Digital Transformation in Summer Training Process at King Abdulaziz University: Action Design Research in Practice

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Abstract
In the knowledge development of online assessment in learning management systems (LMSs), many assessments are evaluated weekly in the summer training course for undergraduate students in the Faculty of Computing and Information Technology at King Abdul-Aziz University in Saudi Arabia. The number of performance assessments in the summer training course reaches 15 weeks. Many of them, however, are sent or done informally or through unreliable ways and cannot be verified by third parties. Therefore, applying the concept of digital transformation is essential. This research study reported herein used the action design research (ADR) method to build a new information technology system that could assist in the digital transformation. An electronic platform was designed, developed, implemented, and evaluated using the ADR method so that the main people involved in the summer training process (i.e., students, academic supervisors, and administrators) would have a high level of satisfaction with it. The study was conducted on 452 students, 105 academic supervisors, and 15 administrative staff and was conducted during the summer semester of 2020. All the training processes were digitally transformed and automated to control and raise the level and reliability of the training. All involved people were satisfied, thus, shifting the process to be in a digital form assist in achieving the high-level goal.

Keywords
Digital transformation, action design research, ADR, automation process.

1. Introduction

Digital transformation is one of the most important processes that many governmental and non-governmental organizations are keen to adopt to gain advantages and to increase their working capabilities [1]. One such advantage is the expansion of such organizations' digital services, which can greatly help increase the accuracy levels of their operations and services [2]. Furthermore, it is worth noting that the digital transformation occurring in Saudi Arabia is supported by the necessary legislative and regulatory frameworks to regulate its main aspects. These frameworks include digital identity, digital signatures, data exchange, data operation, data protection, information security, opened data, freedom of information, transparency, and assistance in rationalizing government spending, and the adoption of new technologies such as artificial intelligence, supply chains, the Internet of Things and big data [3].

From this viewpoint, digital transformation and automation of paperwork systems serve as important measures or indicators of the level of "maturity" of digital services, and this information can then be used to further raise such level until optimal maturity is reached, in which case the traditional services can be made 100% digital [4]. Therefore, many government ministries in Saudi Arabia are embarking on digital transformation and automation projects because they believe in the importance of digital transformation for their future [3]. Different approaches are being used to reach the optimal paradigm for dealing with the challenge of digital transformation [4], [5]. One of these approaches is the "Qiyas Initiative." It is supported by the Ministry of Communications and Information Technology and Saudi Arabia's 2030 Vision to contribute to the development of a digital government through periodic follow-ups in accordance with a clear method and global measurement indicators. This initiative focuses on providing an interactive technical environment for the technical leaders in government agencies to enable them to obtain services and information that can support appropriate decision-making and that can realize the digital transformation of the Saudi Arabian government. Additionally, it facilitates the presentation of services and regular updates of important information [5].

Summer training is defined as one of the mandatory courses for the students in the Faculty of Computing and Information Technology (FCIT) at King Abdul-Aziz University (KAU). It is offered to the students in the summer semester. In this course, the students must train in a technical company or agency and strive to come up with technical solutions that will help trainers' providers, such company or agency realize the best practices that will contribute to business sector support. The training has several requirements, and the most important of these are as follows: (1) completing the

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number of nominated academic courses; (2) undergoing the training only during the summer semester; (3) completing at least 200 training hours; and (4) undergoing the training in an area where one will have to come up with technical solutions to existing problems in the business sector [6]. The summer training mechanism is complex and needs effort and time from many faculty staff and members from all the departments in FCIT. The action design research (ADR) reported herein aimed to digitalize and fully automate the summer training process focusing on the "Qiyas Initiative" aim to provide an interactive technical environment for FCIT leaders. This research has the following objectives: (1) to simplify the summer training process by fully automating it, (2) to assist the summer training students in using the training platform so that nothing would be done manually, and (3) to provide an interactive technical environment for FCIT leaders which enable them to obtain services and information that support their future decision-making.

Using ADR with the scrum framework to develop the summer training platform went through several iterative cycles of building, testing, and evaluation. Close collaboration among FCIT and IT actors and academia resulted in formulating some design features in this transformation. The design features are simplicity, transparency, accessing real-time beneficiary information, and integration of interests.

The rest of this paper is organized as follows. First, the importance of digital transformation and ADR is discussed. Second, the method that was used in the study, and its four main stages, are explained. Third, the findings of the study and their implications are presented. Finally, the paper's conclusion is put forth.

2. The need for the action design research method

The literature on the practices and indicators associated with digital-transformation processes varies greatly. However, discipline and continuity in the transparency and maturity levels of how tasks are carried out are essential requirements of the overall sustainability of technical systems [7]. The difficulty in measuring performance lies in the conflicting interpretations of discipline and the difference in values among the parties involved in the technical process [8]. Additionally, there are concerns about the inflexibility of technical solutions, which is one of the main obstacles in developing research methods and evaluating the theoretical perceptions associated with technical practices [1], [7]. The strategy proposed herein involves re-establishing discipline as the core and foundation of the digital governance of operations, which can provide common ground among processes, automation, and digital transformation [9]. Furthermore, in the field of information systems (IS), the design and construction of innovative information technology (IT) artifacts can effectively generate the appropriate knowledge needed to realize the best technical and analytical practices for dealing with the traditional systems and accelerating the automation of processes [8].

ADR is important for the evaluation and validation of the organizational tools used in digital transformation. It focuses on two main aspects: (1) creating an innovative tool for defining the technical solutions that meet both the users' and stakeholders' requirements and (2) dealing with problems requiring high accuracy, where the traditional processes show inaccuracies in achieving the required results [7], [10]. Although the current design research methods can predict the existence of similar things, they do not highlight the fact that the artifacts used in the design process also show the interactions, which are essential in outlining the design idea [8]. Additionally, the design activities of the organizational elements and the sequence of key steps and evaluation are important in ADR [8]. The context of ADR's origin is determined and the measurement tools adopted for evaluation and development help achieve the continuity and sustainability required for the ADR approach and processes [10]. Taking this into account, another purpose of the current study was to present the artifacts used for IT as a collection or group that could be adopted when addressing a similar technical issue.

Artifact design for a set of procedures includes dimensions that go beyond the technical view of design efforts and encompass the contextual factors during the design process, such as the form, structure, objectives, and visualization of the tool [8]. It also comprises combinations arising from the design, use, and continuous improvement. As such, there is no effective way of providing strict regulations, and there is thus a need to expand everyone's ability to critically examine and reflect on the testing of proposed solutions to obtain the best contextual and organizational suggestions [11]. This can help achieve stability in the

use of systems and sustainability of providing solutions in the development process [10], [12].

3. Method

In the current study, we applied the ADR method, which mainly assists in generating knowledge by building and evaluating an IT artifact within an organization setting. We followed the ADR method developed by [8], which consists of four main stages and seven principles. The four stages are (1) problem formulation, (2) building intervention and evaluation, (3) reflection and learning, and (4) formalization of learning. All these stages are explained in detail in the following sections.

Stage 1: Problem formulation

This stage consists of two principles: practice-inspired research and theory-ingrained artifact. Practice-inspired research, as reported by the authors, is also problem inspired. It was the long manual mechanism that was used to assist and follow KAU summer training's administrators, coordinators, supervisors, and students, starting from generating a summer training letter to getting accepted as a trainee to the academic training supervisor's posting of the final student marks, which indicate if the students passed or failed the course. This mechanism is complex and needs effort and time from many faculty staff and members from all the departments in FCIT: the computer science (CS), IS, and IT departments.

Below are the five main actors in the aforementioned manual, complex, and long mechanism.

- FCIT dean: Must be aware of the students and staff's progress, from the registration to the end of the summer training semester
- Summer training administrators: Issue the summer training official letter for each student and assist the students in finding training opportunities
- Summer training coordinators: Responsible for monitoring the students' progress from the beginning of the training until their mark is posted by their supervisors. There are six coordinators, two for each department (CS, IT, and IS).
- Summer training supervisors: Responsible for monitoring the students' progress during the training and for correcting all the students' reports and posting the students' marks. The number of supervisors depends on the number of students. Each supervisor usually supervises five students, and there are usually more than 300 students.
- Summer training students: The trainees

Below is the summer training mechanism that was formulated during the two in-depth focus group sessions held in March and April 2021 (attended by all the summer training supervisors, administrators, and coordinators) and through the individual interviews of the three experts who had been working as summer training coordinators for at least 2 years.

1. After the student's academic supervisor confirms the student's eligibility to enroll in the summer training course, the student contacts the summer training coordinator to ask for an official letter of application for the training, targeting different organizations.
   a. The students usually do not know the training sites, so the coordinators send an e-mail to the students with the list of such sites.
   b. The aforementioned list becomes outdated after some time and does not include the students' feedback, which can affect mainly the new students.
2. First, the summer training coordinator must check the number of requested official letters per student; they must be no more than three letters according to the FCIT regulations.
   a. A different summer training letter must be issued for each training site. Thus, if the student applies at three different sites, the administrators in the summer training unit must issue three letters, one for each site, after the summer training coordinator contacts them.
      i. If less than three letters are to be issued, the summer training coordinator will ask the summer training unit to issue the letters, which will mainly certify that the student belongs to the FCIT at KAU and will outline the FCIT summer training conditions and regulations.
      ii. If three or more letters are to be issued, the summer training coordinator will not send a request for the issuance of such letters to the summer training unit, and the student must wait until a training site accepts him/her.
      iii. If The students need more letters to contact more training sites, they should request to

cancel one or more from previous letters and request to issue a new one

3. Students who get accepted by a training site must e-mail the summer training coordinator so that the latter will know who among the students already have a training site and who still do not, for effective student management.
   b. The summer training coordinator usually creates an e-mail list and e-mails the summer training students to inform them of any new training opportunities and to motivate them to apply.
   c. The summer training coordinator uses the Microsoft Excel program to manage the students' numbers and status.
   d. The summer training unit administrators and coordinators use their connections to find training opportunities for the students, and the students also search for training opportunities and apply at the corresponding sites.
4. The long process described above takes more than 4 months until all the summer training students have been accepted at a training site.
5. The summer training coordinators must assign five students to each supervisor.
6. All the students will have an academic summer training supervisor to monitor their progress and to make sure that they have no compliance issues.
7. All the students must have another supervisor from the training site to evaluate their progress and to contact the academic training supervisor if any issue arises. The training supervisor will be assigned by the training site.
8. There are several forms and progress reports (more than 15) that must be filled out and progress reports are written by the students, training site supervisor, or summer training supervisor, all of which must be e-mailed to the latter.
9. The summer training supervisor must collect all the aforementioned forms and reports and must archive them at the end of the semester.
10. All the submitted forms and reports must also be collected and read by the summer training coordinators.

The aforementioned mechanism entails much time and effort from the summer training administrators, coordinators, and supervisors. Thus, as members of the summer training unit, we decided to fully automate such mechanism to achieve the main objective of simplifying the mechanism for all the summer training unit members and fully shifting from manual processes to automated processes (digital transformation), starting from the students all the way to the FCIT dean. Shown below are this main objective's sub-objectives.

a. To simplify the students' search for training sites
b. To simplify the process of issuing the official letter of application
c. To simplify the process of the summer training administrators', coordinators', and supervisors' monitoring of the students' progress
d. To produce statistical reports on the students' progress through their supervisors, all of which can be viewed by the summer training coordinators, administrators, and FCIT dean

The theory-ingrained artifact principle that we followed in the current study was the agile method, which can be considered one of the design theories that can be used in any ADR project [8]. We mainly used the Scrum framework to manage the development of the summer training platform. Scrum consists of several short iterations known as sprints. Each sprint includes all the regular phases of the software development life cycle: designing, implementation, testing, and customer evaluation [13].

The product backlog contains all the prioritized customer requirements. The project team members select some of these requirements from the top, which are collectively called sprint backlog. The selection is based on the team members/action design (AD) researchers' ability to produce the software product increment within the available time and recourses. Then the sprint starts, which usually takes 2–4 weeks. Daily scrum meetings must be conducted to ensure that all the team members have all the information they need and to make sure that any issues that arise are discussed. If there are no issues raised or comments made during the customer evaluation phase on the sprint, the software product increment is delivered, and the team members will select other items (new sprints) to work on from the product backlog until all the customer requirements are met [13].

Stage 2: Building intervention and evaluation (BIE)

Based on the results of the problem formulation stage, the ADR team decided to build a summer training platform that would transfer all the manual and complex aspects of the mechanism into a fully automated process (digital transformation). The BIE stage was initiated by one of the summer training unit

administrators, three experts, new members in the unit, and skilled IT people (software engineers) from KAU. The BIE stage consists of three principles: (1) reciprocal shaping, (2) mutually influential rule, and (3) authentic and concurrent evaluation. During this stage, both the problem and the artifact must be continually evaluated focusing on IT and the organizational context. The reciprocal-shaping principle mainly focuses on solving the "wicked problems" that the organization iteratively faces [8]. The mutually-influential-rule principle requires the AD researchers to apply their knowledge/theory and any technological advances they are familiar with, and the participators to bring to the table any practical knowledge they have acquired from their organizational work practices [8]. The authentic- and concurrent-evaluation principle indicates that evaluation is not a separate phase but an important phase that must be performed after the building of the summer training platform, where all the users' needs and the required changes must be addressed within several iterations if needed [8]. The aforementioned principles were applied during the development of the summer training platform, where three experts and other new members of the summer training unit were involved during the requirements elicitation phase. The ADR team identified four main design features that would help achieve the main goal of the project:

1. Simplicity means simple design
2. Transparency where all stakeholders can view the data stored in the platform
3. Accessing real-time beneficiary information, so data can be provided to the users after they are granted appropriate permission immediately
4. Integration of interests, thus, all information is accessible from an information bank stored in the platform

The AD researchers followed the Scrum framework; thus, there were 21 stories and 5 sprints, as shown in Table 1.

Table 1. . Summer training platform's stories and sprints following the scrum framework

Story No.	Stories	Sprint No.
1	Addition of training sites by all the users (administrators, coordinators, students) and confirmation by the administrators	1
2	Display of all the added and approved summer training sites by all the users	1
3	Requesting for an official letter of application for the added training site by the students (only from the list of approved training sites)	1
4	Approval of the official letter of application by the coordinator (maximum of 3 official letters per student)	1
5	Sending and receiving of e-mail messages via the platform	1
6	Students' uploading of the summer training site where they have been accepted	1
7	Administrators' addition of summer training supervisors	2
8	Coordinator's assignment of the summer training students' supervisors	2
9	Students' uploading of their summer training plans	3
10	Supervisors' downloading, viewing, and approval of the summer training plans of the students assigned to them	3
11	Students' uploading of their accomplished summer training start date forms	3
12	Supervisors' downloading, viewing, and approval of the students' summer training start date forms	3
13	Students' uploading of five weekly progress reports	3
14	Supervisors' downloading, viewing, and posting of the students' marks for their five weekly progress reports	3
15	Students' uploading of their final reports	4
16	Supervisors' downloading, viewing, and posting of the students' marks for their final reports	4
17	Students' uploading of their final presentations	4
18	Supervisors' downloading, viewing, and posting of the students' marks for their final presentations	4
19	Supervisors' uploading of the training site evaluation forms after	4

	receiving them from the summer training site supervisors	
20	Posting of the students' marks given by the summer training site supervisors	4
21	Supervisors' generation of statistical reports on the students' progress for the administrators and coordinators	5

The design and contents of the summer training platform were mainly inspired and restricted by the FCIT summer training unit members and summer training students, and FCIT regulations were formulated to address the platform users' needs and to meet these. A total of 6 coordinators, 105 supervisors, 15 administrative staff, and 452 students participated in the evaluation of each software product increment. The AD researchers and team members did not move to the next sprint until all the issues and required changes in the current sprint had been fixed and addressed and until all the users were satisfied. The ADR team decided to form another team that would concentrate on establishing the testing process for the platform features and functions that were to be implemented sequentially. The team was made up of a combination of different platform developers and was tasked to help identify the faults that could appear during the implementation stage, monitor the output of the building block, and find patterns that would help simplify the platform and facilitate its use by its end users. The team evaluated the new functions in the test environment 1–3 weeks before they were made available to the target audience. This approach showed a reduction of more than 80% in the number of errors observed in the previous stages. The team that was assigned to carry out this task remained active until after the completion of the automation of the required processes and of the relevant information that should be displayed on the platform. The end-users expressed their appreciation of the principle of integration of interests as it could support the development of future capabilities.

Stage 3: Reflection and learning

This stage involves more than just solving an organizational problem. In this stage, the AD researchers had to reflect on the problem and the chosen theory and had to adjust the research project process, which reflected their increasing understanding of the ensemble IT artifact. This must occur in the early stages, during the evaluation phase [8]. This stage includes only one principle, guided emergence, which mainly "emphasizes that the ensemble artifact will reflect not only the preliminary design … created by the researchers but also its ongoing shaping by [the] organizational use, perspectives, and participants" (p.44) [8].

This project started as a basic idea only to assist the coordinators and students by simplifying the process of requesting the official letter of application for the summer training sites, and to help the administrators generate such letter in a very fast and simple way, via automation, which would also allow the students to save time. After the implementation of this feature, it took only less than an hour to issue the official letter when it used to take a few days. Then the idea started to grow and mature when the AD researchers and BIE team members started to think of adding more features to the system that would reflect the design principles, and of making the manual mechanism fully automated. As all the users had asked for these same things, the summer training platform started to grow incrementally.

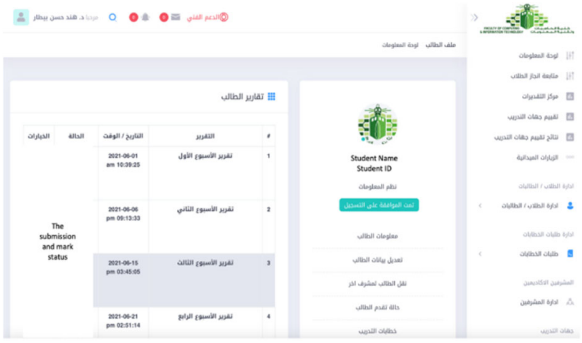

Figure 1. The simplicity design feature for the summer training platform

To realize the summer training platform's design principles, we designed simple Arabic interfaces for all the users, as shown in Figure 1, because their native language is Arabic.

The transparency principle focuses on the stakeholder's ability to view the data stored in the platform in the appropriate templates for the stakeholders. These data can also be provided to the users after they are granted appropriate permission for such, which means that the users' access to information is time-based. Transferring information from one user to another is one of the biggest challenges in building

the platform as the process of receiving a request should include receiving a notification e-mail to be stored in the platform to allow the parties concerned to meet the requests in a timely manner. Log files are also provided for requests displaying the time and date when the request was made. Integration of interests is achieved by making the information accessible from an information bank stored in the platform through the implementation of templates. During the whole project life cycle and during the evaluation phase iterations, several adjustments were addressed to satisfy the users and to provide a simple platform that supports all the needed services with the desired design features. For example, to check a student's progress, the administrators, coordinators, and supervisors can simply search the student's name. If the supervisor forgot to post the student's mark, this information will immediately appear on the screen, next to the space provided for the uploaded file. Figure 2 below shown the BIE stage detailed view.

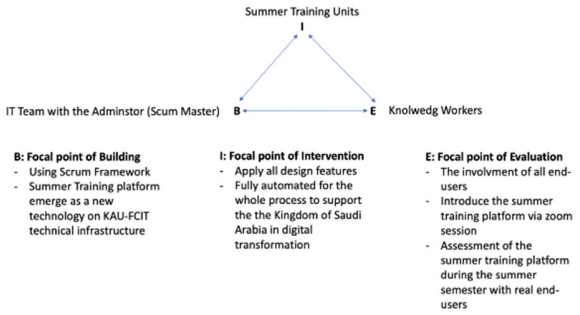

Figure 2. Detailed view of the BIE stage

The IT intervention described herein was a collaboration work mainly among three main elements, as shown in Figure 3. These elements were interacting with each other during the whole project life cycle.

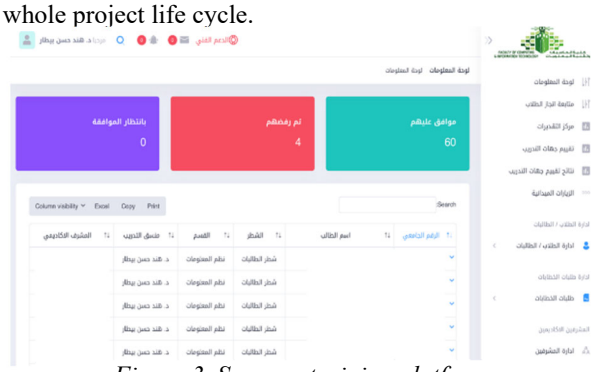

Figure 3. Summer training platform

Stage 4: Formalization of learning

The goal of this stage is to formalize the learning from ADR. This stage includes one principle: generalized outcomes. This is challenging due to the nature of organizational change besides IT artifact implementation. There are three levels of generalization: "(1) generalization of the problem instance, (2) generalization of the solution instance, and (3) derivation of design principles from the design research outcomes" [8].

Digitalization is a very useful solution that can change our work and life. Applying it in any educational organization will enable the latter to obtain better and more students, improve the course experience, and enhance the monitoring of the students' progress [15]. Unfortunately, many educational organizations around the world, including Saudi Arabia, do not fully use it. Our use of an agile method, especially the scrum framework, to build, test, and evaluate the developed IT solution was helpful because it allowed the addition of more requirements and features based on the users' requests. Also, using Scrum helped the BIE and AD researchers solve the related problems quickly and efficiently and obtain a high-end product [16]. The designed solution with simplicity, transparency, accessing real-time beneficiary information, and integration of interests features are the design research's contribution because the solution's utility for its users is also considered an important contribution of any ADR project [8]. The developed summer training platform is an effective solution to a problem that FCIT at KAU faces every year, during the summer semester.

Table 2 summarizes the processes that were carried out during the teamwork associated with the project. The second column focuses on the methods that were used by the project team while the third column highlights the impact of the artifacts on the different phases of the project. Artifacts were defined by the ADR team as elements of development formatted by the diverse and ongoing individual and organizational practices in the summer internship field.

Table 2. Summary of the Action Design Research Process in Internship Projects

Stages and Principles	Artifact
Stage 1: Problem Formulation	

Principle 1: Practice-inspired research	The current research was driven by the need for better IT support for competence management in long manual mechanisms to assist and follow KAU's summer training administrators, coordinators, supervisors, and students.	Recognition: The recognized shortcoming of the existing summer training process is that it lacks the automation.
Principle 2: Theory-ingrained artifact	The theory used and followed is the agile method. The scrum framework was mainly used to manage the development of the summer training platform, which consists of several short iterations.	
Stage 2: Building Intervention and Evaluation		
Principle 3: (1) Reciprocal shaping	Focuses on solving the "wicked problems" that organizations iteratively face and tries to formulate some design features in the simplest way that help achieve the main goal of the project	Alpha version: The artifact conceived is similar to a design idea in that it should focus on the process to be adopted in the platform.
Principle 4: (2) Mutually influential rule	Three experts and other new members from the summer training unit are involved during the requirement elicitations phase.	
Principle 5: (3) Authentic and concurrent evaluation	There were 21 stories and 5 sprints. The action design researchers and team members did not move to the next sprint until all the issues and required changes in the current sprint had been fixed and addressed, as well as users satisfaction were reached.	Beta version: The system has been designed to implement the end users' needs
Stage 3: Reflecting and Learning		
Principle 6: Guided emergence	The idea started to grow and mature when the AD researchers and BIE team members started to think of adding more features to the system that would reflect the design principles, and of making the manual mechanism fully automated.	Emerging version: new requirements has been emerged and added during the BIE stage.
Stage 4: Formulation of Learning		
Principle 7: Generalized outcomes	A set of design principles that provide the main solution which help the main actors to instantly work using the platform.	Ensemble version: An ensemble embodying the design principles used for summer training platform.

4. Discussion and implications

Through this study, we discovered that the process used in the artifact construction phase is suitable for maintaining a procedure and any of its associated aspects. It also enables us to focus on learning and thinking about the interaction between knowledge generation and the emerging changes in the users' demands [13], [14]. The use of the ADR method and the Scrum framework helps develop an IT solution and complete the various aspects of such development within a shorter time. Then, according to [8], it becomes possible to take advantage of personal decisions to measure and accept the approach, procedure, and relevant implications during research. Furthermore, it is important to report that the requirements of the ADR approach concentrate on an output level with a degree of efficiency that can achieve the sustainability of the system and can allow working with non-functional requirements in a more professional manner. Also, the ADR approach may help in communicating with senior management more consistently by automatically providing the appropriate

privilege for accessing all the processes executed in the system to multiple types of users [8], [14], which matches the results of this current research.

In the problem formulation stage, an essential part was included: locating and determining the system requirements elicitation. Also, the traditional complex processes were evaluated to diagnose the existing flaws in the presentation of essential information pertaining to the summer training and in the gaining of access to such information in a timely manner, both of which are fundamental issues in the current system. Therefore, we identified three main entities that could assist in controlling the relevant requirements: the college administration (who would review the governance of the processes used in designing the platform), a select number of trainers and training coordinators in the departments (who would act as supervisors of the implementation of the training process in the college departments), technical experts (who would be involved in the analysis phase to design the basic templates during the requirements elicitation to reduce the cycle changing and the associated modifications). Therefore, we framed the current research as not only addressing the current issues but also building an approach commensurate with other field problems concerning efficiency, accuracy, and continuous follow-up to achieve completion within a specific short time.

The ADR team identified four design features and principles that could help in the designing stage of the summer training platform through an efficient life cycle [8]: simplicity, transparency, accessing real-time beneficiary information, and integration of interests. These design features were formulated based on the stakeholders' needs.

In this study, we focused on the importance of working using the ADR approach and on the hypothesis that artifacts are a dynamic group emerging within the contexts of design and continuous redesign and through general organizational uses [8], [12]. Therefore, this view requires the establishment of logical boundaries of restrictions articulated by boundaries of disciplines to achieve the main purpose of the current automation process [8]. The creation and realization of knowledge through the design and revision of the requirements for artifacts encourage researchers to adopt a more holistic view of artifact design and use than the previous one [5]. This can also be done by participating in the construction, simultaneous evaluation, and continuous adaptive analysis of the local artifacts and their use and by bringing to the table the style of thinking used within the ADR approach [8]. Participating in construction and simultaneous evaluation is important because technological artifacts usually show unexpected characteristics emerging during their design, which means that ADR is well suited to handling projects containing artifacts because it investigates the evolution of their use over time [10].

Through the results of our use of the ADR approach, many fundamental and previously unimplemented procedural characteristics can be put into use as they mark the birth of new knowledge garnered from the design of artifacts. As previously mentioned, we also treated IT perceptions as working groups. This allowed us to identify the combination of theoretical perceptions and technical work as being essential to building a knowledge base that depends on interaction with the requirements of different privileges in relation to the artifacts, which can be activated and deactivated on the basis of the required privilege level. This will help the relevant parties from all sectors obtain the level of control commensurate with their job positions and will also play a significant role in raising awareness of the operations process and its associated artifacts.

Working on the summer training platform based on the ADR approach provides an appropriate applied discipline, and the relevancy of its results extends beyond the IS/IT field. The ADR approach can also potentially solve current and future problems to this matter and confirms that there is no separation between construction and evaluation, which reflects the nature of artifacts as a method that is proportional and harmonious with the end users' needs [14]. It is tantamount to the balancing of the cognitive interests of different researches with variables, which emphasizes a greater role for ADR-based systematic design.

5. Conclusion

The current study provided an example of the useful usage of the ADR in the field of IS for researchers studying the design of artifacts to deal with a set of existing problems. The study positioned ADR as a method of conducting research that simultaneously seeks to meet the calls in the IS field for the procedural theorizing of processes and to engage in research relevant to the research framework while allowing it to emerge, find utility, and reach its optimal operationalization. We also sought to evaluate and validate the organizational tools utilized in digital

transformation, which can be used to sustain the reliability level during the design and implementation processes. Also of importance is reaching a level of satisfaction for the main stakeholders participating in the training process, which can be achieved by automating processes and working on digital transformation through the activation of various technical solutions that will allow work to be carried out according to the precautionary measures based on public health protocols. These protocols are applicable in social distancing and relevant COVID-19 pandemic safety procedures, which can reduce in-person communication among the target audience in internship parties. More design features and actors can be added to the developed platform which we will be considered as a future direction.

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