FDP conducted, status(approved)
- List 2: to be selected AF for the forthcoming instances
- List 2 will have the following fields - AF name, instance_name, instance date, count of previous FDP conducted, approve button
- Approved AF should be displayed in List 1.

The screenshot shows the 'Principal Faculty | Dashboard' of the TCube platform. At the top, there's a navigation bar with links for 'ABOUT_US', 'FDPS_CONDUCTED', 'LIBRARY', 'CONTACT_US', 'TEAM', 'TEST', a search icon, and a user profile icon.

A modal window titled 'Feedback for Ravi Kumar Kadiyam in Workshopname 1' is open. It displays two feedback entries:

- Participant Name:** His Explanation is good.
- Participant Name:** Nice

Below the modal, a table lists participants and their final grades:

Participant Name	Workshop Name	Final Grade	Action
Sal Prasad Kousika	Workshopname 2	A+ <input checked="" type="checkbox"/>	APPROVE + REJECT <input type="checkbox"/>
Rohit Suri	Workshopname 2	A+ <input checked="" type="checkbox"/>	APPROVE + REJECT <input type="checkbox"/>

Fig 4: AF feedback in a workshop

4. Feedback of AF

- Participants of a particular instance will fill the feedback form. The feedback will be given for the course content and for AF who is/are coordinating that instance. The feedback report should be displayed to PF.

The screenshot shows the TCube website interface. At the top, there is a blue header bar with the logo 'TCube' and several navigation links: ABOUT_US, FDPS_CONDUCTED, LIBRARY, CONTACT_US, TEAM, and TEST. There is also a search icon and a user profile icon.

The main content area has a title 'Assistant Faculty Feedback'. Below it, a dropdown menu shows 'Choose Assistant Faculty:' followed by 'Ravi Kumar Kadiyam - Workshopname 1'. A table displays two rows of information:

Workshop:	Workshopname 1
A.Faculty:	Ravi Kumar Kadiyam

Below the table, there is a section labeled 'Feedback' with a text input field. Underneath this is another section labeled 'Feedback:' with a long horizontal text input field. In the bottom right corner of the form area, there is a blue 'UPDATE' button.

Fig 5: Assistant Faculty Feedback

Role Management

About Role Management:

- ❖ This module incorporates entries for each page and the role based behaviour for all the other modules that exist in TCube.
- ❖ This module has the highest authoritative power deciding which module is accessible by which role.

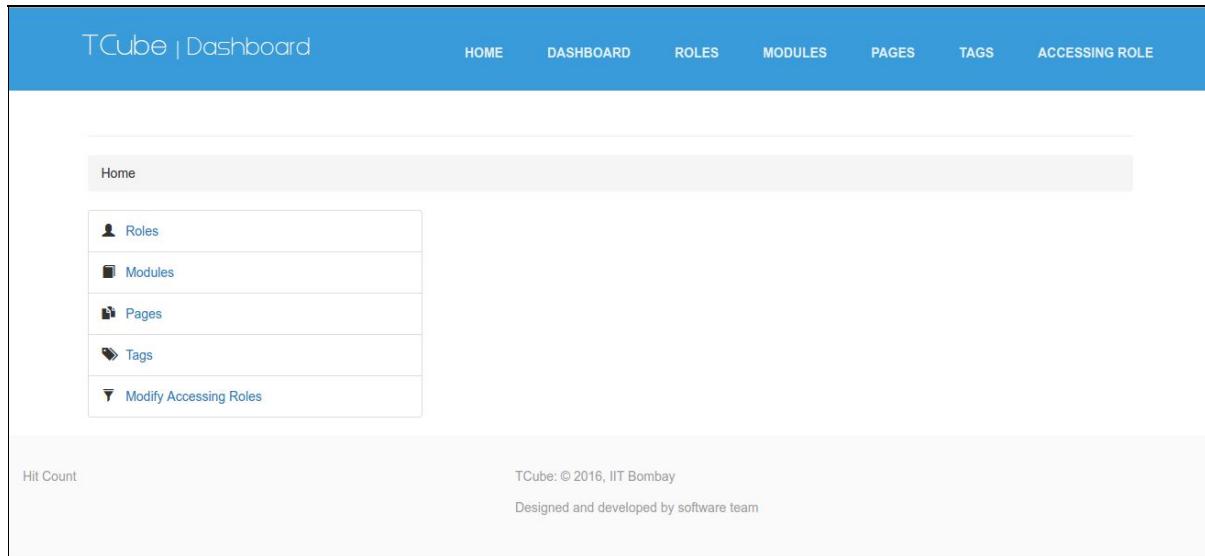


Fig 1: Role Management Dashboard

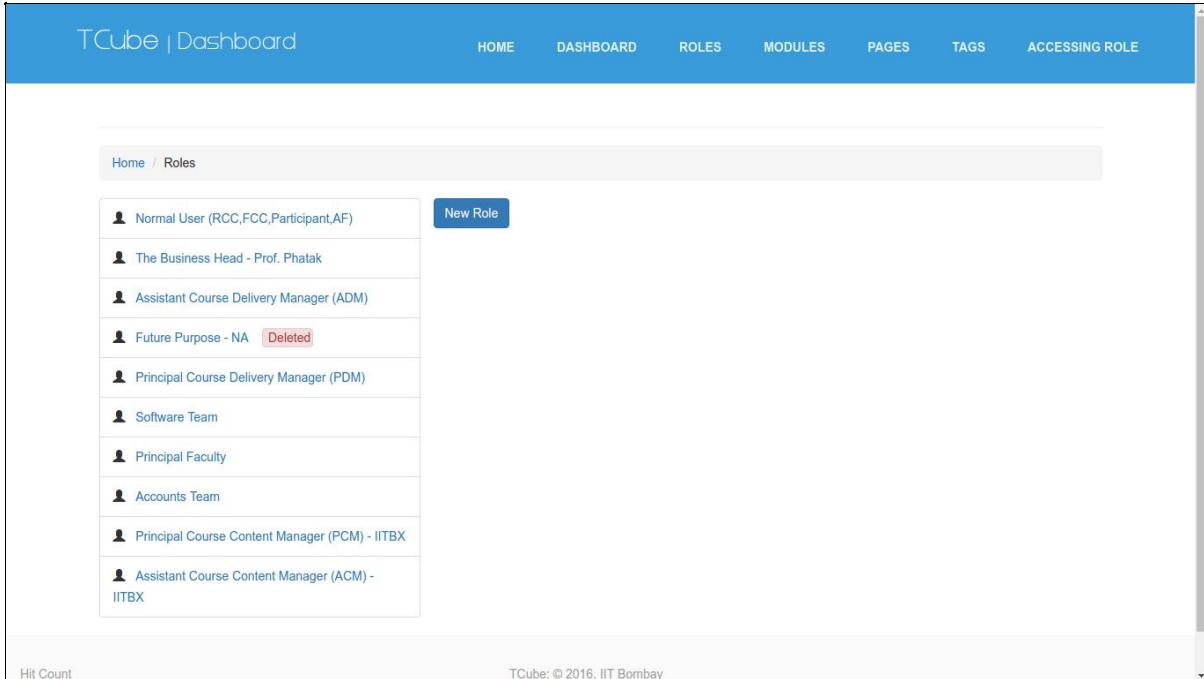
When the Software team enters into the role management module, he will see the dashboard which is given in the picture.

1. Dashboard

- I. Roles
- II. Modules
- III. Pages
- IV. Tags
- V. Modify Accessing Roles

1. Roles:

- In this page, all the roles which are already presented will be displayed.
- One can add a new role and modify the role name.
- One can activate/inactive the usage access to a particular role.



The screenshot shows the TCube Dashboard interface. At the top, there is a blue header bar with the title "TCube | Dashboard". Below the header, there is a navigation menu with links: HOME, DASHBOARD, ROLES, MODULES, PAGES, TAGS, and ACCESSING ROLE. The main content area has a breadcrumb navigation path: Home / Roles. On the left side, there is a sidebar containing a list of roles, each with a small user icon and a link. A blue button labeled "New Role" is located at the top right of this sidebar. At the bottom of the sidebar, there are two small links: "Hit Count" and "TCube: © 2016, IIT Bombay".

Role
Normal User (RCC,FCC,Participant,AF)
The Business Head - Prof. Phatak
Assistant Course Delivery Manager (ADM)
Future Purpose - NA Deleted
Principal Course Delivery Manager (PDM)
Software Team
Principal Faculty
Accounts Team
Principal Course Content Manager (PCM) - IITBX
Assistant Course Content Manager (ACM) - IITBX

Fig 2: List of Roles

2. Modules:

- In this page, all the modules which are already presented will be displayed.
- One can add a new module and modify the module name.
- While adding module, it shows input field to enter module name.
- One can activate/inactive the usage access to a particular module
- If a particular module made inactive, then all its sub modules and tags will be inactive.

The screenshot shows the 'TCube | Dashboard' interface. At the top, there is a blue header bar with the title 'TCube | Dashboard' and navigation links: HOME, DASHBOARD, ROLES, MODULES, PAGES, TAGS, and ACCESSING ROLE. Below the header, the main content area has a breadcrumb navigation 'Home / Modules'. On the left, there is a vertical sidebar containing a list of modules: attendance_module, certificate_module, course_creation, email_content, faculty_pool, FDP manager, manage RCC capacity, page_manage, registration, role_management, and status management. To the right of this sidebar, there is a large, mostly empty white space with a small 'New Module' button located at the top right of the sidebar area.

Fig 3: List of Modules

3. Pages:

- In this page, all the pages which are already presented will be displayed.
- One can add a new page and modify the page name.
- While adding page, it asks to choose parent module and a input field to enter page name.
- One can activate/inactive the usage access to a particular page.
- If a particular page made inactive, then all its sub tags will be inactive.

Page	Parent Module
attendance_admin	- attendance_module
attendance_admin_workshop_index	- attendance_module
attendance_RC_workshop_index	- attendance_module
attendance_student_workshop_index	- attendance_module
attendance_upload_file	- attendance_module
attendance_WSC_update	- attendance_module
attendance_WSC_upload	- attendance_module
attendance_WSC_viewPDF	- attendance_module
attendance_WSC_workshop_index	- attendance_module

Fig 4: List of Pages (along with its parent module)

4. Tags

- In this page, all the tags which are already presented will be displayed.
- One can add a new tag and modify the tag name.
- While adding tag, it asks to choose parent page and a input field to enter tag name.
- One can activate/inactive the usage access to a particular tag.

5. Modify Accessing Roles:

➤ Desc Modules

- In this page, all the modules which are already presented will be displayed.

➤ Accessing Module

- After clicking on a particular module, It will display all its sub pages and the roles who can access that module.
- One can grant/revoke a particular role to access that module.

- The revoked role implicitly revoked from all its sub pages and tags.

The screenshot shows the TCube Dashboard interface. At the top, there is a blue header bar with the title "TCube | Dashboard" and navigation links: HOME, DASHBOARD, ROLES, MODULES, PAGES, TAGS, and ACCESSING ROLE. Below the header, the main content area has a title "Pages in faculty_pool". Under this title, there is a list of four items, each with a small icon and a link: "apply_for_assistant_faculty", "participant_feedback_page", "principal_faculty_dashboard", and "update_workshop_selection_criteria". Below this section, there is another title "Roles accessible to faculty_pool". Under this title, there is a list of three items, each with a small icon and a link: "Normal User (RCC,FCC,Participant,AF)", "Principal Course Delivery Manager (PDM)", and "Principal Faculty". A blue button labeled "New Module Role" is located to the right of the second item in this list. At the bottom of the page, there are two small pieces of text: "Hit Count" on the left and "TCube: © 2016, IIT Bombay" and "Designed and developed by software team" on the right.

Fig 4: Accessing Role for Module

➤ Accessing Page

- After choosing a particular page, It will display all its sub tags and the roles who can access the page.
- One can grant/revoke a particular role from accessing that page.
- The granted role implicitly applicable to its parent module also.
- The revoked role implicitly revoked from all its sub pages.

The screenshot shows the TCube Dashboard interface. At the top, there is a blue header bar with the title "TCube | Dashboard" and navigation links for HOME, DASHBOARD, ROLES, MODULES, PAGES, TAGS, and ACCESSING ROLE. Below the header, the main content area has a breadcrumb navigation path: Home / faculty_pool / principal_faculty_dashboard. The first section, "Tags in principal_faculty_dashboard", contains a message "None". The second section, "Roles accessible to principal_faculty_dashboard", lists two roles: "Principal Course Delivery Manager (PDM)" and "Principal Faculty", each with a small user icon. A blue button labeled "New Page Role" is also present. In the bottom left corner of the content area, there is a "Hit Count" placeholder. The bottom right corner contains copyright and development information: "TCube: © 2016, IIT Bombay" and "Designed and developed by software team".

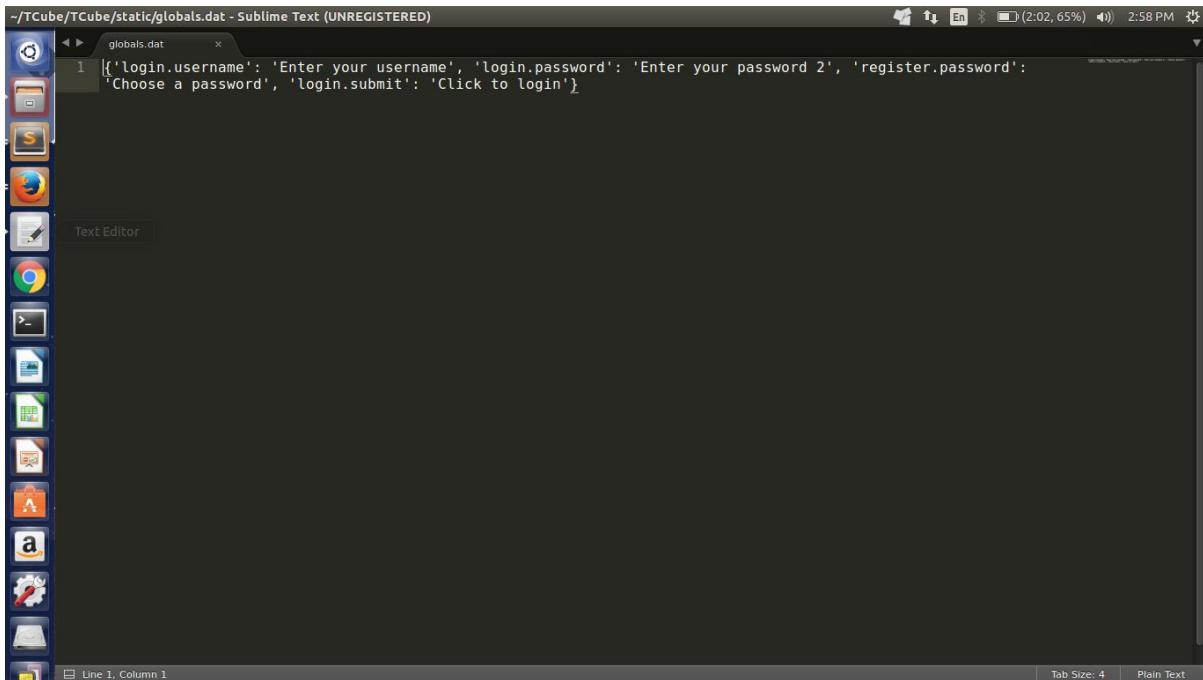
Fig 5: Accessing Role for a Page

➤ Accessing Tag:

- After choosing a particular tag, It will display all the role who can access the tag.
- One can grant/revoke a particular role from accessing that tag.
- The granted role implicitly applicable to its parent page and its parent module also.

Update Page content and email templates

The update page content module has a file ‘globals.dat’ which contains a dictionary. This dictionary contains key value pairs. This dictionary allows us to get values of specific names dynamically instead of hardcoding the names in the html pages. We don’t need to open and close database again and again. We can fetch and update the values of corresponding keys using this module, by reading and writing into globals.dat.



A screenshot of the Sublime Text editor window. The title bar reads “~/TCube/TCube/static/globals.dat - Sublime Text (UNREGISTERED)”. The status bar at the bottom shows “Line 1, Column 1”, “Tab Size: 4”, and “Plain Text”. The main editor area displays the following JSON content:

```
1 [{ 'Login.username': 'Enter your username', 'login.password': 'Enter your password 2', 'register.password': 'Choose a password', 'login.submit': 'Click to login' }]
```

KEYS	VALUES	
login.password	Enter your password	UPDATE
login.submit	Click to login	UPDATE
login.username	Enter your username	UPDATE
register.password	Choose a password	UPDATE

Email content module has different templates for emails which has to be sent to users when they face several issues like forgot password, reset password , sign up mail, dispatch slip mail etc. The admin can change a an email template by uploading another html file for that particular template.

The browse button helps to search among the files he wants to upload.

Also validation is applied such that the admin can upload only html files.

TCube - Mozilla Firefox
CC-IITB Internet Acc... x TCube x New Tab
(2:14, 49%) Fri Jul 1 6:23:33 AM Sai Prasad

10.105.25.162:9000/email_content/

TCube

TEST TEST TEST TEST TEST TEST TEST TEST

SR No.	File Upload	Download Link	Upload
1	Forgot password ForgotPassword_mail.html		Browse... No file selected. SUBMIT
2	Participant status cancelled cancelled.html		Browse... No file selected. SUBMIT
3	Update profile emailconfirm_mail.html		Browse... No file selected. SUBMIT
4	Password change passwordChange_Mail.html		Browse... No file selected. SUBMIT
			Browse... No file selected.

Important News
Test News ..

Important News
Test News ..

TCube		TEST	TEST	TEST	TEST	TEST	TEST	TEST
5	query_mail.html Query-email to user	Download	Browse...	No file selected.	SUBMIT			
6	queryinitiated_mail.html Query Initiated mail	Download	Browse...	No file selected.	SUBMIT			
7	registration_invalid.html Participant registration status invalid	Download	Browse...	No file selected.	SUBMIT			
8	remotecenter_capacity.html Update remote center capacity	Download	Browse...	No file selected.	SUBMIT			
9	request_approved.html Participant registration status approved	Download	Browse...	No file selected.	SUBMIT			

TCube		TEST	TEST	TEST	TEST	TEST	TEST	TEST
10	signup_mail.html Sign Up	Download	<input type="button" value="Browse..."/>	No file selected.	<input type="button" value="SUBMIT"/>			
11	tempPasswordForExistUser.html Create password for existing user	Download	<input type="button" value="Browse..."/>	No file selected.	<input type="button" value="SUBMIT"/>			
12	update_participant_byadmin.html Update details of participant by admin)	Download	<input type="button" value="Browse..."/>	No file selected.	<input type="button" value="SUBMIT"/>			
13	update_registration_success.html Update workshop registration success	Download	<input type="button" value="Browse..."/>	No file selected.	<input type="button" value="SUBMIT"/>			
14	welcome_mail.html Welcome	Download	<input type="button" value="Browse..."/>	No file selected.	<input type="button" value="SUBMIT"/>			

The image shows two separate Firefox browser windows side-by-side, both displaying the same web application interface. The application is titled 'TCube' and appears to be a management tool for workshop registration content.

Top Window (Left):

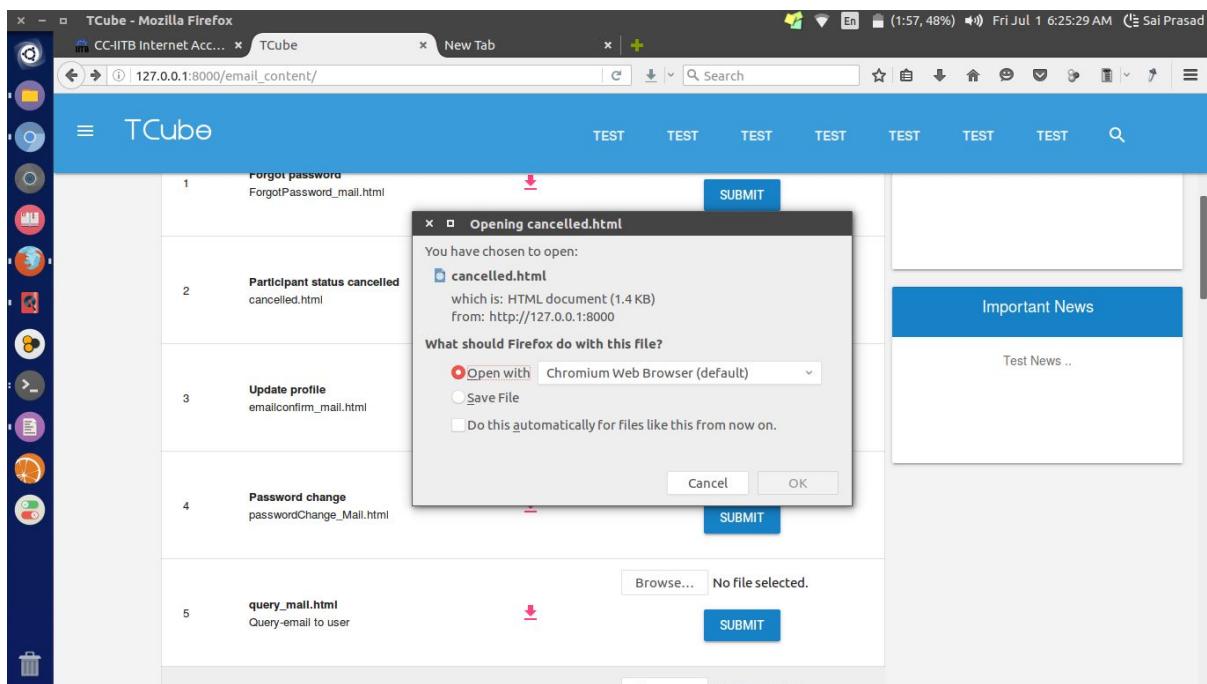
- URL: 10.105.25.162:9000/email_content/
- Content:
 - Item 14: welcome_mail.html (Welcome) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 15: dispatch_slip.html (Dispatch slip for certificate module) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 16: registration_reject.html (Participant registration rejected by RCC) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 17: Verified_Mail_SelfSustained.html (Participant registration status verified for SSM) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 18: countOfOngoingRegistrations.html (On going workshop registration details) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.

Bottom Window (Right):

- URL: 10.105.25.162:9000/email_content/
- Content:
 - Item 17: Verified_Mail_SelfSustained.html (Participant registration status verified for SSM) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 18: countOfOngoingRegistrations.html (On going workshop registration details) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 19: nominateWSC.html (Nominate for workshop coordinator) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.
 - Item 20: attendanceForParticipants.html (Absent mail for participants) - Status: No file selected. Includes a download icon and a blue 'SUBMIT' button.

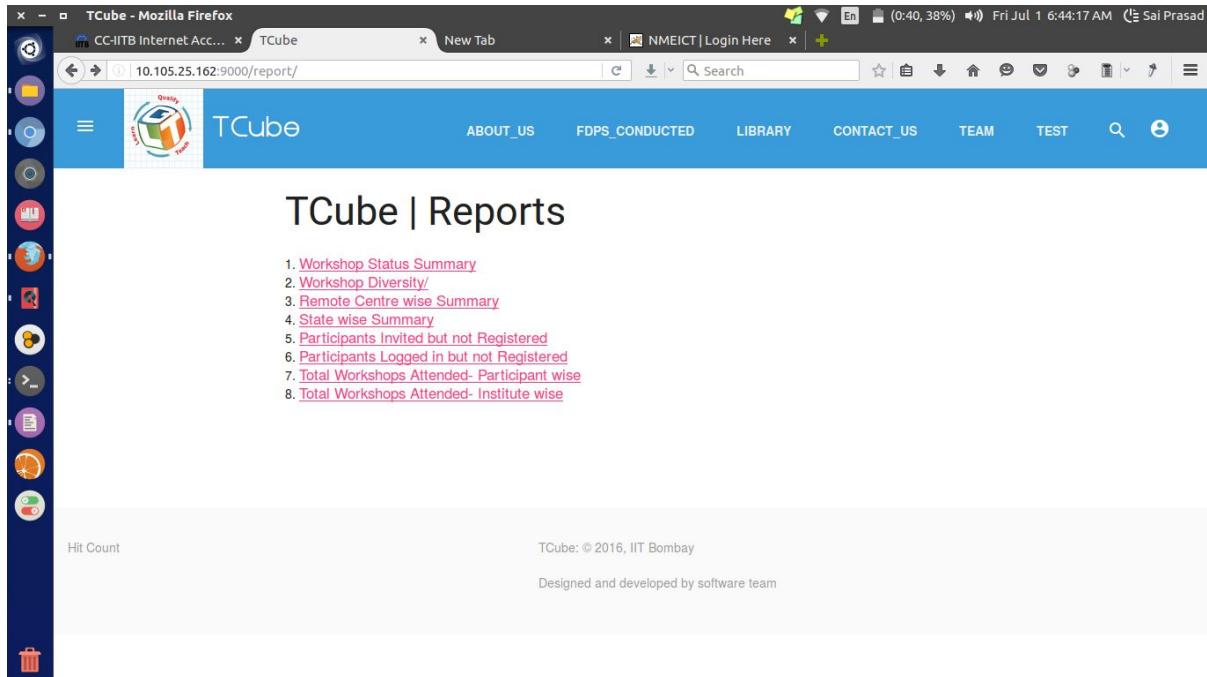
Both windows have a toolbar at the top with various icons, and a footer at the bottom with copyright information.

The templates can be downloaded in the following way:



REPORT MODULE

All the reports have the provision to import data to excel sheet and searching for workshops datewise.



There are different types of reports present for giving a clear view to the users about the number of workshops being held, where they are being held, count of participants, their institutes etc.

1. Workshop Status Summary:

The screenshot shows a Mozilla Firefox browser window with the following details:

- Title Bar:** TCube - Mozilla Firefox, CC-IITB Internet Acc..., New Tab, NMEICT | Login Here.
- Address Bar:** 10.105.25.162:9000/report/workshop_status_summary/
- Page Header:** TCube (left), REPORTS (right).
- Section Title:** Workshop Status Summary Report.
- Form Fields:** Start Year(MM/dd/YYYY): (marked with a red star), End Year(MM/dd/YYYY): (marked with a red star), search button.
- Buttons:** Export Excel (with an Excel icon).
- Data Table:**

WorkshopId	Workshop Name	Start Date	End Date	Participants Registered but not attended				Participants Attended		Total Registrations
				Approved	Cancelled	Invalid	Registered	Certificate Not Issued	Certificate Issued	
700008	only for testing	01 March 2016	15 March 2016	1	0	0	3	0	0	4
700006	test workshop for payment gateway	17 February 2016	29 February 2016	0	0	0	4	2	0	6
- Page Footer:** Hit Count, TCube: © 2016, IIT Bombay, Designed and developed by software team.

2. Workshop Diversity

10.105.25.162:9000/report/workshop_diversity/

Workshop Diversity Report

Group By Criteria : Start Year(MM/dd/YYYY) : End Year(MM/dd/YYYY) :

Export Excel 

Show 10 entries Search:

Geographical Diversity				Gender		Experience (in years)							
WID	Workshop Name	No of Remote Center	No of Institute	City	State	M	F	other	< 2	2-10	> 10	Unknown	Doctorate
	test workshop for												

Hit Count TCube: © 2016, IIT Bombay
Designed and developed by software team

3. Remote Centrewise Summary

localhost:8000/report/remote_centre_summary/

Remote Center Wise Summary Report

Group By Criteria : Start Year(MM/dd/YYYY) : mm/dd/: End Year(MM/dd/YYYY) : mm/dd/:

Export Excel 

Show 10 entries Search:

Summary				Gender		Experience							
RCID	Remotecenter Name	State	City	No of Work shops	No of Institute	Total Participants	M	F	Other	< 2	2-10	>10	Unknown
1001	Maulana Azad National Institute	MADHYA PRADESH	Bhopal	40	128	754	501	253	0	161	390	143	60

Hit Count TCube: © 2016, IIT Bombay
Designed and developed by software team

4. State wise Summary

TCube - Mozilla Firefox

CC-IITB Internet Acc... x TCube x New Tab x NMEICT | Login Here x Kar Gayi Chull - K... x +

10.105.25.162:9000/report/state_wise_summary/ En (0:51, 32%) Fri Jul 1 6:52:43 AM Sai Prasad

TCube REPORTS

State Wise Summary Report

Group By Criteria : – select the type – Start Year(MM/dd/YYYY): * End Year(MM/dd/YYYY): * search

Show 10 entries

State	Summary			Gender		
	No of Remote Center	No of Workshops	No of Institute	No of Participants	M	F
				2		

Export Excel

What should Firefox do with this file?

- Open with LibreOffice Calc (default)
- Save File
- Do this automatically for files like this from now on.

Cancel OK

Hit Count TCube: © 2016, IIT Bombay

Designed and developed by software team

5. Participants who have been invited but not registered.

Enable button is used to register the participants who have been invited. Disable button is used to do vice-versa.

Participants invited but not registered

S.No	Email	Workshop ID	First Name	Last Name	RC ID	Institute Name	Enable/ Disable
1	joshi_ch@amrita.edu	600002	Joshi C.	Haran	1071	Amrita Vishwa Vidyapeetham, Coimbatore	<button>ENABLE</button>
2	nidhi.sharda@nmims.edu	600000	Nidhi	Sharda	1319	Mukesh Patel School of Technology Management and Engineering, Vile Parle	<button>ENABLE</button>
3	dpatra@nitrkl.ac.in	600002	Dipti	Patra	1340	National Institute of Technology, Rourkela	<button>ENABLE</button>
4	ftalukdar@gmail.com	600002	Fazal Ahmed	Talukdar	1184	National Institute of Technology, Silchar	<button>ENABLE</button>
						Sri Jayachamarajendra College of Engineering,	<button>ENABLE</button>

Hit Count: [redacted] TCube: © 2016, IIT Bombay
Designed and developed by software team

6. Participants who have signed up but not registered.

Signed Up But Not Registered in Any Workshop

Sr No	Email	Name	Institute
1	test_101932@test.com	Abhilash K S	Atharva College of Engineering, Malad
2	test_101941@test.com	VASANTHARAJ A	Excel Engineering College, Komarapalayam
3	test_101942@test.com	Asif Ali	KMEA Engineering College, Aluva
4	test_101944@test.com	Manjunath V Gudur	Sri Jayachamarajendra College of Engineering, Mysore
5	test_101949@test.com	suraj jadHAV	Indian Institute of Technology, Bombay
6	test_101950@test.com	Prafulla Patil	NTVS's Gajamai Tulsiram Patil College, Nandurbar
7	test_101955@test.com	Anupreksha Mishra	Shri Dadaji Institute of Technology and Science, Khandwa
8	test_101958@test.com	darshan pendhari jain	G. H. Raisoni Institute of Engineering and Technology for Women, Nagpur
9	test_101960@test.com	Dhastagheer Akbar	Indian Institute of Technology, Bombay
10	test_101961@test.com	Manish Kumar Tripathi	KIRORI MAL COLLEGE, Delhi

7. Total Workshops attended- Participant wise and Institute wise.

TCube - Mozilla Firefox

TCube New Tab 10.105.25.162:9000/report/total_ws_by_participant_wise/ (0:49, 28%) Fri Jul 1 6:59:48 AM CEST Sai Prasad

TCube REPORTS

Export Excel

Choose Type: [Participant Wise](#) | [Institute Wise](#)

Show 10 entries Search:

Sr.No	Person Id	Name	Gender	Number of Workshops Attended
1	1	AJAY KUMAR GOYAL	M	1
2	2	Md. Ilyas Khan	M	6
3	3	NEETESH GUPTA	M	3
4	4	V V Narendra Kumar	M	1
5	5	K.Kiran Kumar	M	8
6	6	ASHISH KUMAR JAIN	M	1
7	7	Ankur Chauhan	M	2

Hit Count TCube: © 2016, IIT Bombay
Designed and developed by software team

TCube - Mozilla Firefox

TCube New Tab 127.0.0.1:8000/report/total_ws_by_institute_wise/ (0:40, 26%) Fri Jul 1 7:00:07 AM CEST Sai Prasad

TCube REPORTS

Export Excel

Choose Type: [Participant Wise](#) | [Institute Wise](#)

Show 10 entries Search:

Sr.No	Institute Id	Institute Name	Number of Workshops Attended
1	721	Mailam Engineering College, Tamil Nadu	3
2	723	Singhania University, Jhunjhunu	3
3	724	Ganadipathy Tulsi's Jain Engineering College, Vellore	10
4	725	Chandigarh Group of Colleges, Chandigarh Engineering College, Mohali	2
5	726	Vignan's Nirula Institute of Technology and Science for Women, Guntur	1
6	727	SVPM's Institute of Technology and Engineering, Baramati	10
7	728	Pandit Deendayal Petroleum Engineering Institute, Gandhinagar	2

Hit Count TCube: © 2016, IIT Bombay
Designed and developed by software team

Configuration Table Module

Configuration Tables:

- We have a dropdown from which we can select any one of the configuration tables like Designation, HeadDesignation, HeadTitle, INVALID_RC, ParticipantTitle, Qualification, ROLE, Stream. Selecting one of them would list all the details such as category, code, description, comments and whether that has an active/inactive status.
- We have an update functionality where we can change the description, comments and active/inactive status.

While Updating:

Fields	Validation/Test Cases	Error message
Description	If the field is left blank	Please fill out this field.
Active/InActive	If none of the option is selected	Please select one of the options.

MANAGING CITIES:

- In the page for managing cities we have a list of cities and their corresponding states along with their Active/InActive status.
- We have an option to update the cities where we can add a city, select a state for it and change its active/inactive status if required.

Fields	Validation/Test Cases	Error message
Select state	If no state is selected	No error message but details aren't submitted.
City name	If this field is left blank	Please fill out this field.

MANAGING INSTITUTES:

- We have three options in the dropdown for 'active', 'inactive' or 'not approved' selecting any one of them lists all the institutes falling in that respective category with all its details.
- The update button functionality helps us to modify and update the details of the institute.
- The details button functionality takes us to a page where we can see the details of heads of that particular institute where in we also have a functionality to update all these details.

While updating institute details:

Fields	Validation/Test Cases	Error messages
Institute name	<ul style="list-style-type: none"> • If less than 5 characters • If this field is blank 	<ul style="list-style-type: none"> • Please match the requested format. • Please fill out this field
State	<ul style="list-style-type: none"> • If no state is selected 	<ul style="list-style-type: none"> • No error message but details aren't submitted
City	<ul style="list-style-type: none"> • If no city is selected 	<ul style="list-style-type: none"> • No error message but details aren't submitted
Institute address	<ul style="list-style-type: none"> • If this field is left blank 	<ul style="list-style-type: none"> • Please fill out this field
Pincode	<ul style="list-style-type: none"> • If it is less than 6 digits • If this field is left blank 	<ul style="list-style-type: none"> • Please match the requested format • Please fill out this field

While updating institute head details:

Fields	Validation/Test Cases	Error message
Head Name	<ul style="list-style-type: none"> If this field is left blank If less than 5 characters 	<ul style="list-style-type: none"> Please fill out this field Please match the requested format.
Head Title	<ul style="list-style-type: none"> If no title is selected 	<ul style="list-style-type: none"> No error message but details aren't submitted
Head Designation	<ul style="list-style-type: none"> If no designation is selected 	<ul style="list-style-type: none"> No error message but details aren't submitted
Head Email	<ul style="list-style-type: none"> If the field is left blank If it doesn't match the correct email format 	<ul style="list-style-type: none"> Please fill out this field Please match the requested format
Head Contact	<ul style="list-style-type: none"> If this field is left blank If it is less than 10 digits 	<ul style="list-style-type: none"> Please fill out this field Please match the requested format
Head Address	<ul style="list-style-type: none"> If this field is left blank 	<ul style="list-style-type: none"> Please fill out this field

TCube Library

Knowledge Content Management

Introduction

TCube library is the webpage designed for administrator to handle the backend work and make changes in the content. The most important task of this library is to implement the search feature for general user. The search is given in two different ways. One is simple basic search while other is the advanced search. Both searches are very useful for the general user to have a quick look at the required content.

Modules

1. Sign in module (redirected to iitb nmeict website for signing up).
2. Search module - search box, result of keyword in list.
3. Advance search module.
4. Suggest keyword (only for registered user).
5. Content management module -- create/manage content.
6. Generate .srt (transcripts) file from any video uploaded.

Roles:

This library provides features which can be used by both – general user & administrator. General user will be using search options (both basic search and advanced search) while the administrator can manage the entire content of the workshops.

1. Library User(registered + general) :-

- The general user can use the search page, both Advanced Search & Basic Keyword Search.
- Download and view the contents from the search results.
- Also, any registered user can suggest some keywords for a particular course topic.

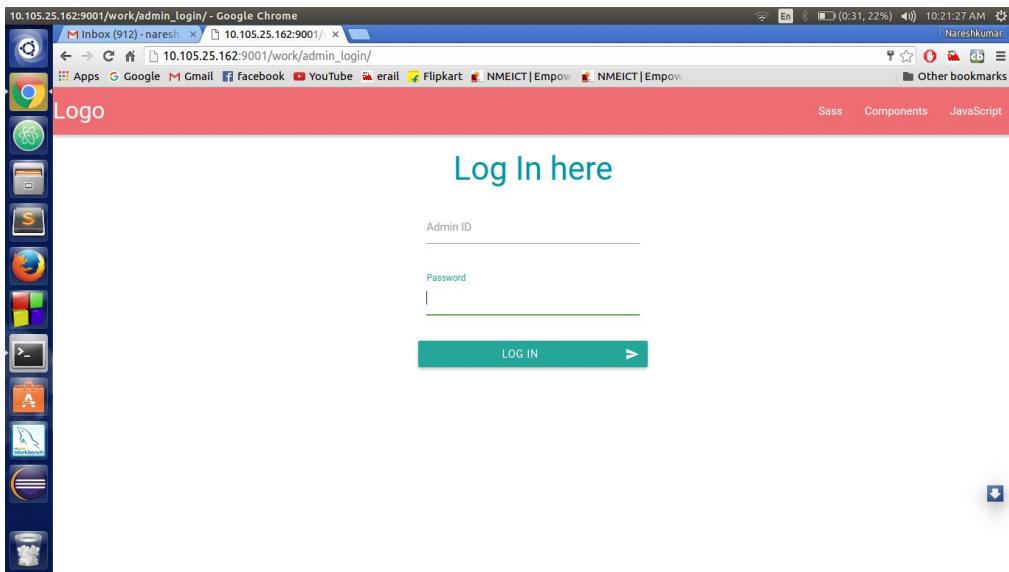
2. Administrator :-

- Administrator will be the head of the site. He can manage entire contents and make changes. (All functionalities are described below.)

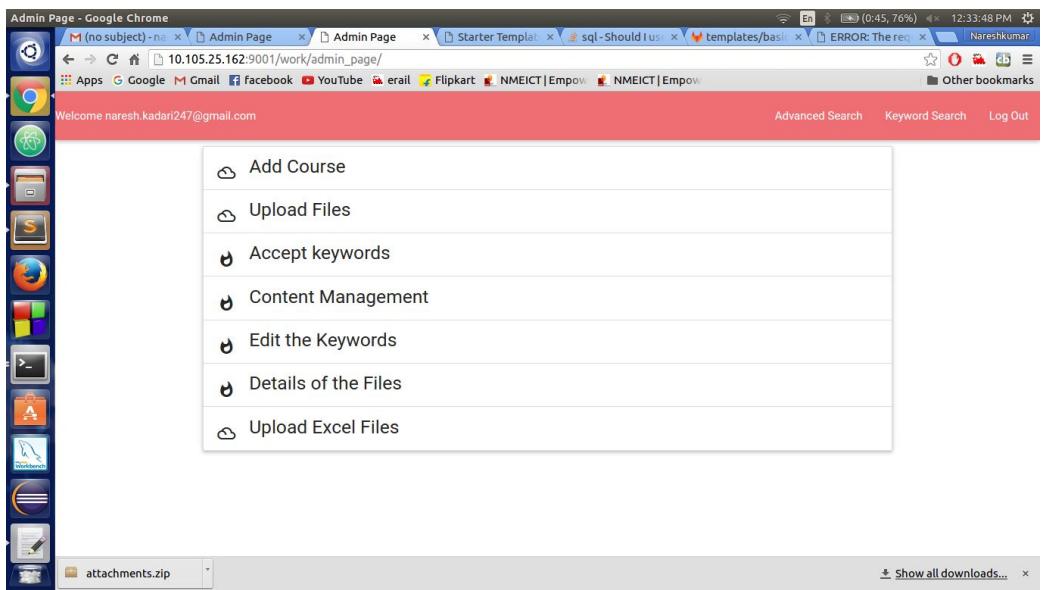
Description of module:-

1. Sign in module (For Administrator) -- from TCube Library:-

The sign in feature is given to only administrator as the administrator only has the authority to make changes in the content and display the content to the general user.



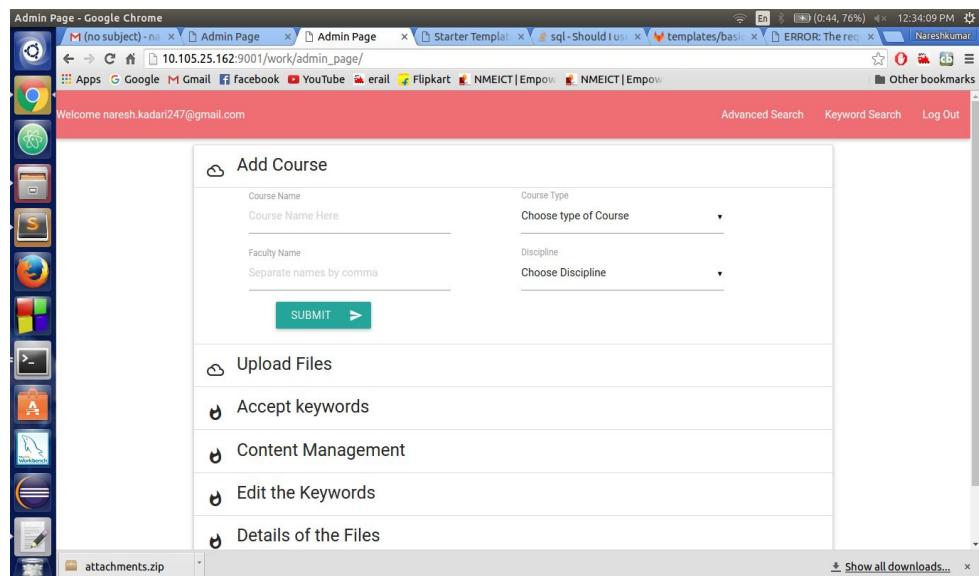
After logging in, following functionalities are accessed by administrator:



1. Add Course :-

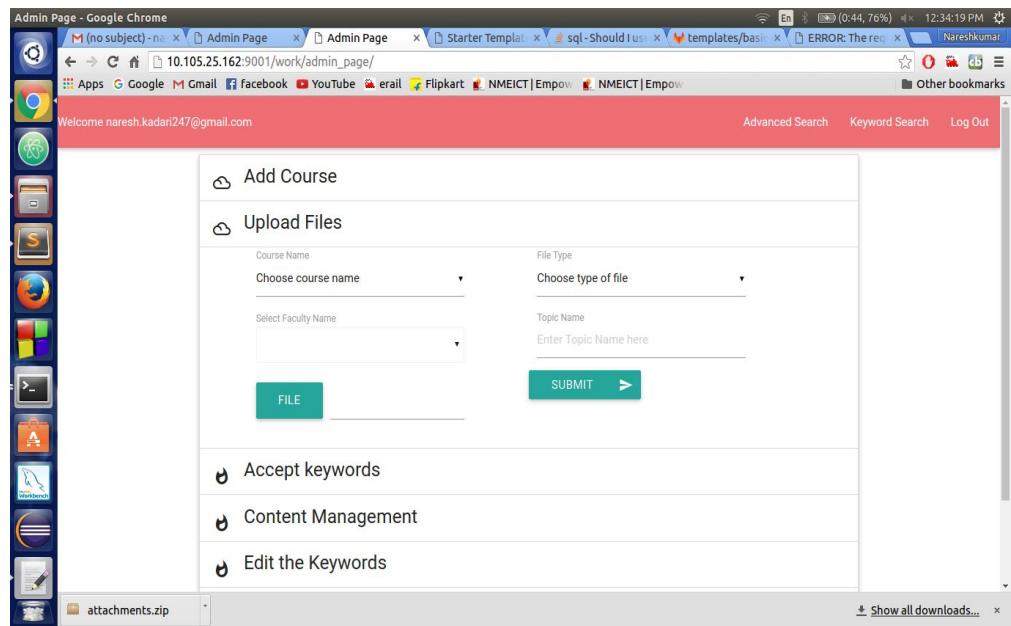
This is the functionality given so that administrator will be able to create new course and assign the professor for that course.

- Add new course with the list faculties which will be teaching that particular course.
- Add course for workshop type either main or co-ordinated.
- Add course for one of the branches already present e.g. CSE, EEE, MECH etc.



2. Create topic :-

This functionality enables the administrator to upload the files for a particular course and create new topic and assign the professor which will be teaching that particular course.



- For a particular course, we can add topics with one of the teachers assigned to that course.
- Along with topic name, also upload files for that particular topic of the format PDF, PPT, Video Lecture.
- After uploading a file, the file will be converted to text format. Like pdf will be converted to text or ppt will also be converted to text whereas a subtitle (.srt) file will be generated for a particular video. (This helps in generating more powerful and accurate results in advanced search. The software used for this text files generations are listed below.)

3. Accept Keywords:-

Accept or reject the keywords which are suggested by users for basic search. The administrator can see the list of keywords which are suggested by the user and administrator can accept or reject the suggested keywords for the particular file of topic.

4. Content Management:-

This is very important page for administrator site. This page enables administrator to manage the entire content make changes in the content, publish the content for user, hide the content for the user and other listed below things.

File Name	Review	Add Keywords	Publish	Publish Date	Hide
CP_C_Image_Processing.pdf	REVIEW >	ADD	published	June 27, 2016	HIDE >
CP_M_Handling_Character_Strings.pdf	REVIEW >	ADD	PUBLISH >	Not published yet	hidden
CP_M_Handling_Multi_Dimensional_Arrays.pdf	REVIEW >	ADD	published	June 27, 2016	HIDE >
CP_M_Iterative_Solutions.pdf	REVIEW >	ADD	PUBLISH >	Not published yet	hidden

Video

PPT

attachments.zip

Show all downloads...

- First, a course name should be selected from already present course.
- A page, sorted according to the file type, will be shown.
- Here administrator can review the files already uploaded for selected course.
- Administrator can add extra keywords for basic search.

Hair

The way

We introduce

Note: Don't press enter while editing the subtitles

DOWNLOAD SAVE

attachments.zip

Show all downloads...

- In review option, administrator can update the srt file of video by simply downloading and uploading the edited file again. This new srt file will now correspond to that particular video. Also administrator can edit the subtitle using 'interface'. In this

interface, the video and subtitles are shown side by side so that both will run simultaneously. Also administrator can click on any line in subtitle file and video will be seek to that particular point and vice-versa.

- Similarly, administrator can also update and make changes to the text file copy of PPT or PDF.
- On this page, administrator can publish that particular file. This means that until administrator publishes this file, it is not shown to user. Only after publishing this file the user can view or download the file corresponding to that particular topic.
- Similarly, even if the file is published administrator can choose to hide this file by clicking on hide button so that this particular file will not be shown to users.
- Last published date can be seen. When administrator publishes it the date is updated. And when administrator hides it is again set back to “Not published yet”.

5. Edit keywords:-

The keywords previously added may need to be edited due to spelling mistakes or irrelevance. This facility is very much useful for that.

File Name	Keyword	Update	Hide
CP_M_L10_Handling_Multi-Dimensional_Arrays.mp4	address	UPDATE	HIDE
CP_M_L10_Handling_Multi-Dimensional_Arrays.mp4	array	UPDATE	HIDE
CP_M_L10_Handling_Multi-Dimensional_Arrays.mp4	base	UPDATE	HIDE
CP_M_L10_Handling_Multi-Dimensional_Arrays.mp4	dimensional	UPDATE	HIDE

- After choosing course name and topic name, a list of keywords with their corresponding file names which are already present will be shown.

- The administrator can update the keyword or he can hide the keyword from users. (This hide functionality works as explained above.)

6. Details of Files:-

All details of the files will be seen in this section.

- After choosing a course name, administrator will be shown a page.
- The page contains topic name, filename and professor who is teaching that particular topic.
- Sorting can also be done based on either of three columns.

7. Upload dump of files:-

Uploading single file every time is very difficult for the administrator. Therefor we have provided this facility using which the administrator can directly copy the files and the details of that file can be added in an formatted excel sheet and simply the database can be filled.

- Administrator can upload a lot of files simultaneously.
- For that, first administrator will have to copy all the files into folder name “files” having path work/static/files.
- Then, administrator strictly has to download the specified format given. Administrator will have to download the format file provided.
- Then all the details of the files should be filled in that particular file in specified format and upload the file with a different name.
- This will store all the details of the files in the database.
- Also, it will generate the text files corresponding to the files.
- But, the format should be maintained and the name of the file while uploading should be changed.
- Suggest a keyword (login required):
 - Library user can also suggest a keyword, when user login he get the functionality to suggest keyword .
 - This keyword is moderated and approved by administrator.
 - After administrator approval new keyword is added in library

- For guest user: Guest user can use basic search or random search directly. He need not sign in.

2. Search module:-

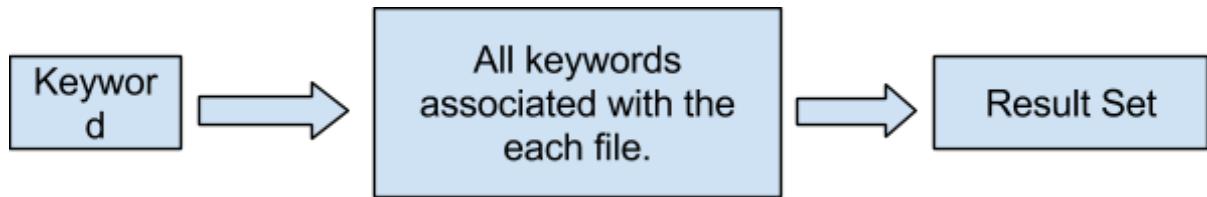
Search module comprises of two types of search. 1. Basic Search
2. Advanced search. Both of them have their own importance and are very useful.

1. Basic Search:-

- Basic Search provides search for a keywords which correspond to particular file.

Topic Name	File Name	Keyword
concurrency control	DBMS_L16A_Concurrency_ControlWT.mp4	control
concurrency control	DBMS_L16B_Concurrency_ControlWT.mp4	control
concurrency control	DBMS_M_Concurrency_Control.pdf	control

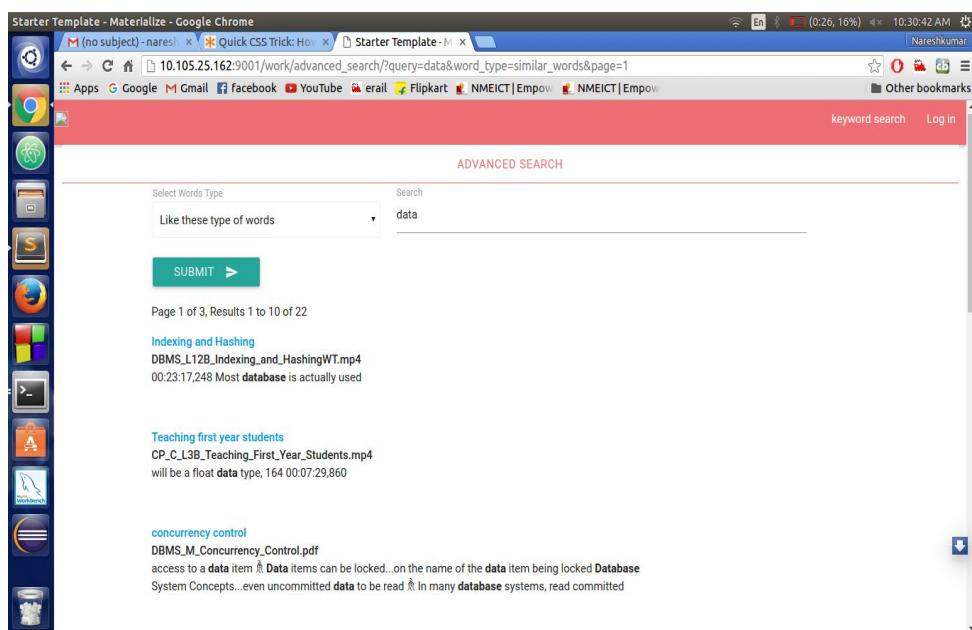
- When keyword is entered into the search bar it checks through all the keywords which match to the given keyword and shows all the files as the result.
- This search can be confined to one particular file type only - PPT, PDF, Video.
- If no file type is chosen it will show results of all file types combined.



- From the given results, user can download that particular file or read the pdf or watch the video.
- The result set will also contain the other related keywords corresponding to one file so the user will have complete idea of what will be there in the file.

2. Advanced Search:-

- Advanced search is the overall search for any type of file or any type of word.
- For any given word, search result will contain all those files which have the similar word or likewise.



- This is where all the subtitles generated and all converted text formats of pdfs and ppts are being used.
- The given search query will run through the entire folder where all these files are present and give out the search result.
- To implement this we have made use of 'Whoosh', a python API (Open source). How this 'Whoosh' has been implemented and installed is described later.

- Whoosh indexes all the files and that is why the result given by whose is very fast and very accurate.
- To make search result more powerful, we have given two options
 1. Like this type of words:- This gives search result of all relevant words with combination of OR, AND and likewise. Eg, if “modi” is the query then search result will contain all words which start with ‘modi’, like modify or modified etc.
 2. Exact words:- This gives the search result of exactly for the words which will be typed in the search box. Eg, for query “modi” only results for “modi” will be shown.
- The search engine takes care of all the spaces or white spaces entered into the query and gives accurate considering the words entered into the query.
- Also if by any chance if user misspelled the words, we have added one autocorrect feature which takes care of the such words and corrects them and shows out the results.
- The user is being let known if such correction is done by us.
- If the search result is more than a page then pagination is done properly so that we can navigate through the search result easily.
- The search result is shown like Google search results where we can see where exactly our searched query is actually present.
- We can click on the search result and it will take us to the file directly and we can view that file. Also those files can be downloaded by simply right clicking and selecting ‘save link as’ option.

For documents,

fdp_id	course_file_name	keywords	path_of_file
XXXX	YYYY	word 1, word 2, word 3	../../..//path
XXX1	YYY1	word 1, word 2, word 3	../../..//path

For videos,

fdp_id	video_file_name	keywords	path_of_file	.srt file path
XXXX	YYYY	word 1, word 2, word 3	../..../path	../..../path1
XXX1	YYY1	word 1, word 2, word 3	../..../path	../..../path2

How it Works?

- **File Upload :-**

1. **Generation of subtitles:**

- For generation of subtitle (.srt) file we used a software named ‘Auto-Sub’. It is an open source software which makes use Google’s speech recognition technique and identifies the language and generates subtitles automatically.
- To install this software simply use following command in the command line :
 1. Download ffmpeg
 2. Extract the tar file
 3. Go to the extracted directory from terminal
 4. Type of command line: `./configure`
 5. Then type: `make`
 6. Then type: `sudo make install`
 7. Then type: `sudo pip install autosub`
 8. To check if it is working properly type: `autosub -h`
- After uploading a video file, this generation of video starts as a new process. This means that this process will not halt the website and it will run in the background.
- Even if the net goes off, it will again start from where it had stopped.
- Therefore any newly uploaded file can be uploaded without any problem and halt.

2. **For PDF to text or PPT to text:**

- To convert this we have used one open source software.
- To install this software simply type in command line :
`sudo apt-get install poppler-utils`
- Like subtitle generation this process will work in background.
- This generation of text files is useful in advanced search.

- **Advance Search :-**

1. Whoosh has been used for faster advanced search.
2. Introduction to whoosh :-

Whoosh was created by [Matt Chaput](#). It started as a quick and dirty search server for the online documentation of the [Houdini](#) 3D animation software package. Side Effects Software generously allowed Matt to open source the code in case it might be useful to anyone else who needs a very flexible or pure-Python search engine (or both!).

3. More about whoosh? [Click here.](#)
4. Installation :- `pip install whoosh`
5. How does it work?
 - Whoosh is fast, but uses only pure Python, so it will run anywhere Python runs, without requiring a compiler.
 - By default, Whoosh uses the [Okapi BM25F](#) ranking function, but like most things the ranking function can be easily customized.
 - Whoosh creates fairly small indexes compared to many other search libraries.
 - All indexed text in Whoosh must be *unicode*.
 - Whoosh lets you store arbitrary Python objects with indexed documents.
6. To generate more appropriate results we also made use of “autocorrect” API of python. This corrects the wrongly spelled word into a correct one.
7. To install the autocorrect API :- `pip install autocorrect`
8. Sample of autocorrect :-

```
>>> from autocorrect import spell
>>> spell('HTe')
'The'
```

- **Read Excel Files :-**

1. To read the data from the excel we made use of some python API 'xlwt'.
2. To install this API :- `pip install xlwt`
3. This helps us to read each row properly and put it in the database.

Software Requirements

- Django
- python
- mysql
- ajax
- json
- javascript
- jquery

Conclusion:-

This project Tcube library is designed for the purpose of the Administrator to manage the whole content of the tcube. TCube library is the website designed for administrator to handle the backend work and make changes in the content .The interface is designed in such a way that it can be handled easily.Many facilities are added to make the work of admin simpler.The search is implemented by whoosh which is very fast and it also tested on a large dump of text files and it is able to search fast than other softwares like solr,xapian.It is faster than all those softwares.

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- a. <https://pypi.python.org/pypi/autocorrect/0.2.0>
- b. <http://www.howtogeek.com/228531/how-to-convert-a-pdf-file-to-editable-text-using-the-command-line-in-linux/>
- c. <https://github.com/agermanidis/autosub>
- d. <http://whoosh.readthedocs.io/en/latest/>
- e. <https://ffmpeg.org/download.html>
- f. <https://pypi.python.org/pypi/xlwt>
- g. <https://getmdl.io/components/>
- h. <https://docs.djangoproject.com/en/1.8/>
- i. <http://stackoverflow.com/>
- j. <https://pypi.python.org/pypi/pdfkit>