NAME OF CATEGORY- OUTSTANDING E-GOVERNANCE INITIATIVE BY ACADEMIC AND RESEARCH INSTITUTIONS

1.Coverage - Geographical and Demographic

a) Comprehensiveness of reach of delivery centres

b) ***Number of delivery centres*** : **01**

c) Geographical

i) *National level - Number of State covered* : **00**

ii) *State/UT level - Number of District covered* : **01**

iii) *District level- Number of Blocks covered* : **01**

Please give specific details:-

d) Demographic spread (percentage of population covered)

There are 572 islands in the territory having an area of 8,249 km^2 (3,185 sq mi). Of these, about 34 are permanently inhabited. The islands extend from 6° to 14° North latitudes and from 92° to 94° East longitudes. The Andamans are separated from the Nicobar group by a channel (the Ten Degree Channel) some 150 km (93 mi) wide. The highest point is located in North Andaman Island (Saddle Peak at 732 m (2,402 ft)). The Andaman group has 325 islands which cover an area of 6,170 km^2 (2,382 sq mi) while the Nicobar group has only 24 islands with an area of 1,765 km^2 (681 sq mi).

The capital of the union territory, Port Blair, is located 1,255 km (780 mi) from Kolkata, 1,200 km (750 mi) from Visakhapatnam and 1,190 km (740 mi) from Chennai The northernmost point of the Andaman and Nicobars group is 901 km (560 mi) away from the mouth of the Hooghly River and 190 km (120 mi) from Burma. Indira Point at 6°45'10"N and 93°49'36"E at the southern tip of the southernmost island, Great Nicobar, is the southernmost point of India and lies only 150 km (93 mi) from Sumatrain Indonesia.

As of 2011 Census of India, the population of the Union Territory of Andaman and Nicobar Islands was 379,944, of which 202,330 (53.25%) were male and

177,614 (46.75) were female. The sex ratio was 878 females per 1,000 males. Only 10% of the population lived in Nicobar Islands.

The areas and populations (at the 2001 and 2011 Censuses) of the three districts are:

Name	Area (km^2)	Population Census 2001	Population Census 2011	Capital
Nicobar Islands	1,841	42,068	36,842	Car Nicobar
North and Middle Andaman	3,736	105,613	105,597	Mayabunder
South Andaman	2,672	208,471	238,142	Port Blair
Total	8,249	356,152	380,581	

Bengali is the dominant language and most spoken language in the Andaman-Nicobar Islands with 25.71% of the population speaking Bengali, the other major languages spoken in the Andaman & Nicobar Islands are Hindi (18.23%), Tamil (17.68%), Telugu (12.81%), Malayalam (8.11%) and Nicobarese (8.04%) according to 2001 Census of India. Other minor spoken languages are Kurukh/Oraon, Munda and Kharia. Andaman Creole Hindi is widely used as a trade language in the Andamans. Presently there remain only approximately 400–450 indigenous Andamanese in the Andaman Islands, the ***Jarawa*** *and* ***Sentinelese*** *in particular maintaining a steadfast independence and refusing most attempts at contact. In the Nicobar islands, the indigenous people are the Nicobarese, or Nicobari, living throughout many of the islands; and the* ***Shompen****, restricted to the hinterland of Great Nicobar. More than 2,000 people belonging to the* ***Karen*** *tribe live in the Mayabunder Tehsil of North Andaman district, almost all of whom are Christians. Despite their tribal origins, the Karen of Andamans has Other Backward Class (OBC) status in the Andamans. The majority of schools and educational institutions are available in Bengali language on the islands, Tamil and Telugu languages are also used in few*

institutions. Hindi is never used despite its being one of the official languages of the islands, with English.

The majority of people of the Andaman and Nicobar Islands are Hindus, with significant Christian population consisting 21.7% of the total population of the Union Territory according to the 2011 census of India. Small but significant Muslim and Sikh minorities also exist on the islands.

2. Situation before the Initiative (Bottlenecks, Challenges, constraints etc with specific details as to what triggered the Organization to conceptualize this project)

Before the Student Information System (SIS) was implemented, the entire process of handling student information in the institutes/schools was manual and faced a host of major challenges like:

- *Lot of time required for managing the information of the students.*
- *Difficulty in creating reports*
- *Time consuming students/staff result analysis*
- *Difficulties in managing the academic details viz. Admission, Pass-out, Fees Collection, Subject Registration, Attendance, Marks etc.,*
- *Preparation of defaulter list*
- *Preparation of certificates viz. Transfer, Duration, Bonafide, Exam Appearance, Character & Conduct etc.*
- *Communication gap between parents/guardian and the schools/institutions regarding the performance/attendance/discipline related issues related to their ward*
- *Analyze the performance of individual student as compared to whole class or the whole institute/school based on marks-Relative marking which could enable the schools to make a list of meritorious students and felicitate them*

3.Scope of Services/ Activities Covered (Relevance of application for end users/citizens, extent of e-enablement in terms of number of services/activities extent to which step in each service/activity have been ICT-enabled #)

The new SIS system has introduced the following advanced features in the overall student information management e.g.:

- *Introduction of a common database of student for easy & swift tracking of performance and taking corrective actions*
- *Redundancy avoided through duplication check*
- *Class Wise subject Registration of Students*
- *Term and Exam Fees Collection*
- *Subject wise Attendance Module*
- *Marks Module for internal as well as external examination*
- *Root cause analysis for poor result in any subject*
- *MIS for monitoring students performance/improvement*

4. Strategy Adopted

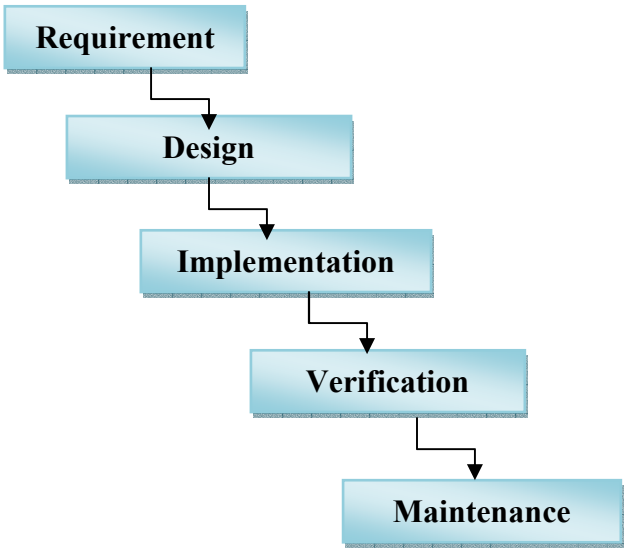
a) The details of base line study done

One of the most important tasks in creating a comprehensive software product of the likes of Student Information System (SIS) is extracting the requirements or performing the detailed requirements analysis exercise. End User typically have an abstract idea of what they want as an end result, but not what software should do. Incomplete, ambiguous, or even contradictory requirements are recognized by skilled and experienced software engineers at this point. Frequently demonstrating live code in the form of POC (Proof of Concept) may help reduce the risk that the requirements are incorrect.

Once the general requirements are gathered from the client, an analysis of the scope of the development should be determined and clearly stated.

b) **Problems identified:** *The real problem lies in the software that was existing earlier for handling the Student Information System. The previous software was windows based i.e., there was no facility to enter or view the information online and the data was also not in a centralized form. To overcome this, now the software was developed in ASP.Net as a Front End and SQL Server as a Back End to overcome the limitation of the existing software. All the processes related to student information management were performed through a window-based system which was not only time consuming due to the lack of proper communication between the different departments but was inefficient. So through this new web-based package, it has become more transparent and secure.*

c) **Roll out/implementation model**



d) **Communication and dissemination strategy and approach used.**

The new SIS system was demonstrated at a number of educational institutions and was well received everywhere. The software is already operational at Model School and all its integral components are performing as expected.

5. Technology Platform used

a) Description

ASP.NET *is an open source server-side Web application framework designed for Web development to produce dynamic Web pages. It was developed by Microsoft to allow programmers to build dynamic web sites, web applications and web services.*

ASP.NET is built on the Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language. The ASP.NET SOAP extension framework allows ASP.NET components to process SOAP messages.

ASP.NET is in the process of being re-implemented as a modern and modular web framework, together with other frameworks like Entity Framework.

ASP.NET aims for performance benefits over other script-based technologies (including classic ASP) by compiling the server-side code the first time it is used to one or more DLL files on the Web server. These .dll files or assemblies contain Microsoft Intermediate Language (MSIL) for running within the common language runtime; this provides a performance boost over pure scripted languages and is similar to the approach used by Python and not dissimilar to java server pages. This compilation happens automatically the first time a page is requested (which means the developer need not perform a separate compilation step for pages).

This feature provides the ease of development offered by scripting languages with the performance benefits of a compiled binary. However, the compilation might cause a noticeable but short delay to the Web user when the newly edited page is first requested from the Web server, but will not again unless the page requested is updated further.

The ASPX and other resource files are placed in a virtual host on an Internet Information Services server. The first time a client requests a page, the .NET Framework parses and compiles the file(s) into a .NET assembly and sends the response; subsequent requests are served from the DLL files. By default ASP.NET will compile the entire site in batches of 1000 files upon first request. If the compilation delay is causing problems, the batch size or the compilation strategy may be tweaked.

Developers can also choose to pre-compile their "code behind" files before deployment, using Microsoft Visual Studio, eliminating the need for just-in-time

compilation in a production environment. This also eliminates the need of having the source code on the Web server. It also supports pre-compile text.

b) Interoperability

The important goal of using .NET during the development of SIS was to promote interoperability with existing technologies. .NET interoperability comes in three types:

- *Interoperability of .NET code with COM components (called as COM interop)*
- *Interoperability of COM components with .NET (called .NET interop)*
- *Interoperability of .NET code with Win32 DLLs (called P/Invoke)*

.NET runtime allows us to use legacy COM code from .NET components. We can call it backward compatibility. In the same way, .NET runtime also provides us forward compatibility, means accessing .NET components from COM components.

The .NET framework object model and its workings are different from Component Object Model (COM) and its workings. For example, clients of .NET components don't have to worry about the lifetime of the object. Common Language Runtime (CLR) manages things for them. In contrast, clients of COM objects must take care of the lifetime of the object. Similarly, .NET objects live in the memory space that is managed by CLR. CLR can move objects around in the memory for performance reasons and update the references of objects accordingly, but COM object clients have the actual address of the object and depend on the object to stay on the same memory location.

Similarly, .NET runtime provides many new features and constructs to managed components. For example, .NET components can have parameterized constructors, functions of the components can have accessibility attributes (like public, protected, internal, and others) associated with them, and components

can also have static methods. Apart from these features, there are many others. These include ones that are not accessible to COM clients because standard implementation of COM does not recognize these features. Therefore .NET runtime must put something in between the two, .NET server and COM client, to act as mediator.

c) **Security concerns**

ASP.NET, in conjunction with Microsoft Internet Information Services (IIS), can authenticate user credentials such as names and passwords using any of the following authentication methods:

- *Windows: Basic, digest, or Integrated Windows Authentication (NTLM or Kerberos).*
- *Forms authentication, in which you create a login page and manage authentication in your application.*

ASP.NET controls access to site information by comparing authenticated credentials, or representations of them, to NTFS file system permissions or to an XML file that lists authorized users, authorized roles (groups), or authorized HTTP verbs.

d) **Any issue with the technology used:** None

e) **Service level Agreements (SLAs)** (Give details about presence of SLA, whether documented, whether referred etc. #): None

6. Service Delivery - user orientation (Give details about improvement in interaction with end user and outcome, relevance of access points, Length and Breadth of services provided online etc. #)

Following services are now being provided online in a closed user group (CUG)

1. *viewing & entering the academic marks of students*
2. *viewing & entering the attendance of the students*

3. *subject registration & viewing registered subjects*
4. *viewing of Lecturer details*
5. *viewing of details regarding the student who involve in extra- curricular activities*

The new system also possesses advanced capabilities of generating On-the-fly MIS reports on the following to concerned stakeholders:

1. *Attendance details*
2. *Monthly attendance details*
3. *Marks statement*
4. *Internal Marks statement*
5. *Board Theory Marks statement*
6. *Details of student in particular department / semester*
7. *Staff details in particular department*
8. *Subject details for a particular students*
9. *Credit regarding subject*
10. *Details regarding skill map*
11. *Details regarding carrier path*
12. *Details regarding fees structure*
13. *SMS alert to parent/guardians for unauthorized absentees*
14. *MIS to monitor academic performance*
15. *Curriculum/Lesson Plan updates*

7. Citizen Centricity (Give specific details on the following#)

a) **Impact on effort, time and cost incurred by user:** *Instant availability of student information, reports, addition/deletion/modification of student records. Users at different levels have role based access to the different modules of the system*

b) **Feedback/grievance redressal mechanism:** NA

c) **Audit Trails:** *The system maintains a log of its activities and captures information on the user-login details (users can be made at all the levels defined in the system)*

d) **Interactive platform for service delivery:** *As explained in the section 5 above, the new SIS provides a wide range of online module and reporting functionalities that aid the user (Institution/Schools/SIS Administrator etc.) in handling the student information efficiently.*

e) **Stakeholder consultation:** *Based on the continuous feedback received on the performance of the SIS, regular enhancements have been made to the system to make it more user-friendly and functionality intensive*.

8. User convenience (Give specific details about the followings #)

a) **Service delivery channels (Web, email, SMS etc.):** *Web, SMS*

b) **Completeness of information provided to the users:** *As explained in the section 5 above*

c) **Accessibility (Time Window):** Instant availability of student information and capability to manage the same

d) **Distance required to travel to Access Points:** NA

e) **Facility for online/offline download and online submission of forms:** *Available*

f) **Status tracking:** *Instant availability of status information through the online SIS interface*

9. Efficiency Enhancement (Give specific details about the following #)

a) Volume of transactions processed

- *Student Details Processed: 1130*
- *Attendance Entered by Staff: 397854*
- *Internal Marks (both Degree and Diploma): 462486*
- *Board Marks Entered (Diploma): 89657*

- *Board Marks Entered (Degree): 25711*

b) **Coping with transaction volume growth:**
   - Installed the software in Cisco UCS Quad Core Blade server, 64 GB RAM, 300 GB (SAS), SAN Storage 6TB with redundancy, Windows Server 2012
   - Back End : Oracle 11g
   - Automatic Backup Schedule

c) **Time taken to process transactions:** 3-4 seconds

d) **Accuracy of output: 100%**

e) **Number of delays in service delivery:** No delay has been observed

10. Accessibility (Give details about how following has been enhanced: user accessibility, transparency in system, single-window resolution, ease of navigation; impact on service response time, number of visits required for accomplishing the task before and after automation, Communication e-mail, SMS, web based tracking, etc.#)

The new SIS provides the following benefits to the involved stakeholders:

1. *To fetch the pre-defined data of each student*
2. *Handling inquiries from prospective students*
3. *Handling records of examinations, assessments, marks, grades and academic progression*
4. *Maintaining records of absences and attendance*
5. *Recording communications with students guardians through e-SMS module of CDAC*
6. *Maintaining discipline records*
7. *Providing statistical reports*
8. *Student health records through online BMI report generation*
9. *Increased transparency in the system through online report generation and view access*
10. *Ease of navigation through structured design of user modules in the new*

Student Information System (SIS)

11.Innovations(Give details on the extent to which initiative/project is unique in purpose/goal, compared to other common e-governance projects , give details about the new processes / new activities, new steps , ICT interventions, administrative process reforms, any use of new & emerging technology functionalities introduced into the system, identification & removal of any bottlenecks / give details irrelevant steps, Comparative with Original Project (Provide a comparative analysis about how is this project similar / different in services provided, design, functionality, technology, platform etc from the original project)

The new improved SIS has the below important functionalities in a closed user group (CUG):

1. *viewing & entering the academic marks of students*
2. *viewing & entering the attendance of the students*
3. *subject registration & viewing registered subjects*
4. *viewing of Lecturer details*
5. *viewing of details regarding the student who involve in extra-curricular activities*

Below mentioned are the important modules of software:

1. *Module to establish connection between the Front End and Back End*
2. *Enrollment of new student*
3. *Registration of subject*
4. *Registration for Multi Point Entry Credit system student.*
5. *Fees Structure (Admission, Registration, Hostel, Exam etc.)*
6. *Details regarding Lecturer*
7. *Managing attendance*
8. *Marks statement*
9. *Exam Registration*
10. *Handling Skill map*
11. *Carrier path entry regarding placement*
12. *Module to deal with the run-time error*

13. *Module for validation to handles error*

For the ease of the stakeholders involved, the new SIS system possesses capabilities of generating the following reports:

1. *Attendance details*
2. *Monthly attendance details*
3. *Marks statement*
4. *Internal Marks statement*
5. *Board Theory Marks statement*
6. *Details of student in particular department / semester*
7. *Staff details in particular department*
8. *Subject details for a particular students*
9. *Credit regarding subject*
10. *Details regarding skill map*
11. *Details regarding carrier path*
12. *Details regarding fees structure*

12. Sustainability (Give details about Self sustainability of these w.r.t Institution (hiring trained staff, training etc.), financial (Scope for revenue generation), saving of time and money etc. #)

The new Student Information System (SIS) is software whose development and maintenance is entirely being taken care of by the Dr. B. R. Ambedkar Institute of Technology, Andaman & Nicobar Islands. All the costs related to change requests and continuous enhancements are borne by the agency.

13. **Adaptability Analysis**

a) **Measures to ensure adaptability and scalability:** *SIS has been designed on a modular architecture that allows it to be adapted to any client requirement with least number of changes required. SIS is scalable and can cater to a wide variety of student information as per the specific requirements of individual institutions/schools.*

b) **Measures to ensure replicability:** *The new SIS has been designed in*

such a way that it can be replicated/installed at multiple locations with least customization required. This helps in the fast roll-out of the system and benefits the institutions/schools.

c) **Restrictions, if any, in replication and or scalability:** None

d) **Risk Analysis:** None

14. Result Achieved/ Value Delivered to the beneficiary of the project-(share the results, matrices, key learning's, feedback and stakeholders statements that show a positive difference is being made etc)

a) **To organization:** *The primary organizational beneficiary of the new Student Information System are the institutions/schools who receive the following benefits:*

1. *viewing & entering the academic marks of students*
2. *viewing & entering the attendance of the students*
3. *subject registration & viewing registered subjects*
4. *viewing of Lecturer details*
5. *viewing of details regarding the student who involve in extra curricular activities*

b) To citizen: *In the citizen group, parents are the beneficiaries who receive SMS's through the eSMS module of SIS in case their ward is absent or in case the school wants to send out the reports on their performance to the respective parents*

c) Other stakeholders: NA

15. Extent to which the Objective of the Project is fulfilled-(benefit to the target audience i.e G2G, G2C, G2B, G2E or any other, size and category of population/stakeholder benefited etc.)

The new Student Information System (SIS) is primarily a G2C, G2G service that caters to the requirements of both the institutions/schools who want to streamline the management of their student's information and possess the capabilities to

generate on-the-fly reports concerning student's performance, attendance and other parameters. The other major beneficiary is the set of parents who are now empowered with the ability to receive messages from the schools regarding their ward and can take corrective action and instill discipline in their ward.

16. Comparative Analysis of earlier Vs new system with respect to the BPR, Change Management, Outcome/benefit, Change in legal system, rules and regulations

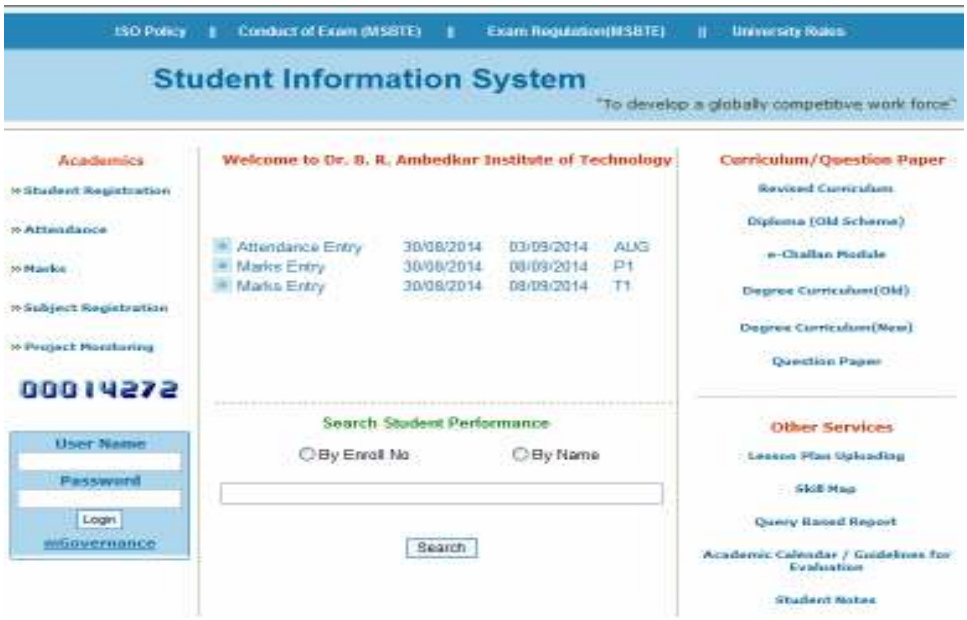
The real problem lies in the software that was existing earlier for handling the Student Information System. The previous software was windows based i.e., there was no facility to enter or view the information online and the data was also not in a centralized form.

To overcome this, now the software was developed in ASP.Net as a Front End and Oracle 11g as a Back End to overcome the limitation of the existing software. All the processes related to student information management were performed through a window-based system which was not only time consuming due to the lack of proper communication between the different departments but was inefficient. So through this new web-based package, it has become more transparent and secure.

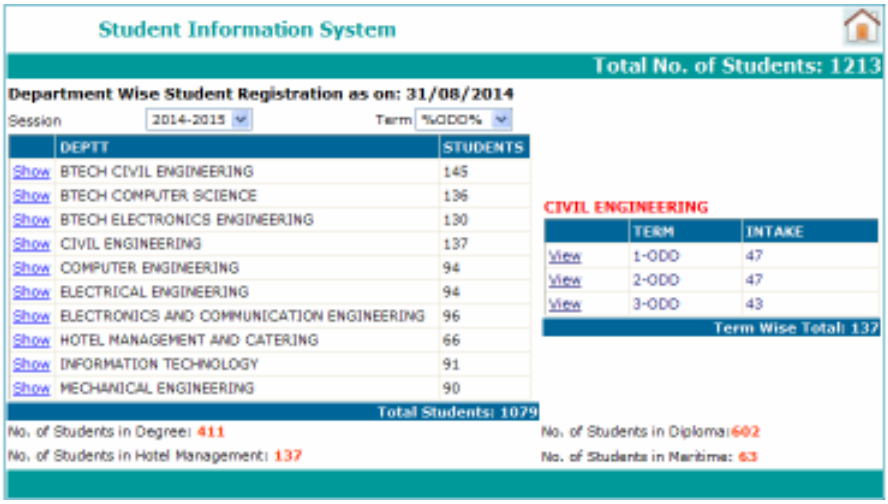
17. Other distinctive features/ accomplishments of the project:

1. *The new SIS is one of its kind in terms of Student Information Management capabilities and its abilities to generate reports on-the-fly real time and over a short period of its operations it has proved its worth in the Educational Institutes/Schools*

18. Screenshot of Student Information System



Student Registration Details as on Date



Student Information System

Total No. of Students: 1213

Department Wise Student Registration as on: 31/08/2014

Session 2014-2015 Term %ODD%

	DEPTT	STUDENTS
Show	BTECH CIVIL ENGINEERING	145
Show	BTECH COMPUTER SCIENCE	136
Show	BTECH ELECTRONICS ENGINEERING	130
Show	CIVIL ENGINEERING	137
Show	COMPUTER ENGINEERING	94
Show	ELECTRICAL ENGINEERING	94
Show	ELECTRONICS AND COMMUNICATION ENGINEERING	96
Show	HOTEL MANAGEMENT AND CATERING	66
Show	INFORMATION TECHNOLOGY	91
Show	MECHANICAL ENGINEERING	90
		Total Students: 1079

CIVIL ENGINEERING

	TERM	INTAKE
View	1-ODD	47
View	2-ODD	47
View	3-ODD	43
		Term Wise Total: 137

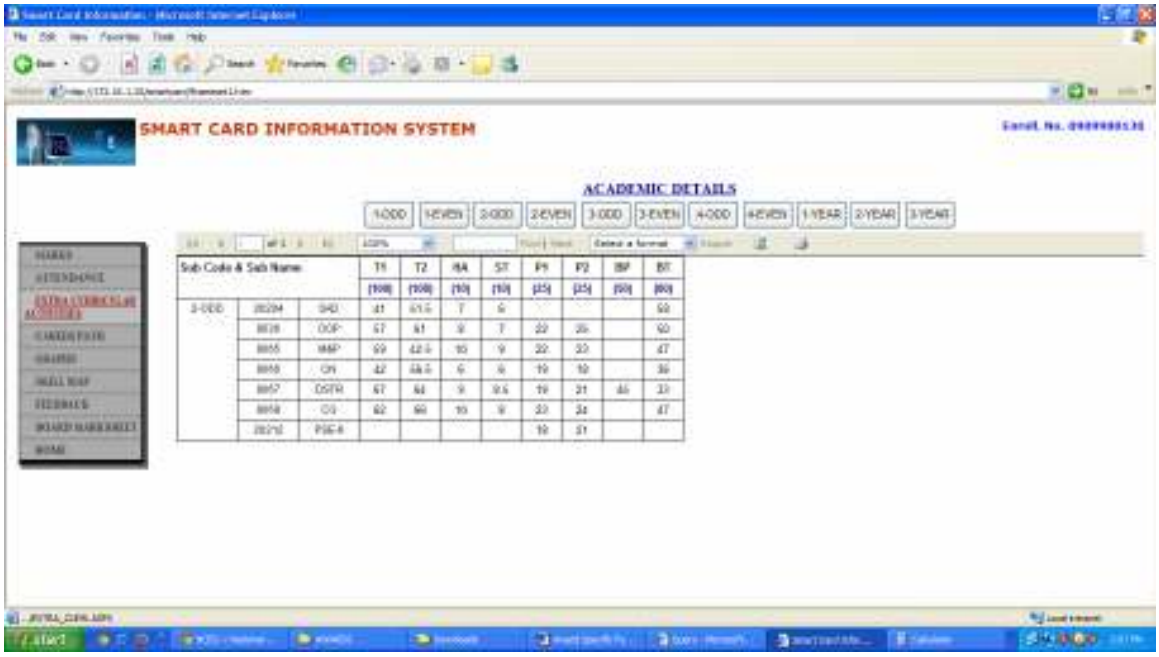
No. of Students in Degree: 411

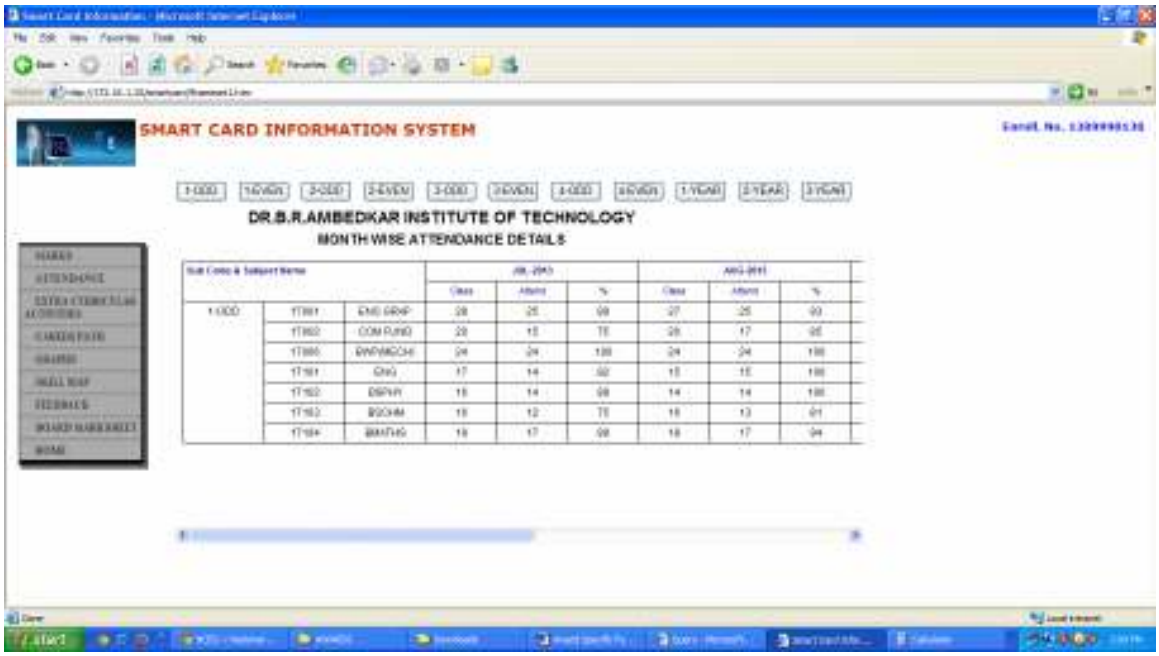
No. of Students in Diploma: 602

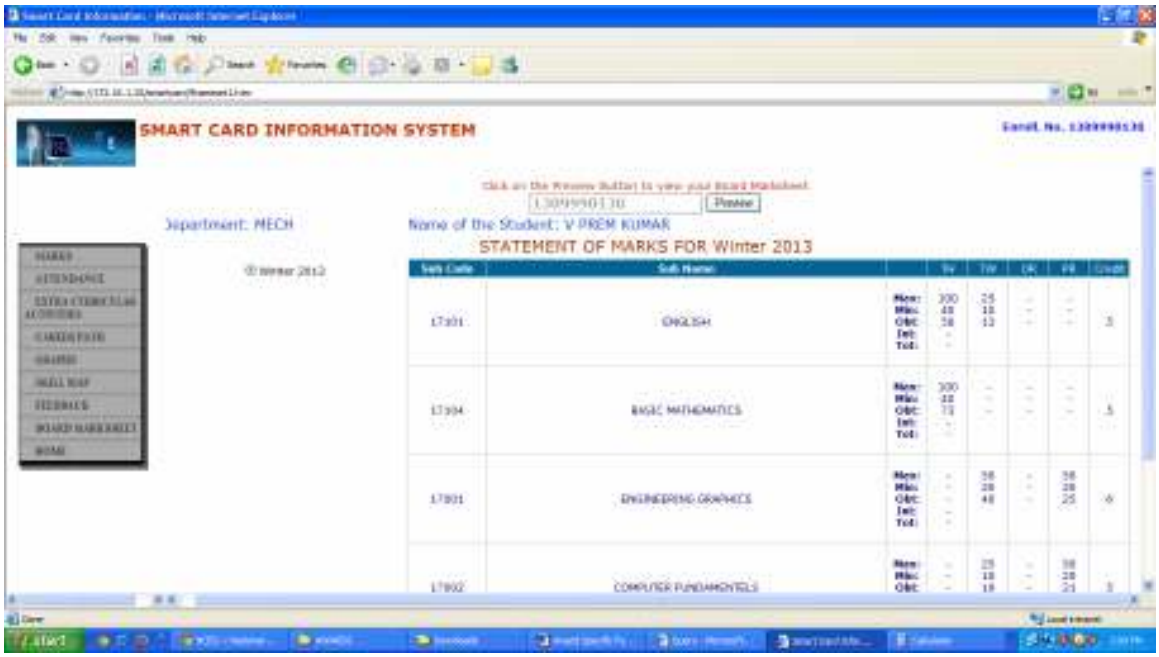
No. of Students in Hotel Management: 137

No. of Students in Maritime: 63

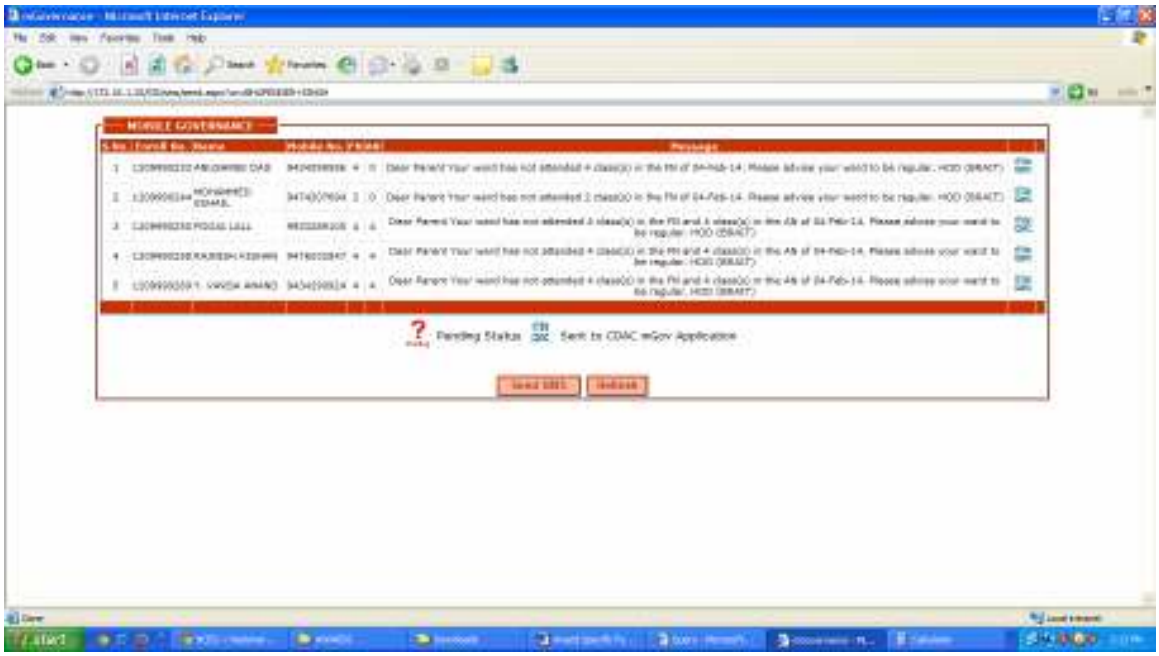
Track Record of Individual Student



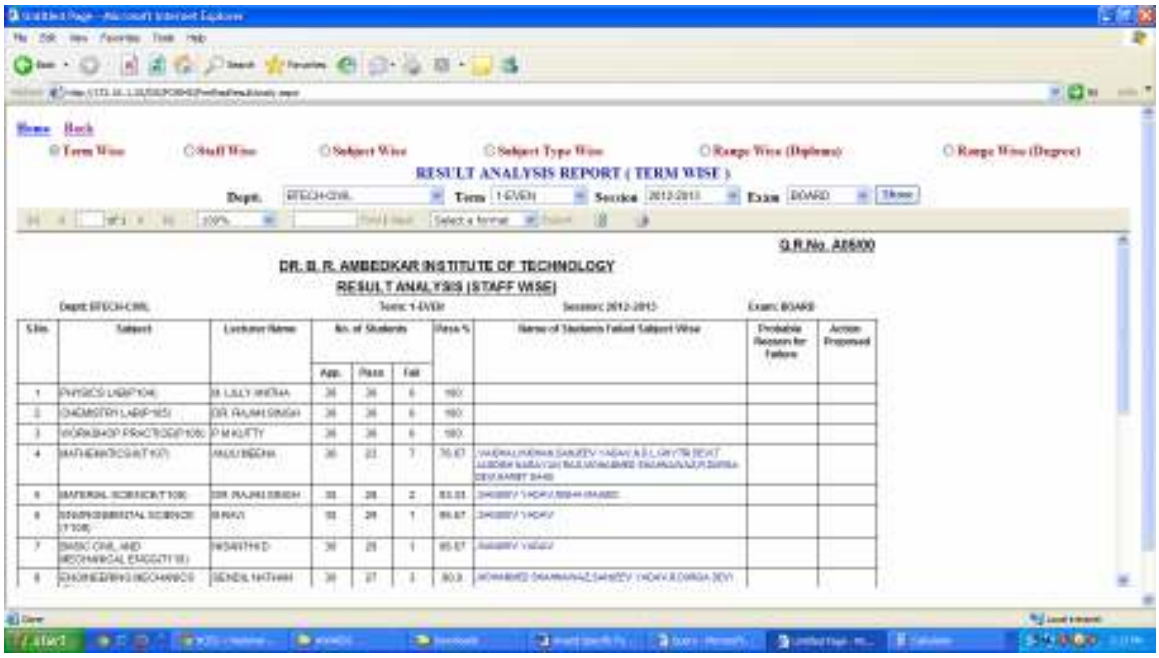

SMART CARD INFORMATION SYSTEM
DR.B.R.AMBEDKAR INSTITUTE OF TECHNOLOGY
MONTH WISE ATTENDANCE DETAILS


SMART CARD INFORMATION SYSTEM
Department: MECH
Name of the Student: V PREM KUMAR
STATEMENT OF MARKS FOR Winter 2013
ENGLISH
BASIC MATHEMATICS
ENGINEERING GRAPHICS
COMPUTER FUNDAMENTALS

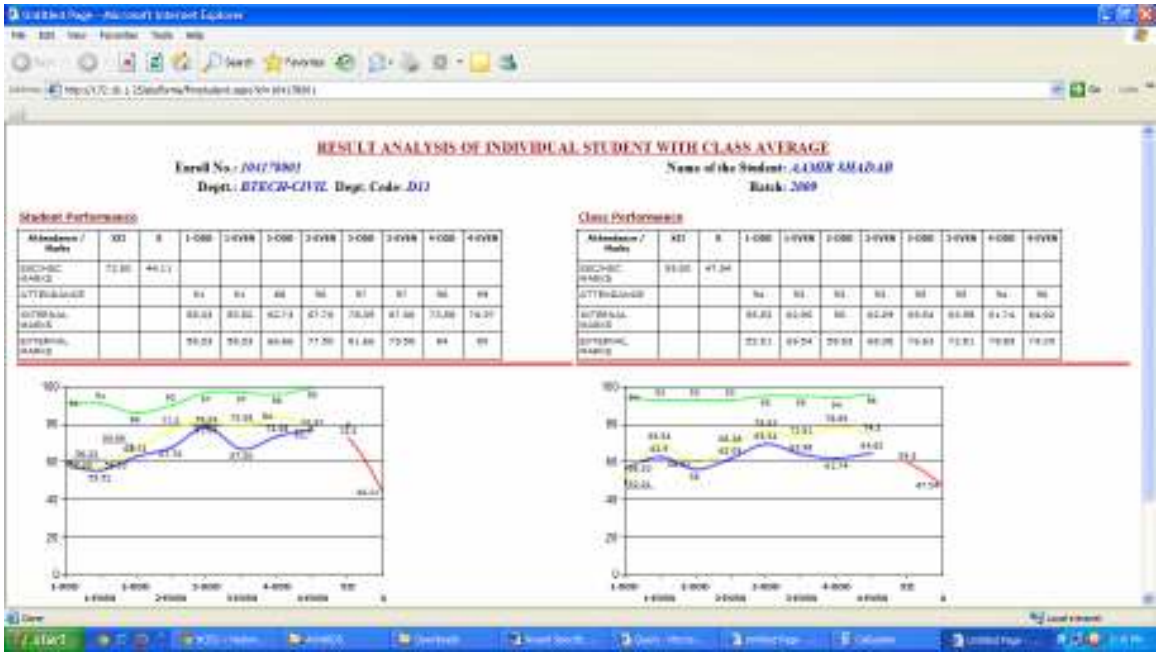
Mobile Governance of Absentee Student



Result Analysis

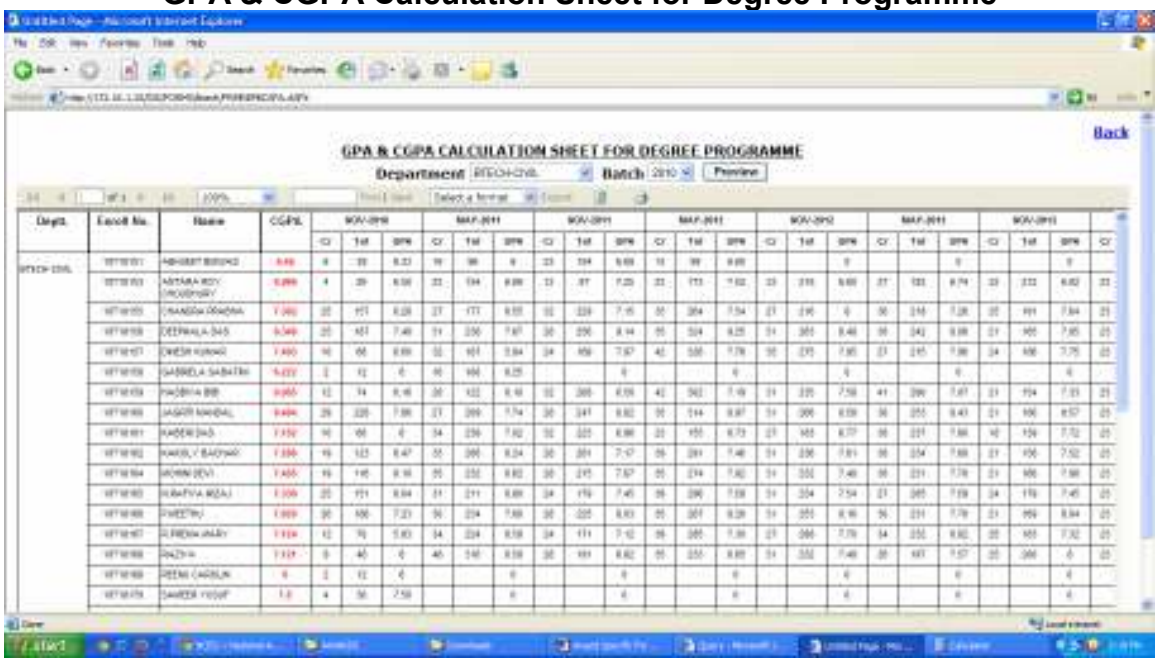


Individual Student Performance –vs- Class Performance

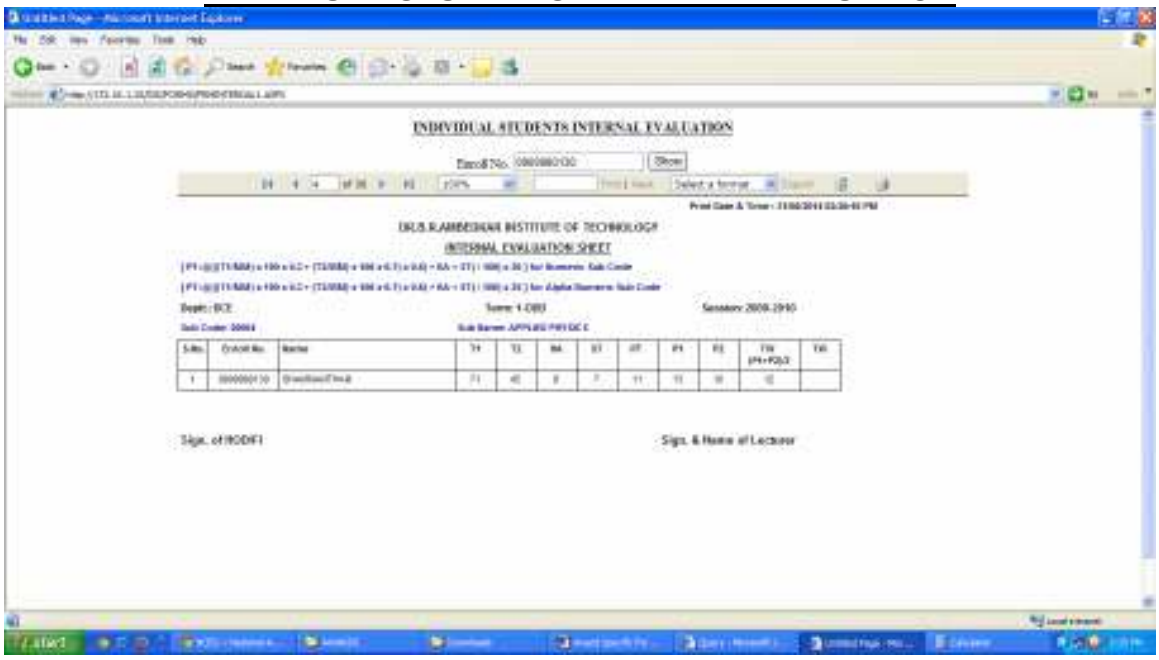


Defaulter List

GPA & CGPA Calculation Sheet for Degree Programme



INDIVIDUAL STUDENTS INTERNAL EVALUATION



19. Brief about Dr. B. R. Ambedkar Institute of Technology (BRAIT)

The process of e-Governance in BRAIT was started 14 years ago following a structured approach of process mapping, process re-engineering followed by computerization. The package has undergone continuous revision with respect to platform as well as features. The benefits accrued by the above e-Governance initiatives are as under: -

- Improving the work culture of the institute and self discipline among the staffs
- Capacity building of staffs
- Institute became a resource centre for supporting IT initiatives of A & N Administration
- Enhanced employment opportunities for the students due to better skill sets
- System driven with no scope for adhoc decisions in routine academic matters

Andaman & Nicobar Islands being geographically isolated from mainland India posses a challenge in adopting best practices which is otherwise prevalent in other institutes of our country. The BRAIT team has successfully transformed the challenge into opportunity and implemented the e-GOV initiatives in the institute with no additional expenditure.