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Reforms In Examination System In Shivaji University, Kolhapur Though Use Of ICT

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Abstract:

Examination and evaluation process is an integral part of Higher Education Institutions. Examination is one of the major tools to evaluate the knowledge, understanding and learning of students. The gross enrollment ratio has significantly increased in the last couple of decades. Also the courses offered by HEI, Universities are also increased considering the market needs. As a result of this the traditional examination system of HEI has become quite complex and complicated. The major task before HEI is to conduct flawless and fair examinations within stipulated time and limited resources. There is only one solution to overcome the difficulties before HEI is effective use of ICT. The technological solutions in examination processing system at Shivaji University, Kolhapur reduces the difficulties in processes as well as increases the security, integrity and smoothness in the major examination procedures by implementing technological recommendations made by the Expert committee.

Keywords: *ICT, Resource Management, Higher Education, SRPD, Grievance Handling*

1.0 : Introduction:

In Maharashtra serious concerns have been expressed on various allegations regarding leakage of university examination question papers. The question was raised by stakeholders about the capability of Universities. The negative image being portrayed by the media about the capabilities of Universities. Various universities were following different methods and procedures for conduction of examinations and evaluation. Which causes even practices and also adversely impacts on further career as well as academic benefits. Hence the state government of Maharashtra decided to take immediate action to set up a reliable system and establish common practices amongst the universities in Maharashtra. The Government of Maharashtra had formed an experts committee

under the chairmanship of secretary, IT , Government of Maharashtra in July 2012. The committee studied all non agricultural Universities in Maharashtra. The Shivaji University, Kolhapur established in 1962 was one of them. The committee made technological recommendations as well as academic interventions , resource allocation, cost benefit analysis etc for the smooth conduct of examinations. The Shivaji University, founded primarily to cater to the regional aspirations has now geared up to transcend this regional image and is emerging as one of the premier institutes of higher education and research in India. The University smoothly conducts about 170 examinations per year of about 190384 students. The University provides an education in the areas of Science & technology, Commerce & Management, Social Sciences, Languages, and other interdisciplinary courses, etc by offering UG, PG, M.Phil., and Ph.D. programmes. In addition, the University has high-end instrumental facilities such as TEM, XPS, XRD, etc. for conducting breakthrough research as well as cutting-edge technology. Due to its high quality academic and research excellence, many credentials have been received by the Shivaji University and it is still progressing with the unique contributions in the various fields of education. The Shivaji University has its jurisdiction in 3 districts namely Kolhapur, Sangli And Satara. The 290 colleges are affiliated to the University. The Shivaji University ranked first in Research output in Materials Science amongst Indian Universities as mentioned in Current science 2016 and Global for collaborations. Efficient IT based Accounts Code admired by Hon'ble Chancellor and adopted by majority of the universities in the state through Govt. of Maharashtra. The University is having State of art Data Centre

2.0 : Statement of the Problems:

The Universities in Maharashtra are facing the problem of skilled and techno savvy man power. The demands of all stakeholders are increasing along with the expectations. The conduction of flawless examinations has become a hercules task before the Universities considering the limited and adequate skilled man power and technology constraints. Shivaji University is one of the reputed state universities offering traditional as well as professional education programs in the field of Arts, Commerce, sciences, Engineering, Technology, Pharmacy and Management. The government of Maharashtra has accepted the Rajesh Agarwal Samiti report on reforms in Examination system in Universities of Maharashtra through use of Technology. The State government has directed all universities in Maharashtra to follow and implement the recommendations suggested by the committee.

This study is intent to answer following research questions:

1. What are the recommendations made by the state Government Of Maharashtra.
2. How technological recommendations have been implemented in Shivaji University?.

3. What are the problems and prospects in implementation of technological recommendations ?.

3.0 : Objectives of the Paper:

1. To study the technical recommendations of Rajesh Agarwal samiti.
2. To study the present status of Secured Remote Paper Delivery System in Shivaji University.
3. To identify the challenges faced during the implementations of Secured Remote Paper Delivery System .
4. To provide suggestions for the implementation of technical recommendations of Rajesh Agarwal samiti.

4.0 : Research Methodology:

4.1 : Procedure of Data collection:

The data was collected through the following procedure.

a) Primary Data:

The primary data will be collected through field survey and through the use of Focused Group interview, discussion and observation techniques. The researcher has interacted with the Head of sections, Administrative staff , students , Directors Board of Examination and Evaluation, Information Technology coordinator and software experts in Shivaji University , Kolhapur. Also the data was collected through personal interviews.

b) Secondary Data:

Secondary data was collected from the database, books, university references and publications, journals, articles, magazines, handbooks, newspapers, primary reports of examination departments and institutions, using reference books available in Balasaheb Khardekar Library, Shivaji University Kolhapur. The researcher also visited the Information Technology cell, Examination department for the purpose of collecting references, similarly, use of the internet and website related to ICT , Higher education development. The Photocopy system reports was considered for the research purpose

4.2 : Methodology of study:

The researcher followed an approach that was systematic and collaborative in nature. In this study, the approach consisted of distinct phases yet tightly integrated for achieving the targeted outcomes. The key phases of the study included:

Phase 1 - Study of previous practices in examination processes at shivaji University

In this phase, the researcher has studied the traditional method of conducting

examinations, inviting applications from students, collection of question paper sets, mechanism of question paper setting, method of distribution of question papers.

Phase 2 - Study of Rajesh Agarwal samiti report

In this phase, researcher have studied the actual recommendation of Rajesh Agarwal samiti.

Phase 3 - Study of newly designed and implemented system and its impact

The researcher has studied the newly implemented business process to conduct examinations, record keeping, distribution of question papers. The actual working of ICT based application process. And also collected the statistical information about the traditional as well as modified ICT based application.

Phase 4 - Study of effectiveness, benefits, drawbacks of system

The researcher has studied the benefits, effectiveness and limitations of newly implemented processes.

Phase 5 - Analysis and conclusion

The researcher has analyzed the collected data, calculated the outcome and conclusion of revision.

5.0 : Scope of the Study:

5.1 : Geographical Scope:

This study was conducted in Shivaji University, Kolhapur of Maharashtra state

5.2 : Topical scope

With reference to topical scope concern, this study was focused on Rajesh Agarwal samiti Report on Reforms in Examinations system particularly in Shivaji University, Kolhapur

5.3 : Time scope

The estimated time for this study was considered from 2020 to 2023.

5.4 : Analytical Scope

The collected data has been analyzed with the help of statistical tools and computer softwares like SPSS, MS EXCEL, online randomizer for the fulfillment of objectives set out

5.5 : Functional Scope

The functional scope was confined to offering a set of meaningful suggestions aimed to implement ICT in the higher education institutes to conduct flawless, secured examinations. Also combat the leakages of question papers during the distribution process, to eliminate the threats and challenges faced in distribution and delivery of question papers to respective institutes.

6.0 : Limitations of the study:

1. This study is focused on Rajesh Agarwal Smiti's technological recommendations specifically recommendation number 4 i.e. SRPD only. These recommendations may not be as it is applicable to the other HEL.
2. The processes implemented can't be the solution to all the issues related to leakage of question papers in the University. ICT can aid in curbing many irregularities and can overcome major repeated work. However, inculcation of strong ethical and moral values in Human beings are more important.
3. This study is concluded from the data for the year 2020 to 2023. The suggestions may not be applicable as technology changes rapidly. The new upcoming ICT technologies, AI may give better solutions than suggested.

7.0 : Review of Literature:

1. **Snehi, N. (2009).** ICT in Indian Universities and Colleges: Opportunities and Challenges. *Management & Change, 13(2)*. studied the ICT implications and concluded that ICTs in higher education has profound implications for the whole education process ranging from investment to use of technologies in dealing with key issues of access, equity, management, efficiency, pedagogy and quality. In this regard the paper addresses the opportunities and challenges posed by integration of ICTs in various aspects of higher education in the present scenario. The paper argues for addressing the issues through formulation of policies and strategies to accrue following potential future developments in ICTs and to integrate them in education sector to transform higher education
2. **A Report** on Reforms In Examination system in Universities of Maharashtra through ICT in 2012 under the chairmanship of Dr. Rajesh Agarwal samiti concluded that Information and communication Technology (ICT) should be effectively used for management of examinations in Universities to usher in greater efficiency, transparency and reliability.
3. **Sukanta Sarkar (2012).** The Role of Information and Communication Technology (ICT) in Higher Education for the 21st Century explains that Applications of ICTs are particularly powerful and uncontroversial in higher education's research function. Enhancing and upgrading the quality of education and instruction is a vital concern, predominantly at the time of the spreading out and development of education. ICTs can improve the quality of education in a number of ways . The researcher suggests that ICT in higher education is not a technique for educational development but also a way of socio-economic development of the nation.
4. **A National Policy** on Information and Communication Technology (ICT) In School

Education (Ministry of HRD [GOI], 2012) earmarked the thrust areas in Indian Schools for the use of Information and communication technology . The policy declares ICT for skill development, ICT for children for special needs.

5. **A IT policy** and guidelines clears the availability of IT infrastructure in Shivaji University campus. Also it clears the role and responsibility of users.

8.0 : Results and Discussion:

The Rajesh agarwal samiti submitted a report to Government of Maharashtra regarding reforms in examination system in Universities of Maharashtra through use of technology. The committee conducted activities like understanding the present scenario of university examination, key issues and challenges faced in the examination system in universities. Also studied best practices across India on implementation of examination management systems. The committee recommended technological, academic reforms , resources allocation etc for smooth execution of University examination. The committee identified the core benefits, analysis of the proper solution. The committee recommended solutions to all state universities in Maharashtra.

The researcher has studied the Before and After methods / procedures / facilities followed in Shivaji University, Kolhapur

SR No	Recommendation	Before method / procedure / facility adopted before recommendation	After Method / procedure / facility adopted after recommendation
1	Effective end to end use of ICT for reforms in Examination	Most of the work related to the examinations was carried out manually like as collection of exam form , filling , downloading required testimonials etc	Web based Inhouse module developed Named EPS (examination processing System) to carry out various procedures like as registration, exam form collection , hall ticket distribution, summary analysis, CAP arrangements, Marks data entry, ledger processing and result display
2	Online student registration for examinations to issuance of hall ticket	Foxbase isolated software was in use and not supported all students related activities	

3	Question bank / question paper bank creation	Question sets was collected manually and stored in physical forms	Rendered Services for software regarding creation of question sets, secured remote paper delivery system through software
4	Secure delivery of examination papers	Papers were send physically to all respective examination centers by road transportation	
5	OMR and barcode technology in cover page of Answer sheets	NO OMR and barcode technology on cover page of answer book Only pilot project was carried out	Not implemented
6	Barcode in each page of the answer booklets.	Bar code in each page of answer book. Only pilot project was carried out	
7	Digital scanning and onscreen evaluation	Answer books evaluation done by teachers manually. Scanning of Answer books is carried out in reevaluation / photocopy cases	
8	Result processing and publications	Processing of result was carried out through system and distribution was manual mode	Processing , Publication and distribution is carried out through University EPS system
9	Online application for Re-evaluation	Manual method was carried out to carry out reevaluation, Photocopy, Re Verification etc methods	Online Inhouse web based application is developed and used to carry out reevaluation, Photocopy, Re Verification etc methods

10	Dematting degrees and certificates.	Manual record maintenance, less security features, No facility to trace out fake / false certificates	Digitalised record keeping done, Online utility to provide data for NAD
11	Other technologies for reducing malpractices.	Question paper packets were ordinary packed and sealed with adhesive tapes	Tamper evident security tapes are used to detect tampering of physical packets
12	Use of IT for teaching learning practices	Limited IT infrastructure was available	Total campus is connected with LAN. Also University provided assess of NMEICT, NKN etc , Audio visuals , IT aids , software are provided to teaching faculty
13	Data center facilities.	Data center is already available	Data center is already available
14	Physical security measures	Only physical infrastructure requirements was observed for examination centers	Physical Infrastructure as well as ICT facilities are made mandatory for examination centers , CCTV, LAN, Internet, Desktops , UPS are made essential to conduct examinations

15	IT related capacity building and handholding support	Use of ICT was limited so training, mock drills and handholding support was very limited.	System awareness training, Workshops, role based training, technical training etc is provided to staff and stakeholders. Competent Manpower recruitment done in the Computer center of University. Training to paper setter , paper chairman , CAP directors , Office Staff and teachers is provided
16	Decentralized, Customized, Interoperable software rather than Centralized solution.	Window based, scattered software applications in bits and pieces were available. Many operations required skilled manpower, person dependent procedures. Causes slow performance and limitations of geographical parameters.	A student centric, Decentralized, Customized web based application is developed by University to cater the examination process needs
17	Hardware and software updation with latest versions	Very limited internet connectivity , ICT resources with older versions.	Updated with cutting edge technological infrastructure. Newer versions of antivirus , operating system and other licensed software purchased
18	Quality and cost based selection of IT solutions.	Only cost based selection criteria was adopted in most IT solution purchase methods.	Quality cum cost based selection method is used to select service providers for IT services.

Table 1.0 - Present status of technical recommendation of Rajesh Agarwal Samiti Out of 18 technological recommendations Shivaji University kolhapur has implemented 15 (83.33%) recommendations. Whereas recommendation number 5, 6, 7 are not implemented.

The following Figure 1.0 shows the data flow chart for Secured remote paper delivery system used in Shivaji University, Kolhapur

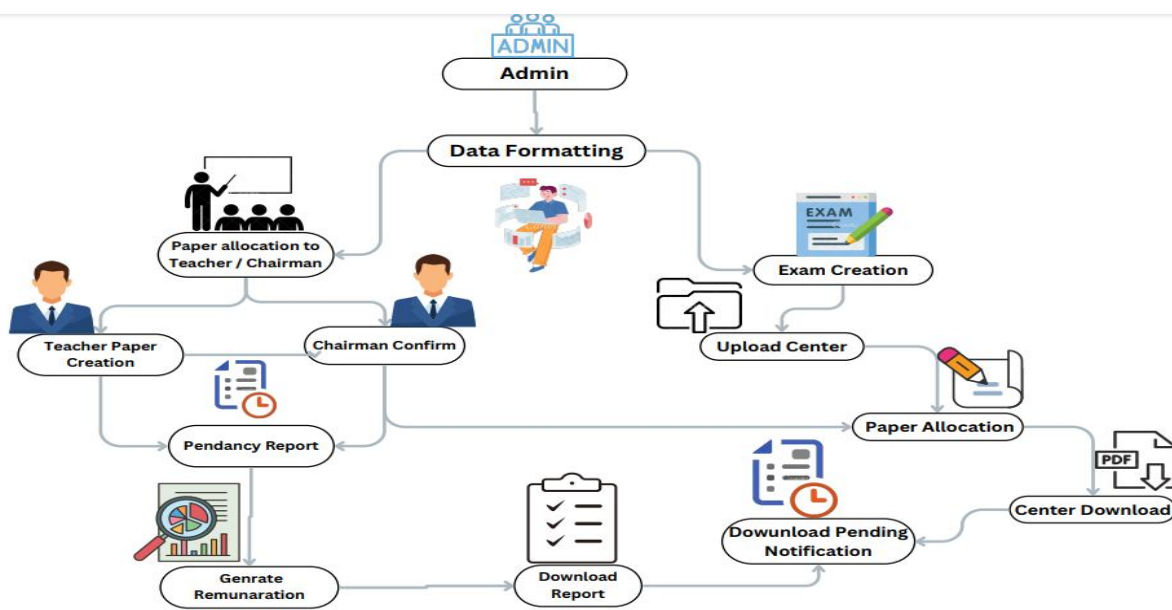


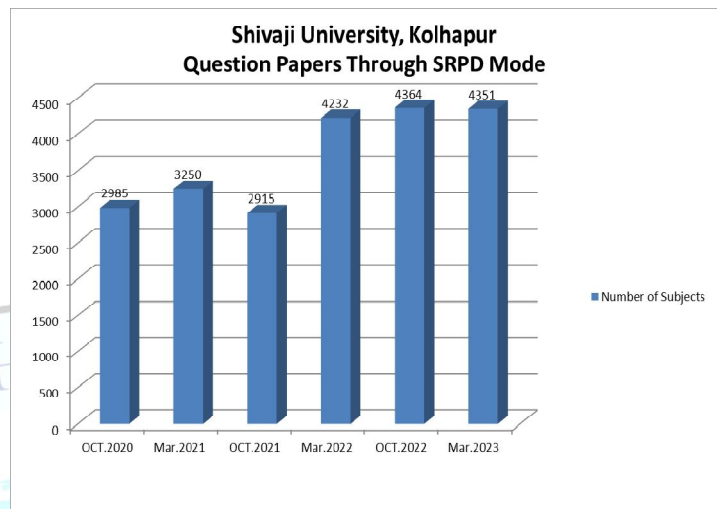
Fig. 1.0 SECURED REMOTE PAPER DELIVERY SYSTEM MECHANISM

Source :- Shivaji University Appointment Section SRPD Manual 2023

The above data flow charts clears the detailed mechanism adopted in setting and delivery of question paper sets at respective examination centers under Shivaji University, Kolhapur. Here the paper allocation (appointment of subject experts) is done by examination section and creation of question paper sets is carried out by respective appointed subject experts. The created set was verified and approved by the chairman (sr subject expert) appointed for the respective subject. Once approved, stored in the question Set bank. The working various reports are made available to the respective section to smoothen their administrative work. The creation of examination is carried out by the system itself as per the time table data fetched for the EPS system. The respective question paper sets will be allotted to the respective examination and will automatically be delivered through the system by decryption and encryption technique in support of other security measures.

The following Table 2.0 Shows the event wise number of papers sent to all affiliated institutions via SRPD.

Exam Event	Number of Subjects
Oct.2020	2985
Mar.2021	3250
Oct.2021	2915
Mar.2022	4232
Oct.2022	4364
Mar.2023	4351



Tab 2.0 The number of event wise question papers (sets) sent through SRPD.

Source :- Shivaji University, IT Cell Report

The University started the SRPD system in 2012. Initially only engineering faculty was taken as a pilot project. Afterwards the number of examinations and courses was progressively increased. During the covid19 pandemic situation, the nature of examination was changed. University authorities have taken the decision to conduct examinations in Online mode with MCQ pattern. Hence the data from Oct 2019 to Mar 2020 tenure is not considered for SRPD project. The table 2.0 clearly shows that the number of subjects in SRPD mode is progressively increased, almost doubling in 6 events in 3 years.

The details of paper leakage cases reported during the SRPD implementation period is as below:

Exam Event	paper leakage cases reported	Exam Event	paper leakage cases reported
Oct.2020	0	Mar.2022	2
Mar.2021	0	Oct.2022	0
Oct.2021	0	Mar.2023	1

Table 3.0 The details of paper leakage cases reported (Source - Shivaji University, Appointment section)

9.0 : Findings

The Shivaji University followed the option of creation of a Question paper set instead of a Question bank. The question papers are encrypted and once randomly selected by the IT system itself. The selected question paper sets transmitted over a secure channel in the scheduled time slot i.e 1 hour before examination. The system provided facility to decrypt the question paper set and only authorized persons can obtain the papers through high end security measures. The tracking of question papers through a surveillance system is possible. The system provides question paper downloading logs for every subject. Also having the ability to deliver multiple sets of question papers at the scheduled time of examination. The SRPD system assures in time and smoother delivery of question paper sets.

In the detailed study of the secured remote paper delivery system at the examination section of Shivaji University it is observed that there is remarkable increase in the SRPD system. For Oct 2020 event 2985 subject papers are sent through the system and 8.9 % hike march 2021 event. There are incremental changes in use of SRPD system and reach up to 45.8 % hike in march 2023 examination.

Table 3.0 shows the number of paper leakage cases reported during 2020 to 2023 October and March events. There are only 3 cases that have been reported as paper leakage. But it is observed that after going through the deep investigation it is observed that the leakage of paper was not from the SRPD system. The said cases happened after delivery of question papers. The cases reported were caused due to human misconduct.

Also during the study it is observed that recommendations number 5,6 & 7 are not implemented by University. They are closely associated with question papers and evaluation methods. The partial implementation of recommendation causes the difficulty handling the issues related to evaluation. Due to adopting the method of Question paper set generation instead of question bank, the leakage of the total set is possible.

10.0 : Conclusion:

On implementation of the SRPD system, question papers are generated and selected directly by the IT system a few hours before the examinations. Therefore, issues related to the setting of question papers like leakage of question papers, printing errors etc are greatly reduced. The requirement of experts on the day of examination during examination paper generation is eliminated.

The transportation, In person presence of subject experts is not required. Which results in the cost of saving in terms of money and man hours. The SRPD system eliminates the major threats and challenges faced in distribution and delivery of question papers to the respective institutes. But still

partial implementation of technical recommendations does not eliminate the issue such as leakage of question paper, In time evaluation, reveal of identities.

The overall impact of SRPD implementation is Increased Efficiency, Maintained Confidentiality, Brought Cost Effectiveness, Nullified Subjectivity, Implemented Digital Initiatives, Reduced Timeframe of Result Declaration, Addressed Shortcomings of Human Resources and Enhanced Accuracy.

11.0 : Acknowledgement:

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11.0 : Glossary:

HEI - Higher Educational Institution

ICT - Information and Communication Technology

Revaluation - Re-assessment of checked answer books on demand.

SRPD - Secured Remote Paper Delivery System

AI - Artificial Intelligence

NAD - National Academic Depository

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