E-Governance Standards and Policies for Public-Sector Universities of Pakistan

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Summary
Input here the part of summary. In supporting organizational development and sustainability, information technology (IT) has become essential. Universities are one of those types that are more dependent on IT having a heterogeneous technological infrastructure that turns e-governance into a real challenge. Effective and efficient e-governance is needed for university teaching and research processes so that universities remain competitive. E-governance includes the identification and implementation of the highest-level structured practices in an enterprise involving systems, procedures and relational frameworks to create business value from IT investments, as practiced in virtually all top-level universities in the world. Universities in third world countries, however, cannot identify these standard practices and structures and enforce them. At Pakistani public universities, the rate of adoption of such structures is quite small, superficial or limited in scope. To address these issues, we recommend using control mechanisms to promote adherence in higher educational institutions to enforce IT governance. The model will be developed with the correct mechanisms defined by public universities of high rank. We plan to contribute with the guidance for effective and efficient e-governance with a framework that has frameworks, Processes, and mechanisms related to universities in the public sector. In addition, in the form of the Times Higher Education (THE), QS and Shanghai World University Rankings, in general, of the best public universities in the world, contributions to the body of knowledge on the implementation of control systems such as COBIT, ITIL and ISO / IEC, considering relative and challenging variables.

Keywords:
E-governance; Public Universities; Control Framework, University Ranking

1. Introduction

From E-Government means introducing ICT; e-Governance, on the other hand, means running a country or entity to develop work with the aid of ICT [1]. E-Governance system has several benefits over manual or traditional models. E-Governance is not just a combination of software and hardware as a normal computer-based system, it is a combination of people and processes.

As is the case in most organizations, IT becomes part of an institution of higher education. The challenge is how IT governance can be understood and the governance structure can be implemented that is expected with IT potential. Good governance characteristics are generally referred to as university management and stakeholders (students, staff, the public, etc.) can see how ICTs can drive change towards good governance in HEIs [2]. Institutions of higher education represent a diverse group of groups. This paper will explain and appreciate multiple phases that can enable universities to introduce e-governance successfully.

1.1 University Governance

Universities are the backbone to impart higher education, regardless of other organizations Universities are complex in operational nature [3]. Most of the developing countries like Pakistan, since last decade or so higher education governance issues has gained importance, however, despite some efforts the issue has never really been given proper attention; usually universities impart education for postgraduate and research degrees, following are standard stakeholders in organizational and management of the public universities are as follow; statutory bodies and top management chancellor vice-chancellor, senate, academic council, administration officers, registrar, controller of examination, finance, academic administration, deans, departmental heads, board of studies Fig-1 illustrates the traditional governance model in public sector universities of Pakistan. [4].

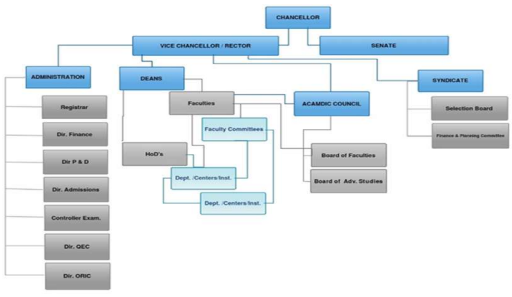

Fig. 1. Governance structure of the Universities of Pakistan

Manuscript received November 5, 2025
Manuscript revised November 20, 2025
https://doi.org/10.22937/IJCSNS.2025.25.11.13

2. Literature Review

The Concept of e-government started in the early 1990s. E-governance in Pakistan was introduced in 2002 [5]. As we know that the Government system is fixed, and the web is dynamic, flat and unregulated. E-Governance brings more transparency and faster services for both frontend and backend applications. With the help of ICT, the culture of transparency, efficiency in routine work and accessibility of services anywhere and anytime. In this globalized world, e-government has become one of the prerequisites for good governance and is an important milestone. Scholars have developed various models of it consisting of stages from 2 to 6, e.g. Model Layne and Lee in the United States, Model Andersen and Maturity Model Henriksen in Denmark. Regardless of the various models of e-governance, the main goal and intent is to increase government productivity and outreach across all private and government sectors. E-governance has evolved over four levels, including involvement, communication, transaction, and transformation. A country such as Pakistan has to go through its fully developed phase of transition. [6] The higher education sector in Pakistan is predominantly public in nature, with public institutions of higher education (HEIs) governing both the University / Degree Awarding Institute (DIA) and colleges (Table .1).

Table 1: Number of Public and Private Sector universities

Year	*Public Sector HEI's*	*Private Sector HEI's*	*Total*
2000	42	35	77
2006	57	59	116
2012	60	74	134
2018	110	83	193
2019	120	85	205

Pakistan's Science and Technology Development Corporation established for development in the area of technology. In 1988~93 science and technology funds considerably increased to meet the requirement of the time [8]. The government realized the importance of the policy and started working for the formulation of technology policy. The first National Technology Policy and Technology Action Plan approved in 1994. The Technology Policy emphasized R&D, established Human Development Program, sandwich-type Ph.D. programs, new universities and new projects [9]. A committee constituted to review the progress of Science and Technology in 1996. Researchers are addressing the issue of higher education ICT integration and suggesting that policymakers and teachers can play an important role in this dimension.

3. Methodology

University, as Pakistan's highest educational institution, is expected to be a role model for good university governance. In higher education, the effectiveness of ICT applications is based primarily on technology infrastructure, knowledge infrastructure, and organizational infrastructure. Various activities are carried out in each functional area. The processing of these areas needs information that is common. It is shared with the help of communication tools. Sometimes the processed information may be required by the other departments for further processing. This can also be shared by ICT tools. Some general activities in these areas are identified [10].
An integrated system can enable the governing body to analyze the performance of the individual and the institute. The analysis can be used to motivate individuals to perform better and reduce the gap between the highest performing people and staff with low performance. This may lead to develop employable students [11]. The Table 2: shows Phases of E-governance implementation in Public-sector HEI's:

Table 2: Phases of E-governance implementation in Public-sector HEI's:

Policy document	*Year of initialization*	*Policy document*	*Year of initialization*
No Infrastructure	1947	Committee of National Commission for Science and Technology Policy	2000
Science & Technology Policy	1984	Draft National IT Policy	2008
Science and Technology Fund	1988~93	National Science, Technology and Innovation Policy	2012
National Technology Policy & Technology Action Plan	1994	Draft National IT Policy	2016
Review Committee	1996	Digital Pakistan Policy	2018

Public Universities' automation process is generally depending upon the availability of funds and trained IT professionals. organizations' web presence provides appropriate information accessible publicly [12]. e-Governance implementation has been done through phases, however, these phases are symbolic and not limited depending upon the specific requirements of the University. In some cases, processes can be trailer made. **Fig:** 2

illustrates the phase-wise implementation process of e-Governance in public-sector**.**

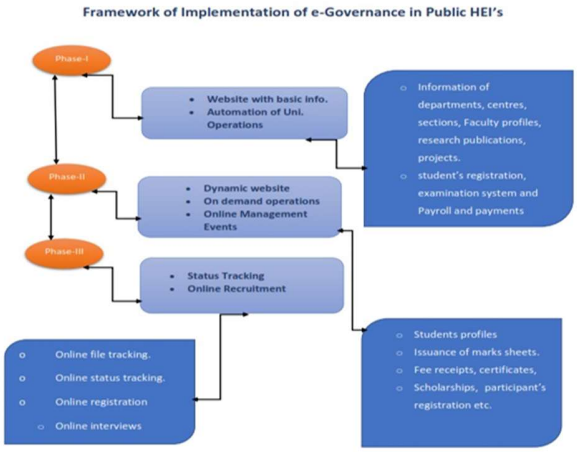

Fig. 2. Proposed framework of e-Governance in Public-sector HEI's

Phase-I: This is the foundation phase of the e-governance ecosystem, which provides information about activities of University available online other phases are also entirely dependent on the quality of automation acquired in this stage.

- *University website:* The website is the basic tool to provide basic information of the University and the concerned departments for one-way interaction with the general public.
- *Automation of University Operations:* All the fundamental operations of the university can be accessible to disseminate information internally with static electronic means.

Phase-II: The goal in this phase is to provide users with the specific user information that may be required. This phase requires user queries and information needs to be supported by databases. A university can be in this e-governance phase if the system can support activities such as individual student results and mark sheets, individual staff members ' payslips, user-specific course syllabus, formats and formats, specific guidelines and policies, minutes of academic bodies meetings, etc.

- *Dynamic University website:* The content on the university website shift from administrator driven to user-driven.
- *On-demand Operations*: Electronic communication and data exchange facilities distribute internal processes; university departments become more open, responsive and accessible for the public as a result of online interactions and processes.
- *Online Event Management*: The day to day activities and various events organized by the University like workshops, conferences, seminars, annual day, etc. can be published online so that information conveyed to the participants reside outside the University.
- Phase-III: The goal in this phase is to provide a mechanism that allows users to interact with the system without having to visit any office in person. This process includes the integration with the existing system of external systems such as the payment gateway. A university may be in this phase if the system can support activities such as online admissions and application forms, user-initiated editing and profile updates, online fee payments, student profile correction, feedback, status tracking, etc.
- *Status Tracking:* The University deals in several activities which involve a number of departments and section of the University. Such processes require information and input from concerned sections. Hence, it becomes important to integrate different systems together to accomplish this task.
- *Online Recruitment:* Time to time, the University employs many men. The online system can provide quick access to all stakeholders across various departments and parts of the University involved in this process Dynamic University website: The content on the university website shift from administrator driven to user-driven.

4. Conclusion and Recommendations

Many institutions of higher education have benefited greatly from the introduction of e-governance systems. They were able to be transparent, convenient and efficient in their processes. But it comes with a cost. There are a number of challenges and concerns. It is necessary to tackle these challenges. Higher education institutions should accept emerging trends and innovations in this changing world to keep up with all stakeholders ' expectations. In this paper, we identified some of the issues and challenges in a higher education institution's planning, execution, and implementation of an e-governance system. The easier and better it is for the institution the sooner an organization introduces an e-governance system. We have identified some of the main operations and the phases in which they can be conducted. For the identified institution, we listed some of the major E-Governance related initiatives and divided those activities into three different phases. It can be said that if the institution identified follows these general guidelines, it can plan, implement and

implement an efficient and effective e-governance system. Public-Sector Universities (PSUs) are operating under the umbrella of Pakistan's Higher Education Commission (HEC) and Provincial Higher Education Commissions. However, HEC mainly providing basic ICT services and infrastructure. The research investigates the importance of specific factors affecting the adoption and use of e-Governance in public-sector universities of Pakistan. however, this system implementation comes with several challenges and issues which need to be addressed. Specific issues and challenges highlighted in the implementation of the e-governance system in Pakistan's public-sector higher education institutions. The proposed framework and phases can be supported the university activities which can be carried out for standardized adoption of e-Governance infrastructure and services for an effective and efficient E-Governance system.

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