

Original Article

Digital Transformation of the College Education Department: A Challenge

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Abstract

Digital transformation has been a topic of priority for almost all sectors. The publicly owned sector is not exceptional. The initiative for the digital transformation of the College Education Department Govt. of Sindh was intended to improve the performance, efficiency, and consistency in the execution of routine business affairs. Bringing the organisational change specifically for its development intent was full of challenges from conceptualisation to execution. The Kurt Lewin 3-Stage Model for organisational change was applied to challenge the Siloed decision-making process, making the system move out of its comfort zone, the old legacy, the culture, inadequate financial resources, and the digital skilled human capital deficiency. The digital transformation execution process was conducted to align with departmental outcomes. Today, the department maintains a transparent communication system at all levels. Despite the challenges and impediments, the system has been successfully implemented, benefiting the employees and students. The process of digital transformation has practical implications and long-lasting effects on the effective and efficient execution of educational procedures and the appraisal of performance. In this research future avenues of digital expansion with a more secure and synchronised system has been identified.

Keywords: Digital transformation, College education, Kurt Lewin model, Organisational change

1. INTRODUCTION

Digital transformation has been a topic of priority for almost all sectors. The publicly owned sector is not exceptional. The initiative for the digital transformation of the College Education Department Govt. of Sindh was intended to improve the performance, efficiency, and consistency in the execution of routine business affairs. Digital transformation can be conceptualised as the combination of digital technology and all-encompassing areas of an organisation, which eventually causes changes in the execution of procedures to render services. Besides this, it is a paradigm shift and an attempt to challenge the status quo, which resists, hinders, and often gets comfortable with failure. The practice sometimes means departing from long-established departmental modus operandi, on which the organisations were based on the procedures that are still being defined. However, the significance of the change heavily depends on the level of commitment of the leadership (Ferro, 2020). An organisation's digital transformation was intended to improve public service, reduce friction, increase efficiency and elevate public confidence. The analyses of the existing conventional approaches, with the intent to transform, revealed varied frictions, as resistance to change has been witnessed for a long in any system.

It was deemed that there is a playbook for digital transformation available. Many people think that easy access and approach to technology can embrace its implementation successfully and quickly. If it was, then why did the earlier initiatives fail? It was not the problem of technology itself but rather the urge, commitment, and dedication required.

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The decision-makers and the executors of the initiatives thought about what digital transformation meant to them, whether it was depriving something or making the business easy for them. It was 100 million questions that required to be answered to hit the perception.

The crescendos of digital transformation in the college education department of the Government of Sindh were similar to any gigantic change program or change philosophy. Every step of observing, implementing, experimenting, identifying, evaluating, and executing required consistent, committed, and determined leadership to make the program successful. It was dismaying that the colleges under the administrative control of the government of Sindh were offering BS programs in computer science, but the execution of official procedures in the offices of the competent authority was based on a long-lasting old legacy. We have the world around, transforming to Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI).

Purpose

A digital transformation is an act by which organisations ingrain technologies throughout their procedures to drive a paradigm shift. The exercise benefits improved efficiency, effectiveness, and time-based services, and it unearths promising value for employees and the public. The Government of Sindh's college education department initiated the digital transformation process to achieve this milestone. The drive was intended to:

- To digitalise the record of all employees and their routine activities
- To digitalise the process of Admission, Enrolment, Examination, and the progress of the students
- To formalise the existing system so that alternative ways of imparting education can be implemented, such as online classes and distance learning programs.
- Create a backup plan to support the system of archiving
- To develop an intelligent, integrated, digitalised system to establish a paper-free organisation.
- Transform conventional practices into green practices

Research Question

RQ1: How can the college employees record and their routine activities can be digitalized?

RQ2: What kind of strategies can be executed to digitalize the Admission, Enrolment and Examination process?

RQ3: How to formalize the existing system so that alternative means of educating students can be implemented?

RQ4: How a plan can be developed to formulate backup plan to support the system security and archiving?

RQ5: What measures ought to be taken to ensure paper free execution of departmental procedures?

RQ6: How the department can transform the conventional departmental practices into the green practices?

Scope

Thematically, the scope of the program was to digitalise the existing system. To transform operational, cultural, and organisational practices. Geographically, the model was intended to be implemented in the College Education Department Govt. of Sindh. The model was successfully implemented throughout all levels and functions.

Justification

The digital transformation initiative was intended to reduce operating expenses and improve work efficiency. Future ambitions can be easily achieved with a unified model across the system. The approach is intended to interact with innovations and the stakeholders. The system was developed and implemented to prepare the department to shape and reshape the potential of the people relevant to the college education department. Besides, digital transformation is also in congruence with the department's vision.

Problem Statement

The journey to digital transformation is unique from organisation to organisation. An organisation

may intend to introduce Artificial Intelligence or maybe cloud computing to augment the quality of services to its stakeholders. Organisations might reshape and redesign their existing modus operandi to serve the people. However, in our case, the agenda and intent were to develop and radically transmute by challenging the status quo. The most critical factor in starting the transformation journey was a new managerial mindset, which was required to develop, observe, change, implement, and evaluate the progress. The department had three essential tasks to accomplish:

- Digitisation
- Digitalisation
- Digital transformation

In the digitisation exercise, the department had to decipher the manually available information into digital form. Thus, the long process of scanning the old documents was mandated. So that the process of digitalisation may be executed smoothly with backup. Meanwhile, in the digitalisation process, the department was mandated to use digital technology to transform its routine affairs into digital accessibility. During this process, the training of the employees to become handy in using the software was also needed.

Meanwhile, digital transformation includes the efforts to implement the system and make the people approve, accept, and execute. It went beyond the model formulation level and affected the department's business procedures. Like most organisations, the college education department government of Sindh also started to realise the significance of technology and the potential it offers for the execution of routine procedures. Most public service organisations, from small to large scale, have brought seismic change as digital and mobile technology penetrated our lives. Today, disruption has become a reality for every sector of publicly owned organisations. New business models and professionalism have replaced conventional approaches. Thus, the manual way of executing procedures has had to adapt. Eventually, the ubiquity of upending the status quo became a boardroom priority because it was a matter of survival. Like every public service organisation, the college education department manually rendered services to the public. The hectic manual system did not allow the routine execution of the business to run smoothly. Besides this, the following issues also existed, which needed attention for a long:

- Delayed Decision
- Legacy Platform
- Budget lacking
- Digital Expertise
- Inadequacy of Technology Resources
- Increased Cyber Security Risk

Research Gap

Although earlier efforts were enthusiastic about challenging the status quo and making the digital transformation business easy, it was required to identify and begin with the problem statement, a well-established opportunity, or an inspirational set of goals. When an organisation cherishes a desire to rally around digital transformation, the effort should have been real. If the people in the organisation have not witnessed a hammer before, one can not demonstrate the hammer in anticipation of doing wonders. The organisation will have to offer them context by introducing them to the hammer to exhibit more meaning and impact, such as making the execution of procedures easier. Making full use of the technologies, intending to produce the desired result and winning the confidence of frontline employees, may not yield the desired results for the organisation. The answering "why" coupled with the level of motivation was anticipated to construct a sense of responsibility and urgency for the change. Despite several efforts toward digital transformation, the college education department did not achieve the desired results. With the intent to identify the causes of earlier failures, the following lauding impediments were found:

- Absence of Managerial Strategy to change
- Unavailability of Complex Software and Technology
- Frequent evolution of the progress
- IT Skills
- Mistrust and lack of confidence

- Skepticism to accept the change
- Cyber Security
- Unconsolidated data

The aforementioned factors had a significant level of influence on the smooth development, implementation, and evaluation of digital transformation. Any effort toward digital transmission received massive resistance from every nook and corner of the system. People being part of the system resisted because they were in a state of risk-aversive organisational culture. Any change challenging their comfort zone was resisted and created more challenges in the smooth implementation of the system. It was not mere technology. Instead, it was also the mindset that resisted too much. The department kept pouring millions of Rupees to digitalise the system, but the success rate was very discouraging. That may be because the earlier efforts were like putting the cart before the horse. Since earlier efforts did not yield the desired results, the department tried aligning the technology investment with its goals. The department relied on learning insider capabilities instead of hiring outsider consultancy. The department heard the scepticism to accept the change.

Research Questions

2. LITERATURE REVIEW

The current global landscape is recognised by the exhaustive use of the Internet of Things (IoT). Technology has transmuted all forms of life to some extent. It has significantly altered every modus operandi of doing business and performing professional activities. However, coupled with the timely flow of information, digitalisation has triggered higher-order efficiency and effectiveness, establishing connectivity and coordination among various sectors of public organisations. It will be worth mentioning here that these tendencies have been considered an indication of establishing an "information society". The concept of information society remained the nucleus of research studies, and fundamentally, through light on its influences on all life features, including health, finance, education, and governance. The strategic indicators of an information society are the skill to employ and orchestrate the information and to develop the human resources having cognitive intellect.

In almost every walk of life, digital transformation and digitisation play a significant role. Owing to the all-encompassing influence of digitalisation on organisations and societies, scholars and professionals are now interested in comprehending the key mechanism behind the challenges. Therefore, there have been significant relationships between technologies and the behaviour of the people using them (Metallo, Ferrara, Lazazzara, & Stefano, 2021). In work settings worldwide, employees keep learning to adapt to the technological demands of their professionalism (Caporarello, Manzoni, & Panariello, 2021). The fundamental and essential components that make the digital transformation successful are people, processes, and stems (Abivin, 2021).

The coherence among all three is essential to make the digital transformation result-oriented. Leadership commitment, Skill improvement, Employee Persuasion, and organisational interaction are essential human behaviours required for successful implementation. Technology alone cannot make the business digital transformation easy. Indeed, transformation requires the positive intent of the people on board (Abivin, 2021). Adopting new technologies does not qualify as digital transformation; instead, it refers to adopting innovative servicing models (Hyseni, 2022). While going for digital transformation, the organisation should have considered all critical factors, from the employees' resistance, friction, and retaliation. Since the digital transformation process influences the organisation's culture and challenges the status quo, the chances of resistance from stakeholders will, therefore, be higher (Ashar, 2021, February 25). Besides several other factors to overcome, the issue of cybersecurity has been considered a paramount challenge and impediment in digital transformation (Ashar, 2021, February 25). The fundamental outcome of digital transformation in the public sector is to generate good data for effective decision-making. However, there is also the chance of generating insufficient data (Rasool & Malik, 2020). Education technology may be disruptive or transformative in education culture today (McGrath & Åkerfeldt, 2019).

The digital transformation process is often an obstacle to well-known and established challenges. For instance, people usually do not want to be convinced to accept change because they want to do things in a way that they have kept on doing (Bhattacharya, 2022). A clear digital transformation strategy is unbelievable (Martin & Xie, 2022). Skilled personnel are unavailable to accept, challenge, train, and

innovate the digital transformation process (Trevino, 2022). The issue of unconsolidated data (Ashar, 2021, February 25). Organisations cannot afford to consider the cyber security afterthought of digital transformation (Zerlang, 2022).

Organisational Change Models

Kurt Lewin's change management model has been considered the pioneer change model. The model describes a three-stage approach to organisational change (Lewin, 1951):

- Unfreeze
- Change
- Refreeze

During the unfreezing stage, the organisation makes and checks the readiness for the change by analytically examining the existing conditions and ways of executing the procedures. To get acceptable readiness, it is essential to identify the level and extent of resistance at this stage of change. This model is instrumental for the managerial leader to manage wide-ranging improvements, even though the unfreezing stage takes time to benefit fully. Because the people in the system to be changed will create resistance to accepting the change, that is why this phase is time-consuming. To prepare the people to accept the change, the process of understanding and comprehension of the existing system behaviour, status quo, the extent of acceptability, the extent of hindrances, and the areas thereof has been carried through this stage. Stereotypical behaviour, compartmentalised ways of perceiving, conventional processes, and old stagnant organisational structures were carefully analysed. During this stage of development, an attempt was undertaken to determine forms of communication to convince the people to accept the change. Since an effective communication mechanism was required during the phase of unfreezing, progressive meetings were conducted to rule out the misperception of change. It frequently communicated with the people about how they would benefit from the change. The motivation behind regular meetings was the logic: "The more we are informed, the more we will be ready to understand the urgency of the change, and the more we are inspired to agree to acknowledge the change."

The unfreezing followed by change is the stage of implementation. Regular interaction, positive reinforcement, and providing quality and authentic information are essential practices to make the transition successful and result-oriented. The unfrozen state of being is often ready to move. At the stage of change, people may struggle with reality. During this stage, it was observed that people are exhibiting their scepticism, insecurity, and anxiety about unknown deprivation. However, they started learning new behaviours, progressions, and attitudes. It was deemed that the more they prepare, the more support they will be provided to make the procedure easy to accept. During this stage, the employees kept reminding the rationales for the change and its benefits once fully implemented.

Kurt Lewin's model of change describes the third stage of change as refreezing. This stage signifies the posture of reinforcing, balancing, stiffing, and stabilising the latest state after change. The shift to the new modus operandi in the organisational structure, objectives, culture, and procedure to serve the people are acknowledged, accepted, and refrozen to constitute the new performing methods. The efforts do cease to continue here. Instead, it further inculcated the newly learned behaviour to form the organisational culture. Recognition and acknowledgement of the individualistic efforts were made, intending that the positive behaviour would likely be repeated.

Digital Transformation in Education

The digital transformation process has reshaped almost all domains, irrespective of any field of inquiry, and the education sector is no exception. The world has witnessed the widespread application of digital technology in educational organisations. The process can offer enhanced efficiency in different areas of education, including educational administration and management. Digital transformation identifies numerous possibilities and offers streamlined interaction and coordination among teachers, students, and educational administration. Besides this, digitalisation can also ameliorate the execution of administrative procedures and policies. It ensures a better working environment.

Despite its several advantages, digitalisation in education is not like low-hanging fruit. Certain hindrances include the absence of an administrative strategy, reluctance to accept change, and deficiencies in pertinent skills. These pretentious factors make a smooth transition from conventional ways.

Digital Transformation in Sindh

The Ministry of Information Technology & Telecommunication Govt. of Pakistan formulated a policy to digitalise its governance processor to smooth the economic prosperity and development of the country (Ministry of IT & Telecom, 2021). Responding to this initiative, the Govt. of Sindh, intending to streamline record maintenance and effective public service, took various initiatives. Govt. of Sindh is committed to creating a paperless environment in its offices (Abro, 2020). The Govt. of Sindh is all set to digitalise the entire system of governance so that transparency may be ensured (Rabbie, 2020). In this regard, the government of Sindh agreed with Microsoft to digitalise the education system (Daily Times, 2022).

Research Premises

Premise 1: Digital transformation of employee records and routine activeties can increase the department efficiency, streamline the process, and easy access to the information

Premise 2: Digital transformation of the admission, examination, and enrollment process can ensure the accuracy, transparency, and accessibility of educational data.

Premise 3: Streamline the prevailing education system to adapt the alternative methods such as online classes and distance learning programs can offer flexibility, accessibility, and scalability in eruditing students.

Premise 4: Developing a robust backup plan for preserving and archiving the system ensures data reliability, integrity, and resilience against probable system failures or data loss incidents.

Premise 5: Establishing a smart digitalized system can facilitate the smooth transition toward a paper-free department.

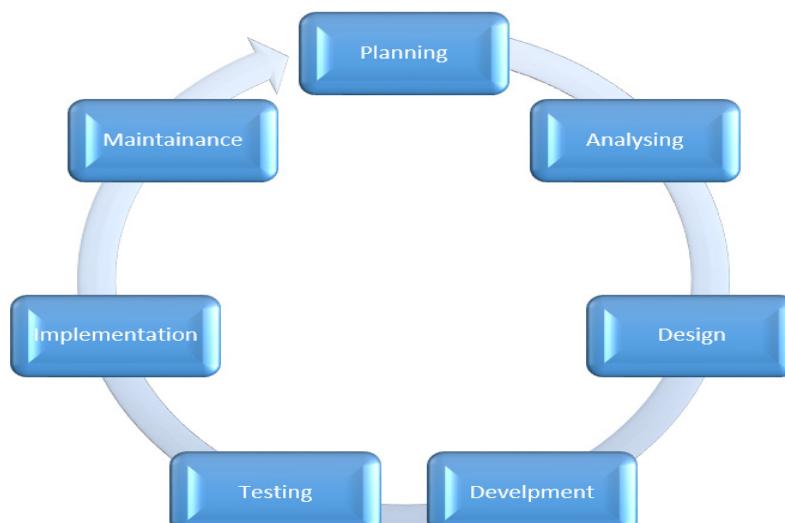
Premise 6: Converting traditional practices into green practices aligns with sustainability goals, condenses resource drain, and ameliorates environmental stewardship within the department.

3. RESEARCH DESIGN

System Development Life Cycle

The project management model results from the system development life cycle (SDLC). According to Preston (2021), the SDLC is 7 stage phases process that includes:

- Planning
- Analysing
- Designing
- Development
- Testing
- Integrating
- Maintenance



Source: Figure 1. Systems development life cycle. Source: Modern Systems Analysis and Design (Hoff, Joey, & Valacich, 2011).

SDLC is a 7-stage process that involves the steps from inception to completion (Preston, 2021). In the college education department, during the planning phase, the following activities were undertaken:

The planning phase of SDLC was undertaken to find out the scope and the problem and identify the probable options to solve the problems. At this stage, an effort was also carried out to plan the system's resources, budget, time, and outcomes. In the 2nd phase, we consider the functional requirements of the system. At this stage, the end user's requirements and needs were analysed, anticipating that the newly established system would qualify to fulfil their requirements. In the third stage, necessary specifications and details, as well as system features, are developed in a line to satisfy the functional needs of the system. 4th stage Development: The starting process was triggered, followed by the development process. The development phase was also characterised as the phase of inculcating and changing. In 5th stage of SDLC, the programs and procedures were integrated and tested. At this stage, an evaluation was also conducted to determine if the system offers the desired outcomes and meets the objectives for which the system was meant. It was also determined that the proposed design coincides with the early set of organisational objectives. In the 6th stage, an effort was undertaken to implement the system with the user guidelines. Moving unsynchronised data into the system was triggered at this stage. In the 7th stage of SDLC, the system was handed over to the end users, and its progression was observed. The process of fine-tuning remained to continue at this stage.

Digital Transformation in the College Education Department

Once it was confirmed that the department was all set, the process of digital penetration into the department office was increased, and the following milestones were achieved successfully:

College Education Management System

The digital facility facilitates the Digital Profiling of College Education Department Employees.

Sindh Electronic Centralized College Admissions Program (SECCAP)

This model was developed and implemented to grant admission in class XI in all the Government-owned Colleges in the province. This initiative was intended to rule out irregularities in the process of admission. The system offers all students a fair and equal opportunity to secure admission. The admission process is also monitored by the committee headed by the Director General Colleges, Govt. of Sindh. The system works successfully and is linked with all intermediate and secondary education boards.

Centralised Biometric Attendance System of Teachers (CBAS)

The art of management also lies in ensuring the regularity and punctuality of the people. To ensure the punctuality of the teaching and non-teaching staff in the college, this e-utility was developed and successfully implemented. Now, the department is in a position to monitor the presence of the staff in the colleges during working hours.

Student Attendance Management System (SAMS)

The fabulous physical infrastructure with all its facilities was in dire need of students' punctuality. This model is developed to mark student attendance. Real-time attendance offers parents access to ensure their children are punctuated into college.

Digital Complaint Box For students

To resolve the issues of the students regarding their studies, admissions, enrollment, and the treatment they are having in the college, this utility is developed and implemented successfully. The students can lodge complaints by expressing their grievances.

Digital Library

The college teachers have been directed to upload e-books relevant to their discipline. The books are accessible to the students and teachers for ready reference.

UDocs Tracking System and QR code System

This digital facility allows college employees to track their submissions to know their status. The QR code system is also implemented to ensure the authenticity of the documents, notifications, and other official correspondences.

4. CONCLUSION, LIMITATIONS AND FURTHER PROJECTS

Conclusion

Like in other departments, the journey of the College Education Department of the Government of Sindh towards digital transformation was one of the most challenging tasks to do. The rapidly evolving landscape of education and technology and the decision to formulate, implement, and execute the transformational process was challenging. Nevertheless, the department travelled through barriers and stronger resilience through strategic planning and utilisation of the Kurt Lewin 3-Stage Model for the organisation. In this regard, one of the primary challenges that cropped up was the conventional siloed decision-making habits that prevailed in the supporting departments, which barred collaboration and innovation. The department could break the ice and facilitate greater congruence towards the common goals by challenging this status quo and nurturing a culture of openness and interaction.

Furthermore, the transition from the conventional legacy system and obsolete practices posed significant hurdles. However, through commitment and persistent progress, the department successfully developed new technologies and practices, placing the foundation for improved performance, efficiency, and reliability in its daily execution of procedures.

Responding to the deficit of funds and digital skilled human capital necessitated innovative and novel solutions and strategic investments. Even though these hurdles existed, the department remained unflattering in its pledge to raise the culture of continuous learning and adaptations, equipping its working people with the essential tools and skills to flourish in the digital age. The College Education Department of Sindh is a successful digital transformation model that excellently executes its everyday procedures with tangible benefits, like employees and students.

Attaining the maturity of digital transformation, the journey continues. The department must remain alert, agile, adaptable, and forward-thinking to benefit more from the system. By accepting innovation, connecting the potential of technology, and enhancing the culture of coordination and ongoing improvement, the department will continue to provide quality services in imparting education for future generations.

Limitations

The digital transmission process in the College Education Department has yet to attain its maturity. Since it is at the early development stage, issues like technical expertise to troubleshoot the problem may arise. The transformation process has yet to expand to become Education Technology (EdTech)—the technology required for class learning.

Future Projects

The digital transformation process has not been stagnant; the room is open for future development. The model is further intended to expand its operation to:

- E-Filing System
- Online submission of application for Granting NOCs to college employees.

Competing Interests

The authors did not declare any competing interest.

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