

## AWARDS SCHEME FOR EXEMPLARY IMPLEMENTATION OF e-GOVERNANCE INITIATIVES

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### III. NAME OF CATEGORY- 'INNOVATIVE USE OF TECHNOLOGY IN e-GOVERNANCE'

1. **Coverage – Geographical and Demographic :-**

(i) Comprehensiveness of reach of delivery centres,

Saurashtra University, Rajkot and its affiliated colleges.

(ii) Number of delivery centres

Saurashtra University, Rajkot and its affiliated colleges.

(iii) Geographical

(a) National level – Number of State covered

(b) State/UT level- Number of District covered

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(c) District level- Number of Blocks covered

Please give specific details:-

The jurisdiction of the Saurashtra University includes Amreli, Jamnagar, Junagadh, Porbandar, Rajkot, Surendranagar, Morbi, Gir Somnath and Dwarka districts.

(iv) Demographic spread (percentage of population covered)

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

- University had an informational website which did not provide two way communications. Main usage of this site was to display results only.
- Colleges and Students had to approach University for each and every task which involved extensive human efforts and substantial amount of time.
- Manual efforts were required in order to validate submitted forms that resulted in time delay.
- Students / Colleges had to shuffle between departments in order to get reply for their queries hence required information were delayed.
- Focus of this project is on removing these bottlenecks, consider Student-College-University relations as a single entity and develop an application which benefits them equally through a centralized and single point access.

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### 3. Scope of Services/ Activities Covered (Relevance of choice of application for client/ agency, Extent of e-enablement in terms of number of services, Extent to which step in each service have been ICT- enabled #)

- As a part of this project, following services were re-engineered with the concept of fully automated web based portal which can be accessed from their own premises, so as to ease the operations and provide a smoother workflow :
  - Student Enrollment
  - Examination Form
  - Seat No Generation
  - Center Allocation
  - Barcode Generation
  - Hall Ticket
  - Internal / Practical / Written Marks Entry
  - Result Process Management
  - Grace Analysis and Apply
  - Ordinance Rule Set Automation
  - Notification of Result
  - Re-Assessment Form
  - Re-Assessment Marks Entry
  - Re-Assessment Result
  - Result Analysis
  - Degree Generation

### 4. Strategy Adopted

#### (i) The details of base line study done,

- In-depth analysis of existing process flow of University was done by the development team with the guidance from domain experts of the University.

#### (ii) Problems identified,

- During the analysis of the University workflow below mentioned constraints were identified:
  - Lack of Automation
  - Decentralization of information
  - Manual Efforts
  - Delay in real time information transfer
  - Administration & Supervision problem due to lack of timely communications and information gap
  - Life Long Content Non-Availability

#### (iii) Roll out/implementation model,

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- Based on requirement study, certain processes were re-engineered to remove bottlenecks.
- Below mentioned strategy was adopted for the application development / implementation:
  - Centralized Approach
  - Anytime, Anywhere accessibility
  - Selection Based Application with Capture Data only Once Approach
  - Three-Tier Architecture
  - State of the Art Microsoft .Net Technology
  - Train the Trainer Approach for implementation

(iv) Communication and dissemination strategy and approach used.):

- For a satisfactory outcome, timely meetings were held between the University experts and the development team which helped in paving the path which resulted in the beneficial application.
- After deployment, online feedback mechanism is introduced to get valuable inputs / suggestions from the end users.
- University officials validate the need for the change and ask the development team to make them via Change Request Notes.
- After deployment of the changes, User Acceptance is obtained so that the end user gets what was required.

### 5. Technology Platform used-

(i) Description,

The application has been developed using .Net Framework 3.5 , Visual Studio 2008 as the development tool, VB as development language, JavaScript as the scripting languages, with AJAX based telerik components and SQL Server 2008 as Database.

(ii) Interoperability

Export of data in the excel format for usage in any other system.

(iii) Security concerns

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- Application level *Authentication and Authorization* is maintained for all the users.
- *Three Level Rights Mechanism* is used :
  - Menu Level
  - Form Level
  - Report Level

Administrator can give relevant rights to the respective User.

- Symmetric Key with *RC4 Algorithm* is used along with Master Key and Certificate to encrypt the sensitive User Information.
- All the data transferred over the internet is encrypted by the powerful *ASP.Net View State encryption mechanism*.
- Server is deployed in the state of the art data center which follows the *ISO standard* norms in order to maintain confidentiality and security of the servers.

(iv) Any issue with the technology used

(v) Service level Agreements(SLAs) (Give details about presence of SLA, whether documented, whether referred etc. #)

- During the development of the Application, Software Development Guidelines were used as per **ISO Standards** and all the Requirements from the University were gathered in terms of *Software Requirement Specification* document. Developed functionalities is deployed to the University and *User Acceptance Testing* is done by them.
- Whenever, a change is required in the application, *Change Request Note* document is prepared based on the requirement and required modifications is done in the application.

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6. **Demonstrate innovative use of ICT for development** (Give details about use of new and emerging technology, innovative usage of ICT for process change to improve quality of the life/ organizational effectiveness, relevance of technology to provide the service #)

- The solution has been developed using 3-tier architecture. Three-tier (layer) is a client-server architecture in which the user interface, business process (business rules) and data storage and data access are developed and maintained as independent modules or most often on separate platforms. The 3 layers are : tier 1 (presentation tier, GUI tier), tier 2 (business objects, business logic tier) and tier 3 (data access tier)
- The division of code in 3-tiers helps in separation of the user interface from business logic and database access has many advantages. A few of them are as listed below:
  - Reusability of the business logic component results in quick development.
  - Transformation of the system is easy. Since the business logic is separate from the data access layer, changing the data access layer won't affect the business logic module much
  - Change management of the system is easy.
  - Having separate functionality servers allows for parallel development of individual tiers by application specialists.
  - Provides more flexible resource allocation. Can reduce the network traffic by having the functionality servers strip data to the precise structure needed before sending it to the clients.
- State-of-the-art Microsoft.Net technology helped to develop an application which is accessible at anytime, and from anywhere from any device with internet connection facility.
- Robust SQL Server database helped to maintain large amount of student data in effective manner.
- Flexibility of Crystal Reports was useful in developed various kind of tabular as well as cross tab reports as per university

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requirement and export them in Excel, PDF, Word etc. file formats.

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

#### (i) Impact on effort, time and cost incurred by user,

- Centralized approach for the Project enables the users with single point access for various processes and reduces the manual efforts required by them.
- After implementation of this Project, all processes of Educational Cycles were optimized and required time duration was drastically reduced. Further, validated inputs and proper logic implementation increases the accuracy of the generated outputs.

#### (ii) Feedback/grievance redressal mechanism,

- University Staff is sensitized for application usage and they guide the College Staff.
- Feedback Mechanism for the College Users allows them to send their valuable feedback with the attachments (if any) online.
- In addition to the online feedback, University is getting valuable feedback from the College Principals, Faculties and other staff in person. University validates the need for the change and asks the development team to make them via Change Request Notes.
- Any other routine changes are tracked through emails.

#### (iii) Audit Trails,

- University Staff is empowered with the effective Audit Trail mechanism to track the data of Students at various stages in the educational process.

#### (iv) Interactive platform for service delivery,

- Entire portal has been developed with the intention to provide easy accessibility to the end-user. Guideline notes and appropriate messages are shown to the user in order to help him with the effective usage.
- Online feedback mechanism helps end users to overcome their difficulties.

#### (v) Stakeholder consultation

Project facilitates to all the stakeholders which are part of the educational life-cycle of a University.

The major Stakeholders directly benefitting from the project are as follows :

- University Staff [Approx 50, Can be extended]
- College Staff [Approx 350, Can be extended]

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- Students [Each year increasing nearly 1 Lac]

8. **Adaptability and Scalability** (Give details about Local language support, ability to leverage shared Government infrastructure, Standardization of technology used (hardware, software, application etc. #)

The application was developed keeping in mind a State Level University following UGC guidelines and adheres to the Choice Based Credit System standards.

ISO Standards are maintained for the development of the software solution and deployment environment.

9. **Adaptability Analysis**

(i) Measures to ensure adaptability and scalability

The application was developed keeping in mind a State Level University following UGC guidelines and adheres to the Choice Based Credit System standards. The system is developed in such a way that any other University can adapt this solution for their Choice Based Credit System. The system is developed in such a way that it can be used by any major university with large student base.

(ii) Measures to ensure replicability

The system is developed after thorough analysis of CBCS guidelines and various implementations of examination processes of different universities.

(iii) Restrictions, if any, in replication and or scalability

The system is developed for Grade based examination conduction process. Thus it cannot be applied directly to the traditional Marks based system. However, the system can work for traditional mark based system after certain changes are incurred.

(iv) Risk Analysis

The web based approach might not be helpful if internet is not available to end-user.

10. **New Models of Service Delivery** (Give details about type of partnership model use, Links to/Supported by Public/Private Organization Links provided to relevant websites etc. #)

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

#### (i) Volume of transactions processed

Each year nearly 1,00,000 new students are enrolled through our system and nearly 2,00,000 Examination Forms are filled.

#### (ii) Coping with transaction volume growth

Caching Mechanism, Hardware Up gradation, Database Tuning and Indexing.

#### (iii) Time taken to process transactions,

After implementation of this Project, all processes of Educational Cycles were optimized and required time duration was drastically reduced.

#### (iv) Accuracy of output,

Validated inputs and proper logic implementation increases the accuracy of the generated outputs.

#### (v) Number of delays in service delivery

First phase of the Project was deployed in a record time frame of 20-25 Days and Examination Forms were directly filled up by the Colleges online.

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

#### (i) Service delivery channels (Web, email, SMS etc.)

- **Anytime, Anywhere** accessibility approach used for the project helps its users to have access from any device with internet connection facility.
- SMS / Emails are sent to the users at various stages of application.

#### (ii) Completeness of information provided to the users,

Users are provided with real-time information data in simplified format.

#### (iii) Accessibility (Time Window),

Certain forms are scheduled for college level access for specific time duration. After which they cannot access the same.

#### (iv) Distance required to travel to Access Points



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All the process are web based and accessible from anywhere.

(v) Facility for online/offline download and online submission of forms,

All the forms are accessible and filled online.

(vi) status tracking

Status of various processes can be tracked through the online portal and various reports.

13. **Sustainability** (Give details about sustainability w.r.t. technology (technology used, user privacy, security of information shared – Digital Encryption etc. #), Organization (hiring trained staff, training etc. #), financial (Scope for revenue generation etc. #))

- Application has been developed keeping in mind a State Level University following UGC guidelines and adheres to the **Choice Based Credit System** standards.
- As per UGC Norms, all the Universities in India have to follow *Choice Based Credit System* and this application can easily increase their ICT Capabilities and facilitate them with highly secure, state of the art, centralized, holistic application.
- **Train the Trainer** approach can be used in order to provide training to the University Staff as well as College Staff.
- **Per Student Costing** mechanism can be introduces to distribute the costing among University, College and Student.

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):

(i) **To organization**

- ▶ **Direct Information access** between various departments.
- ▶ Less efforts in handling various forms due to **automatic validation**.
- ▶ One point information access **helps in Planning and Decision Making** for tasks like examination conduction.

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- ▶ **Monitoring** of assessment made easy.
- ▶ **Automation** of complex tasks of Result Preparation.
- ▶ **Instant notification** to colleges and students about any events.

(ii) **To citizen**

(iii) **Other stakeholders**

**Colleges:**

- ▶ Reduction in the overall time required for any process as no need to go to university for each and every task.
- ▶ Affiliation / change in college details can be done online.
- ▶ Get instant online access to information from University e.g. Hall Tickets, Result.
- ▶ Track & analyze their Student's details online.

**Student:**

- ▶ Students can fill up and verify Examination Form at their college.
- ▶ No need to attach their previous result with examination form.
- ▶ Get their hall-ticket online.
- ▶ Get direct information about any information like Enrollment / Result / Re-Assessment through sms/email.
- ▶ No need to go to University for each and every work.

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):

- Project facilitates to all the stakeholders which are part of the educational life-cycle of a University.

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- Major Stakeholders directly benefitting from the project are as below :
  - University Staff [Approx 50, Can be extended]
  - College Staff [Approx 350, Can be extended]
  - Students [Each year increasing nearly 1 Lac]

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

• Glimpse of the improvement can be realized by the following statistics:		
Process	Before Implementation	After Implementation
Enrollment Process	1-2 Months	5-10 Days
Examination Forms	1-2 Months	5-10 Days
Seat Number Generation and Center Allocation	5 Days	1 Day
Re-Assessment	10-15 Days	5 Days
Marks Gathering and Result Processing	1-2 Months	5-10 Days
Degree Generation	1-2 Months	5-10 Days

17. Other distinctive features/ accomplishments of the project:

- Presently, Empowerment of Educational Institutions with ICT is mainly focused on Colleges / Schools rather than University.
- Current initiatives in this domain is distributed and mainly focused on below mentioned areas :
  - Content Management
  - Online Form Filling / Downloading Facility

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- Online Displaying Result

- Though current initiatives are appreciable, they are merely limited to the individual functions and do not utilize a comprehensive approach.
- Focus of this project is on removing these bottlenecks, consider College – University relations as a single entity and develop an application which benefits them equally through a centralized and single point access.
- It covers every area of Student-College-University relations ranging from Eligibility to Enrollment to Examination to Result to Mark sheet to Re-Assessment to Degree to Migration Certificate.
- This effort might be the first of its kind to consider each aspects of Student-College-University relations.

# This is just an indicative list of indicators. Applicant can add on more information based on suitability of the project nominated.