



*Research Paper on "Impact of Audit  
e-Governance projects"*

**Regional Training Centre, Bangalore**

**2013**

This booklet presents the research on impact of audit of the Examination result processing and result generation process, an e-Governance G2C project. Information Technology Audit of the Bangalore University Examination Wing had been conducted during 2009 and attempt has been made by RTC, Bangalore to study the impact of the audit keeping in view the observations pointed out during audit vis-à-vis the system and the functional changes carried out by Bangalore University Bangalore University hailed as one of the largest universities of Asia was accredited with Five Star Status 'A' Grade status with 2.5lakh students appearing for the exams every semester.

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## *Foreword*

Regional Training Centre (RTC), Bangalore, being the knowledge centre for Information Technology Audit, had brought out this first research work on the topic "Impact of Audit of e-Governance projects", during the year 2013-14. This research work was carried out by correlating the deficiencies in conception, design and implementation of IT systems observed in audit vis-à-vis the changes carried out by the auditee with any positive impact on the society at large over the years. To begin with the research work on this topic, a systematic study of the Information Technology Audit of the Bangalore University brought out as a part in the stand alone IT Audit Report 2009, had been carried out by RTC, Bangalore.

Bangalore University comprising of colleges, the main study and knowledge centre in Bangalore imparts valuable education to the young citizens from all over India. Students being the citizens of the future India form the most integral part of our society. The students of the University/colleges are being valued based on the examination results, which are the main deciding factor for their career prospects. Result generation being a citizen centric, a G2C e-Governance project initiative, embedded with a major social objective, had been topic of selection for the research by RTC, Bangalore.

In pursuance of this, RTC's attempt to research on the "Impact of Audit of e-Governance projects", had been brought out. The IT audit of the Examination wing of the Bangalore University had been conducted during 2009 and four years from then makes it the more appropriate topic for research to study the impact of audit over the years. Attempt has been made by RTC, Bangalore to study the impact of the audit of the examination wing, keeping in view the observations pointed out during audit vis-à-vis the system and the functional changes carried out by Bangalore University.

December 2013

**Principal Director**  
RTC, Bangalore

## *Title*

Impact of Audit of e-Governance Projects with a special study on the Examination wing of Bangalore University

## *Research Team*

The research Team headed by the Principal Director – RTC, Bangalore was assisted by Ms.M.Maragathavalli, Audit Officer (Administration & Core EDP faculty) and Mr.T.V.Sreekumar, Assistant Audit Officer (EDP faculty).

## *Introduction*

Is too much emphasis placed on examination results today? In our view, the examination result processing system needs to be foolproof if they are to continue to play a part in our educational system. In recent years much debate has been stirred regarding whether or not the exams are the most efficient way of comparing the abilities of a group of people which would often encourage students to compete to get better grades. However, exams are becoming mainstream proving the point of view that the exam results gives teachers and examiners some kind of written record that will allow them to justify their grades. In general, it is being reiterated that the Examinations are the only way of assessing a student's knowledge. Therefore, the educational institution conducting such examinations needs to be more efficient and effective in declaring the results.

## *Objective*

A systematic study on the examination wing of Bangalore University to correlate the deficiencies in conception, design and implementation of IT systems observed in audit vis-à-vis the changes carried out by the auditee and also the positive impact, if any, made on the society at large over the years.

## *Sources*

- Stand alone Information Systems Audit Report 2009, brought out by the Principal Accountant General (G&SSA), Karnataka, Bangalore on the performance of Information Systems in selected entities under the Education Department of the Government of Karnataka
- Bangalore University Websites
  - <http://www.bangaloreuniversity.ac.in/>
  - <http://www.attristech.com/bu/>
- Results of the survey and interview conducted by the Research Team
- Brief report on initiatives taken and implemented by BU from the year 2009 onwards
- Data and evidences collected from BU by the Research Team

# *Research Analysis – Impact of audit assessment*

## **1. IT Policy and performance monitoring**

Though BU has made substantial investments in IT from the year 2003, it did not have a centralized IT Department. The application packages working in the Examination, Finance and Academic wings have been developed without any integration of functions across the two campuses.

*Impact assessment based on the research study found that at the instance of audit, BU had addressed the deficiencies by constituting a Technical/IT Committee to formulate IT policy of Bangalore University which would be submitting a detailed report by the end of 2013 to the Academic Council and Syndicate to achieve standardization in IT related activities. Also, an e-Governance Department to oversee the overall computerization activities created in order to integrate the functional activities in BU.*

## **2. Incorporation of key user requirements**

The application software envisaged to automate the information chain across all functions of the Examination wing of BU and to eliminate most of the manual processes and duplication of data and effort. The application software proposed to have the feature of web-based application for announcement of time-table, results, student grievances redressal, communication with colleges etc., with activity monitoring system. Further, provision of OCR/OMR facility and bar-coding of answer scripts for machine reading to improve the efficiency of the result processing system in terms of security, accuracy and speed was also envisaged. These features were very vital for handling the increasing workload.

*As suggested by audit, steps have been taken by BU to incorporate the key user requirement of OCR/OMR sheets to eliminate manual intervention and duplication of data and effort. The research team had collected the evidence of sample OMR sheets which were being used by BU for the process of admission approval and pre-examination process, Coding and decoding of answer scripts, for valuation and scanning of OMR marks awarded by the valuers etc., to name a few. The audit observation had been addressed by BU as BU had implemented the OMR and scanning of OMR sheets, online student approval. Thus the streamlining of valuation process is mainly due to the impact of the audit.*

### **3. Integration of functional wings (examination and academic)**

The delay/duplication of work, by BU in implementing in-house software called '3i Software' to capture student/course data failed to carryout additions/modifications to the code lists in the examination software resulting in mismatches in codes which affected data reliability and increased the risk of wrong generation of results. The deficiencies in the software made it impossible to share data across campuses/sections.

*Consequent to audit, online admission process were introduced. It was stated that the students information are uploaded by the college and admission approval of the student by the University is also made online and register numbers are generated along with the fee details. The collection of internal assessment marks from the colleges is through web based applications with college's user id and password.*

*Further, BU website had been developed and implemented by an outsourced agency "TALISMA" and the result declaration (free of cost) through four different websites viz., indiaresults.com, schools9.com, bharatvision.com, attristech.com. Thus the audit objection was being addressed by online web based process.*

# Input Controls

## 4. Procedures for student registration

Colleges issued admission cards to those students whose admission approvals were pending, by assigning registration numbers on their own (by adopting the next number of the series allotted to the college/centre).

400 students from 66 colleges were allowed to appear for fifth semester examination of B.C.A course held in November 2008, though they were ineligible as they did not clear first and second semesters. Two unregistered students whose profiles were not in the database were allowed to appear for the II and VI Semester examinations by two colleges. The result not processed due to non-receipt of internal assessment marks. Five cases of wrong allotment of registration numbers (B.Ed) resulting in mix-up of marks/candidates. This caused delay in announcement of results and subsequent re-work for correction.

*The pre-examination module has been made online wherein the student's examination details are collected through colleges including the fees to be paid by them. This information is used to generate admission tickets and registration of students as it certifies the genuineness of the student. The admission tickets are downloaded by the colleges online. Also an **Examination Ordinance 2011** introduced would attract penalty from the colleges for any delay in submitting the IA marks. Colleges are now issuing photo admission tickets with online verification of student registration and a penalty clause for any delay by the colleges also introduced.*

## **5. implementation of computerized coding/ decoding**

In order to maintain confidentiality and also to rule out manipulations, answer scripts were to be coded before sending them for valuation and decoded on its receipt after valuation. As per rules, the coding using the software was to be done after completion of examinations and receipt of absentee forms (A Forms). Partial and incorrect usage of computerized coding and continuing the manual process carried the risk of malpractice.

*Coding and de-coding introduced as the answer scripts are scanned by printer cum scanner. The student information and marks awarded are captured in OMR. Coding through the system outsourced and being carried out for the UG/PG courses. Incorrect entry of marks after decoding ruled out as the OMR sheets are being scanned for the marks. The pre-examination process such as registration, admission ticket generation & capturing valuation data through OMR is automated by BU, as per audit recommendations which had resulted in considerably reducing manual intervention.*

## **6. Duplicate Marks cards**

Marks cards with the same serial numbers were found against different candidates who had appeared for different exams from different colleges. The serial numbers available on the marks cards issued were also not matching with the details recorded in the database. Hence, there was high risk of manipulation/misuse of marks cards was difficult to detect.

*This issue has been addressed by BU and as per audit suggestion, the photo marks cards are introduced from 2009 onwards and the serial numbers are generated through the software. The serial number printed on the Marks cards is continuous taking into consideration the last number printed by the printer previous order.*

*These issues have been addressed by introducing the photo marks cards with serial number generated automatically.*



## **Detective Controls**

### **7. "Double data entry" of marks**

Not implementing the facility of OMR/OCR and had retained the manual data entry model. In order to ensure 100 per cent accuracy, the package provided the facility of 'double data entry', which required input of the marks scored by each candidate twice, by two different data entry operators. The inbuilt facility of the system to compare these two entries by generating a 'Mismatch Report' and errors reported, had not been utilised prior to the processing of results.

*The mark is uploaded after the data is scanned through OMR sheets, thus manual data entry is eliminated and this also eliminates manual tabulation and human errors.*

## **General Controls**

### **8. Batch controls**

The receipt and issue of blank marks cards not monitored as no registers were being maintained to tally the receipt of blank marks cards and issue of printed marks card. No account was kept for the marks cards destroyed, lost or misplaced, for verification. As a result, provision of serial numbers in the marks cards has lost its relevance for control purposes and there was no mechanism in the software to insert system generated numbers in marks cards so as to verify the genuineness of the marks cards at a later date.

*This has been addressed and photo marks cards are introduced from 2009 onwards and the serial numbers are generated through the software. The printing of marks card had been outsourced and the serial number printed on the Marks cards is continuous taking into consideration the last number printed by the printer previous order, alongwith barcode.*

## *Conclusion*

The analysis of the examination data reflects a positive correlation between the audit comments and the impact as assessed with reference to social objectives, e-Governance and G2C aspects of the individual audit comments.

Largely, Examination wing of Bangalore University has adhered to the audit observations and incorporated the suggestions and delivered the same to the stakeholders being the students. The initiative had been taken by BU in formation of an e-Governance Department to oversee the functional activities including computerisation. Manual intervention being one of the major audit observations had been substituted by automation, by introducing OMR sheets for coding and valuation, to improve the delivery of services to students. Further, BU had implemented the G2C initiative by incorporating the Examination portal on its webpage and also by accepting and addressing the grievances of the students online through internet.

A detailed study can focus on the other aspects of the initiatives viz. System Administration, Database Administration, Security, Third Party certification, Disaster Recovery Planning etc., which can be achieved through a regular follow up audit.