



STUDENT ENROLLMENT ANALYSIS SYSTEM (SEAS)

CSE303- Sec-04- Group-05

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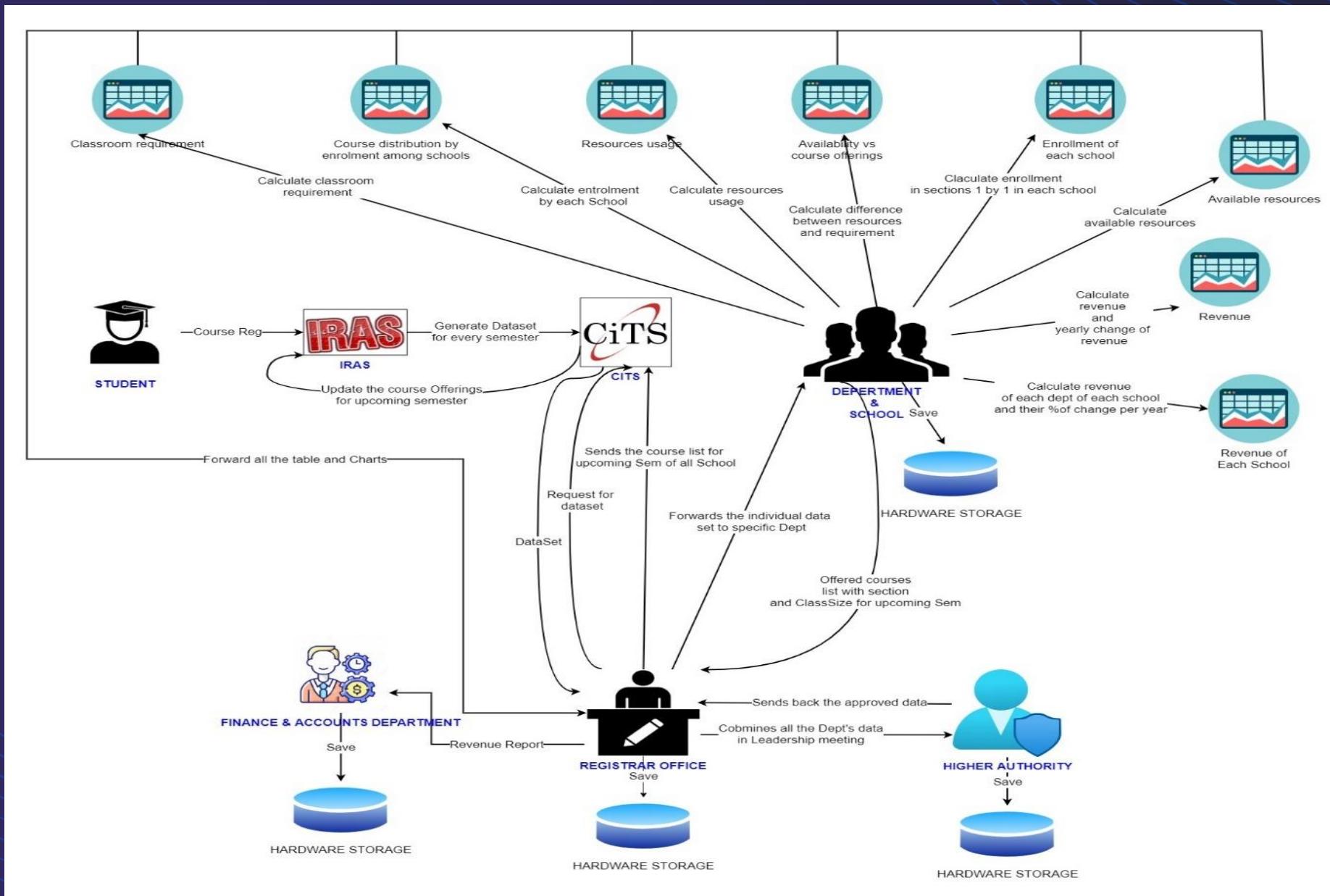
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Rich Picture (AS-IS)



Six Element Analysis (AS-IS)

Process	System Rules					
	Human	Non-Computing hardware	Computing hardware	Software	Database	Network and communication
1. Datasheet Distribution	<p>CITS:</p> <ol style="list-style-type: none"> Collects the generated dataset for every semester from IRAS. Sends the generated dataset to the register's office Updates the course offerings for upcoming semester according to the information provided by register's office <p>Registrar's office:</p> <ol style="list-style-type: none"> Dataset for 	<p>Pen and paper:</p> <ol style="list-style-type: none"> Is used for writing down important notes specific to departments. Intermediate ideas may be written down. 	<p>Computer / Laptop:</p> <ol style="list-style-type: none"> Is used to make soft copies of the dataset as well as extra copies for later use. <p>Printer:</p> <ol style="list-style-type: none"> Used for printing out hardcopies of the dataset. <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>Used to access the Internet.</p>	<p>Microsoft excel:</p> <ol style="list-style-type: none"> It is used by the head of the departments as well as finance and accounts department to map all the calculations related to student enrollment and revenue. To generate charts, MS excel is also used. 	<p>Hardware storage:</p> <ol style="list-style-type: none"> Is used for saving datasets in all the local computers associated with departments and higher authorities. 	<p>Internet & Email:</p> <ol style="list-style-type: none"> Internet and email is used to communicate between the register's office and all the departments along with CITS and higher authority. All stakeholders may discuss important topics via email. <p>Others:</p> <ol style="list-style-type: none"> Phone's or physical means may be used to

	<p>specific departments are forwarded accordingly to the respected department heads and revenue report is sent to the finance and accounts department</p> <p>2. The manually calculated charts and tables from the departments along with the offered courses list as well as section and class size offerings for upcoming semester are received by register's office</p> <p>3. Combines all the received data then sends and waits for approval from higher authority.</p> <p>4. Sends CITS the course list for</p>					communicate about related topics and outcomes between the stakeholders.
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	<p>upcoming semester of all school based on the approved data from higher authority</p> <p>Head of department: Sends offered courses list with section and class size for upcoming semester to the register's office.</p> <p>Higher Authority: Verifies all the combined data and sends the approved data to the register's office</p>					
2. Enrollment wise course distribution analysis	<p>School (Team from school):</p> <p>1. Each school takes the tally sheet.</p> <p>2. Count the number of sections with respect to the number of students</p>	<p>Pen and Paper:</p> <p>1. To note down the necessary information if needed.</p> <p>2. Used for any hard copy of the charts and tables if needed.</p>	<p>Computer / Laptop:</p> <p>1. Users will use the device to access and view the data.</p> <p>2. Storing the necessary information of softcopies such as the</p>	<p>Microsoft office:</p> <p>1. Generate tables and manage them in MS Excel.</p> <p>Web Browser:</p> <p>To send and receive mails about important details and</p>	<p>Hardware Storage:</p> <p>Stores the information of the table on enrollment wise course distribution.</p>	<p>Internet: Use the internet to access IRASv1 and Gmail.</p>

	<p>starting from 1 going to the largest with an increment of 1</p> <p>3. Calculates the total number of sections with respect to the enrollment range.</p> <p>4. Every school sends the total calculation with respect to the enrolled range to the registrar's office.</p> <p>Registrar's office:</p> <ol style="list-style-type: none">1. Receives the calculated tables (in excel file) with respect to the enrolled range from individual schools.2. Calculates the total sections of all the schools with respect to enrolled range.	<p>Calculator: For calculating all the data.</p> <p>excel file.</p> <p>Printer: Print the relevant documents.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>Used to access the Internet.</p>	<p>documents.</p>		
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	<p>3. Creates line charts for the total sections of all the schools with respect to enrolled range.</p> <p>4. Creates bar charts based on the total enrolled range for every school.</p>				
3. Revenue Analysis	<p>Department Team:</p> <p>1. Team from Each Dept. Collects the revenue Data from the Tally sheets</p> <p>2. Starts to Calculate annual revenue data</p> <p>3. Initially open the Excel software and Load the required revenue data</p> <p>4. In order to calculate the annual % change in revenue , we need to set a formula to</p>	<p>Pen and Paper:</p> <p>1. To note down the necessary information if needed.</p> <p>2. Used for any hard copy of the charts and tables if needed.</p> <p>Calculator: For calculating all the data</p>	<p>Computer:</p> <p>1. Department/ CITS/Higher authority use computers to make soft copies of calculation, charts, tables data</p> <p>2. All related data is searched and stored using a computer.</p> <p>Printer:</p> <p>1. To print out hard copies of the generated dataset.</p> <p>Networking Devices (Router, Switch,</p>	<p>MS Excel: All related information is stored and calculated and all charts and tables are generated.</p>	<p>Hardware storage: Used By Department/ CITS/Finance Accounts/Higher authority to store data.</p> <p>File Cabinet: Used by Department/ CITS/Finance & Accounts/Higher authority to maintain the necessary course related documents in hard copy.</p> <p>Internet & Email: Used it to send mail to the Stakeholders to discuss information regarding courses list/capacity.</p>

	<p>find the total revenue of the departments.</p> <p>5. Now set another formula to calculate the % change in revenue (e.g autumn 2009 to autumn 2010).</p> <p>6. Now, the revenue data sheet prepared by each team of the departments is sent to the team of School</p> <p>School (A Team from School):</p> <ol style="list-style-type: none">1. The Revenue data sheet prepared by each team of department is received by a team from School.2. Now the team of school will combine the revenue data sheet into one using Excel.		<p>Bridge, Hub:</p> <p>Used to access the Internet.</p>			
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3. After combining all the revenue data semester wise .

4. Now, add all the semester wise revenue data to get the total sum of all departments (school e.g SETS).

5. Now set a formula to calculate the annual % change in revenue of the school (e.g autumn 2009 to autumn 2010).

6. The final revenue data that has been prepared will be sent to the higher authority for further analysis.

**Registrar's office/
Higher Authority:**

Receives the calculated excel sheets from each

	school.					
4. Resources analysis	<p><u>a. Usage of the resources:</u></p> <p>School (A team from school):</p> <ol style="list-style-type: none"> From the total number of enrolled students divide that value with the number of all sections for that school. This will generate Avg Enroll of a school in a semester. Finding subtraction of Avg room and avg enrollment will give a difference of avg unused resources by each school in a semester. To get %of unused resources divide the difference 	<p>Pen and Paper:</p> <ol style="list-style-type: none"> To note down the necessary information if needed. Used for any hard copy of the data. 	<p>Computer/ Laptop:</p> <ol style="list-style-type: none"> Department / Registrar Office/ Higher authority use computers to make soft copies of data All related data is searched and stored using a computer. <p>Printer: To print out hard copies of the generated dataset.</p> <p>Networking Devices (Router, Switch, Bridge, Hub): Used to access the Internet.</p> <p>Calculator: For calculating all the data</p>	<p>MS Excel: All related information is stored and managed.</p>	<p>Hardware storage: Used by Department Heads /Registrar Office/Higher authority to store data.</p> <p>File Cabinet: By Department Heads /Registrar Office/Higher authority to maintain the necessary course related documents in hard copy.</p>	<p>Internet & Email: Used it to send mail to the stakeholders to discuss information regarding courses list.</p>

	<p>value with Avg room value then multiply by 100.</p> <p>4. Send the calculated analysis of a school to the reg office.</p> <p>Registrar Office:</p> <p>1. A central team combines all the school's resources usage analysis tables in Excel file in right format.</p> <p>2. The team calculates overall semester's resources usage by all of the schools by using formulas in Excel file.</p> <p><i>b. IUB available resources analysis:</i></p> <p>Registrar</p>					
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	<p>Office:</p> <p>1. Calculate the available capacity of IUB based on class size and available class.</p> <p>2. Using Class size* IUB resource formula a Central team finds the capacity table by class size as well as total available resource.</p> <p>3. Then the team analyzes 6 slots or 7 slots per day capacity.</p> <p>4. The team calculates the free% of capacity depending on 6/7 slots/day class allocation.</p> <p><i><u>C. Availability and course offering comparison</u></i></p>				
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	Registrar Office: 1. The Central team calculates a comparison table based on class size, IUB resources vs offered courses in a semester. 2. The central team calculates the difference based on class size between available classroom and needed classroom in a semester. 3. Generate the charts for Resource Utilization in different semester(s) using Excel charts.					
5. Classroom requirement	Registrar's office : 1. A central	Paper & pen: 1. Need to	Computer / Laptop: 1. Users will	Microsoft office: 1. Make	Hardware Storage: Stores the	Internet: Use the internet to

analysis	<p>team with respect to the total sections of all the schools based on the enrolled range, calculates the total number of slots required per day in excel sheet using the formula.</p> <p>2. Sends the excel file to School for confirmation of distribution of classrooms per class size range on per slot.</p> <p>3. Receives confirmation from each individual school.</p> <p>3. Create pie charts showing percentage distribution of the classrooms per class size range based on per slot.</p> <p>School(Team from School):</p>	<p>take important notes for example during meetings.</p>	<p>use the device to access and view the data and use excel to design the table.</p> <p>2. Storing the necessary information as softcopies such as charts and tables on classroom requirement summary.</p>	<p>reports using MS Word.</p> <p>2. Generate tables and manage them in MS Excel.</p> <p>Web Browser: To send mails about important details and documents.</p> <p>Printer: Print the relevant documents.</p> <p>Networking Devices (Router, Switch, Bridge, Hub): Used to access the Internet.</p>	<p>information on classroom requirement summary.</p>	<p>access IRASv1 and Gmail.</p>
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	<p>1. Receives the excel file containing slots per day based on class size range.</p> <p>2. Checks if the slots calculated can be accepted or not.</p> <p>3. After checking it sends the final excel sheet to the registrar's office.</p>				
6. Accumulate school-based analysis	<p>School(Team from School):</p> <p>1. All the respective teams of each school sends the calculated table based on their school to the registrar office. The calculated tables include:</p> <p>i. Classroom requirement calculation</p>	<p>Pen and Paper:</p> <p>1. To note down the necessary information if needed.</p> <p>2. Used for any hard copy of the data.</p>	<p>Computer/ Laptop:</p> <p>1. Department / Registrar Office/ Higher authority use computers to make soft copies of data</p> <p>2. All related data is searched and stored using a computer.</p>	<p>MS Excel:</p> <p>All related information is stored and managed.</p> <p>Printer:</p> <p>To print out hard copies</p>	<p>Hardware storage:</p> <p>Used by Department Heads /Registrar Office/Higher authority to store data.</p> <p>File Cabinet:</p> <p>By Department Heads /Registrar Office/Higher authority to maintain the necessary</p> <p>Internet & Email:</p> <p>Used it to send mail to the stakeholders to discuss information regarding courses list.</p>

	<p>ii. Calculation of enrollment by each school</p> <p>iii. Resource usage calculation</p> <p>iv. Calculation of differences between resources and requirements.</p> <p>v. Calculation of enrollment in sections 1 by 1 in each school</p> <p>vi. Resource availability calculation.</p> <p>vii. Calculation of school wise revenue and yearly change of revenue.</p> <p>viii. Calculation of each department of each</p>		<p>of the generated dataset.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>Used to access the Internet.</p> <p>Calculator:</p> <p>For calculating all the data</p>	<p>course related documents in hard copy.</p>	
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	<p>school along with % change per year.</p> <p>2. Central Team:</p> <p>1. Accumulates all the calculated tables of each school that was provided by the schools and places accordingly to the respected tables in an excel sheet. The tables here include:</p> <ul style="list-style-type: none">i. Revenue of IUBii. Revenue in Engineering School.iii. Enrollment wise course distribution among the schools.iv. Usage of the resourcesv. Classroom requirement as per				
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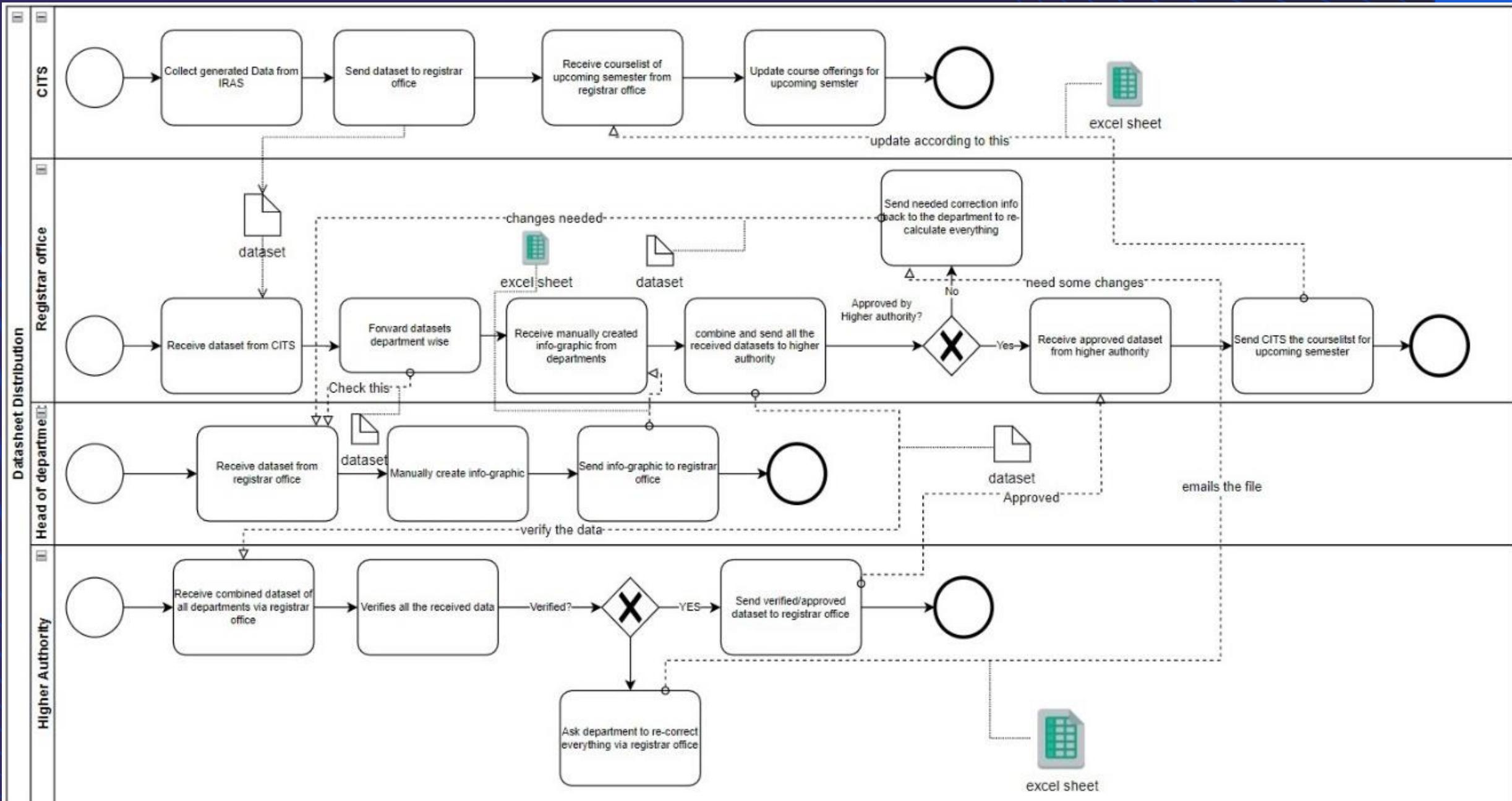
	<p>course offering</p> <p>vi.</p> <p>Breakdown of number of courses of each school table.</p> <p>2.</p> <p>Calculates some of the accumulated tables. The calculations include:</p> <ul style="list-style-type: none">i. The total revenue of all the schools in a certain semester. It is calculated by summing each of the schools revenue of a certain semesterii. The annual percentage change of revenue.iii. The total revenue of engineering schools along with the percentage				
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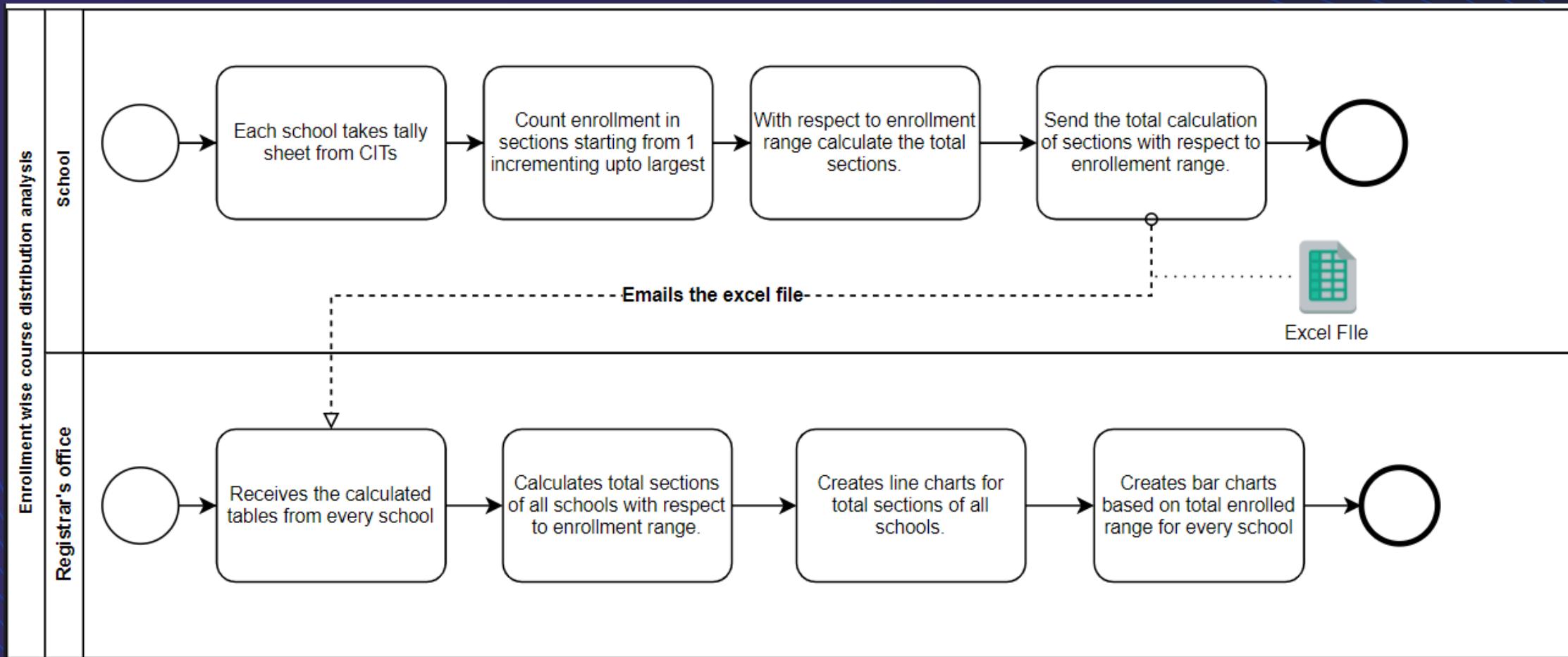
	<p>change annually.</p> <p>iv. The total enrollment among the schools is based on size.</p> <p>v. The total resource usage of a semester among all the schools including average enrollment, average room capacity, difference between them and unused resource percentage.</p> <p>vi. Total enrollment of all the schools of a semester based on incrementation of 1 to the largest number of students. Also the end total.</p> <p>vii. Total sections needed for a certain range of</p>					

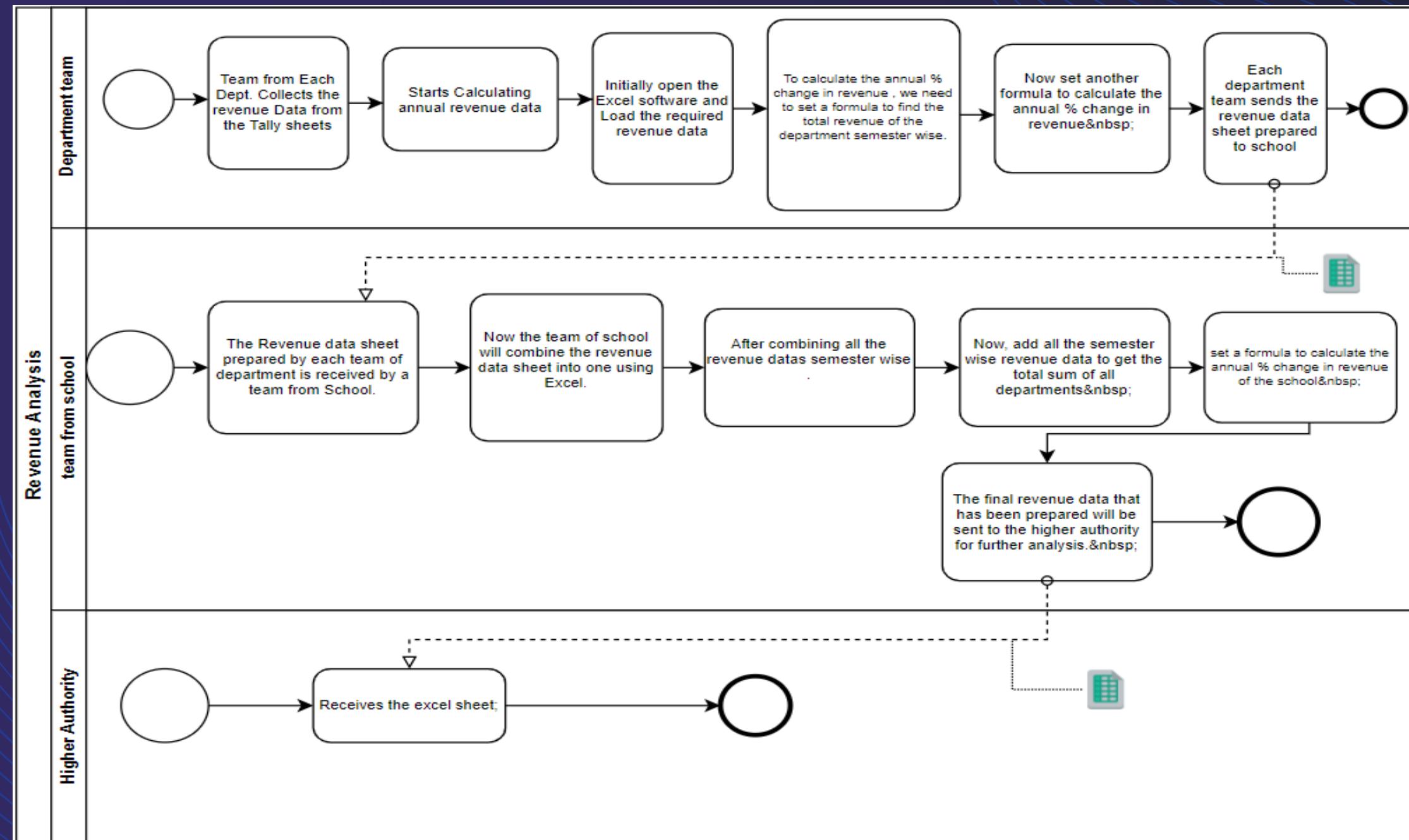
	<p>capacity of a semester also the total sections for all capacities.</p> <p>viii. Required classrooms for a given number of slots per day for a certain semester also the total number of classrooms for all capacities.</p> <p>2. Generates charts on excel based on the accumulated data. The charts include:</p> <ul style="list-style-type: none">i. Class size requirement pie chartii. Bar and line chart of class size distributioniii. Resource utilization bar chart .iv. Line				
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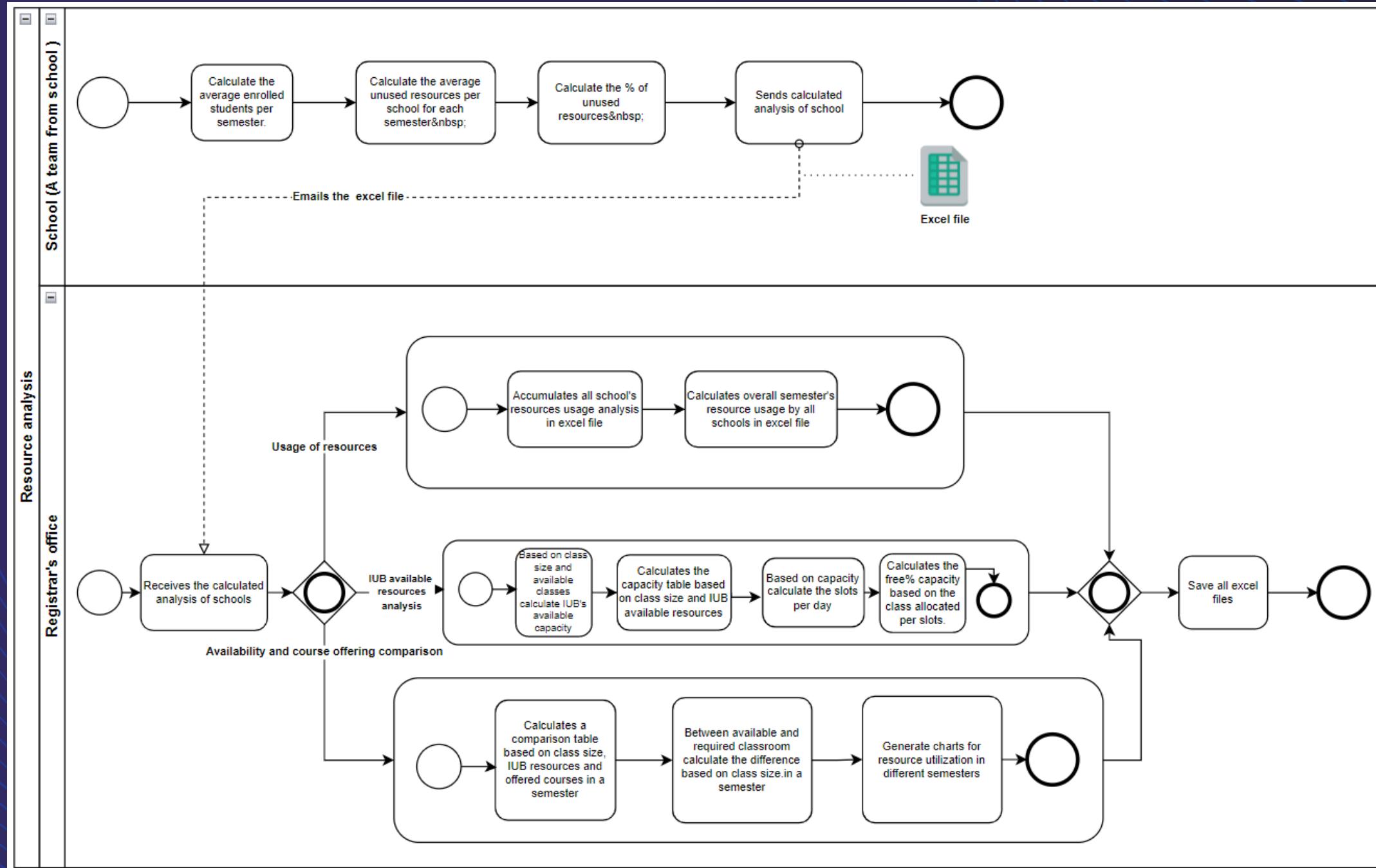
chart for Revenue Trend of the schools
vii. Area chart on Revenue Distribution among the schools
viii. line and bar chart on IUB Revenue and Change %
ix. Line chart on Department wise revenue in SETS.
x. Area chart on Revenue of SETS.

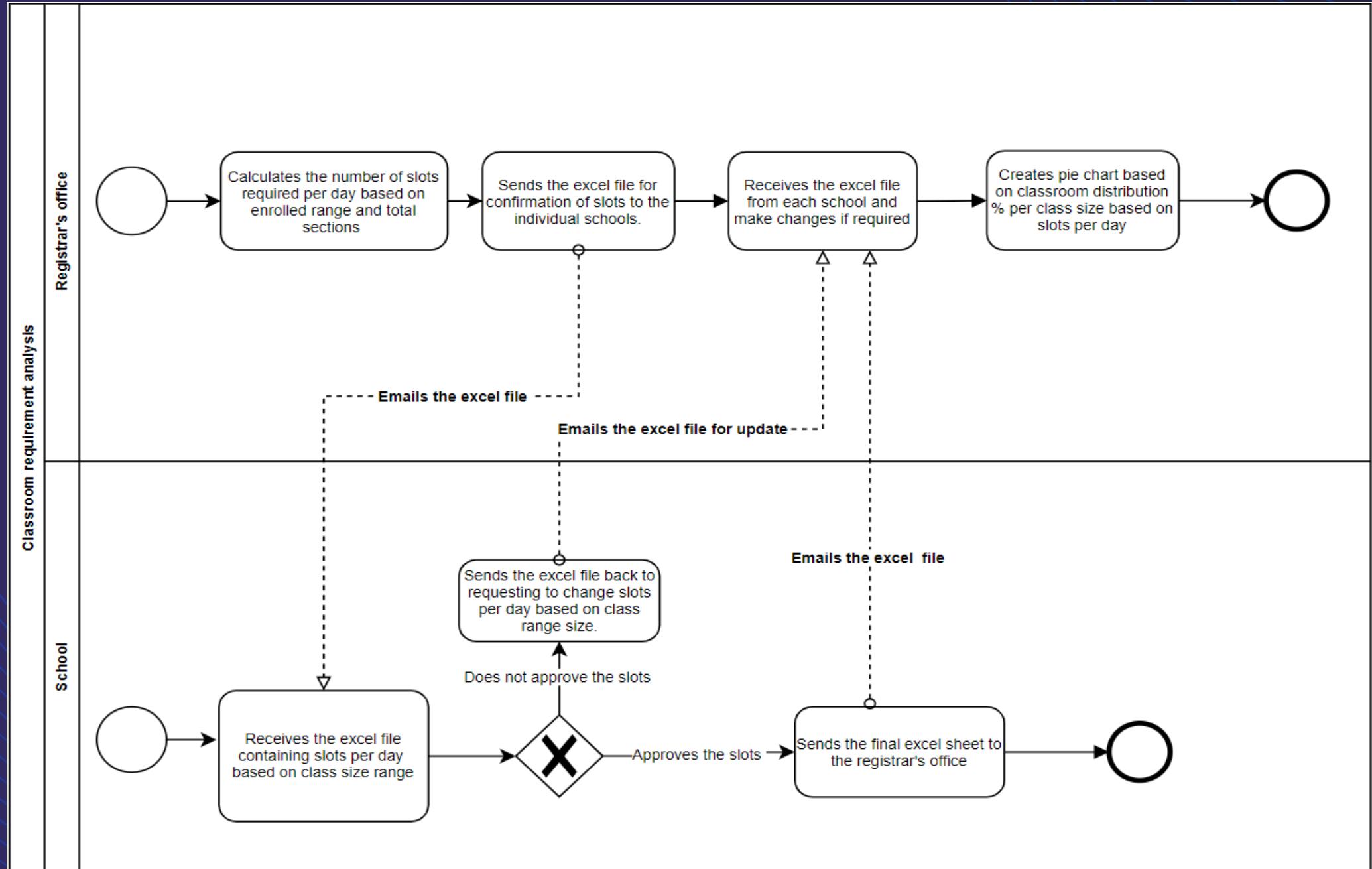
Process Diagram (As-Is)

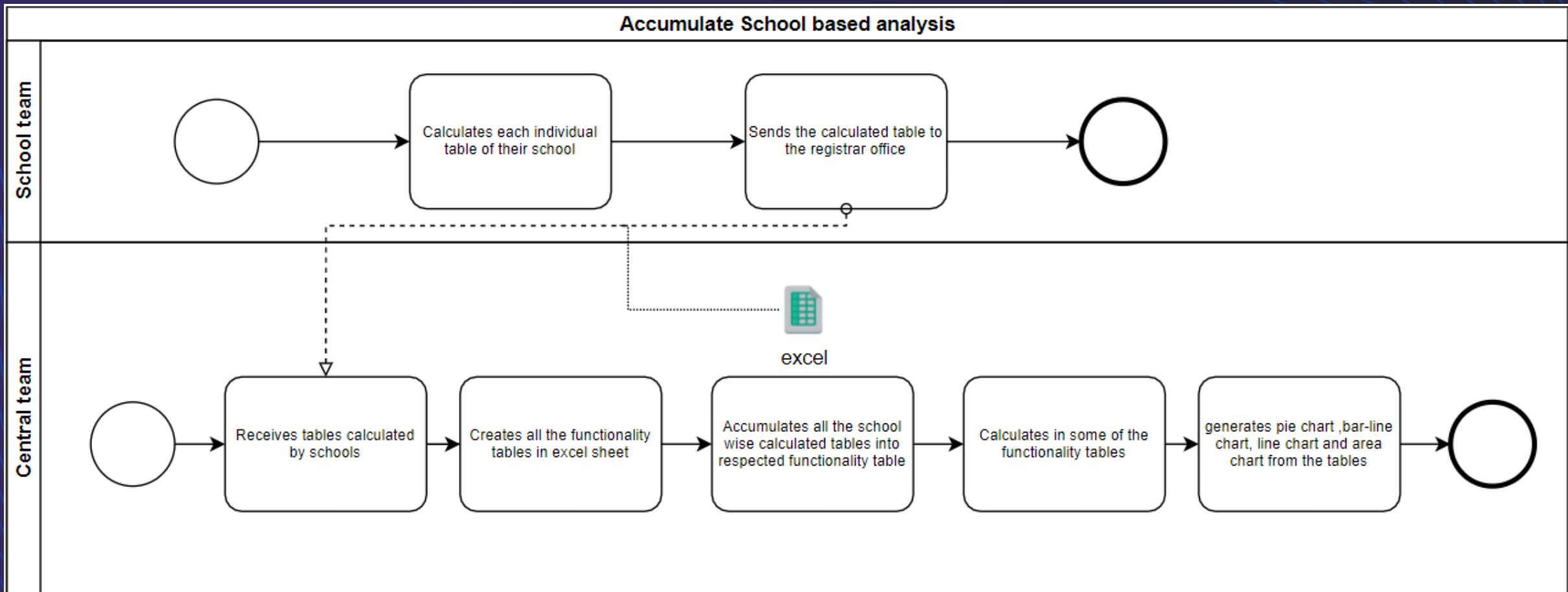












PROBLEM ANALYSIS – EXISTING SYSTEM

Process Name	Stakeholders	Concerns(Problems)	Analysis (Reason of the Problems)	Proposed Solution
Datasheet distribution.	1. CITS 2. Registrar Office 3. Department 4. School 5. Higher Authority	1. Requires manual distribution of all the files 2. Data redundancy and variability 3. Time Consuming 4. Human error 5. Decentralized	The datasheet generated from IRAS needs to be distributed among the stakeholders to manually calculate their parts in different analyses. As there is no central system that will do all analysis irrespective of the department or school. In the current system each dept needs to do their part then with that each school needs to do their part finally a team needs to combine all, which is time consuming as well as there is huge possibility of data redundancy and inconsistency .	We proposed a system where there's no need for distribution. The system will work as a central system.

Enrollment wise course distribution analysis.	<ul style="list-style-type: none">1. School2. Registrar's Office	<ul style="list-style-type: none">1. Time consuming2. Human error3. Data redundancy and variability4. Involves manual calculations5. Decentralized	<p>Every school needs to calculate their course distribution part manually and then send them to the Registrar's office for combining all schools' analysis, which is a long process since one process needs to wait for another process to finish its task. As there is no central system that will do all the analysis irrespective of the schools the more human involvement the more human error can happen which is time consuming as well as there is huge possibility of data redundancy and inconsistency.</p>	<p>The system itself calculates and generates tables and charts according to the user request from the dataset it is provided. So no need for manual calculation or hassle for school or dept-wise data combination.</p>
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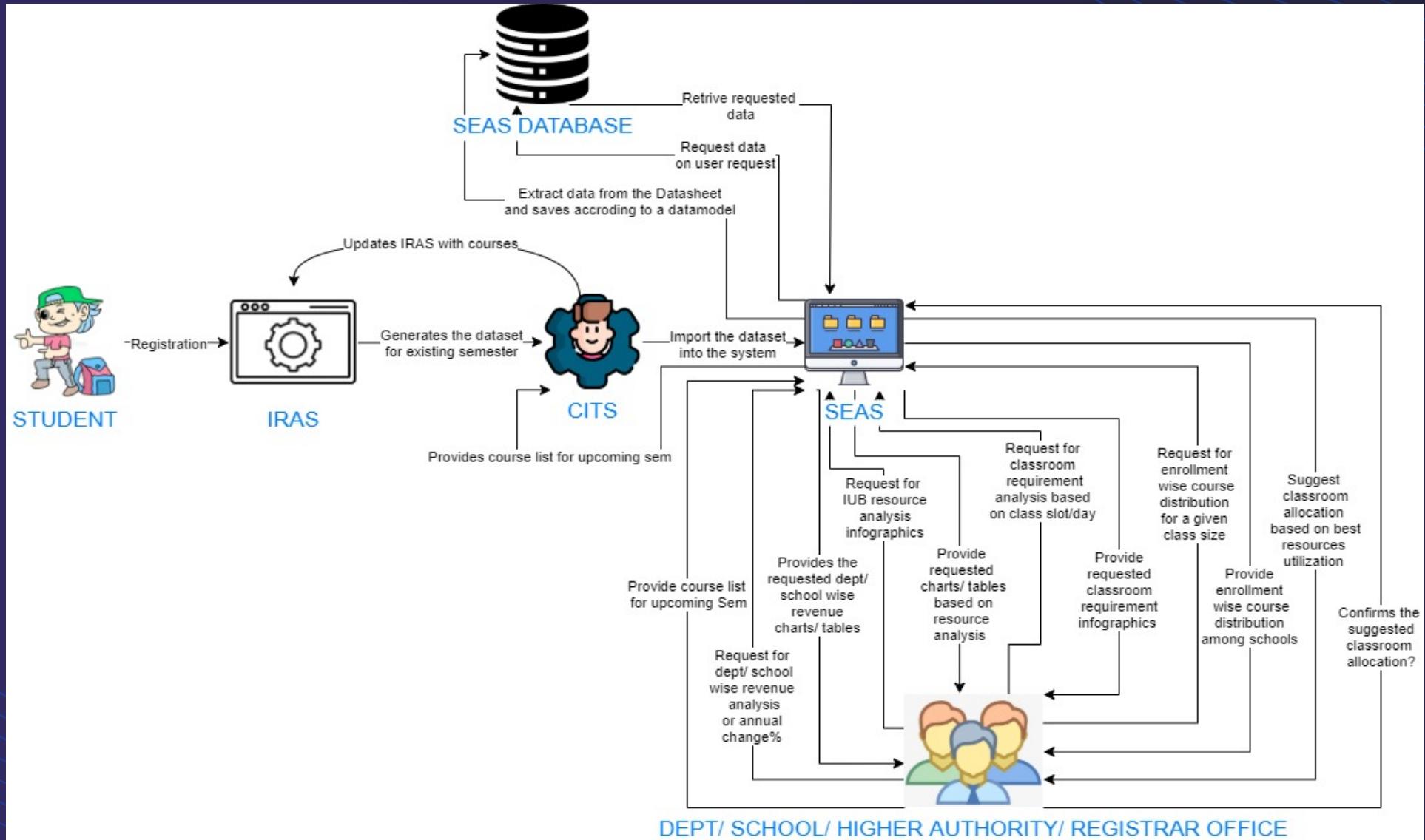
Revenue analysis.	<ol style="list-style-type: none">1. Department2. School3. Registrar's office4. Higher Authority	<ol style="list-style-type: none">1. Involves manual calculations.2. Human error3. Time consuming4. Data redundancy and variability5. Incorrect data values	<p>Every department and school needs to calculate their revenue analysis part manually and then send them to the Registrar's office for combining all schools' analysis sheets. As there is no central system that will do all the analysis irrespective of the schools, this is time consuming as well as there is huge possibility of data redundancy and inconsistency. The datasheet also consist of some inexact values of data. The more human involvement the more human error can happen.</p>	<p>The system itself calculates and generates tables and charts according to the user request from the dataset it is provided. So no need for manual calculation or hassle for school or dept data combined.</p>
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Resources analysis.	<ol style="list-style-type: none">1. School2. Registrar's office	<ol style="list-style-type: none">1. Involves huge data compilation2. Time consuming3. Data redundancy and variability4. Human error5. Decentralized6. Incorrect data values	<p>Analyze the resources usage by different schools individually. Overall usage needs to combine all school data which is a long process. As there is no central system that will do all the analysis irrespective of the schools, this is time consuming as well as there is huge possibility of data redundancy and inconsistency. The datasheet also consist of some invalid values of data. The more human involvement the more human error can happen.</p>	<p>The system itself calculates and generates tables and charts according to the user request from the dataset it is provided. So no need for manual calculation or hassle for school or dept data combined.</p>
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Classroom requirement analysis.	1. Registrar's office	1. Involves manual calculations 2. Time consuming 3. Human error 4. Decentralized	A central team from all schools manually calculate the classroom analysis and then generate charts. For every semester doing this task manually takes a lot of time. As there is no central system that will do all the analysis irrespective of the schools. The more human involvement the more human error can happen.	The system itself calculates and generates tables and charts according to the user request from the dataset it is provided. Hence no need for manual calculation or hassle for school or dept data combined.
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Accumulate school-based analysis.	1. School 2. Registrar's office	1. Involves huge data compilation 2. Data redundancy and variability 3. Human error 4. Time consuming 5. Decentralized	<p>All the calculated excel sheets from all schools need to be combined and then overall university analysis is done. Since every dept, school does their calculation individually and saves that to their hardware storage a single data can be stored in multiple storage. Since there is no central system that will do all the analysis irrespective of the schools. The more human involvement the more human error can happen. Different dept/ schools may save or generate data in different formats which may lead to difficulties while combining; moreover, if one calculation error is found anywhere or a data needs to be changed anywhere it needs to be changed or corrected everywhere which is a huge problem of the current system.</p>	<p>The system itself calculates and generates tables and charts according to the user request from the dataset it is provided. Hence no need for manual calculation or hassle for school or dept data combined. Also all data is now in one place so no need to worry about data redundancy or inconsistency.</p>
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Rich Picture (TO-BE)



Six Element Analysis (TO-BE)

Process	System Rules					
	Human	Non- Computing hardware	Computing hardware	Software	Database	Network and communication
1. Import dataset into the system	CITS: 1. Retrieves the generated dataset from IRAS. 2. Upload the Dataset into the System.	Pen and Paper: 1. To note down the necessary information if needed. 2. Used for any hard copy of the data	Computer: 1. CITS uses computers to make soft copies of data. 2. All related data is searched and stored using a computer.	MS Excel: IRAS: Printer: To print out hard copies of the generated dataset. Networking Devices (Router, Switch,	Hardware storage: All related information is stored. Generates the dataset for the existing semester SEAS: Import the dataset into the system for further analysis.	Internet : Internet is used to import data from IRAS and store it into the System. SEAS Database: The Imported Data will be stored into the System's Database.

			Bridge, Hub): Used to access the Internet.			
2. View System generated Resources analysis.	Department /School /High Authority/ Registrar Office: 1. Logs into the System using UserID and password. 2. Select user type from User Type selection drop box. <i>(i) Usage of the resources:</i> 3. From the navigation menu select the option for Usage of the resources.	Computer/ Laptop: Users will need a computer to access SEAS. Printer: To print the infographic report if needed. Networking Devices (Router, Switch, Bridge, Hub): Used to access the Internet.	SEAS: The system will generate the requested infographic. Web Browser: To access SEAS.	SEAS Database: Contains all data. Hardware storage: To save the system generated infographic.	Internet: It is required to access the system.	

	<p>4. Select school from school selection checkbox, Semester from selection checkbox.</p> <p>5. Click generate to view the usage table by selected school in the selected semester.</p> <p>6. This will also show the overall usage by the selected semester(s).</p> <p><i>(ii) IUB available resources:</i></p> <p>3. From the navigation menu select the option for IUB</p>				
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available resources.

4. Selecting this will show a summary table of available resources based on the capacity of all university rooms and the quantity of such rooms.

(iii) Availability and course offering comparison:

3. From the navigation menu select the option for Availability and course offering comparison.

4. Select type of infographics

	<p>(i.e. chart/table), select semester from semester selection checkbox.</p> <p>5. Clicking generate will show the selected chart/ table that is comparing the number of available classrooms per classroom size to the number necessary.</p>					
3. View system generated Revenue Analysis.	Department /School /High Authority/ Registrar Office: 1. Logs into the System using UserID	Computer/ Laptop: User will need a computer to access SEAS.	SEAS: The system will generate the requested infographic.	SEAS Database: Contains all data.	Internet: It is required to access the system.	Hardware storage: Web Browser: To save the system

	<p>and password.</p> <p>2. Select user type from User Type selection drop box.</p> <p><i>(i) Revenue of IUB:</i></p> <p>3. From the navigation menu select the option for Revenue of IUB.</p> <p>4. Select the type of infographic from the selection checkbox.</p> <p>5. Select the school(s) from the school selection checkbox, Select Annual change% if the user</p>		<p>To print the infographic report if needed.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p> <p>Used to access the Internet.</p>	<p>To access SEAS.</p>	<p>generated infographic.</p>	
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wants to view the percentage of annual revenue change by a school.

6. Click generate to view the selected infographic.

(ii) Revenue Of a School:

3. From the navigation menu select the option for Revenue Of a School.

4. Select the type of infographic from the selection checkbox.

5. Select the school from dropdown box.

6. Select the dept(s) from the available dept checkbox.

7. Click generate to view selected infographic of Department wise revenue in selected school.

(iii) Revenue by a Dept:

3. From the navigation menu select the option for Revenue Of a School.

4. To view dept wise infographic Check Mark the Dept wise View option.

	<p>5. Select the Dept.</p> <p>6. Clicking generate will show the Revenue trend as well as change% in revenue chart by that dept for all semester.</p>					
4. View Classroom requirement analysis.	<p>Department /School /High Authority/ Registrar Office:</p> <p>1. Logs into the System using UserID and password.</p> <p>2. Select user type from User Type selection drop box.</p> <p>3. From the navigation menu select</p>	<p>Computer/ Laptop: Users will need a computer to access SEAS.</p> <p>Printer: To print the infographic report if needed.</p> <p>Networking Devices (Router, Switch, Bridge, Hub):</p>	<p>SEAS: The Software will propose course capacity based on user request.</p> <p>Printer: based on previous semester data and resources.</p> <p>Networking Devices (Router, Switch, Bridge, Hub): important information from other sources such as the IUB</p>	<p>SEAS Database: 1. To provide required data based on user request.</p> <p>Web Browser: 2. SEAS retrieves data from the database, when needed.</p>	<p>Internet: Use the internet to log in for accessing into SEAS.</p> <p>Hardware storage: To save the system generated infographic.</p>	

	<p>the option for Classroom requirement charts and tables.</p> <p>4. Select the type of infographic from the selection checkbox.</p> <p>5. Select the class size range from the dropdown box, select semester from semester selection checkbox, select class slot/day from selection checkbox.</p> <p>6. Click generate to view the selected infographic.</p>	Used to access the Internet.	<p>webpage to view details about any courses.</p> <p>2. To send mails about important details and documents.</p> <p>3. To access SEAS.</p>		
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5. View enrollment wise course distribution analysis.	Department /School /High Authority/ Registrar Office: 1. Logs into the System using UserID and password. 2. Select user type from User Type selection drop box. <i>(ii) Enrollment wise course distribution:</i> 3. From the navigation menu select the option for enrollment wise course distribution. 4. Select the type of infographic from the	Computer/ Laptop: Users will need a computer to access SEAS. Printer: To print the infographic report if needed. Networking Devices (Router, Switch, Bridge, Hub): Used to access the Internet.	SEAS: The Software will propose course capacity based on SEAS.	SEAS Database: 1. To provide required data based on user request. Web Browser: 1. Access important information from other sources such as the IUB webpage to view details about any courses. 2. To send mails about important details and documents. 3. To access SEAS.	SEAS Database: 1. To provide required data based on user request. Internet: Use the internet to log in for accessing into SEAS. Hardware storage: To save the system generated infographic.
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selection
checkbox.

5. Select the class size range from the dropdown box, select school from school selection checkbox, select semester from semester selection checkbox.

6. Click generate to view the selected infographic.

(ii) View number of enrollments in sections I by I:

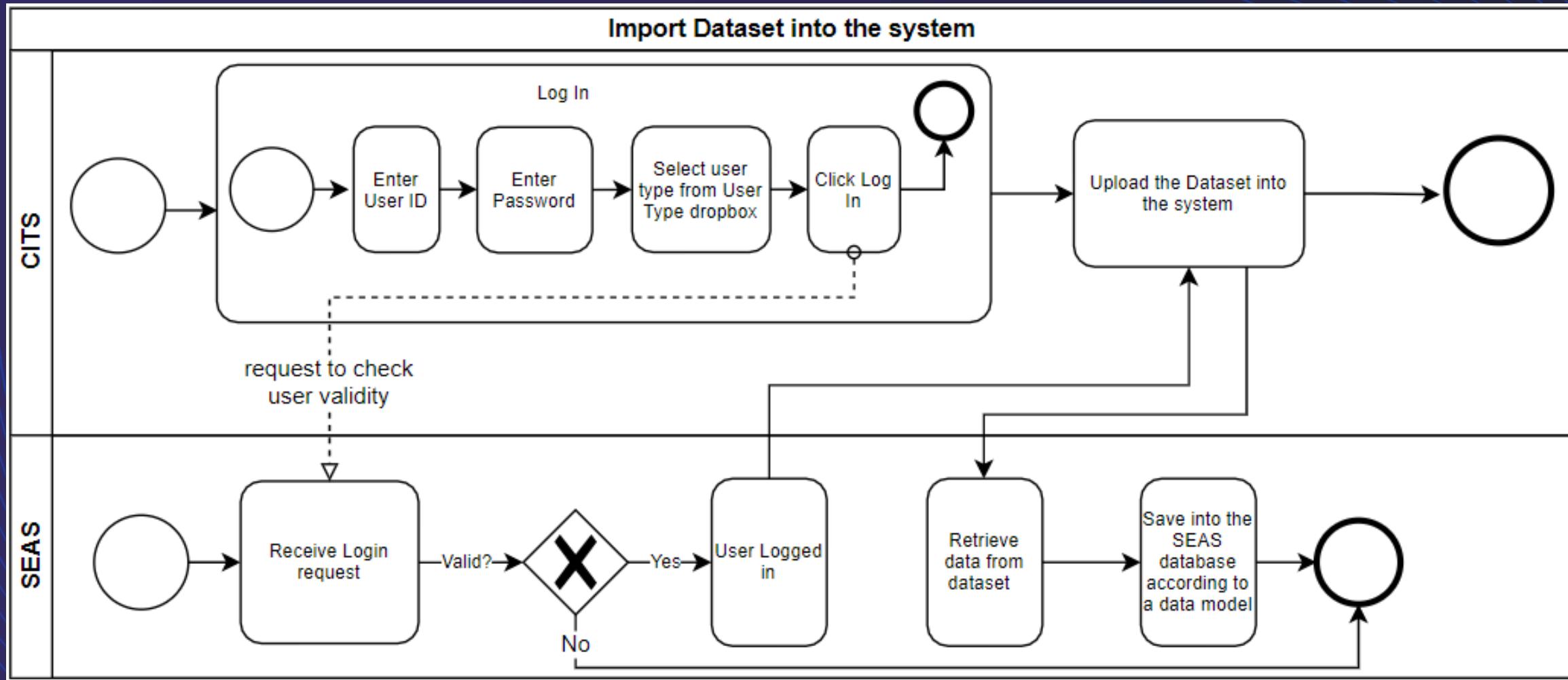
3. From the navigation menu select the option for

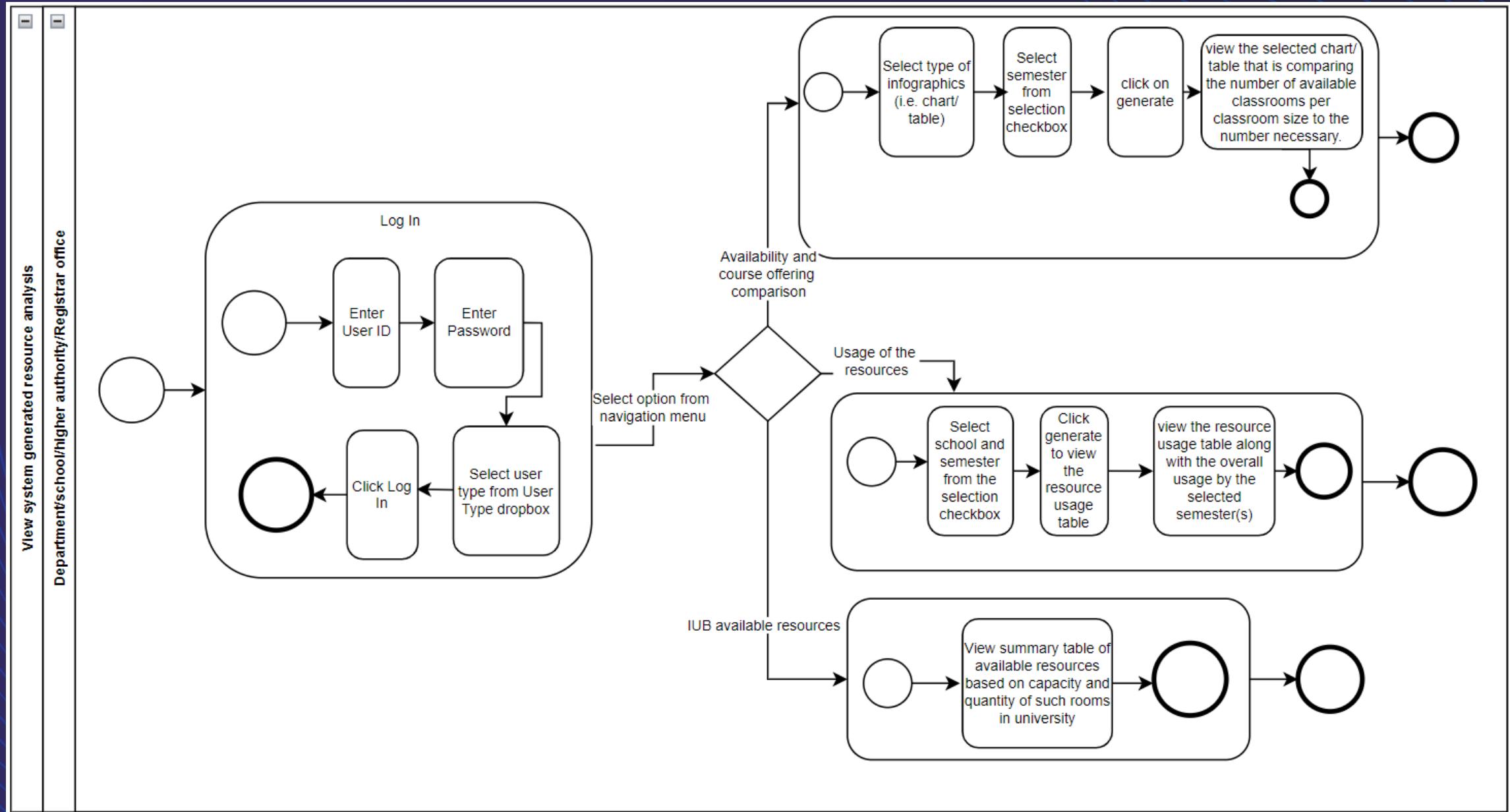
View
number of
enrollments
in sections 1
by 1.

4. Select the
school from
the school
selection
checkbox,
select
semester
from
semester
selection
checkbox.

5. Click
generate to
view the
table.

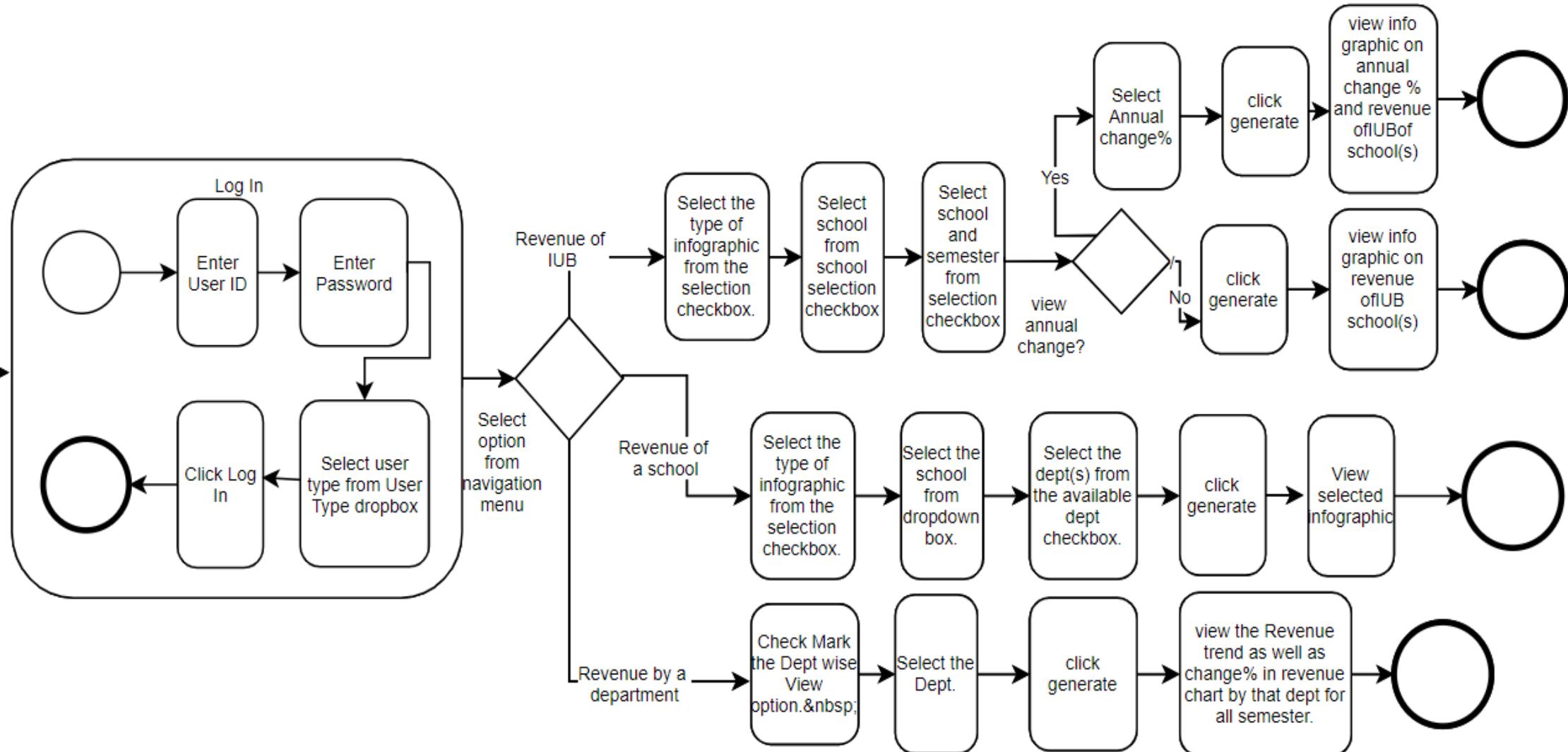
Process Diagram (To-be)



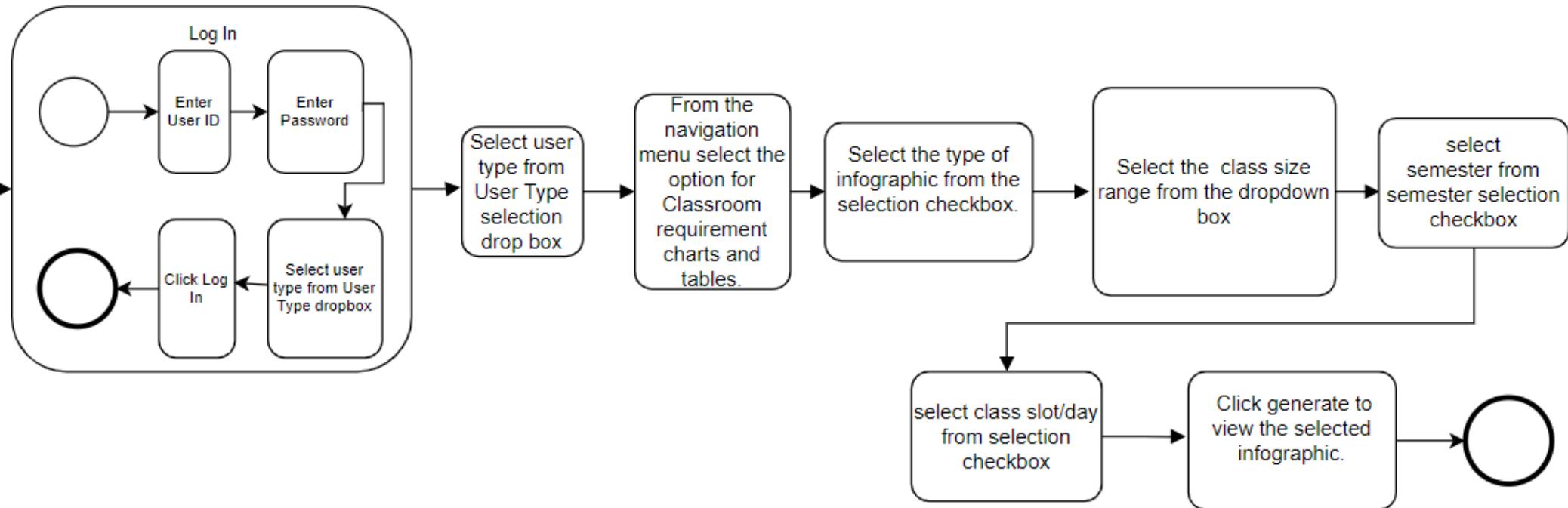


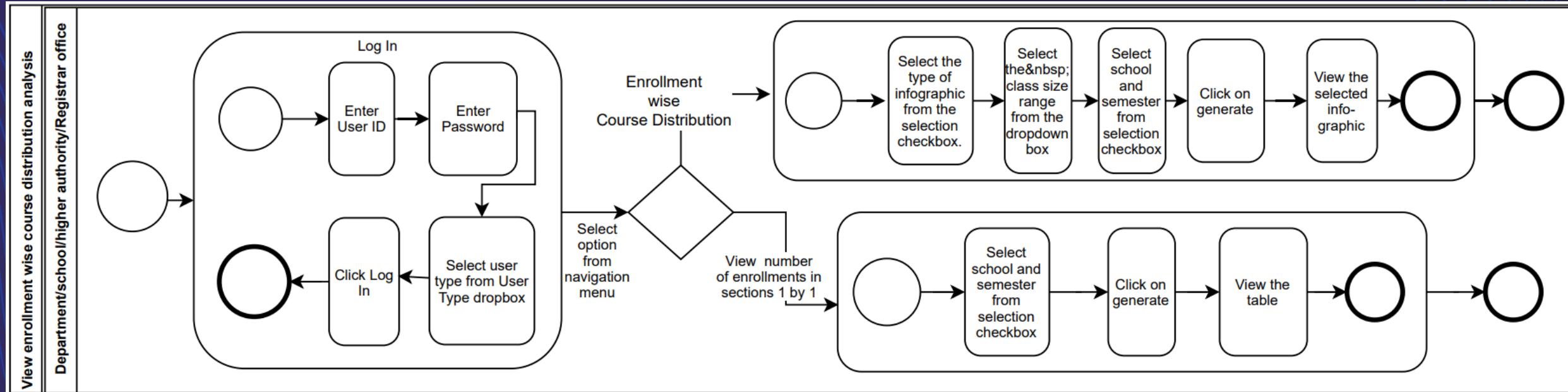
Department/school/higher authority/Registrar office

View system generated Revenue Analysis



View Classroom requirement analysis
Department School /High Authority/ Registrar Office:

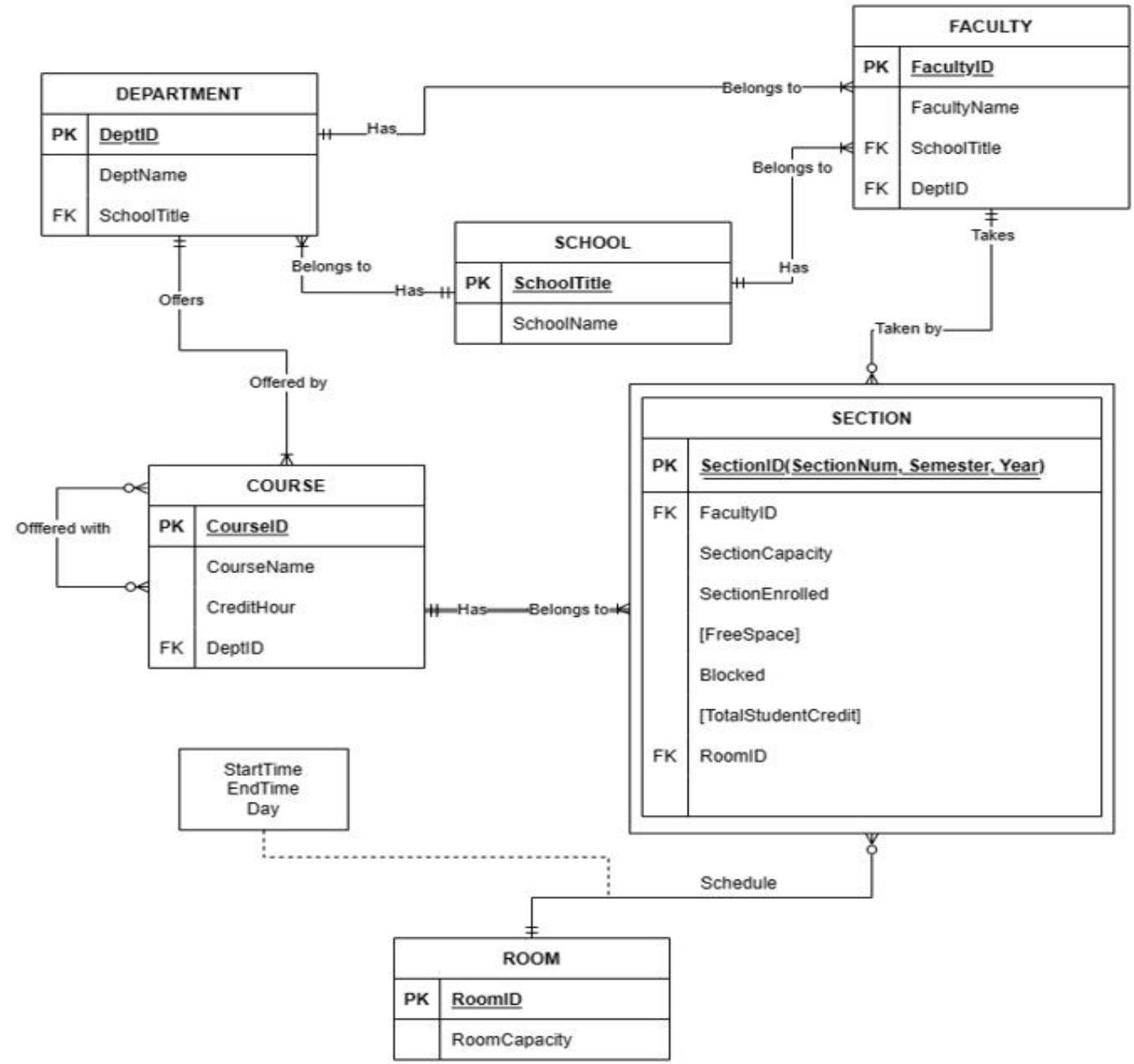




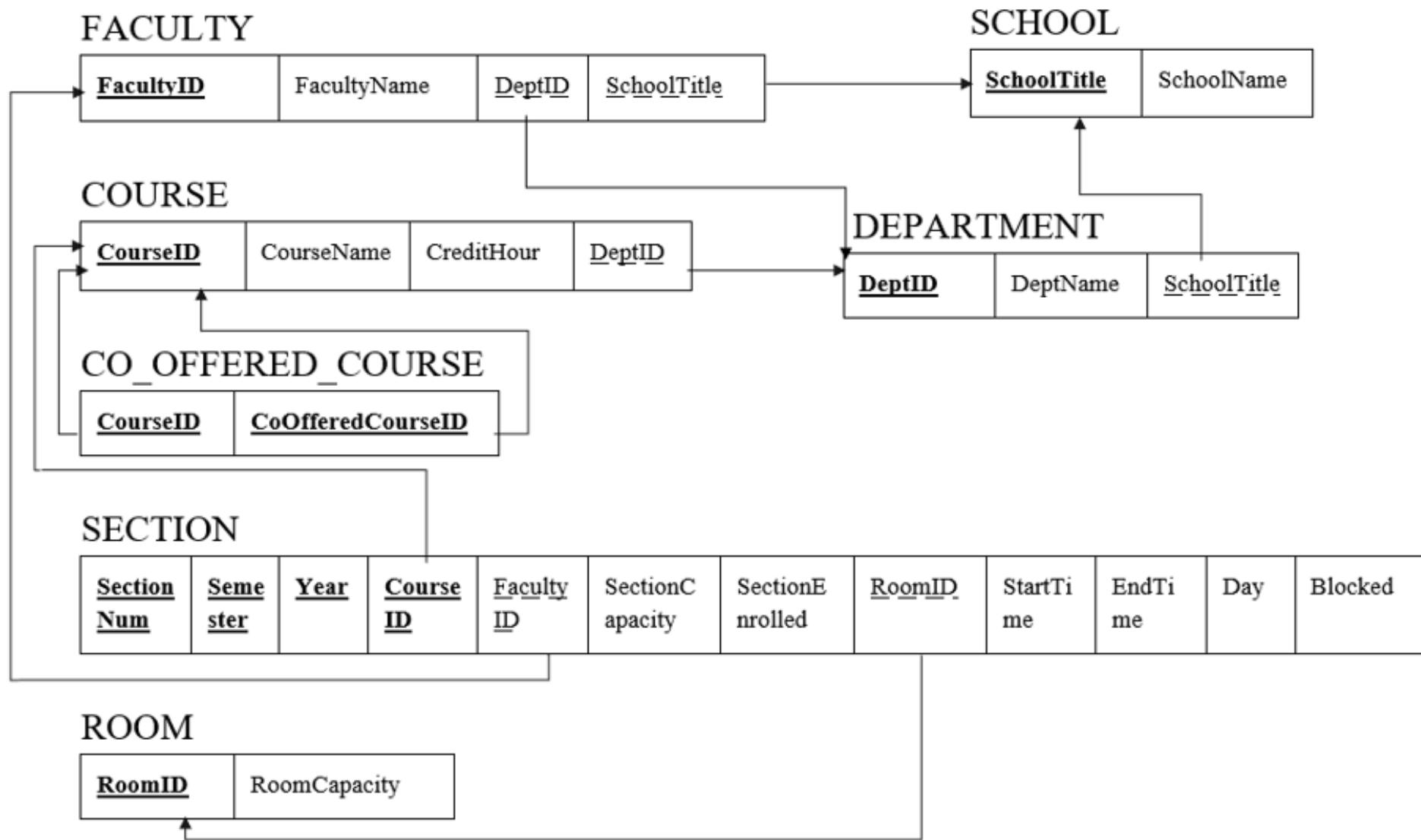
BUSINESS RULE

1. A Faculty has a FacultyID, FacultyName.
2. A Department has a DeptID, DeptName. Each Faculty must belong to a Department. A Department must have one or more Faculties.
3. A School has a SchoolTitle, SchoolName. A Department must belong to exactly one School. A School must have one or more Departments. Each Faculty must belong to a School. A School must have one or more Faculties.
4. A Course has a CourseID, CourseName, CreditHour. Each Course must belong to exactly one Department. A Department must offer at least one Course.
5. A Course may have many co-offered courses as well as a course may be offered with multiple courses.
6. Each Course must have one or more Sections, where the existence of a Section depends on the existence of that Course. The SectionID can be uniquely identified using SectionNum, Semester and Year. A Section also includes SectionCapacity, SectionEnrolled, Blocked status of that section, FreeSpace which is always calculated based on SectionCapacity and SectionEnrolled, and TotalStudentCredit which is calculated by multiplying SectionEnrolled and CourseCredit. A Section must belong to exactly one course.
7. Each Section must be taken by a Faculty. A Faculty may take many sections.
8. A Room has a RoomID, RoomCapacity. Each Room may contain many Sections. A Section's class must be held in one Room where the StartTime, EndTime and Day of the class must be recorded.

Entity Relationship Diagram (ERD)



Relational Schema



NORMALIZATION

Functional Dependency

Functional Dependency:

FacultyID	→ FacultyName, DeptID, SchoolTitle
SchoolTitle	→ SchoolName
CourseID	→ CourseName, CreditHour, DeptID, CoOfferedCourseID
CoOfferedCourseID	→ CourseID
DeptID	→ DeptName, SchoolTitle
SectionNum, Semester, Year, CourseID	→ FacultyID, SectionCapacity, SectionEnrolled, RoomID, StartTime, EndTime, Day, Blocked
RoomID	→ RoomCapacity

1NF

T1:

<u>SectionNum</u>	<u>Semester</u>	<u>Year</u>	<u>CourseID</u>	FacultyID	FacultyName	DeptID	DeptName	SchoolTitle	SchoolName
-------------------	-----------------	-------------	-----------------	-----------	-------------	--------	----------	-------------	------------

SectionCapacity	SectionEnrolled	RoomID	RoomCapacity	StartTime	EndTime	Day	Blocked	CourseName	CreditHour	CoOfferedCourseID
-----------------	-----------------	--------	--------------	-----------	---------	-----	---------	------------	------------	-------------------

2NF

T11:

<u>CourseID</u>	CourseName	CreditHour	CoOfferdCourseID	DeptID	DeptName	SchoolTitle	SchoolName
-----------------	------------	------------	------------------	--------	----------	-------------	------------

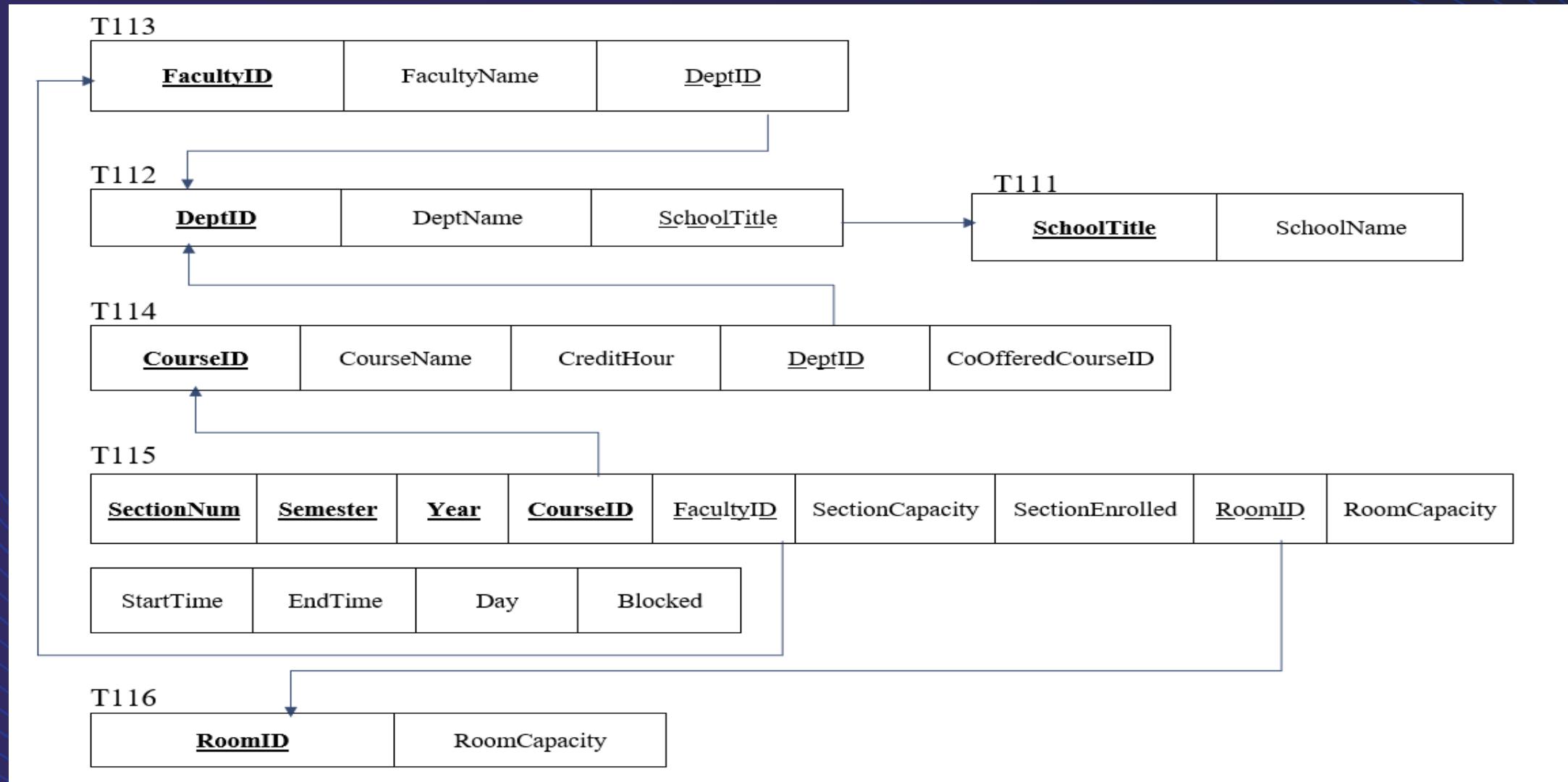


T12:

<u>SectionNum</u>	<u>Semester</u>	<u>Year</u>	<u>CourseID</u>	FacultyID	FacultyName	SectionCapacity	SectionEnrolled	RoomID	RoomCapacity
-------------------	-----------------	-------------	-----------------	-----------	-------------	-----------------	-----------------	--------	--------------

StartTime	EndTime	Day	Blocked
-----------	---------	-----	---------

3NF



BCNF

BCNF:

T113

<u>FacultyID</u>	FacultyName	<u>DeptID</u>
------------------	-------------	---------------

T112

<u>DeptID</u>	DeptName	<u>SchoolTitle</u>
---------------	----------	--------------------

T111

<u>SchoolTitle</u>	SchoolName
--------------------	------------

T1141

<u>CourseID</u>	CourseName	CreditHour	<u>DeptID</u>
-----------------	------------	------------	---------------

T1142

<u>CourseID</u>	<u>CoOfferedCourseID</u>
-----------------	--------------------------

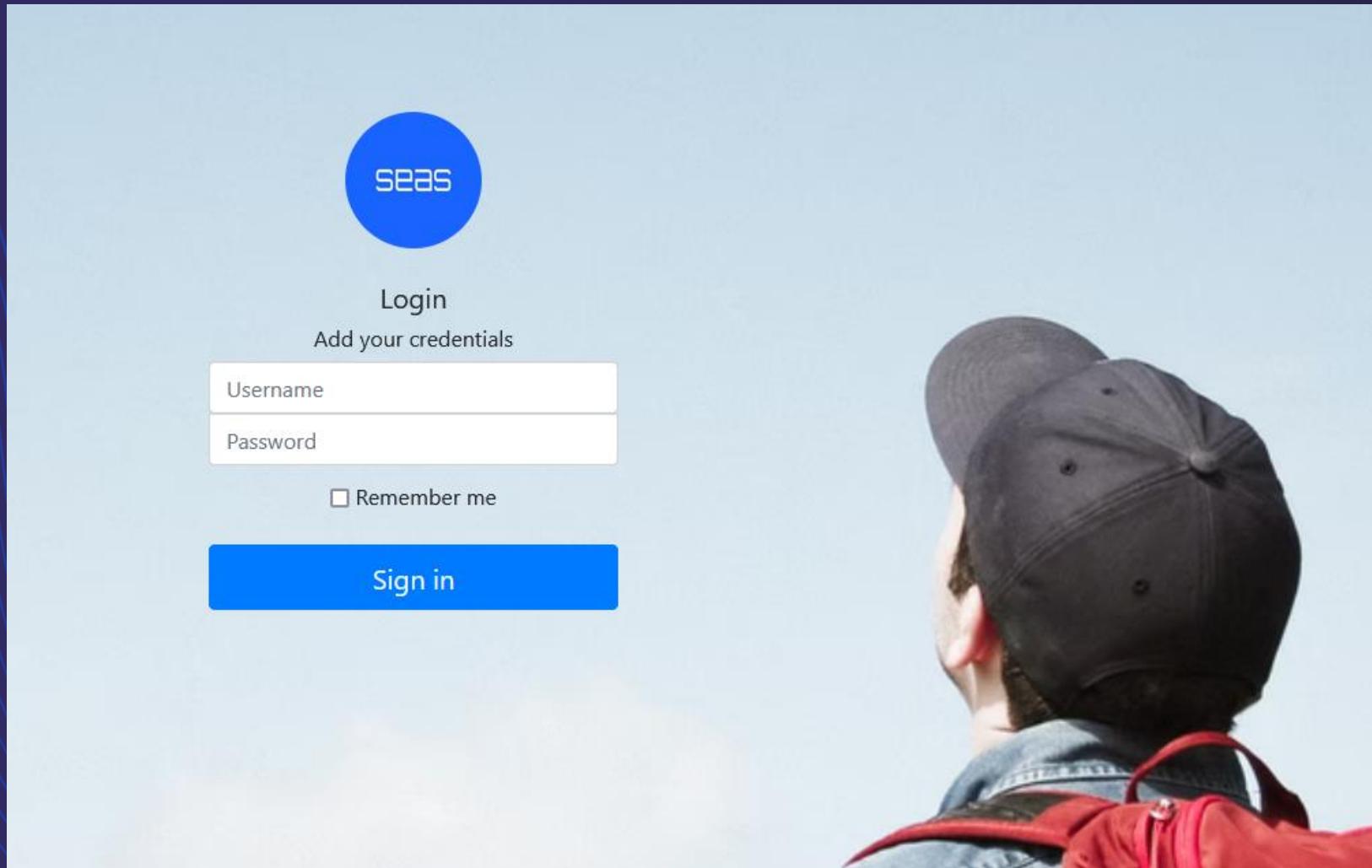
T115

<u>SectionNum</u>	<u>Semester</u>	<u>Year</u>	<u>CourseID</u>	<u>FacultyID</u>	SectionCapacity	SectionEnrolled	<u>RoomID</u>	RoomCapacity
StartTime	EndTime	Day	Blocked					

T116

<u>RoomID</u>	RoomCapacity
---------------	--------------

IMPLEMENTATION



Log in Dashboard of SEAS

- Front-End Developing tools: HTML, CSS, Bootstrap JavaScript, Chart Js
- Back End Developing tools: Python, Django
- Database-integration: MySQL

STUDENT ENROLLMENT ANALYSIS SYSTEM

Someone from High Power
Higher Authority



←Select From Left menu

- DASHBOARD
- CLASSROOM REQUIREMENT
- ENROLLMENT WISE COURSE
- DETAILS ENROLLMENT TABLE
- RESOURCES ANALYSIS ▾
- REVENUE OF IUB ▾
- ENGR. SCHOOL REVENUE ▾

The project's goal is to develop a system for stakeholders and institutional bodies to retrieve statistical data on school-level revenue analysis, classroom requirement analysis based on class slot, classroom allocation recommendations based on IUB best resource utilization, and IUB resource analysis.

Click the "upload file" to upload new file. Please upload file in
"Tally Sheet For Semestername Year.xlsx"

OR

"Revenue.xlsx"

Upload File

Click the "Click to run Population Script" to Populate The Database.

Don't click if not necessary

Click to run Population Script

STUDENT ENROLLMENT ANALYSIS SYSTEM



DASHBOARD



CLASSROOM REQUIREMENT



ENROLLMENT WISE COURSE



DETAILS ENROLLMENT TABLE



RESOURCES ANALYSIS



REVENUE OF IUB



ENGR. SCHOOL REVENUE

Classroom Requirement Summery

Semester

Select Semester

Year

Select Year

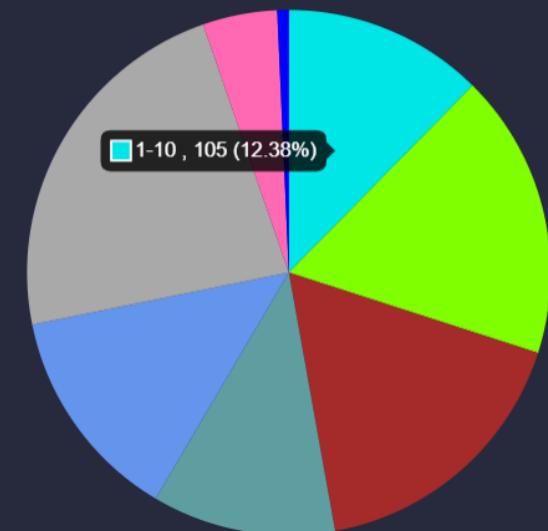
Search

Classroom requirement as per course offering (Summary)

Class 6 Class 7

Number of Sections

1-10 11-20 21-30 31-35 36-40 41-50 51-55 56-65



1-10 , 105 (12.38%)

STUDENT ENROLLMENT ANALYSIS SYSTEM

- DASHBOARD
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- ENROLLMENT WISE COURSE
- DETAILS ENROLLMENT TABLE
- RESOURCES ANALYSIS
- REVENUE OF IUB
- ENGR. SCHOOL REVENUE

Classroom Requirement Summary

Semester **Select Semester** Year **Select Year** **Search**

Classroom requirement as per course offering (Summary)

Class 6 Class 7

1-10 11-20 21-30 31-35 36-40 41-50 51-55 56-65

Course Offering Range	Percentage
1-10	~15%
11-20	~25%
21-30	~20%
31-35	~10%
36-40	~15%
41-50	~5%
51-55	~5%
56-65	~5%

STUDENT ENROLLMENT ANALYSIS SYSTEM



- DASHBOARD
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- ENGR. SCHOOL REVENUE

Classroom Requirement Summery

Semester

Select Semester

Year

Select Year

Search

Classroom requirement as per course offering (Summary)

Class 7

1-10 11-20 21-30 31-35 36-40 41-50 51-55 56-65



Class 6 Class 7

STUDENT ENROLLMENT ANALYSIS SYSTEM

- DASHBOARD
- CLASSROOM REQUIREMENT
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SPRING 2021				
CLASS SIZE	SECTIONS	CLASS ROOM 6	CLASS ROOM 7	
1-10	105	8.75	7.50	
11-20	149	12.42	10.64	
21-30	146	12.17	10.43	
31-35	96	8.00	6.86	
36-40	113	9.42	8.07	
41-50	194	16.17	13.86	
51-55	39	3.25	2.79	
56-65	6	0.50	0.43	
Total	848	70.68	60.58	

STUDENT ENROLLMENT ANALYSIS SYSTEM

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STUDENT ENROLLMENT ANALYSIS SYSTEM



⌚ Enrolment wise course distribution among the schools



DASHBOARD



CLASSROOM REQUIREMENT



ENROLLMENT WISE COURSE



DETAILS ENROLLMENT TABLE



RESOURCES ANALYSIS



REVENUE OF IUB



ENGR. SCHOOL REVENUE

School **Select School** Semester **Select Semester** Year **Select Year** **Search**

SBE SELS SETS SLASS SPPH Total



STUDENT ENROLLMENT ANALYSIS SYSTEM



DASHBOARD



CLASSROOM REQUIREMENT



ENROLLMENT WISE COURSE



DETAILS ENROLLMENT TABLE



RESOURCES ANALYSIS



REVENUE OF IUB



ENGR. SCHOOL REVENUE

SPRING 2021

ENROLLMENT	SBE	SELS	SETS	SLASS	SPPH	TOTAL
1-10	6	19	22	54	4	105
11-20	12	25	30	52	30	149
21-30	14	30	55	28	19	146
31-35	9	6	53	16	12	96
36-40	38	7	33	14	21	113
41-50	96	4	25	56	13	194
51-55	23	0	13	3	0	39
56-60	4	0	0	1	0	5
60+	2	0	0	0	0	2

STUDENT ENROLLMENT ANALYSIS SYSTEM



DASHBOARD

CLASSROOM REQUIREMENT

ENROLLMENT WISE COURSE

DETAILS ENROLLMENT TABLE

RESOURCES ANALYSIS

REVENUE OF JUB

ENGR. SCHOOL REVENUE

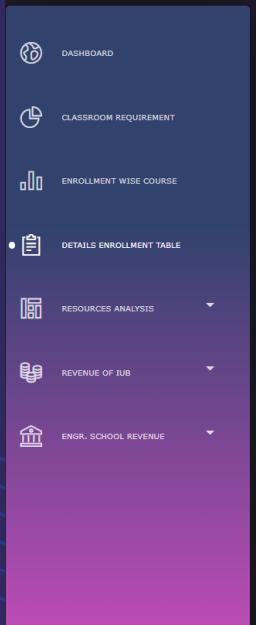
Enrollment Details of Schools

Semester Year

SPRING 2021

ENROLLMENT	SBE	SELS	SETS	SLASS	SPPH	TOTAL
0	0	0	0	0	0	0
1	0	1	1	6	0	8
2	0	1	4	4	0	9
3	0	1	2	4	0	7
4	0	0	1	10	0	11
5	1	0	3	3	1	8
6	2	1	3	9	0	15
7	1	0	4	1	1	7
8	1	3	1	4	1	10
9	1	5	2	6	0	14
10	0	7	1	7	1	16
11	3	1	5	2	2	13
12	2	4	4	5	3	18
13	0	5	3	6	1	15
14	1	3	2	7	2	15
15	0	2	2	6	2	12
16	0	0	5	4	3	12
17	1	3	3	3	4	14
18	2	2	4	5	2	15
19	2	2	1	3	5	13
20	1	3	1	11	6	22

Continued..



21	2	4	3	3	4	16
22	0	1	6	2	1	10
23	1	1	5	2	1	10
24	0	0	1	1	1	3
25	3	4	7	5	2	21
26	3	2	5	0	2	12
27	4	4	2	2	2	14
28	0	6	3	1	2	12
29	0	2	6	5	3	16
30	1	6	17	7	1	32
31	1	2	13	1	2	19
32	3	3	9	0	2	17
33	1	0	10	3	1	15
34	3	0	10	2	2	17
35	1	1	11	10	5	28
36	2	1	19	5	4	31
37	5	2	2	1	1	11
38	10	0	5	0	4	19
39	4	1	0	3	2	10
40	17	3	7	5	10	42
41	5	0	3	14	4	26
42	2	0	5	8	0	15
43	4	1	1	1	1	8
44	4	1	2	4	0	11
45	13	0	3	5	7	28
46	8	0	1	13	1	23
47	9	0	0	3	0	12
48	22	0	1	3	0	26

Continued..

DASHBOARD	49	8	1	2	1	0	12
CLASSROOM REQUIREMENT	50	21	1	7	4	0	33
ENROLLMENT WISE COURSE	51	17	0	6	2	0	25
DETAILS ENROLLMENT TABLE	52	1	0	1	1	0	3
RESOURCES ANALYSIS	53	2	0	5	0	0	7
REVENUE OF IUB	54	2	0	1	0	0	3
ENGR. SCHOOL REVENUE	55	1	0	0	0	0	1
	56	1	0	0	1	0	2
	57	2	0	0	0	0	2
	58	1	0	0	0	0	1
	59	0	0	0	0	0	0
	60	0	0	0	0	0	0
	61	0	0	0	0	0	0
	62	1	0	0	0	0	1
	Total	203	91	231	224	99	848



DASHBOARD



CLASSROOM REQUIREMENT



ENROLLMENT WISE COURSE



DETAILS ENROLLMENT TABLE



RESOURCES ANALYSIS



REVENUE OF IUB



ENGR. SCHOOL REVENUE

Usage of the Resources

Semester

Select Semester

Year

Select Year

Search

| SPRING 2020 | SUMMER 2020 | AUTUMN 2020 | ↗

	SUM	Avg Enroll	Avg Room	Difference	Unused %
Spring	26733.0	26.22	38.86	12.65	33.45
SBE	8236.0	38.67	46.31	7.65	16.51
SELS	2354.0	20.12	37.09	16.97	45.76
SETS	8383.0	27.58	39.8	12.23	30.72
SLASS	6006.0	26.46	35.64	9.18	25.76
SPPH	1754.0	18.27	35.47	17.2	48.49

SPRING 2020

Average of ROOM_CAPACITY	26.22
Average of ENROLLED	38.86
Average of Unused Space	12.65
Unused Percent %	33.45

STUDENT ENROLLMENT ANALYSIS SYSTEM

 IUB available resources

 DASHBOARD
 CLASSROOM REQUIREMENT
 ENROLLMENT WISE COURSE
 DETAILS ENROLLMENT TABLE
 RESOURCES ANALYSIS
USAGE OF THE RESOURCES
IUB AVAILABLE RESOURCES
AVAILABILITY VS REQUIREMENT
 REVENUE OF IUB
ENGR. SCHOOL REVENUE

IUB AVAILABLE RESOURCES			
CLASS SIZE	IUB RESOURCE	CAPACITY	
20	18	360	
25	18	450	
30	5	150	
35	11	385	
40	13	520	
45	1	45	
50	49	2450	
Total	115	4360	
Total Capacity with 6 slot 2 days			52320
Total Capacity with 7 slot 2 days			61040
Considering 3.5 average course load (6 slot)			14948
Considering 3.5 average course load (7 slot)			14948
free % for 6 slots capacity			71%
free % for 7 slots capacity			76%



CLASSROOM REQUIREMENT



ENROLLMENT WISE COURSE



DETAILS ENROLLMENT TABLE



RESOURCES ANALYSIS

USAGE OF THE RESOURCES

IUB AVAILABLE RESOURCES

AVAILABILITY VS REQUIREMENT



REVENUE OF IUB



ENGR. SCHOOL REVENUE

AVAILABILITY COURSE OFFERING

CLASS SIZE	IUB RESOURCE	SPRING	DIFFERENCE	SUMMER	DIFFERENCE	AUTUMN	DIFFERENCE
20	18.0	21.66	-3.66	18.91	-0.91	17.0	1.0
25	18.0	11.67	6.33	11.75	6.25	12.67	5.33
30	5.0	11.67	-6.67	11.75	-6.75	12.67	-7.67
35	11.0	10.08	0.92	5.92	5.08	9.17	1.83
40	13.0	11.08	1.92	5.58	7.42	8.5	4.5
45	1.0	13.92	-12.92	11.08	-10.08	14.33	-13.33
50	49.0	13.92	35.08	11.08	37.92	14.33	34.67
54	0.0	4.0	-4.0	1.0	-1.0	1.08	-1.08
64	0.0	0.42	-0.42	0.08	-0.08	0.33	-0.33
Total	115.00	98.42	16.58	77.15	37.85	90.08	24.92

STUDENT ENROLLMENT ANALYSIS SYSTEM

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DASHBOARD

CLASSROOM REQUIREMENT

ENROLLMENT WISE COURSE

DETAILS ENROLLMENT TABLE

RESOURCES ANALYSIS

REVENUE OF IUB

ENGR. SCHOOL REVENUE

Availability and course offering comparison

Semester

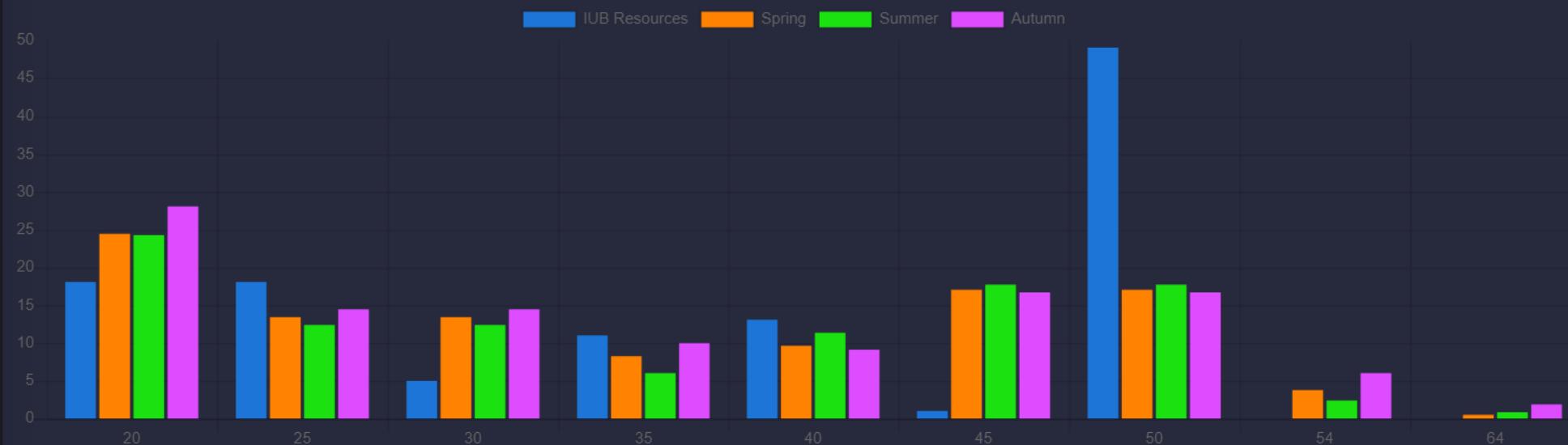
Select Semester

Year

Select Year

Search

Availability and Course Offering Comparison Semester wise



STUDENT ENROLLMENT ANALYSIS SYSTEM

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DASHBOARD

CLASSROOM REQUIREMENT

ENROLLMENT WISE COURSE

DETAILS ENROLLMENT TABLE

RESOURCES ANALYSIS

REVENUE OF IUB

ENGR. SCHOOL REVENUE

Revenue of IUB Schools

School

Select School

Year From

Select Year

Year To

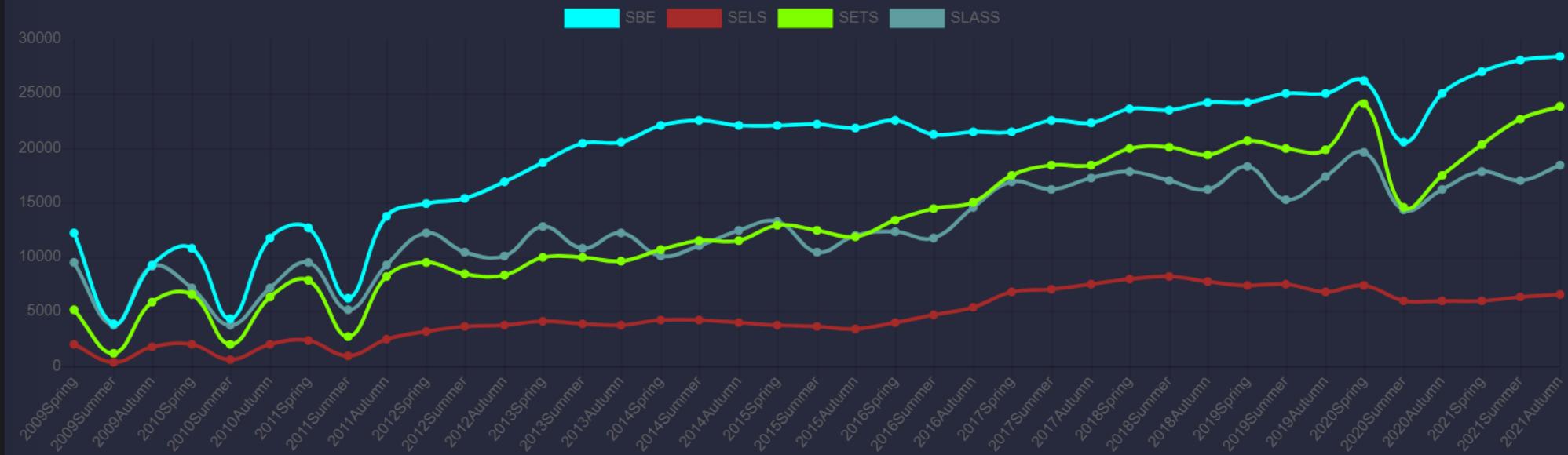
Select Year

Search

Revenue Trend of the schools

Revenue Trend

Revenue Distribution

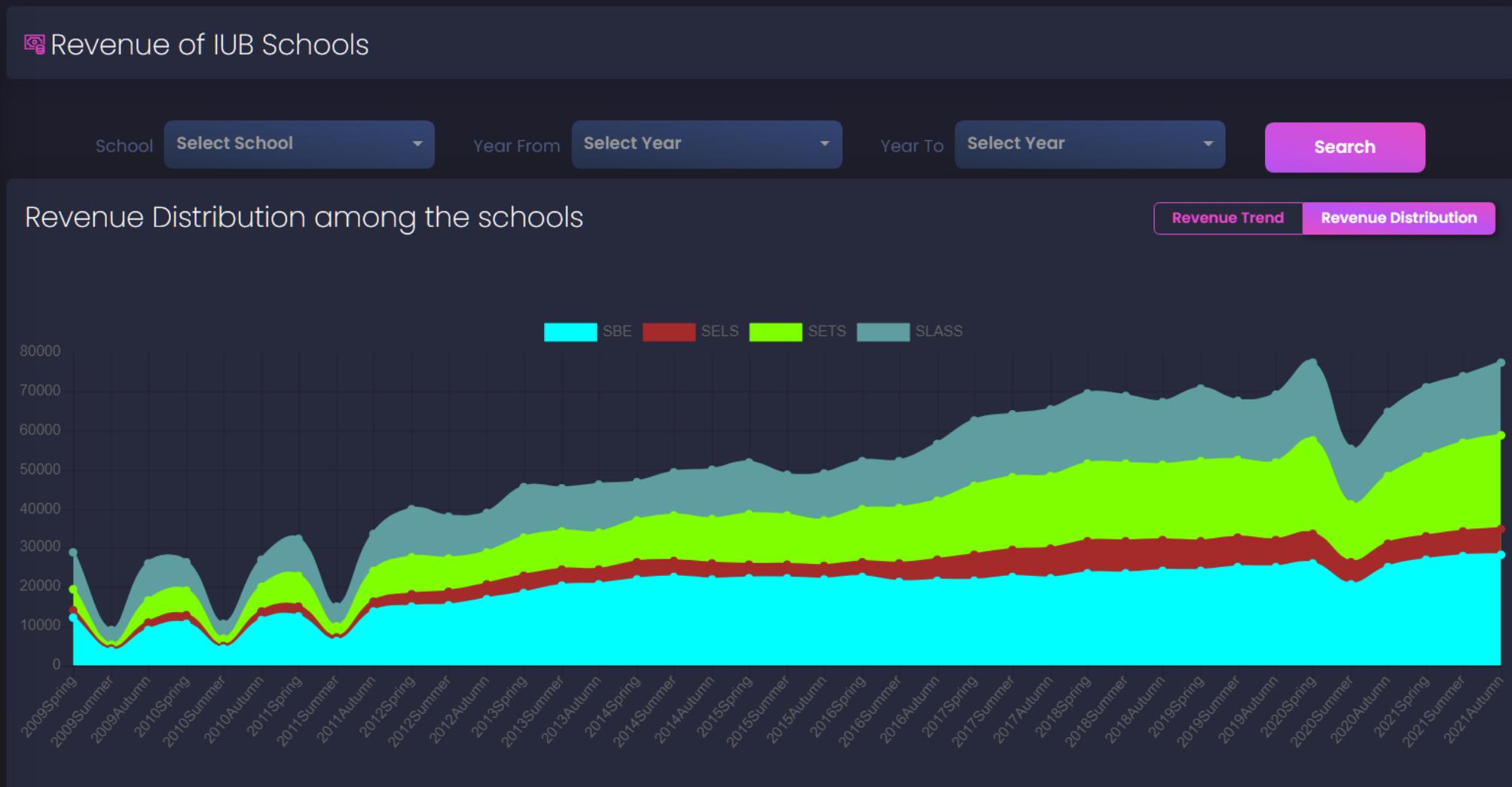


STUDENT ENROLLMENT ANALYSIS SYSTEM

Someone from High Power
Higher Authority



- DASHBOARD
- CLASSROOM REQUIREMENT
- ENROLLMENT WISE COURSE
- DETAILS ENROLLMENT TABLE
- RESOURCES ANALYSIS
- REVENUE OF IUB
- ENGR. SCHOOL REVENUE



STUDENT ENROLLMENT ANALYSIS SYSTEM

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- Dashboard
- Classroom Requirement
- Enrollment Wise Course
- Details Enrollment Table
- Resources Analysis
- Revenue of IUB
- ENGR. SCHOOL REVENUE

IUB Revenue and Change Percentage

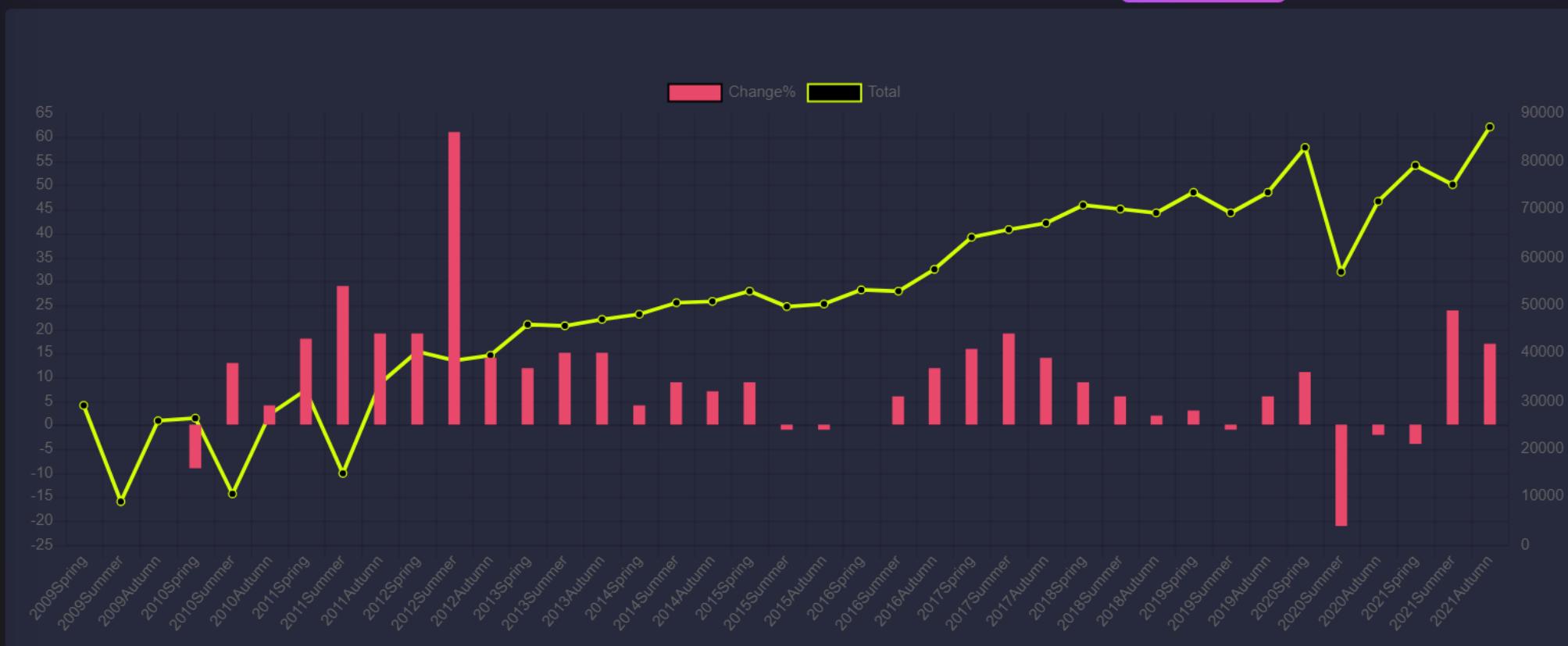
Year From

Select Year

Year To

Select Year

Search



STUDENT ENROLLMENT ANALYSIS SYSTEM

 Md. Zakaria Kabir
 Super User

- [DASHBOARD](#)
- [CLASSROOM REQUIREMENT](#)
- [ENROLLMENT WISE COURSE](#)
- [DETAILS ENROLLMENT TABLE](#)
- [RESOURCES ANALYSIS](#)
- [REVENUE OF IUB](#)
- [ENGR. SCHOOL REVENUE](#)

Revenue of IUB

 School: **Select School** | Year From: **Select Year** | Year To: **Select Year** | **Search**

THE RAW DATA OF

SEMESTERS	SBE	SELS	SETS	SLASS	SPPH	TOTAL	CHANGE%
2009Spring	12204	2024	5205	9474	171	29078	0
2009Summer	3867	360	1183	3738	0	9148	0
2009Autumn	9210	1728	5817	9142	66	25963	0
2010Spring	10782	1933	6527	7158	90	26490	-9
2010Summer	4281	564	1929	3789	0	10563	13
2010Autumn	11700	1942	6314	7113	75	27144	4
2011Spring	12648	2339	7826	9444	165	32422	18
2011Spring	12648	2339	7826	9444	165	32422	18

 Md. Zakaria Kabir
 Super User

STUDENT ENROLLMENT ANALYSIS SYSTEM

2011Autumn	947	2738	5091	0	14947	29	
2012Spring	13719	2434	8154	9276	192	33775	19
2012Summer	14919	3202	9495	12201	429	40246	19
2012Autumn	15339	3569	8491	10470	507	38376	61
2013Spring	16896	3722	8354	10116	378	39466	14
2013Summer	18630	4125	9906	12759	603	46023	12
2013Autumn	20466	3879	9937	10833	567	45682	15
2014Spring	20574	3754	9644	12189	777	46938	16
2014Summer	22062	4164	10680	10032	1035	47973	4
2014Autumn	22554	4186	11540	11046	1116	50442	9
2015Spring	22050	3969	11467	12474	738	50698	7
2015Summer	22116	3703	12841	13254	1059	52973	9
2015Autumn	21849	3413	11802	11910	1185	50159	-1
2017Summer	22506	7057	18412	16170	1605	65750	19

 Md. Zakaria Kabir
 Super User

STUDENT ENROLLMENT ANALYSIS SYSTEM

2017Autumn	22317	7453	18475	17240	1665	67150	14
2018Spring	23604	8015	19906	17880	1464	70869	9
2018Summer	23478	8154	20029	17046	1350	70057	6
2018Autumn	24132	7727	19333	16131	1835	69158	2
2019Spring	24198	7366	20692	18282	2972	73510	3
2019Summer	24993	7522	19918	15204	1647	69284	-1
2019Autumn	25041	6846	19883	17317	4520	73607	6
2020Spring	26145	7382	24036	19581	5680	82824	11
2020Summer	20550	5951	14538	14267	1749	57055	-21
2020Autumn	24981	5936	17527	16233	6906	71583	-2
2021Spring	26970	6026	20263	17872	8091	79222	-4
2021Summer	28002	6335	22641	16966	1248	75192	24
2021Autumn	28350	6563	23806	18458	10006	87183	17

STUDENT ENROLLMENT ANALYSIS SYSTEM



Revenue of SETS

Department

Select Department

Year From

Select Year

Year To

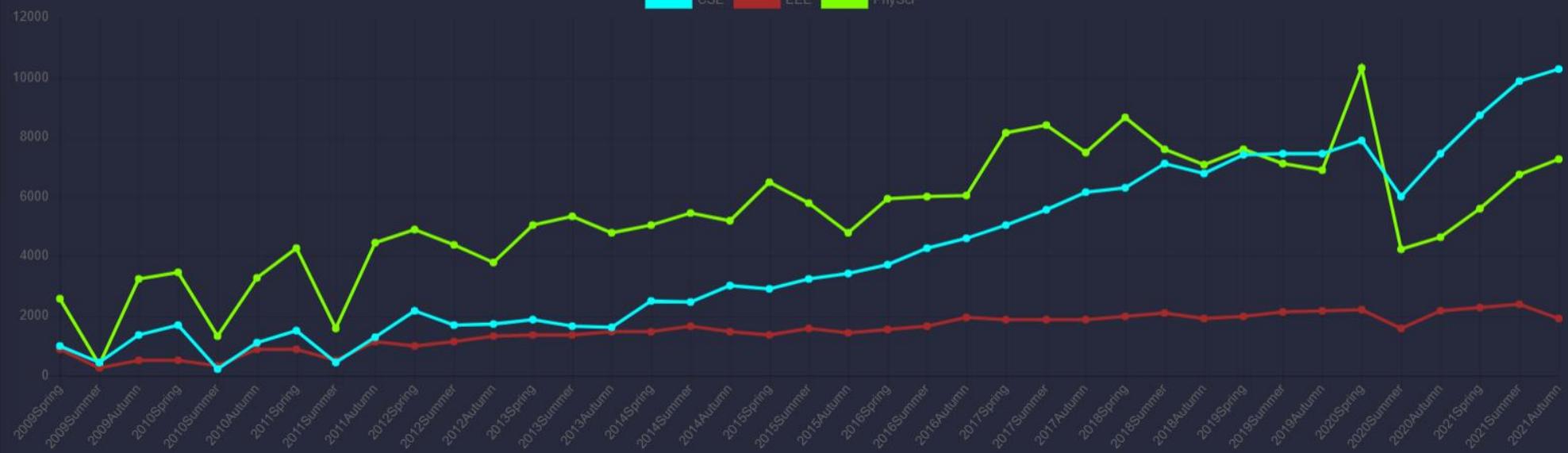
Select Year

Search

Department wise revenue in SETS

Department wise revenue in SETS

Revenue of SETS



STUDENT ENROLLMENT ANALYSIS SYSTEM



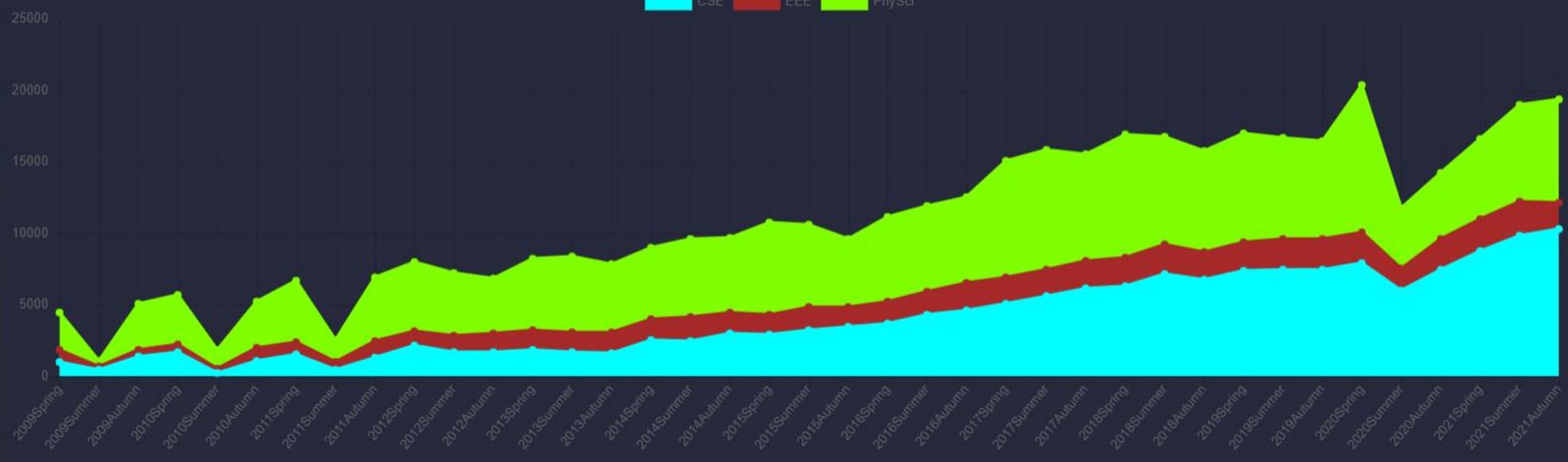
Revenue of SETS

Department Year From Year To

Revenue of SETS

Department wise revenue in SETS

Revenue of SETS

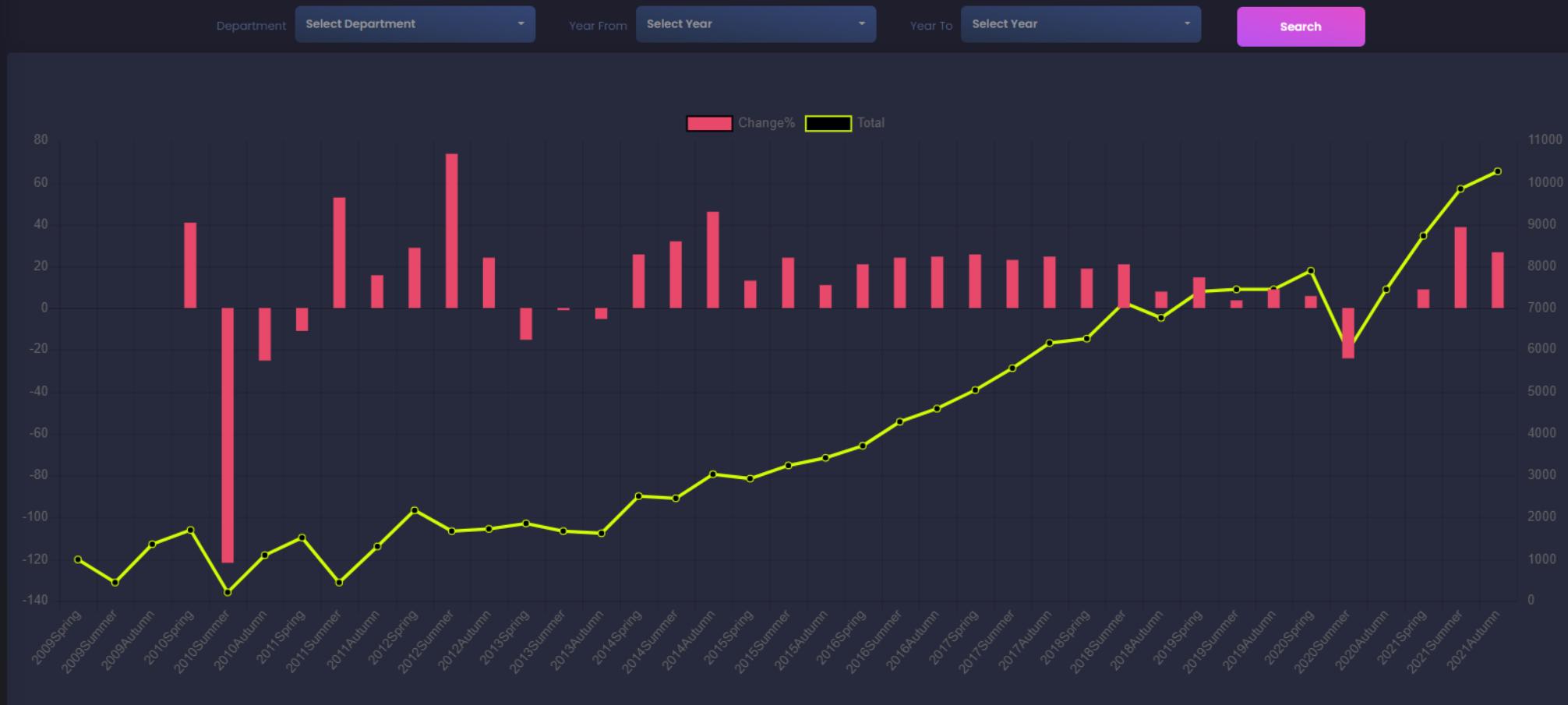


STUDENT ENROLLMENT ANALYSIS SYSTEM



Engineering School Revenue and Change Percentage

- DASHBOARD
- CLASSROOM REQUIREMENT
- ENROLLMENT WISE COURSE
- DETAILS ENROLLMENT TABLE
- RESOURCES ANALYSIS
- REVENUE OF IUB
- ENGR. SCHOOL REVENUE
- DEPARTMENT WISE REVENUE
- REVENUE AND CHANGE %



STUDENT ENROLLMENT ANALYSIS SYSTEM

DASHBOARD

CLASSROOM REQUIREMENT

ENROLLMENT WISE COURSE

DETAILS ENROLLMENT TABLE

RESOURCES ANALYSIS

REVENUE OF IUB

ENGR. SCHOOL REVENUE

DEPARTMENT WISE REVENUE

REVENUE AND CHANGE %

ENGR. SCHOOL REVENUE TABLE

Raw Data of Revenue in Engineering School

Department

Select Department

Year From

Select Year

Year To

Select Year

Search

REVENUE IN ENGINEERING SCHOOL

SEMESTERS	CSE	EEE	PHYSICI	SETS	CSE%	EEE%	PHYSICI%	SETS%
2018Spring	6734	2969	10203	19906	0	0	0	0
2018Summer	7728	3138	9163	20029	0	0	0	0
2018Autumn	7795	3088	8450	19333	0	0	0	0
2019Spring	8814	3027	8851	20692	23	1	-15	3
2019Summer	8445	3237	8236	19918	8	3	-11	0
2019Autumn	8737	3080	8066	19883	10	0	-4	2
2020Spring	9320	3302	11414	24036	5	8	22	13
2020Summer	6976	2460	5102	14538	-21	-31	-61	-37
2020Autumn	8893	3082	5552	17527	1	0	-45	-13
2021Spring	10382	3122	6759	20263	10	-5	-68	-18
2021Summer	11453	3141	8047	22641	39	21	36	35
2021Autumn	12319	2842	8645	23806	27	-8	35	26



THANK YOU

