

MASTER THESIS, MIOM05

WHERE ADOPTION BECOMES VALUE

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**Segment Assessment for Digital Administrative
Systems in Kenyan Tertiary Education**

Abstract

Digital administrative systems are increasingly used in tertiary education. These systems act as the institution's nervous system by supporting and connecting processes such as registration, attendance, grading, fees, reporting and records. However, the implementation itself does not automatically imply adoption, utilisation or value realization. In heterogeneous educational contexts the same type of system can create value in some institutions and cause friction in others, depending on the institutional conditions, workflows and stakeholders.

This study investigates how adoption feasibility and value realization are shaped by institutional conditions, administrative workflows and stakeholder alignment in Kenyan tertiary education. Empirically, it is a qualitative field-based case study featuring interviews, complementary field conversations and secondary data. Investigated institutions were grouped into four archetypes, based on institutional type and ownership. The analysis combines adoption theory, value perspectives and socio-technical system theory to understand the relation between institutional readiness, workflow-level value and stakeholder alignment.

The main findings show that there is a high demand for digitalised solutions, but the adoption feasibility varies within and between the institutional archetypes. Value was most clearly realized in standardised, repetitive and data-driven workflows, while cross-departmental processes were more prone to cause friction. The study also found digital maturity should not be understood as a fixed institution-wide trait, as even digitally mature institutions may experience process-specific friction and value loss.

The contribution of this study is an analytical logic to assess where and when digital administrative systems are able to create value. For system providers this means that segmentation assessment should consider the overlap between adoption feasibility, workflow value potential and stakeholder alignment.

Keywords: Digital Administrative Systems; Adoption Feasibility; Kenya; SchoolTry; Tertiary Education; Technology Adoption; Value Realization; Stakeholder Alignment; Segment Assessment.

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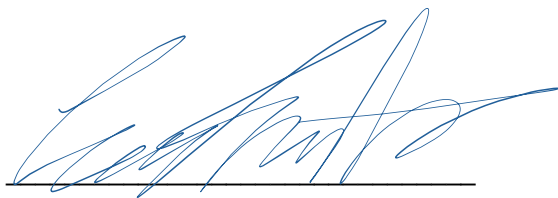
This thesis concludes our master's degree at the Faculty of Engineering, Lund University. We have been given the opportunity to investigate digital transformation within the education sector in a context that has been equally informative and complex. The insights, impressions and memories from the field research would not have been possible to obtain through literature or secondary data alone.

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Abbreviations

AI	Artificial Intelligence
AWS	Amazon Web Services
CRM	Customer Relationship Management
CUE	Commission for University Education
DAS	Digital Administrative System
DDM	Data-Driven Decision-Making
ERP	Enterprise Resource Planning
EU	European Union
FY	Fiscal Year
GDP	Gross Domestic Product
GTM	Go-to-Market
HEF	Higher Education Financing
HELB	Higher Education Loans Board
ICT	Information and Communication Technology
IMP	Industrial Marketing and Purchasing
IS	Information Systems
IT	Information Technology
KPI	Key Performance Indicator
KSh	Kenyan Shilling

KUCCPS	Kenya Universities and Colleges Central Placement Service
LMS	Learning Management System
MIS	Management Information Systems
NCPD	National Council for Population and Development
PhD	Doctor of Philosophy
PWPER	Presidential Working Party on Education Reforms
REREC	Rural Electrification and Renewable Energy Corporation
RPL	Recognition of Prior Learning
SIS	Student Information System
STS	Socio-Technical Systems
TAM	Technology Acceptance Model
TE	Tertiary Education
TOE	Technology-Organization-Environment
TVET	Technical and Vocational Education and Training
UF	Universities Fund
UNCTAD	United Nations Conference on Trade and Development
UNESCO-UNEVOC	UNESCO International Centre for Technical and Vocational Education and Training
USD	United States Dollar
YoY	Year-over-Year

Definitions

Term	Definition
Administrative workflow	A recurring administrative process with specific inputs, responsibilities and outputs.
Adoption	The stage where users begin to use the digital system and adjust their work routines.
Adoption feasibility	The extent to which an institution has the right conditions to implement, adopt and sustain system use over time.
Digital administrative system (DAS)	A digital system used to support administrative processes such as registration, grading, fees, reporting and student records.
Digital maturity	The extent to which digital systems are integrated, trusted and used in practice.
End-user	A stakeholder affected by system outputs, such as students.
Implementation	The stage where a system is introduced, configured and made available to the users.
Institutional archetype	An analytical category used to group institutions by ownership and institutional type.
Process-level realization	Value realization or value loss within a specific administrative workflow.
Segment assessment	Evaluation of candidate institutions based on adoption feasibility, value potential and implementation risk.
Stakeholder alignment	The extent to which stakeholder roles, expectations and responsibilities are coordinated.

Stakeholder misalignment	A lack of coordination between stakeholders that may create friction or value loss.
System provider	An organisation that supplies, implements and/or supports a digital administrative system.
Technical gatekeeper	A stakeholder responsible for system access, support, troubleshooting or integration locally.
Tertiary education (TE) institution	An institution providing education after secondary school, such as a university or TVET institution in this study.
Utilisation	Stable and repeated use of the system in daily administrative workflows.
Value loss	Expected benefits that are reduced or lost due to friction, workarounds, weak integration or distrust.
Value realization	Benefits that are actually achieved through system use.

1. Background and Purpose

This thesis comes from a practical problem; digital systems may be needed, purchased and implemented, but still fail to create the expected value. This chapter introduces the background of the study and will gradually narrow the focus towards adoption feasibility and value realization in Kenyan tertiary education (TE).

1.1 Digitalisation of organisations

Over the past decades, digital technologies have become one of the most significant transformative forces for organisations across industries all over the world. The term digital transformation refers to the use of new digital technologies. The process of integrating new digital technologies into organisations and replacing old technologies fundamentally changes the way value is created and delivered (Fitzgerald et al., 2013, pp. 2, 5). It is not just about automating existing processes, digital transformation can open new ways of doing business and organizing value creation (Fitzgerald et al., 2013, p. 2). This is a natural progression in a world with continuously increasing demands for data-driven efficiency.

A central application of digitalisation is the increased use of information systems (IS) within organisations. The use of such systems enables the collection, storage and processing of vast amounts of data, which in turn can support improved operational and managerial decision-making for organisations through data-driven decision-making (DDM) (Colombari et al., 2023, pp. 2-3). The literature also links digitalisation and organisational efficiency. Automating previous manual processes can reduce manual effort, reduce the frequency of errors and improve the data traceability (Colombari et al., 2023, p. 3; Schilirò, 2024, pp. 72-73).

The administrative functions act as the backbone for internal processes such as flows of information, communication and alignment. By digitalising these functions, organisations have an opportunity to improve both efficiency and quality. But digitalising these processes can be challenging, and value realization is not guaranteed. In many organisations, the value of the digital system depends on implementation, utilisation and organisational tailoring, rather than on the technical implementation itself. Furthermore, the value of digitalisation is not created by implementation alone, but through the integration of the digital solution into the daily workflows of the organisations.

1.2 Administrative processes in organisations

Administrative processes cover a range of internal functions from the initial stages of planning, to decision-making and the monitoring and coordination of the organisation. In each stage, the processes involve documentation, resource allocation and internal communication (Davenport, 1993, p. 275). Every process has specific inputs and outputs as well as defined performance metrics such as time, cost, output quality and customer satisfaction (Davenport, 1993, pp. 5-7). It is not uncommon for processes to be cross-functional, ensuring smooth information flows across organisational units (Davenport, 1993, pp. 8-9). Administrative processes primarily focus on internal alignment to generate value through increased quality, coordination and efficiency.

Some organisations are more complex than others, particularly when multiple and diverse stakeholders interact across organisational boundaries (Daft, Murphy and Willmott, 2014, p. 152). This is particularly relevant in public and nonprofit settings, such as government agencies and universities (Daft, Murphy and Willmott, 2014, pp. 6, 30-33). In these types of organisations, the need for alignment and information sharing is particularly significant (Daft, Murphy and Willmott, 2014, p. 38).

While the challenges vary, a recurring issue in operational processes is inefficiency related to time, cost and resource use (van der Aalst, 2013, pp. 1-2). Process problems often arise when formal models and manual work are misaligned or when data are not effectively used (van der Aalst, 2013, p. 22). Additionally, manual labour can affect decision-making when process data are not effectively used or captured (van der Aalst, 2013, p. 22). Additional issues may arise from misalignment between departments, stakeholders and governance levels. As a result, governance and follow-up become more difficult (Janssen and van der Voort, 2016, pp. 1-3).

Organisations need to maintain structure and alignment in order to face these challenges. In the desired state, relevant and accurate information is accessible when needed, supporting coordination, governance and efficient performance (Daft, Murphy and Willmott, 2014, p. 38; Davenport, 1993, p. 85). But in order to succeed, processes and IS needs to be tailored specifically to the certain needs, structure, objectives and information of the organisation (Davenport, 1993, p. 96; van der Aalst, 2013, pp. 1-2).

Administrative processes are therefore not only supportive functions but rather a core part in the modern organisation (Davenport, 1993, p. 275). As data-driven decision making becomes increasingly important, together with increased complexity in organisations, administrative processes act as channels of information

(Colombari et al., 2023, p. 3; Daft, Murphy and Willmott, 2014, p. 38). Administrative processes are not only internal support functions but also generate alternate scenarios where digital systems either create measurable organisational value or generate new forms of friction.

1.3 Digital administrative systems

In order to ensure quality within and between processes, many organisations opt for a digital administrative system (DAS). These include Enterprise Resource Planning (ERP), Management Information Systems (MIS), Customer Relationship Management (CRM) and Student Information Systems (SIS). While they all have their own advantages, they share the common purpose of supporting and optimizing the organisation's administrative processes (Davenport, 1998, pp. 121-124).

The biggest impact of DAS is the automation of formerly manual processes. This allows organisations not only to save time and resources, but also to scale administrative work more efficiently (Brynjolfsson and Hitt, 2000, pp. 28-29). In such a system, data is centralised and stored in general databases as opposed to fragmented existing IS. As a result, governance and flexibility increase as well as data transparency and accessibility (Davenport, 1998, pp. 123-124).

DAS can also strengthen organisational alignment by improving communication and connectivity between different parts of the organisation. This does not only make the decision-making process more efficient, but also strengthens unification and cooperation (Vial, 2019, p. 127). It is especially important in larger, more complex organisations with several layers of stakeholders.

While solving many problems, DAS also brings new challenges such as organisational changes and modifications to already existing processes. This can create friction, not only between processes themselves, but also between users and decision-makers. It is not uncommon for users to experience the digital leap as overwhelming (Vial, 2019, p. 130). This may require the organisation to invest in adequate adoption support to ensure a smooth transition. Because of this, the value gained from an administrative system is heavily dependent on implementation and adoption. In other words, an administrative system will not create value without appropriate usage (Vial, 2019, p. 125).

In this study, it is important to establish the distinction between value realization and value loss, because the expected value of a system can sometimes differ from the realized value in practice. Realized value will refer to benefits that are actually achieved through system use, while value loss will be used to describe the

reduction of expected benefits because of insufficient adoption, workarounds, mismatch in workflows and distrust in data. In order to capture the potential value of an administrative system, organisations need to correctly balance technological, organisational and human aspects. Hence, training and education both play a critical role in the feasibility of the system (Hanelt et al., 2021, pp. 1166-1167).

In summary, DAS are complex, especially in larger organisations. If implemented successfully, they can act as an enhanced nervous system, reaching and integrating different parts of the organisation. However, the implementation is at least as important as the technical aspects of the product and needs to be performed with caution and careful planning. Since technical factors intersect with organisational structures and human behaviour, studying these complex systems is essential to understand how value is realized or lost in practice.

1.4 Tertiary education institutions

Tertiary education (TE) institutions are complex organisations that combine academic, administrative, financial and governance-related activities. Generally, these organisations integrate several processes along a detailed pipeline, ranging from education to conducting research. While most institutions are public, there are also private ones. But regardless of ownership, these organisations tend to include stakeholders from all parts of society. Even the private ones generally have commitments and relations to the government (Alzahmi et al., 2025, pp. 2, 9-10). The organisational complexity of TE institutions, consisting of academic, administrative and financial processes, creates a demand for complex administrative systems. These systems must support multiple stakeholders, decision levels and reporting frameworks simultaneously.

As mentioned, TE institutions link a wide range of stakeholders, including students, parents, academic staff, administrative staff, researchers, management, governments, businesses and entire communities (Jongbloed, Enders and Salerno, 2008, p. 305). In order to serve all stakeholders, organisations demand coordination and a seamless information exchange. This is where DAS have the potential to function as coordinating mechanisms, enabling cooperation and organisational alignment (Tallon and Pinsonneault, 2011, p. 467).

The multi-stakeholder structure of TE institutions also makes adoption more complex (Jongbloed, Enders and Salerno, 2008, p. 310). Different stakeholders may evaluate the same system differently depending on their role, responsibilities and daily workflows. Administrators may value efficiency and reporting accuracy

while teachers may be more concerned with usability and added workload (DeLone and McLean, 2003, pp. 22-23). As a result, perceived value, trust and implementation friction can vary significantly across stakeholders.

In essence, the complex structure of TE institutions creates a critical environment for DAS. It is an environment with vast challenges, but also opportunities for significant gains. In the end, it comes down to implementation and adoption, which makes this sector a relevant empirical setting for studying how DAS create or lose value in practice.

1.5 Kenya as a heterogeneous context for digital education adoption

Kenya is a part of the Sub-Saharan region undergoing rapid digital transition across every aspect of society, especially since the COVID-19 pandemic. Technology is considered a pillar of future development and growth, particularly for the education sector. Digitalisation does not only enhance productivity and generate wealth but also increases the competence and education among the citizens. Additionally, it can increase resource accessibility and streamline the allocation. (Salmi, Amegah and Shinde, 2025, p. 1)

Demographically, Kenya has one of the youngest and fastest-growing populations in the world. In order for these new citizens to not only benefit from, but to contribute to the economic growth, nations need to invest heavily in digital infrastructure and digital education (Salmi, Amegah and Shinde, 2025, p. xvi). This creates both opportunities and challenges for the education sector. The student count is rising, not only due to demographic changes but also as a result of increased accessibility to education. This rapid development can lead to variations in terms of resource constraints, which emphasizes the importance of organisational adaptation, effective resource allocation and continuous institutionalized growth (Salmi, Amegah and Shinde, 2025, p. 105).

In terms of innovation, there are several cases of leapfrogging in the region, where technology rapidly has progressed society. In this context, leapfrogging refers to skipping the intermediate stages of technological developments through the direct adoption of newer technologies (UNCTAD, 2018, p. 1). One of the most notable examples is the mobile payment solutions in Kenya, M-Pesa, that was launched in the early 2000s. This financial service, based on the mobile SIM-card, enables the user to store and transfer money outside of the conventional banking system. This is notable as many citizens were ineligible to open bank accounts. However, most citizens could open up phone accounts which contributed to the invention's quick success.

This example illustrates how quickly technology can be adopted in the right conditions (Salmi, Amegah and Shinde, 2025, p. 1; UNCTAD, 2018, pp. 2, 4).

Despite the success stories, Kenya is a broad region, and the extent of digitalisation varies with the main difference found in infrastructural changes and current capacity. Even with a feasible infrastructure, it comes down to policies, coordination and local adaptation in distinguishing successful adoptions and continuous development (World Bank, 2024, p. 4). This variation creates different conditions for the adoption and effective use of DAS across institutions. As a result, institutions should not be treated as a homogeneous market, but rather as segments based on their adoption feasibility and value realization potential.

1.6 Research gap

The increasing digitalisation of organisations has created growing interest in how digital systems can improve administrative efficiency, data management and decision-making. In education, DAS are expected to support recurring institutional processes such as registration, attendance tracking, grading, fee management, reporting and student records. However, previous research on digital transformation emphasizes that digital technologies do not create value automatically. Instead, value depends on how technologies are embedded in organisational structures, processes and everyday practices (Vial, 2019, pp. 119, 125).

This distinction is particularly important in TE, where institutions are organisationally complex and involve multiple administrative units, user groups and external stakeholders. Implementing a DAS therefore requires more than technical availability. It also requires organisational capacity, user acceptance, workflow alignment, training and continuous use. As a result, the implementation of a system does not necessarily mean that it is adopted, utilised or translated into realized value.

Kenya represents a relevant context for studying these issues. The country has experienced significant digital development and increasing policy interest in information and communication technologies (ICT), but the digitalisation remains uneven. Research on Kenya display inconsistencies in access, affordability, digital literacy, infrastructure and rural-urban conditions (Okello, 2024, pp. 1-4). These differences affect the conditions under which organisations can adopt and benefit from digital technologies. In TE, such variation means that the need for DAS does not necessarily correspond to the institutional maturity or capacity required to use them effectively.

At the same time, Kenya's broader economic and institutional context places pressure on public services, education funding and organisational efficiency. Financial constraints and demands for more efficient public spending further strengthen the relevance of understanding how digital systems may support administrative capacity, transparency and resource use (World Bank, 2025, p. 10, 13, 20). However, these potential benefits depend on whether digital systems can be integrated into existing administrative workflows and trusted by the stakeholders who use or depend on them.

Technology adoption, digital transformation and information system success are well-established fields of research. Yet, the empirical understanding is limited of how DAS are adopted in heterogeneous contexts such as TE in Kenya. To concretize, more knowledge is needed about how institutional conditions, workflow characteristics and stakeholder interactions shape adoption feasibility, implementation friction and value realization. This study therefore addresses DAS adoption beyond the implementation stage. It focuses on the contextual and process-based dynamics in which value may be realized or lost across different administrative workflows, specifically in Kenyan TE.

1.7 Purpose

The purpose of this study is to analyse how adoption feasibility and value realization of digital administrative systems are shaped by institutional conditions, administrative workflows and stakeholder alignment.

The study aims to contribute to a broader understanding of why digital administrative systems create value in some settings while generating friction or loss in others. To achieve this, organisational context, process-level use and stakeholder interaction will be studied in relation to each other.

1.8 Research questions

To fulfil the purpose of this thesis, the study is guided by the following research questions:

1. How do contextual characteristics shape the conditions for adopting digital administrative systems?
2. What organisational, technological and environmental factors affect adoption feasibility?
3. How is value realized or lost across key administrative workflows?
4. How do stakeholder roles and interactions influence perceived value, trust and implementation friction?

1.9 Analytical perspective and provider-oriented approach

While the research questions are primarily analytical in scope, the findings will later be translated into managerial implications for system providers. The broad nature of the research topic encouraged a selection of perspectives, and a provider-oriented approach was adopted to structure the practical implications of the findings. The provider perspective is relevant because system providers influence implementation, onboarding, support and system adaptation. It is also relevant since heterogeneous organisational contexts require prioritization as one provider cannot approach all organisations the same way or at the same time. These implications will focus on how providers can assess and prioritize organisational segments based on adoption feasibility, value realization potential and implementation risks. The study therefore connects the analytical findings to provider-oriented assessment and implementation considerations.

1.10 Delimitations

The study is limited geographically to Kenya and by sector to TE institutions. Primary schools, secondary schools and other national education contexts are therefore outside the scope of this study. Additionally, any processes beyond those of administrative systems are excluded, such as processes affiliated with Learning Management Systems (LMS) and similar. This means that pedagogical digitalisation and digital learning are not analysed in depth. The study is primarily focused on user-related and organisational aspects, rather than the technological ones of DAS. Lastly, the study derives market-related implications from the analysis of institutional conditions, adoption feasibility and potential value realization. However, it is not shaped as a commercial market strategy.

The study does not aim to provide a cultural analysis of Kenyan or African business relations. Relational and access-related aspects are only considered where they affect adoption conditions, stakeholder interaction or the interpretation related to market implications.

2. Methodology

This chapter outlines the methodology chosen to approach the research questions. It explains the qualitative case-study design, selection of participants, data collection methods and the procedure to structure the empirical material. The chapter also addresses research quality, ethics and use of generative AI.

2.1 Research design and approach

This study was conducted as a qualitative, field-based case study with limited quantitative elements. Aligned with Denscombe's *The Good Research Guide*, a problem-driven and pragmatic methodology was selected rather than a purely theoretical approach (Denscombe, 2010, pp. 4-7). The limited scope of this study further justified the case study design. This is a suitable approach for small-scale research that relies on empirical work (Denscombe, 2010, p. 62).

The purpose is to examine how value creation and system adoption vary based on institutional influences across different TE institutional contexts and segments. Since the study focuses on processes, experiences and organisational conditions rather than measurable statistical effects, a qualitative research approach is appropriate. The study is therefore explorative and analytical, aiming to identify patterns, differences and connections between cases rather than establish causal relationships.

Denscombe emphasizes that research strategies should be chosen based on what is appropriate for the specific research purpose, rather than from a predetermined methodological model. The choice of strategy should therefore be made based on suitability, feasibility and with ethical considerations in relation to the study (Denscombe, 2010, pp. 4-9). In this study, this means the methodology has been chosen based on the desire to understand a practical and contextual problem within a limited empirical field. This justifies a small-scale qualitative design, where the data collection can be adapted to the availability of relevant institutions, respondents and documentation.

A comparative multi-case approach was applied to find variations between different institutional contexts and levels of system-adoption. Considering the study contains institutions with different degrees of digital maturity, resources and structures, the multi-case approach allows for identifying institutional patterns for feasibility and value realization. The case study is appropriate since it allows for a deeper analysis of the processes, relations and organisational contexts in its natural environments. Denscombe describes case-

studies as especially useful when you want to research a limited number of cases in depth and understand relations and processes within a specific context (Denscombe, 2010, pp. 52-55).

In this study, the empirical material is approached through a comparative multi-case logic with regard to the fact that the findings are not to be considered equal case-by-case narratives. Moving forward, institutions are grouped into archetypes based on ownership and institutional type. This selection of archetypes was based on the varying empirical coverage across institutions. Simultaneously, the research purpose concerns broader patterns of adoption conditions, administrative workflows and value realization across various contexts. As a result, the archetypes can support the analysis by organizing categories for pattern detection, as opposed to representing statistically significant segments.

The study had an iterative design where the empirical findings and selection could be adjusted and refined over time. This is relevant since the access to institutions, respondents and documentation could not be predetermined in the beginning of the study. This does not mean the research is missing structure, but rather that the original plan is being treated as a starting point that can and should be adjusted when new empirical findings emerge. The iterative design made it possible to gradually modify the data collection to enable further case comparison once certain patterns were unfolded (Denscombe, 2010, pp. 107-112).

The empirical study is mainly qualitative but has quantitative elements to structure and support the analysis. The quantitative elements consist of interval-based estimations from the respondents, which will add to the comparisons between the cases and categorization of institutions and adoption stages. The quantitative findings will be used to support the triangulation, comparability and analytical structure. This is in line with Denscombe's view on mixed methods as a pragmatic combination of qualitative and quantitative elements, where one is dominant and the other acts complementary (Denscombe, 2010, pp. 138-141).

The methodology does not aim to produce statistically generalizable results. It aims to develop an empirically grounded understanding of how administrative processes and system adoption vary between institutions. The case-study design enables analytical insights regarding patterns and mechanisms within similar cases, while the study's limited scope and dependency on access to field data are considered. This delimitation is in line with small-scale empirical research and case study generalisation (Denscombe, 2010, pp. 60-62).

2.2 Case selection and access

The case selection is based on the study's purpose to research how administrative processes, value-creation and system adoption varies across tertiary institutions. In this case study, the included institutions were not selected randomly but rather strategically, based on their relevance to the research questions as well as accessibility. Denscombe underlines that case studies normally originate from an explicitly defined selection of one or several cases, where the selection criteria need to be justified in relation to the practical and theoretical problem of the study (Denscombe, 2010, pp. 56-57). In this study, the institutions have been chosen to contribute to variation in both types of institutions, the level of system adoption and ultimately the value realization.

The primary empirical focus was on two institutional types: universities and technical and vocational education and training (TVET) institutions (Salmi, Amegah and Shinde, 2025, pp. 73-74). The purpose of including different types of institutions was to broaden the understanding of how institutional contexts influence administrative needs.

The participating institutions were primarily divided into four institutional archetypes:

- Public TVETs
- Private TVETs
- Public universities
- Private universities

These archetypes were based on two central dimensions to the research questions: institutional type and ownership. Adoption stage, size, digital maturity and workflow complexity were subsequently regarded as additional dimensions, rather than as separate case categories.

The institutions were later categorized based on three adoption stages: non-user, in adoption and mature user. This categorization was selected to capture variation between institutions that do not yet use a DAS, institutions that are in the implementation or adoption stage, and institutions that have formally implemented a system. These differences allow for analysing the transition between the categories, which could help explain adoption dynamics and potentially value realization. The selection of institutions can be described as strategic or purposive sampling, since the cases have been chosen based on their relevance and ability to answer the research questions. Denscombe describes purposive sampling as an effective method to obtain relevant information based on a relatively small sample size. This is particularly appropriate for

explorative and small-scale studies, as the goal is to generate insights rather than to achieve statistical significance (Denscombe, 2010, pp. 34-36).

The empirical data was partly accessed through collaboration with the local administrative system provider SchoolTry Ltd. While giving access to some institutions and respondents, this collaboration also poses a risk of selection bias through the relationships between SchoolTry and the institutions. In *The Good Research Guide*, it is pointed out that the research strategy must be assessed based on feasibility. This includes the researcher's ability to gain access to relevant respondents, organisations and documentation (Denscombe, 2010, pp. 6-7). Access is not treated as a neutral technicality, but rather as an influential factor that needs to be displayed (Denscombe, 2010, p. 58).

To minimize the risk of a one-sided selection bias, institutions in different adoption stages are included, especially institutions that are not current users of SchoolTry's products. This makes it possible to compare different perspectives from potential, in-adoption and mature users. Since case studies are built on a limited sample size, the researcher, according to Denscombe, needs to be distinct with how the empirical findings can be used and transferred to other similar contexts and with regard to potential limitations (Denscombe, 2010, pp. 60-62).

To further ensure data quality, multiple different stakeholders within the selected institutions were interviewed, for example: administrators, teachers, managers and students. Even policy and governance actors within education are considered as relevant for this study. This will not only ensure the quality of the data but also enable comparisons between different perspectives on the same case. Deviations between different stakeholders are treated as empirically relevant indicators on how administrative processes, needs and system adoption can be understood from different stakeholders' perspectives. This aligns with the strength of a case study with multiple sources and perspectives, in order to understand relationships and processes in its natural context (Denscombe, 2010, pp. 53-54, 62).

2.3 Data collection methods

The data collection is mainly based on semi-structured interviews, complemented by secondary sources from desktop research. This approach is aligned with the exploratory approach and context-dependent nature of the study (Denscombe, 2010, pp. 174-175).

2.3.1 Interviews

Semi-structured interviews are commonly used in exploratory studies (Denscombe, 2010, pp. 174-175). This flexibility was suitable as the study was heavily influenced by contextual factors. Certain general areas of interest were predefined, but room was left for dynamic steering towards prominent themes and topics that would potentially be unveiled at a subsequent stage. Each interview lasted approximately 30-45 minutes and was conducted in English.

The respondents were classified into five different categories based on their relation to the DAS:

Stakeholder category
Decision-makers
Operational users
Technical gatekeepers
End-users
External actors

Table 1: Stakeholder categories used in interviews and through the study.

This approach implied different perspectives, which ultimately provided a holistic view and a deeper understanding of the role of the administrative system and various administrative processes. The variation of perspectives could also reflect differences in perceived value and challenges during adoption, enabling a deeper analysis of realized value across cases.

Based on this, an interview guide was shaped from a selected number of administrative processes. In the beginning, these were guided from standardised tasks but were ultimately adapted to fit the context.

The processes in focus during interviews were ultimately:

- Student Registration
- Attendance Tracking
- Assessment & Grading
- Fee Management
- Reporting & Compliance
- Student Records & Transcripts

These processes were selected as they represent key administrative processes, which is ultimately where administrative digital systems could realize or suppress potential value. The processes were investigated by comparing various roles and adoption stages of the organisation.

The processes were mainly investigated qualitatively, with the addition of a limited number of quantitative elements for structured comparisons. The quantifications were interval-based estimations, which were further explored through follow-up questions and triangulated between different respondents to enable comparison across cases. These served as supportive tools rather than primary quantitative measures (Denscombe, 2010, pp. 138-141).

Depending on the respondent's role, different administrative processes were in focus. As most questions were adapted to fit any process, the interviews could have the same structure with various respondent roles. Furthermore, the interview also had segments specifically formed for different respondents (Denscombe, 2010, pp. 174-175). For example, managers had a specific section about KPIs, while direct users had questions more relevant to the usage of the system and more in detail regarding the processes. The inclusion of multiple stakeholders allowed the study to investigate different perceptions of realized value and the implementation friction across departments in the same institution.

During the interviews, a constant awareness remained that interviews are shaped by the situation and may be influenced by the interviewer-interviewee dynamics (Denscombe, 2010, p. 173). Hence, the interview findings were sorted and prioritized based on their recurrence across interviews. If multiple independent respondents stated something similar, the validity increased. To validate this potential claim, documents and statistics were used as complementary triangulations (Denscombe, 2010, pp. 346-348).

The fieldwork consists of 27 formal interviews and 16 supplementary field conversations across four public universities, two private universities, three public TVETs and three private TVETs. This provided a broad data pool, with the purpose of investigating similarities and differences across the variety of institutions. The institutions varied in size, financial conditions, levels of digital adoption and geographically (urban vs. rural).

2.3.2 Documents and secondary data

As mentioned, interviews were conducted partly to find certain themes and patterns, which were subsequently triangulated with secondary data and external documentation. The secondary data was primarily official government reports and research reports. This did not only provide supplementary context but provided one additional step towards validating claims found in the interviews. Furthermore, the documents were also viewed critically, as documents cannot be considered objective facts, but rather “versions of reality” (Denscombe, 2010, pp. 221-222).

2.4 Data structuring and analysis procedure

The data was first structured using a case matrix, where each documented institution included characteristics such as ownership, institutional type, adoption stage, critical administrative processes and potential value indicators (Denscombe, 2010, pp. 239-240).

The matrix was subsequently rearranged into four institutional archetypes: public TVET, private TVET, private universities and public universities. By doing this, institutional thematic patterns could be presented while preserving case-level differences. The archetypes were related to the research questions by comparing adoption feasibility and value realization across various institutional contexts. After each interview, the case data was integrated to the matrix and coded to identify recurring patterns regarding adoption feasibility, value realization and variations across different types of institutions (Denscombe, 2010, pp. 283-285).

The following analysis was conducted in two steps: 1) description of empirical findings and 2) analytic interpretation of patterns and differences. Themes were explored further when they appeared more consistently across several interviews, in cases or stakeholders’ perspectives and when they could be supported through triangulation with other sources.

2.5 Research validity and reliability

Building on the research design described in Chapter 2.1, this section will explain how research quality was addressed in terms of validity and reliability. Reliability was strengthened through structured research design with an interview guide and semi-structured interviews, which Denscombe (2010, p. 114) describes as suitable for studies that require both structure and flexibility. To further increase the validity and credibility, triangulation was used between different sources and systematic comparisons across institutional contexts (Denscombe, 2010, p. 40).

The researchers' position as external Swedish master's students may also have influenced access, trust and interview dynamics. This was considered relevant since relationship building, access and trust in Kenyan organisational context can be shaped by institutional conditions, communication channels and existing networks according to Kiambi (2026). To address this beforehand the study sought to strengthen the research quality through transparent communication, confidentiality and a neutral interview approach.

The case study design was selected to develop a context-sensitive understanding of DAS adoption and value realization across different institutional settings. In line with Denscombe's (2010, pp. 52-64) view of case studies within their specific context, the study was not designed for statistically generalizable findings. Instead, it was to support what Yin (2014, pp. 11-12) describes as analytical generalization, where multiple cases can provide a broader insight into the studied phenomenon.

2.6 Research quality and ethics

This section describes how research quality and ethical measures were addressed throughout the study. It will cover research ethics, confidentiality, external interests and the limited use of generative AI.

2.6.1 Research ethics

The research project was designed in accordance with the report "God forskningssed 2024" (Vetenskapsrådet). The main element for this study's ethics is transparency, as research should be conducted, documented and published in a responsible way (Vetenskapsrådet, 2024, pp. 11-12). This involves a transparent methodology, clear documentation and replicability. In order to achieve reliable results, efforts were made to include several sources of data for further validation and triangulation.

Ethical considerations were taken in regard to data collection from interviews. All interviews were conducted with informed consent and were only recorded when given explicit approval. Furthermore, respondents were anonymous and confidentiality principles were applied to protect individuals and their rights (Vetenskapsrådet, 2024, p. 63). On this topic, data was collected and stored in line with ethical and legal standards, protected from any third parties. Lastly, the study only collected data aligned with the actual needs of the project (Denscombe, 2010, p. 344).

Given the qualitative research and case-based nature of the study, there is an unavoidable risk of biases stemming from the authors' influence as researchers (Denscombe, 2010, p. 178). In order to mitigate this risk, interviews were conducted in a standardised and professional manner, for example by including multiple roles and non-users for contrast. As the interviews were following the interview guide, the exploratory elements could be additional follow-up questions. In order to benefit from this, a certain degree of trust needs to be established (Denscombe, 2010, pp. 332-334). By quickly establishing confidentiality, respondents would likely be more sincere in their responses. One way of reaching a degree of trust was to clarify that the research would be openly accessible online once published, but to emphasize confidentiality and anonymity among respondents.

To protect confidentiality, individual institutions are not presented by name in the empirical findings but rather organized through the presented archetypes and through anonymized examples. This was necessary to reduce the risk of identifying individual institutions or respondents, as some institutional settings could be recognizable by triangulating size, ownership and adoption stage (Vetenskapsrådet, 2024, p. 67).

Moreover, research should be unaffected by external interests (Vetenskapsrådet, 2024). To approach this concern, a clear agreement was stated with the external partnering company SchoolTry. The proposed guidelines underlined the importance of allowing research to be conducted independently, as potential impact from the partnering company would compromise the results, which ultimately could provide misleading results and findings. To further reassure this concern, data was collected from both affiliated and non-affiliated institutions.

Finally, the research has consistently been aware of the limitations of social research. Despite recognizing that social research cannot be fully controlled, efforts were made to reduce unnecessary influence on the interview setting. (Denscombe, 2010, p. 72).

2.6.2 Use of generative AI

Generative AI was used as a supportive tool throughout the thesis process. ChatGPT and Google Gemini were used to refine formulations of research questions, identify relevant theoretical concepts, structure parts of the writing process, improve interview questions wording and to improve grammar and sentence structure. The outputs were treated as suggestions and were critically reviewed and verified against academic sources as well as the empirical material consistently throughout the work.

AI-supported transcription tools, such as Transcribe in Word from Microsoft 365, were also used to process recorded interviews. The transcripts were manually reviewed and corrected using notes from the interview when necessary. No identifiable interview data, confidential institutional information or raw empirical material was entered into an external generative AI tool. The empirical coding, categorisation and interpretation were conducted by the authors.

The use of generative AI has been intended to comply with Lund University's policy for responsible AI use. It was not used to replace academic judgement, empirical interpretation or methodological decisions. The authors remain responsible for the content, argumentation and conclusion of this thesis (Lund University, 2025; Lund University, 2026).

3. Theoretical Frameworks

This chapter presents the theoretical perspectives used to analyse DAS adoption and value realization. It introduces theories on socio-technical systems (STS), information system value, technology adoption, process-level realization and stakeholder interaction.

3.1 Digital administrative systems and value creation

This section explains how DAS can be understood as STS and how their value can be assessed. The relationship between technical and social systems are discussed before introducing the IS Success Model as a basis for analysing different dimensions of value.

3.1.1 Digital administrative systems as socio-technical systems

The STS approach is defined by Bostrom and Heinen as the approach of considering an organisation as a system made of two subsystems, the technical and the social system. The technical system is responsible for processes and tasks, acting as a function that converts physical inputs into organisational outputs. The social system, on the other hand, concerns the involved people's attitudes, skills and values. The entire output of the organisational system is constituted by the interaction of the two subsystems (Bostrom and Heinen, 1977, p. 14).

The STS approach becomes relevant when organisations implement advanced technical systems without changing existing work processes. Such a misalignment can cause friction which subsequently can suppress potential value realization. This is especially relevant in complex organisations, where changes in one aspect may give unintended effects in other parts of the organisation (Bostrom and Heinen, 1977, p. 11).

The aim of the STS approach is joint optimisation, where technology requirements are aligned with psychological and social aspects. In contrast to traditional MIS approaches, where the social systems are adapted to the technical requirements, STS is focused on balancing both dimensions (Bostrom and Heinen, 1977, p. 11). Moreover, the STS approach seeks to create an iterative and adaptive learning system that continuously develops to a changing environment (Bostrom and Heinen, 1977, p. 14).

DAS are particularly relevant from an STS perspective, as even the technical output directly affects people, decisions and relationships. Hence, it can be a useful tool to balance the two dimensions. Smaldino et al. defines information architecture as the “structural features and affordances that enable and constrain information flow between sources and receivers”. These include physical and digital infrastructure, but also

cultural features, norms and laws (Smaldino et al., 2025, p. 2). Educational institutions have several things in common, but even slight variations in the social system could potentially lead to big differences in outputs.

Furthermore, DAS are an example of a direct link between the technical system and the social system. For instance, these systems regulate who can access or distribute certain types of information (Smaldino et al., 2025, p. 2), which subsequently regulates both subsystems. These systems are rarely value-neutral, since they directly influence aspects of the social system such as behaviours, norms and ideas. Additionally, the systems are often shaped by the stakeholders' values, goals and desired outcomes (Smaldino et al., 2025, p. 5). Therefore, the DAS directly influence organisational outcomes, not only through the technical systems, but because of how they shape information flows and user interactions.

3.1.2 Dimensions of value in digital administrative systems

The value realized from a DAS cannot be interpreted through a single channel. Instead, it is multi-dimensional output dependent on several aspects of the organisation. The value is derived from numerous dimensions beyond adoption or technical performance. In order to understand how value is created and realized, DeLone and McLean created the IS Success Model in 1993 and updated it in 2003 (DeLone and McLean, 2003, p. 10). The IS Success Model measures technical success through system quality and communicational success through information quality. These are highly related to one another and in order to understand value each has to be taken into consideration (DeLone and McLean, 2003, pp. 10-11)

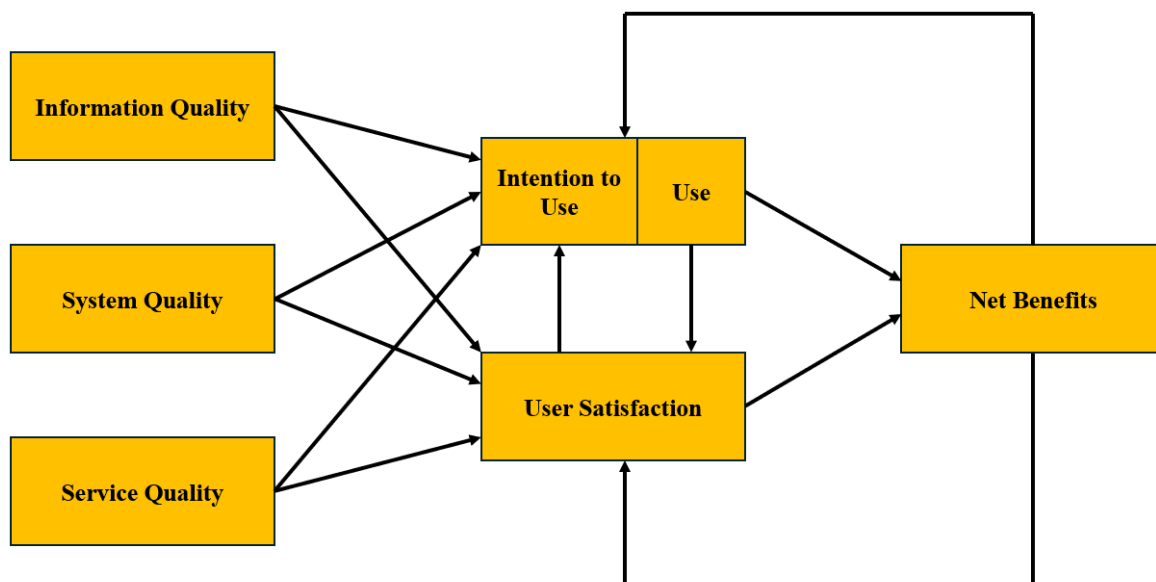


Figure 1: The IS Success Model of DeLone and McLean, 10-year update, adapted from DeLone and McLean (2003, p. 24)

In analysing the success of an organisation, the selected dimensions should be based on “the objectives and contexts of the empirical investigation” (DeLone and McLean, 2003, p. 27). There are 6 general dimensions defined, which could be interpreted as following:

Dimension	Interpretation
System quality	Adaptability, reliability, usability
Information Quality	Accuracy, completeness, relevance
Service Quality	Support, responsiveness, training
Use	Actual use across administrative workflows and roles
User satisfaction	Perceived usefulness, confidence, satisfaction with output
Net Benefits	Operational, informational, governance-related value, and user-perceived value

Table 2: Dimensions of success and their respective interpretation, derived and adapted from: (DeLone and McLean, 2003, pp. 24-26).

In applying the framework, the qualitative dimensions (information, systems and service) should be considered separately, as they all can influence the use and user satisfaction directly (DeLone and McLean, 2003, p. 23).

Interestingly, DeLone and McLean emphasize the term net benefits, rather than *impact*, as the latter can have a dual meaning of both positive and negative. Moreover, the different stakeholders can have varying views on the benefits which further underlines that perceived value is dependent on the receivers (DeLone and McLean, 2003, pp. 22-23). For instance, a DAS could yield benefits for management in terms of increased reporting quality, while simultaneously causing an additional workload for administrative staff.

As a result, net benefits need to be contextualized and related to the core objectives of the institution. Moreover, the defined net benefits need to be analysed using the qualitative dimensions. When applying the IS success model, a common mistake is to underestimate the complexity of the system by selecting too few dimensions. It is especially common to focus excessively on user satisfaction (DeLone and McLean, 2003, p. 21). Instead, it is important to fully comprehend and respect the complexity of the organisation. This can be achieved by applying several dimensions with respect to the contextual factors. In this study, the net benefits will be assessed and understood through the dimensions: operational value, informational value, governance-related value and user-perceived value.

3.2 Technology adoption and organisational conditions

This section is about the organisational conditions that shape DAS adoption. It introduces the TOE framework as the main perspective for analysing adoption feasibility.

3.2.1 The TOE framework

Adoption of DAS on an organisational level can be analysed with the *Technology-Organizational-Environment* framework (TOE), developed by Tornatzky and Fleischer (1990, p. 153). The framework explains how technological innovations are being implemented through three interacting dimensions: technology, organisational and environment (Tornatzky and Fleischer, 1990, p. 154). In this study, TOE is being used as an analytical tool to understand the different perspectives of how institutions within Kenyan TE are different from each other and their ability to adopt and use DAS. Instead of explaining every case from its characteristics, the framework will illustrate how internal conditions and external factors together affect adoption feasibility.

The technological dimension refers to the system's properties and its compatibility with existing administrative processes. This includes the system's complexity, ability to integrate with existing modules and the workflows (Tornatzky and Fleischer, 1990, p. 153). The organisational dimension includes internal factors such as resources, digital literacy, management support and organisational structure. These aspects affect both implementation and ability to maintain system use over time. The environmental dimension refers to the external factors, such as regulations, funding and access to infrastructure. These aspects in the Kenyan context include differences between public and private institutions, variations in digital infrastructure and the need for external stakeholders (Tornatzky and Fleischer, 1990, p. 154).

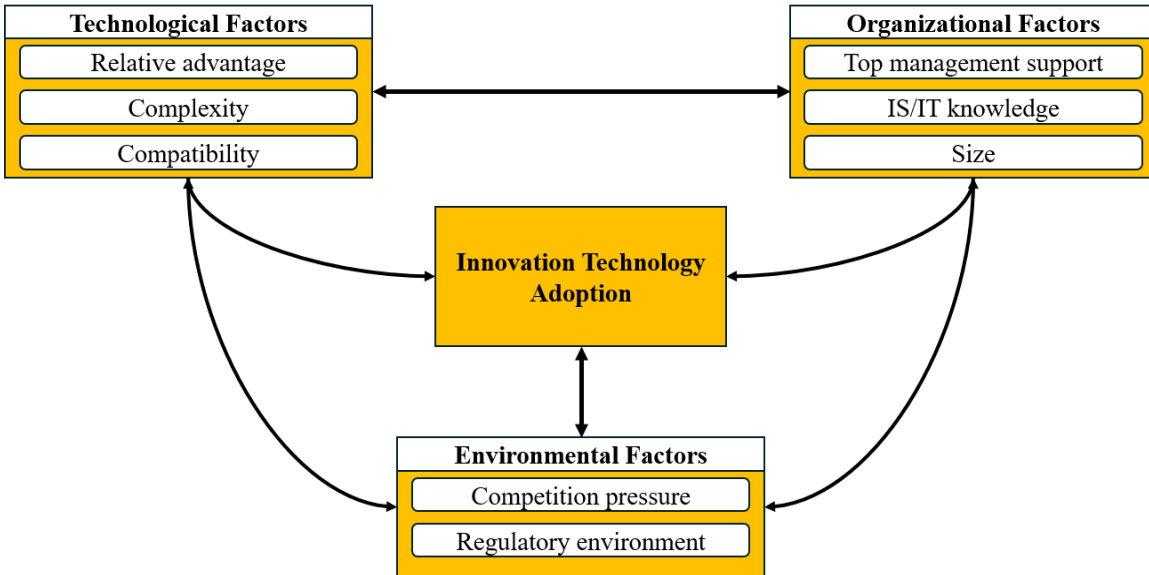


Figure 2: The technology-organization-environment framework adapted to DAS adoption, based on Tornatzky and Fleischer (1990, p. 153).

In summary, the TOE framework shows how adoption cannot be explained by a single factor, but the interaction between technological, organisational and the surrounding environment (Tornatzky and Fleischer, 1990, pp. 153-154). Even if the framework forms a stable theoretical basis, it needs to be customised to this study, to illustrate the importance of interaction between administrative processes and different stakeholders.

3.2.2 Organisational capacity and adoption feasibility

Adoption feasibility can be related to the TOE framework through the internal capacity of the institution to implement, adopt and sustain a digital system over time (Tornatzky and Fleischer, 1990, pp. 153-154). This includes organisational resources, technological competence and managerial support. These are some of the key factors prior research has identified for organisational digital readiness (Michelotto and Joia, 2024, pp. 3295-3296).

Digital skills and ICT capacity are both central during the adoption by influencing the users' adoption rate, system understanding and support accessibility. The ICT capacity refers to the technical staff that handles internal technical support, access, troubleshooting and communication with the system supplier or developer. All these factors affect how well a digital system goes from implementation to actual use (Michelotto and Joia, 2024, pp. 3295-3296; Purnamasari et al., 2025, pp. 3-4).

Financial resources and management support are aligned in relation to adoption feasibility. DAS requires licensing, infrastructure, internal education and continuous maintenance (Purnamasari et al., 2025, pp. 2-4). Support from management furthermore affects if the digitalisation is being prioritized, how resources are allocated and that all departments are aligned (Tornatzky and Fleischer, 1990, pp. 153-154; Michelotto and Joia, 2024, pp. 3295-3296).

In this study adoption feasibility is being used as an analytical concept to analyse why some institutions have better conditions than others to realize value from a DAS. Adoption feasibility acts like the bridge between the TOE framework's organisational dimension and the analysis of workflow alignment and value realization.

3.2.3 Workflow alignment and contextual fit

Organisational capacity is insufficient on its own if the digital system does not align with the existing workflows. A system can be technically feasible for an institution with great demand, but if the processes are not fully aligned and the system tailored, the implementation could even cause value loss (Davison et al., 2019, pp. 6-7). A successful implementation at one institution is no guarantee that the same will generate value at another institution (Davison et al., 2019, pp. 10-13).

Workflow alignment is the level of agreement and understanding between a system's functions, rules, flow of information and practical processes (Tronina, Tatenko and Semenikhina, 2020, pp. 303-305). For example, how registration of a person is directly connected to their balance account or how grades are registered to a certain account. If a system's function does not match existing workflows there is a risk that users create workaround, manual controls, or informal solutions outside the digital system (Davison et al., 2019, pp. 6-8). Contextual fit regards to which extent a digital system must be customised to meet the local context. In Kenya, institutions face different challenges and variations. For example, digital literacy, unreliable internet connection and infrastructural restrictions. Local variations influence how well a standardised digital system will work in practice (Rahman, 2025, p. 6).

Workflow alignment and contextual fit are central for the adoption feasibility. When the system fits into the context the possibility to realize value through more efficient processes increases. When the fit is weaker the system is more likely to create friction.

3.2.4 User-level adoption

The TOE framework from 3.2.1 helps to understand technological adoption from an organisational perspective, but it does not explain how individuals receive and use digital systems in practice. To complement this, the Technology Acceptance Model (TAM) could provide a better understanding of how digital systems are used in practice from a user perspective. TAM focuses on the user-perceived ease of use and perceived usefulness (Davis, 1989, pp. 319-320).

Perceived ease of use covers how easily a user experiences the system to be during usage. If the system demands extensive support, feels complex or does not fit with existing processes, the approval of the system will be reduced even if the system has a high functionality. Perceived usefulness refers to how the user perceives the ease of workflows and processes. In the context of digital administrative processes, a sensation of reduced manual work or increased information accessibility could exemplify perceived usefulness (Davis, 1989, p. 320).

In this study, TAM is not acting as a main framework but a complementary one to display different stakeholder perspectives. DAS are being used by multiple stakeholder groups and when evaluating the system usefulness and usability, each group needs to be taken into consideration. This is relevant for understanding perceived value, since TAM shows that user perceptions are shaped not only by whether a system is used, but also if it is experienced as useful and easy to use.

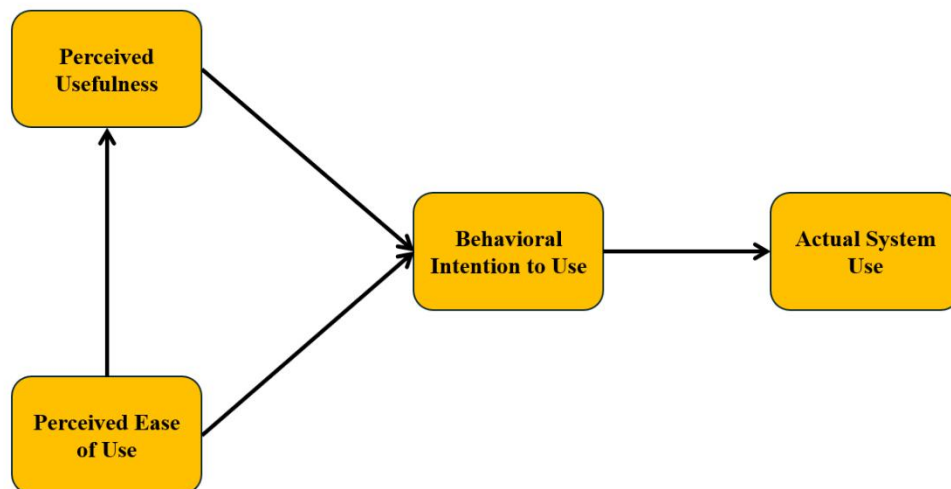


Figure 3: Simplified Technology Acceptance Model (TAM), adapted from Davis (1989, p. 320).

3.3 Adoption process and process-level value realization

This section explains how DAS adoption develops from implementation to utilisation. It focuses on how onboarding, training, integration and workflow variation influence whether system use creates value or friction.

3.3.1 From implementation to utilisation

Adoption of DAS should be understood as a process rather than a single event. The fact that a system has been introduced into an organisation does not necessarily mean that it has been accepted by users, used consistently or generated the intended value. It is therefore analytically important to distinguish between implementation, adoption and utilisation (Garcia-Aviles, 2020, p. 2; Cooper and Zmud, 1990, pp. 124-125).

Implementation refers to the phase in which the system is introduced into the organisation. This includes activities such as technical installation, configuration, allocation of user roles, onboarding and making the system available to all users. Post-implementation therefore means that the system formally is in place, but it does not by itself provide any indication on the actual success of the system usage (Cooper and Zmud, 1990, p. 124). Adoption refers to the phase in which users and organisations begin to use the system and adjust their work practices. This involves a gradual shift from previous manual or parallel routines toward a digital system-supported administrative practice. Adoption therefore concerns both acceptance and changes in actual practices (Garcia-Aviles, 2020, p. 2; Cooper and Zmud, 1990, p. 124). Utilisation refers to the more stable and repetitive use of the system over time. At this stage, the system is not limited to occasional use for single events, but as an integrated support mechanism in the administrative processes it is intended to handle. It is primarily through utilisation that potential value can be realized in the form of more efficient workflows, enhanced data quality and improved coordination (Cooper and Zmud, 1990, p. 124; DeLone and McLean, 2003, p. 16).

This distinction is important because systems may be implemented without being fully adopted and adopted without being effectively utilised. In this study, implementation, adoption and utilisation are therefore treated separately in the analysis, to ultimately understand where value is created, limited or lost during the adoption process. This emphasizes the need to analyse realized value on a process level. Different administrative workflows may be at different stages of use within the same institution (Cooper and Zmud, 1990, p. 124).

3.3.2 Onboarding, training and integration

After a DAS has been implemented, onboarding and training become central for turning formal availability into actual use and value realization. Users need to understand not only how to access the system, but also how their workflows, routines and data practices change when administrative work becomes digitalised. Insufficient training can lead to user errors, inconsistency, increased support burden and continued reliance on manual work and workarounds (Rani et al., 2024, p. 29; Nah, Lau and Kuang, 2001, p. 293).

Training alone is not sufficient unless the system connects the administrative processes it is meant to support. Digital administrative processes often consist of several modules dependent on each other. Registration may depend on fee clearance, grading may depend on correct course registration, and reporting may depend on data across departments. When these modules are weakly integrated, digitalisation can create fragmented data, manual workaround and unclear responsibilities rather than smoother coordination (Nah, Lau and Kuang, 2001, pp. 285, 293-294).

In this study, onboarding, training and integration are therefore treated as mechanisms that connect implementation to utilisation. Onboarding affects whether users are able to work with the system, while integration affects whether the system can support end-to-end administrative workflows. Weakness in either area can explain why a system may be formally adopted but still produce uneven value across processes.

3.3.3 Process-level realization

DAS do not create value just by being implemented or adopted at the institution. Value is realized through specific administrative processes in which the system is used. This means that the same system may generate clear benefits in one workflow while creating limited value or friction in another. A process-level perspective is therefore necessary for understanding how DAS can produce uneven outcomes within the same institution (van der Aalst, 2013, pp. 1-2).

In TE, DAS support recurring administrative workflows such as student registration, assessment and grading, fee management, reporting and student records (Bhat, 2023, p. 149). These workflows differ in purpose, data requirements and stakeholder involvement, meaning that value may be realized in different ways across them. Some workflows primarily concern operational efficiency while others are more closely related to data quality, transparency, financials or institutional governance.

A process-level perspective also makes it possible to distinguish value realization and value loss. A workflow may become faster or more standardised while still producing unreliable data, increased need for support or reduced trust (DeLone and McLean, 2003, p. 23). Similarly, digitalising one part of a process may create new dependencies if related workflows remain manual or poorly integrated (van der Aalst, 2013, pp. 1-2). This perspective on process-level connects the logic of use and net benefits from the IS Success Model with the actual workflows investigated in this study (DeLone and McLean, 2003, pp. 23, 28). Therefore process-level analysis helps identify not only where value is created, but also where it is constrained or lost.

3.3.4 Process variability and outcomes

Administrative workflows differ in complexity, data requirements and dependency on other processes (van der Aalst, 2013, pp. 1-2). As a result, the same DAS may produce different outcomes depending on the workflow in which it is used. A linear process may be easier to digitalise and standardise, but workflows involving multiple steps, financial transactions, records and cross-functional collaboration may be more difficult to standardise (van der Aalst, 2013, p. 2; Bhat, 2023, pp. 147-148).

Process outcomes should not be assessed only based on whether a workflow has become digitalised or faster. A digital workflow may improve speed and standardization, but still perform poorly in terms of information quality, reliability or user satisfaction (DeLone and McLean, 2003, pp. 23, 26). A process may appear slower because it includes many validation steps but still produce stronger governance and more reliable records. Variability in processes therefore helps explain why DAS may realize value in some areas while producing limited or no value in others (DeLone and McLean, 2003, pp. 23-24).

3.4 Stakeholders and interaction in system adoption

This section examines the role of stakeholders in DAS adoption. It focuses on how stakeholder roles, interactions and potential misalignment influence adoption, perceived value and implementation friction.

3.4.1 Stakeholder roles in digital administrative systems

A stakeholder is anyone that is affected by the output of the organisation or anyone that can affect an organisation's objectives (Freeman and McVea, 2001, p. 4). In digital systems this means any person or group that affects the adoption or the output of the system, ranging from students and operational users to institutional decision-makers, system providers and external regulatory units. In the adoption of digital

systems, it is important not only to identify stakeholders, but also to align roles and demands. Moreover, the relationships and expectations between stakeholder groups also needs to be considered.

In adopting a DAS, each stakeholder needs to be understood in relation to the integration of the new system. To accomplish that, it is important to understand the contextual roles of each stakeholder to fully distinguish their characteristics (Freeman and McVea, 2001, p. 4). Roles such as decision-makers, operational users, technical gatekeepers and end-users need to be defined. In various organisations, even the same type of role could imply different mandate and flexibility.

To assess stakeholder salience, Mitchell et al. refers to the traits of *power*, *legitimacy* and *urgency* (Mitchell, Agle and Wood, 1997, p. 869). This could explain how management prioritises different stakeholders in different scenarios. Mitchell et al. has researched it further, with their *salience model*. The salience for a stakeholder group varies depending on how much power, legitimacy or urgency that specific group possesses (Mitchell, Agle and Wood, 1997, pp. 872-873). In the salience model, there are three levels based on their attributes:

Salience level	Attribute	Relevance
Latent stakeholders	One attribute	Low priority
Expectant stakeholders	Two attributes	More notable, likely to require management attention
Definitive stakeholders	Power + legitimacy + urgency	High salience, immediate attention

Table 3: Levels of stakeholders' salience based on power, legitimacy and urgency, adapted from Mitchell, Agle and Wood (1997, pp. 872-873)

The categories can subsequently be divided into subcategories in order to understand how different combinations of the three attributes affect stakeholder salience. Mitchell et al. identifies 8 different stakeholder types based on the three deciding traits (Mitchell, Agle and Wood, 1997, p. 874). While each of the stakeholder types are interesting, the emphasis in this study will be on the three traits: *power*, *legitimacy* and *urgency*, as well as the salience level.

This model can be helpful in the study of DAS because of the involvement of multiple stakeholders that are different from one another. For instance, in an organisation management may possess a high level of power and legitimacy, whereas certain units such as ICT may possess a high power but a lower legitimacy.

Considering the context of digital adoption, they may be a gatekeeper and have increased salience. End-users may have a low formal power but could become salient if their demands are urgent. External actors could have a large power or legitimacy through regulations or funding. In the scope of this study, the framework is mainly used to illustrate various stakeholder perspectives and will not play a central role in the subsequent analysis. However, it will be used as a complementary analytical lens to understand how the relevance of different stakeholder groups varies across workflows and adoption stages, primarily in Chapter 6.3.2.

3.4.2 Interaction and alignment

The previous section identified stakeholders and their positioning based on power, legitimacy and urgency. While this extends to each of their relationships to the organisation and the management, it is also essential to understand how stakeholders interact with one another. The relationship between stakeholders varies over time and a successful stakeholder management implies an active management of these relationships over time (Freeman and McVea, 2001, pp. 10-11). In the context of digital adoption, this means that every department and stakeholder needs to be viewed as a collective interaction system, with inputs and outputs, rather than approached separately (IMP Project Group, 1982, pp. 14-15).

To achieve a better understanding of these interactions, the Industrial Marketing and Purchasing (IMP) model could prove useful. Originally designed to analyse relations between buyers and sellers on industrial markets, the perspective challenges the conventional perspective on transactions as single definite transactions. Instead, one should focus on the long-term relations, mutual affections and complex patterns of interaction between organisations (IMP Project Group, 1982, p. 1). This can be transposed to the context of DAS, as it is a relational process between two parties, while simultaneously consisting of several internal relationships. Although the IMP approach originates from industrial relationships, it can be useful when studying DAS as well. The system adoption involves long-term interaction between system providers and institutions as well as internally between stakeholder groups.

In the IMP *Interaction Approach*, the interaction consists of four base elements: 1) the interaction process, 2) the participants in the interaction process, 3) the environment within which interaction takes place and 4) the atmosphere affecting and affected by the interaction (IMP Project Group, 1982, p. 15). The interaction process can be divided into episodes of “exchange”, such as product/service exchange, informational exchange, financial exchange and social exchange (IMP Project Group, 1982, pp. 16-17). In this study, the product and service exchange could be a digital system, implementation and maintenance. The financials are represented by costs, the ability to pay and financial capacity. The social exchange could relate to trust,

communication and mitigation of uncertainty (IMP Project Group, 1982, p. 17). Taken together, the IMP model displays that adoption is not only based on the system's functionality, but also on the relation between the involved parties.

Alignment, in this context, is a gradual process of mutual adaptation. The IMP Project Group exemplifies with adaptations to products, financial arrangements, information or in social relationships (IMP Project Group, 1982, p. 18). For example, successful system adoption may require process-specific configuration, additional training or increased support. Regardless, the exchange goes beyond technical delivery and also covers organisational and social compatibility between the involved parties.

Moreover, the exchange is also influenced by the organisational aspects of the involved parties. An organisation's size, competence, experience and structure all have a vital part in the exchange (IMP Project Group, 1982, pp. 18-19). In this study, this becomes especially important considering participating institutions vary in size, ownership, strategy and digital development, which subsequently may influence the adoption of a DAS.

Taken together, IMP's *Interactive Approach* underlines the importance of viewing stakeholder interaction and alignment as a dynamic process that constantly changes (IMP Project Group, 1982, pp. 21-23). DAS do not create value simply by being implemented, but through the exchanges done by the involved stakeholders. Once these interactions are aligned, the system can be completely integrated and potentially realize value. In the event of misalignment, it can lead to uncertainty, flawed adoption and counterproductive workflows.

3.4.3 Stakeholder misalignment and friction

Stakeholder alignment is important because different actor groups may evaluate the same DAS with different priorities in mind (Freeman and McVea, 2001, pp. 4-6; DeLone and McLean, 2003, p. 23). Decision-makers may focus on reporting, control and having an overview while operational users may focus on workload, usability and process fit. Students may primarily evaluate the system through accessibility, transparency and reliability. When these expectations are not aligned the system may be perceived as valuable by one group while creating friction or additional work for another (Freeman and McVea, 2001, pp. 10-12; DeLone and McLean, 2003, pp. 23-24)

In digital system adoption, misalignment can create friction when responsibilities, data visibility or process ownership are unclear (IMP Project Group, 1982, pp. 21-23). For example, a financial workflow may be experienced differently by finance staff, students and management because each group depends on different outputs from the same process. Additionally, technical staff may become a gatekeeping layer between users, management and system providers when problems cannot be resolved locally. Such misalignment can lead to support burden, double the workload, workarounds and reduced faith in the system (Davison et al., 2019, pp. 5-8).

Stakeholder misalignment is therefore treated in this study as a source of implementation friction and potential value loss. It helps explain why adoption feasibility depends not only on institutional capacity and workflow fit, but also on whether different groups share the same understanding, responsibility and trust in the system.

3.5 Analytical framework

This section synthesizes the theoretical perspectives into the analytical framework used in the empirical analysis. The framework connects institutional conditions, adoption feasibility, adoption process, process-level realization, value realization/loss and stakeholder alignment as a cross-cutting dimension.

3.5.1 Synthesis of theoretical perspectives

The theoretical perspectives presented above address different parts of digital system adoption. The TOE framework explains how technological, organisational and environmental conditions shape the feasibility of adoption at different institutional levels (Tornatzky and Fleischer, 1990, pp. 153-154). Adoption process theory then clarifies that implementation, adoption and utilisation are separated stages. Together, these perspectives explain why adoption should be understood as both contexts driven and developing over time.

However, adoption feasibility and process analysis do not in themselves explain whether value is realized or not (DeLone and McLean, 2003, pp. 23-24). Information system value theory highlights that benefits emerge through use, and the outcomes may result in improved efficiency, information quality, governance and user satisfaction (DeLone and McLean, 2003, pp. 23, 25-26). At the same time, stakeholder perspectives show that these outcomes may be experienced differently by decision-makers, operational users, gatekeepers and end-users (Freeman and McVea, 2001, pp. 10-11). The analytical framework therefore combines external conditions, adoption mechanisms, process level outcomes and stakeholders to analyse how value is created, realized or lost in different contexts.

3.5.2 Core analytical dimensions

Based on theoretical perspectives presented above, the analytical framework is structured around five sequential dimensions: institutional conditions, adoption feasibility, adoption process, process-level realization and value realization/loss. Stakeholder alignment is treated as a cross-cutting dimension across all stages. For operational purposes, value realization and value loss are separated in *Table 4* in Chapter 3.5.4. These dimensions are used to compare institutions, administrative workflows and stakeholder perspectives in the empirical analysis.

Adoption feasibility refers to the extent to which an institution has the conditions required to implement, adopt and utilise a DAS. In this study, it is assessed through organisational capacity, technical infrastructure, workflows and stakeholder alignment (Tornatzky and Fleischer, 1990, pp. 153-154; Cooper and Zmud, 1990, pp. 124-125).

Process-level realization refers to where and how the system creates value within specific administrative workflows. The analysis focuses primarily on registration, grading, finance and reporting, as these are central areas where DAS can affect efficiency, coordination and data quality (DeLone and McLean, 2003, pp. 23, 25-26). *Value realization* refers to the benefits that are actually achieved through system use. In this study, realized value is analysed through efficiency, data quality and governance (DeLone and McLean, 2003, pp. 23-26). *Value loss* refers to situations where expected benefits are reduced or disappear during implementation or use. This is analysed through workarounds, support burden and process breakdowns (DeLone and McLean, 2003, pp. 23-24).

Stakeholder alignment is treated as a cross-cutting dimension in the model. Decision-makers, operational users, technical gatekeepers and end-users may evaluate the same system differently. This means that perceived value, trust and friction can vary across different roles. This makes stakeholder alignment important to understand both adoption feasibility and realized value potential (Freeman and McVea, 2001, pp. 10-12; DeLone and McLean, 2003, p. 23).

Together these dimensions make it possible to analyse not only why DAS are adopted, but under what conditions they generate value or create friction.

3.5.3 Conceptual model

Building on the theoretical perspectives presented above, the conceptual model brings together the main dimensions of the study into a sequential analytical framework. The model illustrates how institutional conditions shape adoption feasibility, how adoption feasibility influences the process from implementation to adoption and utilisation. System use within specific administrative workflows results in either value realization or loss.

The model follows the logic below:

Institutional conditions

- **Adoption feasibility**
- **Adoption process**
- **Process-level realization**
- **Value realization / value loss**

Stakeholder alignment runs across all stages of the model.

Institutional conditions refer to the broader technological, organisational and environmental factors that influence whether an institution is ready for DAS adoption. These conditions are analysed through the TOE framework and include technical infrastructure, organisational capacity, funding, governance and workflows. Together these factors shape adoption feasibility, which focuses on the practical ability to implement, adopt and maintain system use over time.

The adoption process includes the movement from implementation to adoption and utilisation. This distinction is important because a system may be formally implemented without being fully integrated or used on a daily basis. Value is therefore not assumed to follow automatically from implementation. Instead, value is analysed through process-level realization, meaning how the system is used within specific administrative workflows such as registration, attendance, grading, fee management, reporting and student records.

The final outcome of the model is value realization or value loss. Value realization refers to successful achievements through system use, including operational, informational, governance and user-perceived value. Value loss refers to situations where expected benefits are lost through workarounds, support burden, data distrust and weak integration. Stakeholder alignment is treated as a cross-cutting dimension because stakeholders influence and experience every stage of the model differently. Different stakeholder groups may shape and experience adoption feasibility, system use and perceived value differently.

The model is used as an analytical guide for comparing institutions, processes and stakeholder perspectives in the empirical analysis. It supports the study's purpose by explaining how adoption feasibility and value realization are shaped by institutional conditions, administrative workflows and stakeholder alignment.

3.5.4 Operationalization for analysis

The conceptual model is operationalized by applying each analytical dimension to the empirical material. The purpose is not to analyse DAS as one uniform process, but rather to compare how adoption feasibility and value realization differ across contexts, administrative workflows and stakeholder roles. *Table 4* below summarizes how each analytical dimension is supposed to be used in the analysis:

Analytical dimension	What is analysed	Empirical focus
Institutional conditions	Differences between institutional contexts	Institution type, size, digital maturity, resources
Adoption feasibility	Condition for adoption	Organisational capacity, technical infrastructure, workflow alignment, stakeholders
Adoption process	Progression of system use	Implementation, adoption, utilisation
Process-level realization	Where value is created or lost	Registration, attendance, grading, fee management, reporting, transcripts
Value realization	Benefits achieved through use	Efficiency, data quality, governance, trust
Value loss	Expected benefits reduced	Workarounds, support burden, data distrust, process breakdowns
Stakeholder alignment	Role-based differences in experience, responsibilities and perceived value	Decision-makers, operational users, technical gatekeepers, end-users

Table 4: Operationalization of the analytical framework

In the analysis chapter the framework is applied in three steps. First, institutions are compared to assess how organisational and contextual conditions affect adoption feasibility. Second, key administrative workflows are analysed to identify where value is realized or lost at process level. Third, stakeholder perspectives are compared to understand how perceived value, trust and implementation friction differs across roles. Together these steps provide a basis for understanding adoption and value realization in heterogeneous organisational contexts. The same framework will later support the provider-oriented discussion by showing how system providers can assess and prioritize different segments, with focus on adoption feasibility, process-level value potential and stakeholder alignment.

4. The Kenyan Context and Case Description

This chapter provides the contextual background for the empirical study. It first introduces Kenya and the TE sector. Then describing relevant administrative processes, digitalisation conditions and the case organisations included in the study.

4.1 Kenya overview

Kenya is one of the biggest economies in East Africa. Since the declaration of independence in 1963, the country has seen remarkable population growth and urbanisation. Although the population growth has stagnated to 2% annually in 2024, it was over 3% almost constantly until 2010. As a result, the population has grown from 8,627,971 in 1963 to 56,432,944 in 2024. Since 1963, the life expectancy has increased from 51 years to 64 years. The GDP has increased by a factor of 129 in the same period, from \$926,589,349 USD to \$120.34B USD, while the GDP per capita has increased from \$107.4 USD to \$2,132.4 USD (World Bank, n.d.-a).

The rapid growth has caused capacity shortage, both in regard to funding and a lack of skilled labour. Additionally, a partly developed infrastructure creates socioeconomic gaps. Since the year 2000 up till 2024, the access to electricity has increased from 15.2% of the population to 76.2%. Simultaneously, the percentage of the population using the internet has only increased from 0% to 35%, despite 75% of the population being aged under 35. (World Bank, n.d.-a.; NCPD, 2024, p. 5). These external conditions are important for the study, as they illustrate the ambitious yet uneven development and capacity in Kenya. This subsequently affects the adoption feasibility which is likely to vary across institutions.

Recently, Kenya has implemented several political incentives targeting economic growth, improved education and technological development. The most recent being *Kenya Vision 2030*, which aims “-- to transform Kenya into a newly-industrializing, middle-income country, providing a high quality of life to all its citizens by 2030.” It was launched in 2008 by then President Mwai Kibaki. The large-scale project has already allocated heavy investments in infrastructure such as fibre optic cables but also drafted a new constitution which was outlined in 2010. In 2015, the *Last Mile Connectivity Programme* was launched, including electrification of all Public Primary Schools (Kenya Vision 2030, n.d.; Kenya Vision 2030, 2024; REREC, n.d.; Global Infrastructure Hub, 2018).

In 2010, Kenya's governance shifted from 8 provinces to the establishment of 47 counties. The goal was to allow self-governance to the people and to promote a more even distribution of resources (State Department for Devolution, n.d.). Each of the 47 counties appoint their own governor that subsequently selects a county assembly to legislate laws independently. Additionally, there is a county executive committee, also referred to as "county ministers". The county governments are responsible for infrastructure, utilities and energy, health among other matters (Nyambura and Grant, 2022).

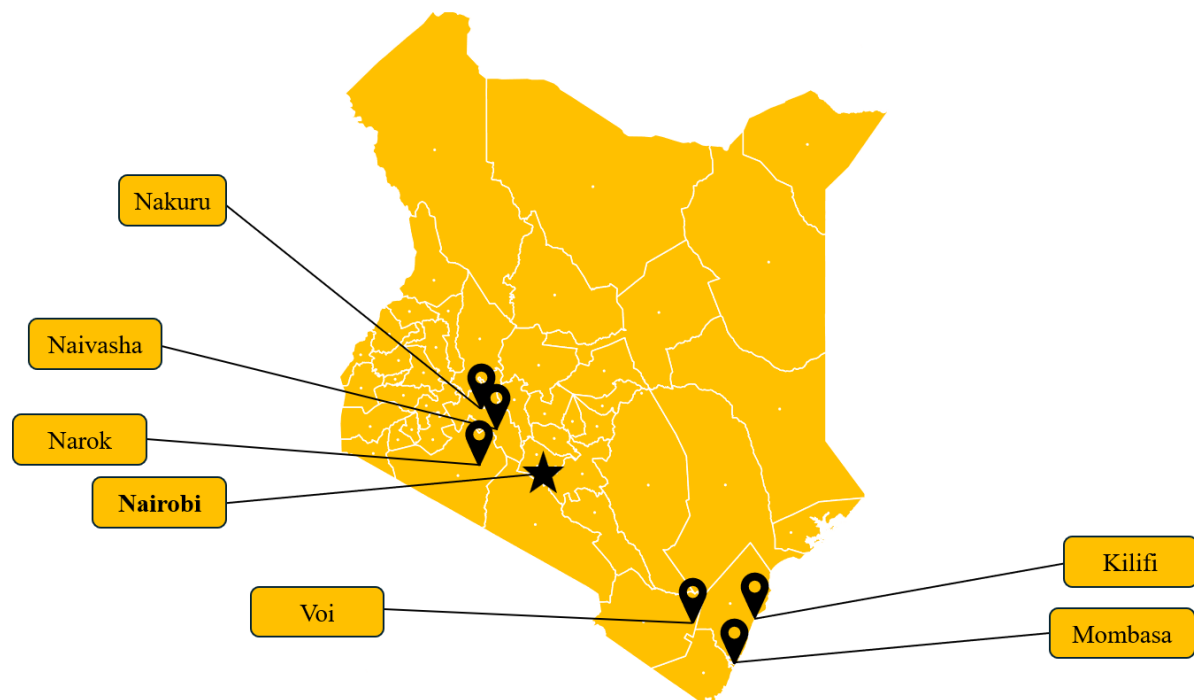


Figure 4: Geographical overview of Kenya, including visited cities during the field research, adapted in PowerPoint from SimpleMaps (n.d.).

4.2 The Kenyan education sector

The educational sector in Kenya has undergone a rapid expansion over the past decades. This is partly due to population growth, but the main driver is government incentives to increase the accessibility of education (World Bank, n.d.-b). For the year 2024 Kenya spent roughly 4% of GDP on education (World Bank, n.d.-b) which can be compared to the EU averaging 4.6%, with Sweden having the highest expenditure at 6.9% during 2022 (Eurostat, 2025).

Although the heavy investments have led to significant growth, they also have created several administrative challenges. An increased student count makes the registration, data management and administrative tasks more difficult. The limitation of resources creates constraints and demands effective resource allocation. The financial constraints can force institutions towards self-sufficiency which in turn can cause qualitative gaps between public institutions. Furthermore, this self-sufficiency tendency can reduce the state's ability of governance (Altbach, Reisberg and Rumbley, 2009).

In 2018, only 25% of Kenyan students were proficient in math and 20% in reading. The biggest underlying reason is stated to be financial, as only 10% of children from the poorest households in Kenya complete secondary school (World Bank, n.d.-a. ; Government of Kenya, 2023). The financial constraints extend beyond households, as inadequate resource allocation hinders infrastructure projects and suppresses the supply of learning materials. Additionally, governance issues and conflicting initiatives cause more friction. Concerns have been raised about high management salaries as well as an excessive number of administrative staff (Government of Kenya, 2023).

4.3 Tertiary education in Kenya

The Kenyan education system for TE includes various types of institutions, *Universities* and *TVETs*. These vary in structure, purpose and organisational aspects but together cover the nation's competence demands and development (UNESCO-UNEVOC, 2018, pp. 5-6; CUE, 2025a, p. 7).

The universities consist of public and private institutions, offering undergraduate as well as post-graduate degrees and PhDs (CUE, 2025b, pp. 7, 11). The TVETs consist of institutions that target practical skills and competencies adapted for the labour market (UNESCO-UNEVOC, 2018, pp. 6, 8). TVETs generally offer shorter educations and close partnerships with industry for internships and early recruiting (UNESCO-UNEVOC, 2018, p. 8). Both types of education are directed by the Ministry of Education, but have separate

governmental departments for governance (CUE, 2025b, pp. 5-7; UNESCO-UNEVOC, 2018, pp. 8-9). These differences motivate the subsequent use of institutional archetypes in the empirical and analytical chapters.

4.3.1 Universities

The Kenyan university-sector is undergoing expansion and development. From founding the first university, University of Nairobi, in 1970 to having 79 universities as of 2024/2025 (CUE, 2023, p. 6; CUE, 2025b, p. 10). Out of these 79 universities, 45 are public and 34 are private. The number of students has increased from 3000 in 1970 to 67,558 in 2003 to over 276,000 in 2013 (CUE, 2023, p. 6). As of 2024/2025 the student count is 628,541, up 12% from the previous year (CUE, 2025b, pp. 12-13).

A majority of students (> 75%) attend public universities, yet private universities are growing and make up approximately 43% of the number of universities (CUE, 2025b, pp. 10, 12-13). The three biggest universities account for over 25% of the total student population. *Jomo Kenyatta University of Agriculture and Technology* had the highest enrolment with 44,131 students, followed by *University of Nairobi* with 41,174 students and *Kenyatta University* with 36,013 enrolled students (CUE, 2025b, pp. 13-14). The biggest private university is *Mount Kenya University* with 30,448 students enrolled (CUE, 2025b, p. 14). The most common level of education is bachelor's with 577,345 students out of which 320,439 were male and 256,906 females (CUE, 2025b, p. 16).

Academically, several universities struggle with maintaining qualified staff due to an aging faculty and a shortage of PhD-holders (CUE, 2025b, p. 19). In total, the teaching staff in universities consist of 15,383 employees, making a 1:39 staff to student ratio. For public universities, this ratio is 1:44 (1:41 in 2023) and for private universities it is 1:34 (1:43 in 2023). This indicates a movement towards private universities, with an increasing staff-per-student ratio (CUE, 2025b, pp. 19-20).

The non-teaching staff in universities makes up 21,993 employees nationwide. A total of 16,663 (75.8%) work at public universities which aligns with the staff to student ratio at public and private universities (CUE, 2025b, pp. 26-27)

4.3.2 Technical and Vocational Education and Training

TVETs in Kenya are mandated to provide middle-level-skilled manpower for socioeconomic development and priority sectors. This is being done through institutional training, industry-based training, internship and Recognition of Prior Learning (RPL) (Ministry of Education, 2025, p. 4).

Even with the growth of the universities in mind, the development and expansion of TVETs is even greater. Aligned with the greater goals of *Vision 2030*, education and especially TVETs has become one of the pillars of the future society (Republic of Kenya, 2013, pp. 72-73; Ministry of Education, 2025, pp. 1-2).

The TVET sector has experienced significant growth in the past decades. In 2012 there were 706 which can be compared to 2969 TVET institutions in 2024/2025, up 24% from 2023/24. Simultaneously, the recurrent allocation on a national level rose from KSh 19.0 billion to KSh 32.1 billion. Furthermore, the public enrolment is up 63.8% YoY, reaching 565,842 students. This can be compared with 127,691 in 2012. Of the 2969 institutions, 1204 are public with 160,894 students (28%) (Ministry of Education, 2025, pp. 1, 5, 9).

The rapid growth has created several obstacles. As of 2024/25 the instructor to student ratio was 1:55, compared to the target of 1:25. Additionally, increased costs have led to several incomplete infrastructure projects (Ministry of Education, 2025, pp. 1, 10-11). Politically, the government has several initiatives in motion aimed at improving the TVETs strategy and operational capacity. The report commissioned by the *Presidential Working Party on Education Reforms* (PWPER), highlights the need for innovative policy approaches and adoption of digital technologies. In the medium-term, the targets are to increase the number of instructors, to develop a digital curriculum and to strengthen the ties to the industry. In FY2022/23 1157 TVETs were mapped across all 47 counties with the Ministry of ICT and Digital Economy, to prepare for connecting the TVETs to the national fibre optics network. In FY2023/24, 14 TVETs had established Wi-Fi hotspots and digital hubs (Ministry of Education, 2025, pp. 2, 10-12).

4.3.3 Funding

The expenditure per student separates public and private institutions. This can be reflected through the tuition fee under the “New Higher Education Funding Model”. Unveiled in 2023, this initiative uses the new Universities Fund (UF) which funds students directly through scholarships rather than transferring funds to universities for allocation. The UF is complemented by loans from Higher Education Loans Board (HELB) as well as household funds (Universities Fund, n.d.; HEF, n.d.; Universities Fund, 2023, p. 1;

Universities Fund and HELB, 2025, pp. 4, 6). The new student-centred funding model covers both universities and TVETs, with the goal of making education more equal as applicants are funded depending on the levels of need (HEF, n.d.; Universities Fund and HELB, 2025, p. 6). However, students attending private universities are only eligible for loans, meaning the scholarships are concentrated to public universities (Universities Fund, 2023, p. 1; Universities Fund and HELB, 2025, p. 6).

Considering the tuition fees, the households carry 10-40% of the burden under the 2025/2026 funding year, with household contribution capped at KSh 150,000 per year (Universities Fund and HELB, 2025, pp. 11, 14-16). The rest is funded by scholarships and loans. For instance, a Bachelor of Law programme averaged an annual cost of KSh 257,000 in 2024 in one of the most expensive private institutions. With an average of 30% covered by HELB loans, the household burden would be KSh 179,900 annually. The corresponding number for University of Nairobi is KSh 261,000, but due to government scholarships and loans, the household burden is significantly lower for eligible students in public universities (KUCCPS, n.d., p. 24; Universities Fund, 2023, pp. 1-2; Universities Fund and HELB, 2025, pp. 14-16). This cost-diversification is reflected in the participating universities of this study, underlining the different conditions for the adoption of DAS.

4.4 Administrative processes in tertiary education

Administrative processes in TE vary with the organisation's needs. However, there are some recurring, default tasks. These include attendance tracking, assessment and grading administration, fee management, reporting and compliance, as well as storage of student transcripts and records (Bhat, 2023, pp. 147, 149). These continuous processes are often data-driven and subject to standardization, which supports the feasibility for the digital DAS. Furthermore, transparency and data traceability becomes enhanced (Davenport, 1998, pp. 123-124; Bhat, 2023, p. 149). However, this also raises the requirements for IT infrastructure and data security measures (Bhat, 2023, pp. 147, 150).

These processes represent key areas where DAS may create value or lose value. *Table 5* summarizes an overview of some central administrative workflows and their potential value and friction areas. These processes will be further examined in the upcoming chapters.

Administrative workflows	Potential realized value	Potential loss/friction
Student registration	Faster onboarding, application handling, better coordination between departments	Incomplete documentation, manual verification, delays between admission, finance and academic department
Attendance tracking	Improved monitoring, student participation data	Inconsistent use, limited trust in attendance data
Assessment and grading	Faster result processing, reduced manual handling, improved traceability	Missing marks, inconsistency, delayed submissions, still manual workflows
Fee management	Financial transparency, payment tracking, reduced administrative burden	Distrust in financial data, mismatch between records and payments
Reporting and compliance	Improved governance, auditability, reporting to internal and external stakeholders	Unclear responsibility for data quality and validation
Student transcripts	Easier access to student records, improved traceability, faster transcript processing	Fragmented records, data entry errors, uncertain about completeness

Table 5: Overview of central administrative workflows and potential value/friction areas, developed by the authors based on Bhat (2023), Davenport (1998) and the analytical dimensions presented in Chapter 3.

In practice, these activities are separated by different departments, such as the finance department handling fee management while the admission department handles registrations. Yet, many administrative assignments are dependent on several departments. Because of this, tertiary institutions operate as complex systems of interdependent processes. Furthermore, tasks rely on information transfer and coordination across departments (Bhat, 2023, pp. 147-149). Even with automated workflows, a standardised application for a potential student demands coordination through several departments. The application has to be reviewed by an admission office, fees and payments must be established and the submitted course preferences has to be matched to offered courses and programmes (Helms, 2009, pp. 5-6).

The complexity of admission increases further when including governmental factors. In some countries, there is a general admission to the university at first, followed by a subsequent course selection. In other countries, the matching of preferences, eligibility and offered programs is matched automatically (Helms, 2009, pp. 5-6). Additionally, universities frequently base eligibility on more than purely academic performance or standardised metrics. The vast inclusion of various stakeholders in processes such as admission, illustrates the intrinsic complexity and required coordination of administrative systems in tertiary institutions.

This makes administrative workflows central to understanding value creation and value loss. The same digital system may create more efficiency, transparency and governance benefits in one workflow, while generating friction in another (Davenport, 1998, pp. 123-125; Bhat, 2023, pp. 149-150).

4.5 Digitalisation of administrative processes

The Kenyan government focuses heavily on digital solutions. ICT is considered one of the key areas to fuel growth and innovation, driving increased investments and attracting technological companies. Governmental incentives and national investments have positioned Kenya as a regional hub for technology and innovation. These incentives have created a hub for digital innovation in Kenya as “Silicon Savannah”, hosting global enterprises such as Google, AWS, IBM and Microsoft (International Trade Administration, 2024). These developments contribute to an increasingly innovation-friendly environment for technological companies across several sectors. This could give potential benefits for sectors such as education, aligned with national digitalisation strategies.

Streamlining administrative processes through digitalisation can result in increased accessibility for different users. Different departments can access and share data across organisational units. Students and parents can track payment plans and results, which is not only faster but also reduces an administrative burden for both administrative and academic staff. Furthermore, institutions can execute online assessments for remote examinations with automated grading. The expansion of online education has led to an increase in enrolments, particularly among those previously unable to attend in-person (Kayanja, Kyambade and Kiggundu, 2025, pp. 1-3, 8-10).

Despite these potential benefits, the implementation and adoption of a DAS is not frictionless. The complex structure and bureaucratic rigidity of the educational sector can create resistance towards change.

Additionally, it may hinder a full adoption which in turn can limit the potential value realized from the system (Kayanja, Kyambade and Kiggundu, 2025, pp. 1-3, 8-10; Hanelt et al., 2021, pp. 1160-1162).

Institutional resistance mainly stems from resistance among the staff and because of limited digital skills. This can also apply to students who are accustomed to the conventional teaching methods (Kayanja, Kyambade and Kiggundu, 2025, pp. 1-3, 8-10). Digital illiteracy and rigidity is an urgent matter in all of Kenya, as approximately 50-55 percent of jobs in Kenya will require basic digital skills by 2030 (Salmi, Amegah and Shinde, 2025, p. 61). Hence, the education sector has become critical in providing the required skills for the future job market.

Although investments into human capital and training is important, digitalisation also demands heavy investments in digital infrastructure. The biggest bottleneck is currently internet connectivity, but also electricity and educational environments such as computer laboratories. (Salmi, Amegah and Shinde, 2025, pp. 84-85). Funding is the main bottleneck for many institutions, especially in rural regions, limiting both internet connectivity and access to adequate hardware such as computers and laptops (Kayanja, Kyambade and Kiggundu, 2025, pp. 4-5).

These conditions suggest that the challenge of value realization does not revolve around demand. Instead, it is whether institutions have the organisational, technical and stakeholder-related conditions required to realize value.

4.6 Case organisations and stakeholder roles

This section introduces the case organisations and stakeholder roles included in the empirical material. The purpose is to show how the selected institutions vary in terms of type, ownership, size, geography, resources and digital maturity.

4.6.1 Case organisations in the empirical material

As outlined in Chapter 2.2, four institutional archetypes are used to differentiate institutions based on ownership and institutional type: Private universities, public universities, private TVETs and public TVETs. Each organisation represents a unique context, but collectively they provide variations and insights across the broader Kenyan sector of TE. The purpose is to treat the cases as components to capture relevant conditions and patterns for DAS adoption.

To further illustrate the contextual variation in the empirical material, additional case characteristics are described: size, ownership, resource capacity, geography and maturity. This will provide the reader with further understanding of the participating institutions, yet respect to confidentiality as each organisation and respondent will remain anonymous.

The largest included university is public and serves tens of thousands of students. The smallest university in this study has a few thousand students. The variation among TVETs was greater, with the biggest hosting thousands of students and the smallest ones consisting of less than a hundred students. In total, four public universities of various sizes were included in the study, and two private universities. Additionally, three public and three private TVET institutions were studied across different regions of Kenya.

The participating institutions also differentiate geographically. While most are located in the Nairobi region, they still represent urban and rural areas. Additionally, a few of the sampled institutions are located in the countryside, with the aim of further capturing potential geographical differences. The institutions also vary in terms of financial and infrastructural resources, ranging from resource-intensive institutions to generally affordable options for TE. Lastly, the level of digitalisation also differs between the institutions. Some institutions had complex systems and all the necessary infrastructure, while others relied on manual processes and limited digital proficiency.

These variations make the case material suitable for exploring how certain institutional characteristics shape adoption feasibility, implementation conditions and potential value realization in Kenyan TE. The table below presents an overview of these characteristics:

Case characteristics	Variation in sample	Contextual relevance
Institution type	Universities and TVETs	Captures differences between academic and vocational TE contexts
Ownership	Public and private	Enables comparison of governance structures, funding and decision-making
Size	From less than 100 students to +50 000 students	Captures variation in administrative volume and complexity
Geography	Nairobi region, urban areas, rural/countryside	Captures potential differences in infrastructure, access and local challenges
Resources	Resource-intensive to more affordable and constrained institutions	Captures differences in financial and infrastructural capacity
Digital Maturity/Adoption stage	Internally developed systems and advanced infrastructure to limited digital proficiency	Captures variation in adoption feasibility and realized value potential

Table 6: The table features an overview of case characteristics, exemplifying sample variation and underlines the contextual relevance for an overview of the case material.

4.6.2 Stakeholder roles in the case material

As described in Chapter 2.3.1, stakeholders were structured into the categories: decision-makers, operational users, technical gatekeepers, end-users and external actors. This section will illustrate how these groups were present in the case material.

The groups were based on their relationship to DAS and institutional decision making. These roles range from operational use and technical support to strategic decision making and external governance. This distinction is important because different stakeholders interact and relate to the system differently. Below, a brief summary is provided with the presence of each stakeholder category in the case material:

Stakeholder category	Presence in the case material
Decision-makers	Managers, directors, vice-chancellors, deans, principals
Operational users	Administrative staff, finance staff, teachers
Technical gatekeepers	ICT staff, support teams, system developers
End-users	Students
External actors	Government officials, county representatives, funders, regulators, industry actors

Table 7: Summary of the relevant stakeholder categories and their presence in the case material.

The decision-makers were generally less involved with the system on a daily basis. Instead, their influence appeared through interactions with the other stakeholder groups. This category includes the roles of institutional leadership such as managers, deans, chancellors and directors, who regularly carry out strategic decisions. Their role is important because they often influence the adoption through resource allocation, priorities, approvals and oversight.

In contrast, the operational users, technical gatekeepers and end-users interact with the system more frequently. This increased interaction means additional data points and insights on daily use, usability issues and operational value creation.

The external actors cover officials representing the initiatives and policies from the government, the county and the industry. This includes policymaking, regulation and funding. Additionally, external investors can be included, such as non-profit organisations and foreign companies investing in the education sector in Kenya. Even if they do not use the system directly, they influence the adoption conditions through regulations, reporting and funding.

The meaning and influence of stakeholder roles also varied between institutions. Therefore, their interactions will not be compared role-by-role, but rather to structure and compare perspectives across the empirical material. The awareness of the stakeholder complexity is important for the following empirical and analytical chapters, as stakeholder alignment is considered a condition for value realization.

4.6.3 External collaboration and access through SchoolTry

SchoolTry works with several institutions included in the study. The customer base includes various universities and TVETs which gives access to a diverse set of institutional contexts. Furthermore, the partnership provided the foundation for a contact network that ultimately led to additional visits externally. Despite acting as an intermediary, SchoolTry has not controlled any interview material, interpretation of data or the analysis. All institutions participated independently, with data anonymized to ensure confidentiality. The implications of this collaboration for potential access bias are further addressed in Chapter 2.2.

5. Empirical Findings

This chapter presents the empirical findings from the interviews and supplementary field conversations. The findings are structured around institutional variation, adoption stages, administrative workflows and stakeholder perspectives. The chapter ends by summarizing the main cross-case patterns that form the basis for the analysis in Chapter 6.

5.1 Overview of empirical material

This chapter presents the empirical findings from the interview material. The empirical material consists of documented interview summaries from TVETs, universities, student representatives, technical/system representatives and two policy- and governance representatives. Several interviews included more than one respondent, particularly the student, student leadership and policy-level interviews. For this reason, the empirical material is treated as a set of documented interview cases rather than a simple count of individual interviewees. The chapter therefore focuses on empirical variations across institutional settings, adoption stages, stakeholder roles and administrative processes rather than on statistical generalizability.

The documented material includes TVETs and universities with both public and private contexts represented. The four archetypes will be used to structure institutional variation, followed by process-level descriptions to organize findings in relation to specific administrative workflows. The material includes multiple stakeholder roles both within and outside the same institutional setting. Among them are roles in admission, finance, academic management, ICT, marketing, teachers, managers/principals and students. In addition, an interview with the council of education provides a policy and governance perspective and is used for contextual extension.

The archetypes are not to be treated as statistically significant representations of the context. Instead, they are used to analytically organize the findings to subsequently enable institutional comparisons across adoption conditions, administrative workflows and stakeholder roles. In addition to institutional type and ownership, dimensions such as size, adoption stage, digital maturity, technical capacity and workflow complexity will be included. This matters as a small TVET and a large public university may share some attributes, while displaying substantial differences in other dimensions.

Table 8 below summarizes the findings for each of the four archetypes:

Institutional archetype	Empirical relevance	Typical adoption profile	Main findings
Public TVETs	Vocational institution with public/county linked governance	Early adoption, pilot use or gradual adoption	Basic administrative digitalisation in several processes. Limited to funding and approval
Private TVETs	Vocational institution with higher operational flexibility	Active user in partial adoption	Workload reduction, modular differences within institution
Private universities	University, several internal departments and higher demands from students	Mature user but partial adoption	Admission, finance, student-facing transparency and cross-department friction
Public universities	Large university setting with mature in-house digital infrastructure	Mature user	Governance, auditability, security concerns, large scale integration

Table 8: An overview of institutional archetypes, their empirical relevance, profiling and the main findings.

The material captures variations in the adoption stage. Some institutions were still in early adoption, where only selected digital administrative modules were in use or in testing. For example, one TVET was piloting student registration while other functions were still yet to be implemented and another TVET had not yet activated fee management due to county-level approval constraints. Another case showed a broader but incomplete adoption, one TVET used the platform across several processes, but manual verification and student access limitations remained. More mature digital environments are also represented, although these cases also show that maturity does not necessarily mean that all processes are fully integrated or that all users experience the system as central to their daily work.

The interviews cover multiple stakeholder groups. These include institutional managers and principals, deans, teachers, administrative staff, finance staff, ICT representatives, students, student leaders and policy-level actors. This variation is important because the same DAS was often experienced differently depending on the respondent's role. For example, managers and deans tended to discuss overview, reporting and institutional control, while students focused more on transparency, predictability and access to information. ICT-staff described the system from a support and integration perspective, often acting as a bridge between users, departments and system developers.

The empirical material is structured around six key administrative processes: student registration and admission, attendance tracking, assessment and grading, fee management, reporting and compliance, student records and transcripts. These processes were selected because they represent central areas where DAS may create value or generate friction. Across the material, finance and grading/results appear as the most recurring high-friction areas, followed by admission/registration and support burden.

5.2 Institutional variation and adoption conditions

The empirical material does not represent a unified market or adoption context. Instead, the four institutional archetypes suggested different adoption conditions based on traits such as: size, adoption stage, digital maturity, governance conditions and workflow complexity. As a consequence, the same system could behave differently in different institutions. For some institutions, the system acts to reduce manual workload, while other institutions utilise the system for reporting and long-term governance. Considering the material contains different institutions and interviews with various roles, it is possible to compare adoption conditions in several different contexts.

The different adoption conditions are partly related to the institutional type. The TVET cases in the material displayed a closer link to core processes such as student registration, attendance tracking, grading and basic reporting. The university cases instead showed additional organisational layers, with focus on aligning different departments such as finance, management, student service and ICT. Across the archetypes, the data can be summarized as following:

Archetype	Institutional patterns in the data
Public TVETs	Adoption linked to core administrative processes and governance limitations. Adoption is often slowed by approval processes, funding or lack of infrastructure. Mainly external factors affecting adoption feasibility.
Private TVETs	Stronger operational focus on workload reduction and efficiency. Often discussed before- and aftereffects of the system. Adoption was mainly partial in key processes.
Public universities	Mature in-house system, strong internal governance and security. However, high technical maturity does not automatically translate into value realization.
Private universities	Higher flexibility and adoption speed, but internal complexity and stakeholder dependent. Alignment issues between departments caused friction.

Table 9: Institutional patterns in the empirical findings for archetypes.

A central variable across the archetypes was size and administrative volume. In low-volume institutions or departments, manual workarounds could compensate for potential system flaws. In larger institutions, similar flaws were reported to potentially give bigger consequences with bottlenecks stacking at a faster rate. Some institutions showed an awareness that manual workarounds potentially could create bottlenecks in the future but were manageable with current volumes. This illustrates why size matters for adoption conditions.

Moving on to digital maturity, institutions in the study showed early adoption, active use, mature use and hybrid adoption. The maturity could also vary internally in an institution, with some departments being relatively mature and others underutilising the system. This suggests that digital maturity should be examined beyond the acquisition of a digital system.

This internal variation of digital maturity within an institution could possibly affect the workflow complexity. In several institutions, departments which had adopted the digital system faced issues when dealing with less digitalised departments. This was exemplified when one finance department reported that their digitalisation could reduce the paperwork, but that it required additional coordination, support and data validation. Because of this, the department was not sure whether the system would be beneficial or not. This suggests that workflow fit appears to shape the adoption conditions.

The institutions also varied in terms of funding and governance. The TVETs generally showed funding and approval as central limitations, while universities encountered limitations with workflow design and module fit. The empirical data suggests that the adoption barriers often could be translated to direct causes such as costs, approvals or insufficient capacity, rather than a scepticism towards digitalisation. In search for further understanding, government entities emphasized their role by frameworks and standards as opposed to central governance of all affected institutions. This could contribute to not only private in-house solutions but also vendor-based solutions for digital systems.

Ultimately, the empirical material displays that adoption conditions differ across several dimensions. Institutions with a high administrative volume often had great potential gains of digitalisation, but the adoption tended to be increasingly complex. Smaller institutions or departments could often handle their specific processes by utilising the system only to a limited extent but were restricted to scaling and funding. Mature digital environments tend to be limited by underutilised resources in adjacent departments, but also by less general alignment and transparency towards end-users. This

indicates that a high demand for a digital system does not necessarily imply a high adoption feasibility. *Table 10* below provides an overview of the institutional variations with regard to the adoption conditions:

Dimension	Empirical variation observed	Relevance for adoption conditions
Type of institution	Public TVETs, private TVETs, public universities and private universities	Structural differences regarding ownership, approvals and administrative complexity
Size and volume	Low volume departments, smaller TVETs and larger university environments	Affects potential efficiency gains but also scale of alignment complexity
Digital maturity	Early adoption, active user, mature user and hybrid adoption	System implementation does not define full adoption or utilisation
Workflow complexity	Processes varied in number of steps, involved departments or degree of continuing manual work	Indicates that adoption varies by processes and administrative routines
Stakeholder variation	Managers, teachers, deans, finance, ICT, admissions, students and policy actors had different needs	Different stakeholders have different needs when using the system which could affect the total potential benefits through different perceived values
Funding and governance	Different constraints depending on the size and governance	Affects implementation pace, approval and decisions

Table 10: Several dimensions assessed during the empirical phase, how each was assessed and the dimension's relevance for adoption conditions.

5.3 Adoption stages: from non-use to mature use

In line with the theoretical distinction of implementation, adoption and utilisation, system use was not binary. A technically implemented system was no guarantee of consistent usage among every department and user of the institution. On the contrary, the empirical data showed varying patterns of use, ranging from early adoption to pilot programs to digitalisation of routine processes. The variation appeared across institutional archetypes, but also across departments and stakeholders within the same institution.

Institutions in early adoptions were frequent in the empirical data. At this stage the system was available or in adoption, but the usage was often module specific. The use was modular in the sense that it was dependent on onboarding, where some departments had migrated to the digital system while others preserved manual processes. Despite high expectations on the digital system, several institutions encountered friction during

adoption. In several cases, this friction could be traced to financial constraints, lack of digital knowledge or uncertainty towards the new system.

In the institutions with partial-adoption, complete non-use was relatively rare. However, manual workarounds were consistently observed, such as Excel, printed copies or utilisation of WhatsApp. This meant that the system co-existed with former workflows rather than replacing them. This was especially notable when onboarding, data quality, modular fit or integration was insufficient.

However, not all institutions struggled with the onboarding processes. There were also institutions with an active system usage in the majority of processes. These institutions showed direct benefits post-implementation in comparison to previously. Several cases described an unwillingness to return to manual work processes, such as manual reporting forms, physical transcripts or manual accounting of financial transactions. This indicates that some processes have moved beyond implementation and initial adoption, towards a stable utilisation of the system in the every-day processes.

But not all mature users were frictionless. Some institutions displayed problems in admissions, finance, result visibility and transparency towards students. In several of these cases, the implementation of the system caused new problems to emerge, as the system did not completely replace every former process seamlessly. One of these cases regarded student payments and balance transparency, where several students struggled with receiving payment confirmations and reports. In another case, a mature in-house system had been established, but the system was rigid and lacked several features asked by teaching staff and students. Taken together, this indicates that the maturity varies across different roles and processes and cannot be considered institution wide.

Generally, the most observed obstacles were not limited to early adoption. Several institutions across all adoption stages reported insufficient onboarding and training. This included roles such as managers, teachers, students, ICT, marketing and admission. User confidence in digital routines was also a recurring issue, as users reported discomfort with graphical user interfaces. Moreover, several institutions showed difficulties with data migration, historical records, workflow mismatch and infrastructural instability. Hence, it is likely that the adoption proceeds post-implementation as the users are required to adapt to the system.

In summary, the data illustrates that adoption is an important empirical dimension, but that it needs to be regarded based on different processes and users. Early adoption-cases indicated excitement but faced vast onboarding needs and incomplete functionalities. Partial adoption-cases often displayed hybrid workarounds, inconsistent usage across users and a greater need of integration. The mature cases suggested a higher routine use, but also specific demands regarding data quality, transparency and process development. This means that the adoption stage is not definitive and depends on the available support, risks and areas of potential value realization. To understand the value realization further, it is necessary to dive deeper into specific processes.

Adoption stage	Empirical traits	Relevance to archetypes
Manual use / early implementation	Analogue workflows, fragmented data, low system dependency	Mainly visible in early-stage or approval-dependent TVET contexts
In adoption / hybrid adoption	Hybrid processes, requirement of training and manual workarounds	Uncertainty detected with several archetypes, primarily when usage varied across departments
Active user	Repeated use in certain processes, data migration and accessibility, reduced manual work	Visible in selected workflows across more mature institutional settings
Mature but inconsistent usage	Established system, friction between processes and stakeholders	Mature university settings
Mature in-house use	Strong governance and alignment, but high internal complexity	Public university archetype

Table 11: Empirically defined adoption stages, recurring traits and their relevance to the four defined archetypes.

5.4 Administrative workflows and process-level findings

Building on institutional archetypes and the adoption stages in the previous subchapters, the focus will now shift to administrative workflows. The empirical material shows that the value of digitalisation and the friction were uneven across the administrative chain. Instead, both varied by process, depending on the stakeholders and how standardised the specific workflow was.

The findings are presented across six key administrative workflows: registration and admissions, attendance tracking, assessment and grading, fee management, reporting and compliance and student records and transcripts. The empirical data shows that the strongest experienced benefits came from registration, record retrieval and grading cycle reduction. The most recurring friction appeared in relation to fee management, result visibility, onboarding and student-facing transparency. The findings will be presented process by process below.

5.4.1 Registration and admissions

In the empirical material, the process was described by uploading data, followed by an admission, an acceptance, an account activation and a final registration to courses or units. In some cases, this process was extensively digitalised while other cases required support from the admissions staff.

The most observable value in relation to registration was faster onboarding, less paperwork, improved monitoring and centralised data records. One public TVET reported a decrease from 10 minutes per registration to under 2 minutes. Other early-stage TVET cases expected similar reductions as paper and physical files shifted towards digital workflows. In more mature settings, digital registration also improved monitoring, traceability and accessibility of data.

Simultaneously, registration and admissions showed a sensitivity to workflow breaks. In the private university archetype, the process could become more time consuming when other departments were misaligned. Such bottlenecks were related to finance clearance, account activation, incomplete documents, status visibility or a lack of understanding from the student.

The relevant stakeholders for this process were applicants or students, admission staff, finance, ICT and management. Hence, the process extends beyond the admission's office, creating a dependency between different departments. In aligned workflows, this could generate immediate operational benefits. In the event of weaker links between departments, the same process became a liability through additional support requirements and delays.

5.4.2 Attendance tracking

Attendance tracking behaved differently in the material. It was less established among the participating institutions, often described as a potential function rather than a core function integrated in the daily tutoring. From the empirical data, attendance tracking is related closer to potential value than consistently realized value.

Despite the lower maturity level, the empirical data displays a prominent potential value. Digital attendance could support institutions with an overview of student attendance, tutoring activities and records. This was particularly relevant for TVETs where follow-ups of tutoring and practical moments often were necessary. Some respondents even expressed reluctance to return to manual attendance tracking when the system had substituted the manual process.

The main struggles were operational rather than technical. In some cases, teachers reported difficulties when some students participated online and others remotely. In the public university archetype, attendance was occasionally replaced by workarounds such as WhatsApp, email or LMS tools. In the process, the involved stakeholders were found to be teachers, students, management and ICT. Overall, attendance tracking appeared as a lower-maturity workflow where value realization was dependent on operational aspects such as routines, teaching format and student accessibility.

5.4.3 Assessment and grading

Another operational-heavy process was assessment and grading. In the material, teachers reported that exams were first manually marked and then compiled in an external software. After that, the reports were uploaded to the system through a fixed system template. In the public university archetype, the results passed through several layers of validation prior to publication. In the private university archetype, the results were also followed up by executives such as the dean or head of department. This illustrates the different roles of the same stakeholder in different departments.

The most prominent value found in grading was shorter cycles and less manual work. One public TVET reported that the cycle was reduced from 5 days to 1 day. A private university teacher reported that some instances were reduced from 45 minutes to 25 minutes. Other cases also reported shortened cycles. Although these are interview-based estimates, they still indicate that assessment and grading was one of the strongest areas of improvement in the material.

While the material showed various benefits from digitalisation, several instances of friction were also reported. The friction mainly concerned teachers in adapting to the system template and institutional validations. Reported issues included missing students or units in the system, missing marks, result disappearance, complex weighting prior to final marks, system slowness and migration of results in the former system. In some cases, manual workarounds with external tools were used, meaning the process was

only partially digitalised. As a result, the process suggested potential value realization in the compilation, but also potential value loss with the encountered issues.

The opinion among stakeholders was also different. Teachers emphasized the workload with inputting results and using the template. Management focused on result visibility, approvals and student complaints. The students emphasized transparency, final marks and display of progression. The ICT was mainly concerned with support needs and system stability. These findings suggest that assessment and grading is a cross-stakeholder process with varying demands depending on the perspective.

Overall, the process appeared as a high-value but high-complexity workflow. While digital systems could reduce manual compilations, shorten report cycles and improve data traceability, the process is dependent on stakeholder coordination and governance alignment. In the event of mismatch, the benefits of digitalisation were often replaced by workarounds or new errors.

5.4.4 Fee management

In the data, fee management was found to cover more than simply transactions. The process also covers student balances, confirmations, debtor visibility, overpayments, carry-forward balances, scholarships, HELB-payments, registration rights, institutional revenue and student trust. Furthermore, the consequences of errors related to this process had a more direct impact on stakeholders, especially students.

The clearest value appeared when students used the integrated payment functionality in the system. In these cases, the system would provide traceability, accessible balance statements and faster confirmation. In the public university archetype students experienced fee management as functioning, although several mentioned delays in the system. This indicates that fee management has the potential to increase the transparency and coordination of the payment function.

The most occurring problems appeared when payments were made outside of the system. In the private university archetype, students who made payments using bank transfer, alternative M-Pesa transfers, scholarships or HELB-payments often reported alignment issues. The system was not always directly compatible with the external payment route, which subsequently affected the student balance and the student trust. Thus, finance staff frequently relied on external bank statements, local files or manual verifications to confirm transactions and to correct balances.

Furthermore, the balance disputes had direct consequences for the students. Invalid student balances could block registration and result in distrust and repeated physical visits to finance offices. In the private university archetype, several students expressed frustration while the corresponding finance staff expressed increased workload from support and escalations.

Ultimately, the empirical findings explain fee management as a high value but high-risk workflow. When functioning correctly, it can create transparency, traceability and increase reliability. For certain stakeholders, such as students, it can generate high perceived value. When errors occur, the consequences appear to be reduced trust among students and increased workload for the finance department. In certain public TVET contexts, fee management was on plan for rollout but awaited approvals from county officials or the institution. As a result, the value generated from the process is dependent not only on the system functionality, but also the coordination of infrastructure, institutional rules, finance workflows and student interactions.

5.4.5 Reporting and compliance

Reporting and compliance refer to the linkage between operational workflows and management oversight. In the empirical material, managers, principals and deans requested reports related to most of the other selected key administrative processes. These underlines reporting as an oversight functionality dependent on the output from the other processes. Errors in sub-workflows would yield subsequent errors in the reporting.

The main value appeared when records were accurate and reliable. In these instances, the reporting became faster, with increased traceability and resulted in higher usability for management. In the material, several respondents described reporting cycles as substantially reduced after digitalisation, in some cases to around five days. This is not an exact estimation of efficiency but indicates that digitalisation could yield measurable benefits. In the public university archetype, governance was also prioritized among several users, as reports were raised to political representatives on county-level or on national level.

Most reporting concerns were traced back to data quality and trust. Several respondents preserved their previous manual workarounds, partly because of habit but also because of distrust. Managers expressed challenges in inconsistent data and in data retrieval. Administrative staff described extensive double-checking, comparing system data with external data such as bank statements or local files. The teaching staff reported verification remarks prior to upload and the maintaining of local backups. Taken together,

the material illustrates that digital reporting does not automatically remove manual verification and the potential value appears to be strictly dependent on the data quality.

An exemplification of the reporting issues was found between marketing, admissions and finance in the private university archetype. Marketing reported that after having created leads, the department experienced weak transparency on how these leads were converted to applicants, admissions and ultimately fee-paying students. This misalignment was subsequently escalated to management. After speaking to management, the explanation was that the government shapes the frameworks and standards, but that each institution is responsible for the operational systems. Thus, reporting and compliance is dependent on the internal capacity of the institution to create reliable, transparent data and reporting.

5.4.6 Student records and transcripts

Student records as a process considers student profile, academic history, grades and results, transcript requests, graduation list, stored documents, long-term retrieval and verification. The empirical data explores long-term storage, access and verification of student data. Unlike processes such as registration, this workflow creates value over time by storing data in an accessible, reliable and traceable way.

The most apparent value was in retrieval and traceability, when digital records reduced the dependency on physical storage. In more mature contexts, there were reports of centralised records, user IDs, role-based access and logs. The public university archetype illustrated this through internal servers, digital archives and role-based logs. Taken together, the findings suggest that value was created through governance and reliability, rather than through direct time savings.

The vulnerability shown in the empirical material was data quality. Several cases described problems with graduates still being registered as active, documents that were hard to locate, disappearance of results or unreliable transcripts. To mitigate these problems multiple institutions reported storing backups in Excel or printed copies. This suggests that digital records do not create confidence and trust by merely existing. Instead, the data suggests that information has to be adequate, complete and possible to verify.

The main concerned stakeholders in this workflow are administrative staff, academic offices, students, ICT and management. Students interact with the process when requesting transcripts, while admins and management demand reliable and accessible records. ICT became central in maintaining access, storage, logs and migration from the legacy system. Governance stakeholders became central in approvals of infrastructure and directives.

Overall, the student records and transcripts could enable long-term value according to the data. However, it requires coordination between stakeholders and a well-defined integration of the digital system and the directives that influence the workflows.

5.4.7 Process findings overview

A brief summary of the empirical findings, with regard to process-level workflows, is presented below to provide an overview:

Workflow	Main value observed	Main friction observed	Main stakeholders
Registration and admissions	Faster onboarding, reduced paperwork, centralised data records	Alignment to other departments, especially finance. General process monitoring.	Applicants (students), admission staff, finance, ICT, management
Attendance tracking	Management overview, data monitoring.	Inconsistency, hybrid teaching formats. Manual workarounds.	Teachers, students, management, ICT
Assessment and grading	Time savings through shorter cycles, reduced manual workload, improved traceability	Missing data, struggles to standardise templates, system responsiveness, delays	Teachers, Head of Departments, Deans, academic administrative staff, ICT
Fee management	Payment traceability, visibility, transparency, revenue control	Integration issues, aligning system with external payment methods, balance statement problems	Finance department, students, ICT, admissions, management
Reporting and compliance	Faster reporting cycles, management overview, governance and traceability	Incomplete data, low system trust encourages manual double-checking, misalignment between departments	Management, administrative staff, deans, finance, marketing, government actors
Student records and transcripts	Accessibility, traceability, long-term storage, verification	Missing documents, result disappearance, unreliable data, migration issues	Registration office, academic offices, students, ICT, management

Table 12: A summary of the process-level findings of observed value, friction and relation to stakeholders.

5.5 Stakeholder perspectives on value and friction

The previous section illustrated how value and friction varied between different processes. This section will focus on the stakeholders and their relationship between each other and to the processes. The empirical material revealed that the same digital system could be perceived differently depending on the role. Moreover, specific processes could be perceived differently and ultimately the perceived value varied depending on the respondent's role. For instance, managers displayed a focus towards overview, reporting and accountability. The operational users focused on workload, usability and the system's integration into the daily routines. ICT appeared to focus on support, stability and system integration. For students, perceived value was often derived from transparency, reliability and accessibility. With this in mind the stakeholder perspectives will be presented separately.

5.5.1 Decision-makers

Managers, principals, deans and heads of departments were mostly concerned with the system's ability to provide an institutional overview. In several cases, KPI metrics such as student count, finance, results, attendance and progress were emphasized. When these were reliable and accessible, decision-makers described the system as valuable. When data was unreliable or inconsistent, decision-makers could display frustration with the system. Their perspective therefore focused on governance value and was exposed to weak alignment and data quality.

5.5.2 Operational users

The operational users experienced value closer connected to the daily workflows. In the administrative processes, the system was often perceived as valuable when it reduced manual workload, shortened cycles or made information more accessible. Simultaneously, this group of respondents frequently reported use of manual workarounds. In situations where documents were missing, payments had to be verified or data was incomplete, it did not appear uncommon to use a workaround with an external software such as Excel or WhatsApp. The main struggle was related to fitting the system into the daily practice, where analogue and digital workflows would be integrated.

Teachers and academic staff represented a specific operational perspective. The data suggests that these perceived system value based on how it influenced processes such as grading, attendance and the uploading of results. Value appeared when the system reduced the degree of manual work, while shortening the cycles. Friction appeared when data was incorrect, missing or when templates for system compatibility were difficult to use. Furthermore, some teachers reported difficulties in understanding which system features to

use and in which contexts. Taken together, adoption was dependent not only on acceptance but also on the integration with existing academic workflows.

5.5.3 Technical gatekeepers

ICT and technical roles act as gatekeepers between the system, the users and occasionally external developers. From the empirical material, the ICT handled support, modified guidelines, solved local issues and assisted departments with specific tasks. For ICT, the value was experienced in system reliability, integration and a decreasing demand for support over time. Simultaneously, friction from other departments was transferred to ICT. For example, several cases showed how financial alignment issues, student-facing transparency or teaching related issues were escalated to the ICT. The ICT perspective therefore appeared more system-oriented than process-specific. Lastly, several cases reported how issues in one process could result in additional issues in other processes.

5.5.4 End-users

End-users, such as students, appeared to mostly perceive the system value from transparency and reliability rather than direct efficiency. Several respondents experienced value when able to access fee balances, results, registration status and transcripts. The main concerns found in the data were when information was incorrect or difficult to access. The student perspective is particularly relevant because errors often resulted in additional consequences, such as not being able to register for new courses if payments were not successfully reflected in the system. Moreover, the same issue of transparency was reported regarding housing and exam access. Ultimately, even relatively minor data issues could result in high perceived friction for students.

5.5.5 External actors / policy/governance actors

External policy and governance actors were mostly influential through the institutional environment and governance rather than through the daily workflows. The role appeared to relate more to funding, regulation, compliance and frameworks. These actors shaped the adoption indirectly by providing the rules and regulations. At the same time, the influence varied across both archetypes and institutions, as different institutions could have different governance structures.

Summarized, the stakeholder perspectives display that value and friction were role dependent. Each stakeholder emphasized different perspectives and friction appeared when these desires were not aligned. For instance, a payment system could improve institutional transparency, while simultaneously creating student distrust if the data was incorrect. Value was therefore dependent on the alignment of stakeholder needs and through the coordination of workflows.

Table 13 below presents an overview of the core findings regarding stakeholders and the main value and friction points:

Stakeholder	Main value perspective	Main concerns and friction
Decision-makers	Overview, reporting, governance	Inconsistent data, poor transparency
Operational users	Workload reduction, shorter cycles, accessible information	Manual verifications, workarounds, incomplete data
(Academic) operational users	Faster processes, easier document upload	Missing data, issues with integrating the system
Technical gatekeepers	Reliability, integration, reduced support burden	Customization, infrastructural issues, workflow alignment
End-users	Transparency, reliability, accessibility	Balance errors, delayed results, blocked enrolments
External actors	Governance, compliance, funding	Fragmented systems, resource constraints

Table 13: A summary of the empirical findings with regard to stakeholders and their respective value perspective, concerns and potential friction points.

5.6 Cross-case empirical patterns

The empirical findings presented in this chapter show that the adoption of DAS was experienced very differently across cases. However, recurring patterns appeared across institutional archetypes, adoption stages, administrative workflows and stakeholder roles. This section summarizes these patterns to bridge the empirical findings and the following analytical chapter.

5.6.1 High digital need but varying readiness

Across the material the need for DAS appeared generally high. Respondents described administrative problems related to paper-based processes, fragmented records, manual reporting, slow retrieval and repeated verification work. However, readiness varied between institutions. Public TVETs were often affected by approval structures, gatekeepers, funding and infrastructure limitations. Private TVETs showed more direct operational use but still faced training problems and access-related constraints. In the university cases, the need for digital coordination was also clear. However, universities faced difficulties in stabilizing and integrating the system due to larger student volumes, specialized workflows and multiple departments.

5.6.2 Value concentrated in standardised data-dependent workflows

Value was most visible in workflows that were standardised, repetitive and data dependent. Registration, records retrieval, reporting and parts of assessment and grading showed examples of reduced manual handling and improved access to information. These benefits were strongest when the workflow could be standardised and when the necessary data were available in the system. This was visible in parts of the TVET material, where digital registration and records reduced dependence on physical files. It was also observed in the public university archetype, where the infrastructure of mature systems supported traceability, auditability and long-term record control.

5.6.3 Friction in cross-departmental processes

Friction appeared most clearly when workflows crossed departmental boundaries. Registration could depend on finance clearance, account activation, document upload, admission approval and student understanding. Grading could depend on correct course registration, teacher uploads, management approval, system templates and publication logic. Fee management could depend on payment structures, student balances, bank statements, scholarships, overpayments and semester allocation. The digital system did not work when these dependencies were misaligned. Instead of increasing the efficiency, the misaligned systems could shift work into support, verifications, escalations and manual corrections.

5.6.4 Reduced paper, but increased coordination work

Digital systems often reduced visible paperwork while creating new coordination work. Several respondents described reduced physical filing, easier retrieval and faster reporting. However, the material also showed continued reliance on Excel, printed copies, WhatsApp, Google Meet, local files, manual checks and physical verifications. These workarounds also appeared in more mature environments, especially where users lacked confidence in system data or where the system did not support local workflow requirements.

5.6.5 Stakeholder trust and system use

Stakeholder trust appeared to highly influence system use. Students tended to evaluate the system through visible outputs such as balances, results, units/credits, announcement and records. Finance staff focused on whether payments, debtors, overpayments and balances could be trusted. Teachers focused on whether student lists, grading templates and uploaded marks were correct. Managers and deans focused on whether the system provided reliable reports and overview. ICT staff focused on whether issues could be solved locally or had to be escalated to developers. Across these roles, trust was closely linked to whether the system output was visible, accurate and useful for the users.

5.6.6 Mature use does not eliminate value loss

Mature use did not eliminate value loss. This was exemplified in the public university archetype. Despite showing mature digital infrastructure, strong governance and system-based traceability, the student use was still largely episodic and not fully integrated into the daily routine. In the private university archetype, several departments used digital systems actively, but still reported problems in admission, finance, results visibility, student records and cross-department coordination. This indicates that maturity at the institutional level did not necessarily mean maturity across every process or stakeholder experience.

5.6.7 Archetypes matter, but not alone

While institutional type and ownership mattered, they were insufficient on their own. The four archetypes showed different empirical tendencies: public TVETs were more affected by approval, funding and infrastructure. Private TVETs showed more operational flexibility and visible workload reduction. Private universities showed more complex internal coordination and strong student-facing friction. Public universities showed mature infrastructure and governance but also complexity and limited daily student integration. However, size, workflow complexity, adoption stage, digital maturity, stakeholder alignment and training also appeared to affect the outcomes.

5.6.8 Training and provider support as continuity factors

Training and provider support influenced adoption continuity. Across the empirical material, respondents described onboarding as too short, unevenly attended or insufficiently repeated. This applied to staff, students, teachers, admission, marketing and ICT-related roles. In several cases, users had to learn through trial and error, while ICT or technical staff support became necessary when users could not complete workflows independently. Provider support was especially important in complex cases where system configuration, finance logic, migration or result publication did not yet match institutional needs.

In summary, these cross-case findings show that DAS created value primarily when they reduced manual handling, centralised information, improved traceability and made recurring workflows easier to monitor. At the same time, value was constrained when system use depended on several departments, when data was not trusted, when users lacked training or when local workflows were not fully reflected in the system. The empirical patterns therefore point to a central tension in the material: the demand for digital systems was strong, but realized value depends on interaction between institutional readiness, process design, stakeholder trust and continued support.

The table below summarizes the main cross-case patterns identified in the empirical material and indicates their relevance for the following analysis:

Cross-case pattern	Empirical expression in the material	Analytical relevance
Digital need was high, but readiness varied	Institutions wanted reduced paperwork, faster reporting and better records, but differed in funding, infrastructure, approval structure and digital capacity	Supports analysis of adoption feasibility
Value was strongest in standardised, data-dependent workflows	registration, records, reporting and parts of grading showed clear efficiency and traceability gains	Supports analysis of process-level value realization
Friction appeared where processes crossed departments	Admission, finance, grading and reporting often depended on several roles and system outputs	Supports analysis of workflow alignment and process correlation
Digitalisation reduced paperwork but created coordination challenges	Excel, printed backups, WhatsApp, email, manual verification and support chains remained common	Supports analysis of value loss and workarounds
Stakeholders trust shaped system use	Students, finance, teachers, managers and ICT trusted different outputs and experienced different failures	Supports analysis of stakeholder perspectives and perceived value
Mature use did not remove all friction	Mature systems still showed student-facing transparency gaps, complex workflows or module-specific problems	Supports analysis of adoption stages beyond implementation
Institutional type mattered, but not alone	Public/private and TVET/university differences were visible, but size, workflow complexity and maturity also shaped outcomes	Supports analysis of institutional archetypes
Training and provider support influenced continuity	Onboarding, uneven attendance and escalation to developers appeared across several cases	Supports analysis of enabling factors and adoption barriers

Table 14: A summary of the discovered cross-case patterns, how each was observed empirically and their analytical relevance.

6. Analysis

This chapter analyses the empirical findings through the analytical framework developed in Chapter 3. The analysis first examines adoption feasibility across institutional archetypes then process-level value realization, stakeholder alignment and maturity. The chapter ends with a synthesis of how adoption feasibility and value potential can be assessed together.

6.1 Adoption feasibility across institutional archetypes

The empirical findings revealed that DAS were relevant in multiple institutional settings, but the conditions for adoption varied. In this chapter, this variation will be analysed through adoption feasibility and the TOE framework. A central argument is that the demand of digitalisation does not automatically translate into high adoption feasibility. Institutions facing similar administrative issues could have different conditions for implementing, utilising and maintaining the system over time.

This reflects the distinction made in Chapter 3.2 between demand and adoption feasibility. In the TOE framework, adoption is not defined solely by technological needs, but through the interaction of technological, organisational and environmental factors. The TOE framework is not used to mechanically categorize each observation, but rather to structure the analysis of why certain institutions appear to be more ready for adoption than others. The technological aspect of TOE covers the system compatibility with existing workflows, integration and ICT capacity. The organisational aspect is visible in resources, management support, digital capacity and the adaptability of routines. The environmental aspect is covered by funding, public governance, county approval, policies and through infrastructure.

To clarify how the TOE framework is applied in this analysis, *Figure 5* presents an adapted version of the framework. Rather than treating technological, organisational and environmental factors as separate categories, the figure shows how these dimensions together shape adoption feasibility. In this study, adoption feasibility refers to the practical ability of an institution to implement, adopt and sustain the use of a DAS over time. This feasibility then influences whether value can be realized, constrained or lost across specific administrative workflows.

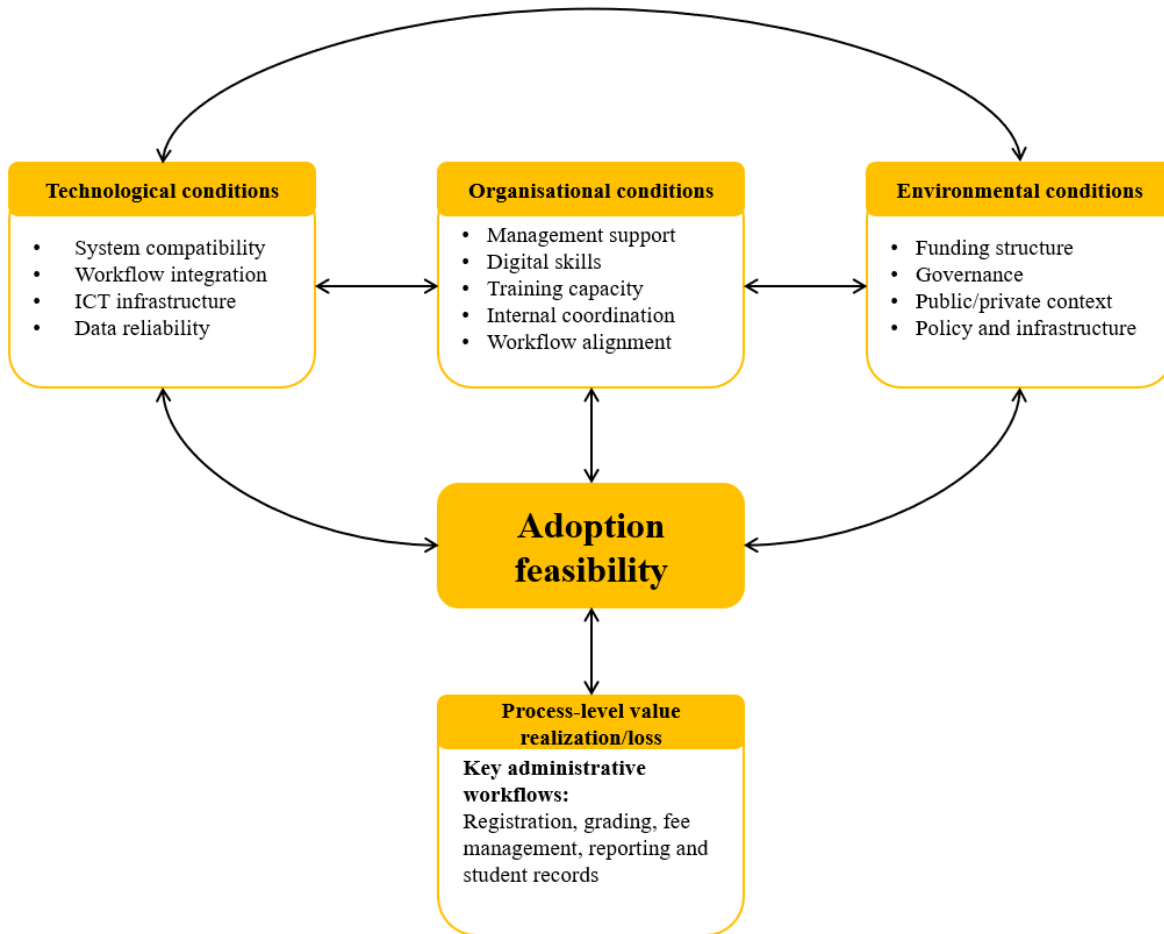


Figure 5: Framework based on the TOE framework for analysing adoption feasibility in Kenyan TE, adapted from Tornatzky and Fleischer (1990, pp. 153-154) and the analytical dimension presented in Chapter 3.5.2.

The following sections analyse each of the four institutional archetypes in-depth with the TOE framework. The purpose is to assess adoption feasibility as the combined ability to implement, adopt and sustain the digital system from a technological, organisational and environmental standpoint. The archetypes should not be treated as fixed segments, but as analytical categories revealing how adoption feasibility is affected by the main dimensions of ownership and institutional type.

6.1.1 Public TVETs

This archetype appears to have a clear administrative demand but faces limited adoption feasibility. The demand is often tied to core workflows such as registration, grading, attendance and basic reporting. Simultaneously, the empirical findings show that adoption can be limited by environmental factors such as public governance, funding and approval structures. This corresponds to the environmental dimension of TOE, where adoption is dependent on external factors such as funding, regulation and infrastructure. From

a TOE perspective the technical relevance is apparent but is limited by organisational and environmental conditions to fully adopt the system. As a result, public TVETs may show a high value potential, but the adoption feasibility appears low to moderate and based on funding, internal structure and organisational capacity.

6.1.2 Private TVETs

Private TVETs appeared to display a higher adoption feasibility compared to the public TVETs. One possible explanation could be the shorter decision paths and closer focus on operational efficiency. The empirical findings suggest a clear prioritization for workload reduction and emphasize measurable expectations on the system. This can be linked to the value dimensions mentioned in Chapter 3.1.2, where operational value could be associated with reduced manual workload, shorter cycles and increased information accessibility. From a TOE standpoint, the organisational aspect appeared more flexible, however limited resources and ICT capacity could still constrain adoption. As a consequence, adoption feasibility could be high in the event of an easily implemented system. The main risk comes with partial adoption if various departments at the institution digitalise unevenly, which can create subsequent friction. This reflects Chapter 3.3.1, which states that implementation and adoption do not lead to effective system usage by default.

6.1.3 Public universities

The public university archetype was different from the other archetypes by displaying a higher digital maturity and a broader established digital infrastructure. The empirical data unveiled governance, auditability, security and large-scale integration as important areas. This does not necessarily suggest a high adoption feasibility for external systems. However, it illustrates why digital maturity, and adoption feasibility should be separated. While a mature in-house system may imply technical capacity, it may also imply dependency, integration barriers and stronger demands for contextual fit. Moreover, scaling and internal integration could hinder the adoption rate for external systems. From a socio-technical and workflow alignment perspective, the main challenge is whether the new system can be aligned with established workflows, reporting structures and information channels. In light of the TOE framework, the technological aspect appears to be relatively strong, but complexity in the organisational and environmental aspect are potential obstacles. As a result, public universities are strategically relevant but likely challenging in terms of adoption.

6.1.4 Private universities

Private universities appear as an archetype with high potential value, but with an adoption feasibility heavily dependent on internal coordination. They may possess a higher flexibility and greater ambition to improve student-facing services compared to their public university counterparts. However, these expectations risk creating misalignment and friction. With regard to perceived value, student value appears to be linked to transparency, access and reliability rather than internal efficiency. In accordance with the stakeholder logic in Chapter 3.4, each department in the institution needs to be carefully coordinated. Beyond the workflows and ambitions this also applies to the alignment of demands from decision-makers, potential gatekeepers and end-users. From a TOE perspective, this archetype appears to have an organisational ability, but workflow alignment and stakeholder alignment are central risks. Hence, private universities appear attractive from an adoption context but still may require additional precaution regarding implementation, support and adaptation of existing workflows.

6.1.5 The limitations of archetypes

The archetypes are important, but the two defining dimensions of ownership and institutional type are insufficient variables for explaining adoption feasibility on their own. Ownership appears to affect governance and decision-making, while institutional type appears to affect process complexity and organisational complexity. Furthermore, adoption feasibility is shaped by size, administrative volume, digital maturity, ICT capabilities and workflow complexity. All of these additional dimensions need to be considered in the analysis. In smaller institutions, manual workarounds may still be feasible to handle flaws, but the same type of problems in larger institutions may be difficult to manage due to the scalability of the problem. Moreover, a digitally mature institution may still display low feasibility for a new system due to dependency of the legacy system, governance complexity or stakeholder misalignment. As a result, adoption feasibility should be evaluated beyond the archetypes, by combining both institutional and workflow-related variables. This is consistent with Chapter 3.5, where institutional conditions are treated prior to analysing the adoption and workflow-level value realization.

Taken together, the analysis supports the TOE-perspective. Adoption feasibility cannot be derived from a single variable, but rather through the combination of technology, organisation and the environment. However, the findings show that the TOE-perspective alone is not enough to explain realized value. The empirical material revealed that high demand and willingness is insufficient on its own and that digital maturity is insufficient without a workflow fit. The same applies for operational flexibility without adequate support and maintenance. Following this, adoption feasibility becomes dependent on the integration of

technical functionalities and the institutional workflows. For an organisation with the capacity to maintain its staff and users, the system also needs to be aligned with the governance and funding terms to allow long-term adaptation and growth. In order to deepen the understanding of value realization, the analysis will proceed to process-level analysis.

For an overview from the analysis, in relation to the TOE framework, please refer to the table below:

Institutional archetype	Technological conditions	Organisational conditions	Environmental conditions	Overall adoption feasibility
Public TVETs	Basic digital need, modular implementation	Limited resources and capacity, focus on core workflows	Funding constraints, county and public approval structures and governance dependent	Low-medium, high need but limited by external actors
Private TVETs	Modular systems, closely related to operational workflows	Increased flexibility, decision-making, but resource constraints and limited technical capacity	Fewer public approval limitations, but funding hinders complete adoption	Medium-high, promising if implementation can be performed easily
Public universities	Mature infrastructure, in-house systems, focus on security and traceability	Strong internal governance, complex structure and scale	Public accountability, internal approval structures and legal constraints	Low-medium for external adoption, strategically beneficial but complex
Private universities	Broader system uses in several workflows	High capacity, but more internal dependencies and stakeholder complexity	Higher flexibility, but high student expectations and pressure on services	Medium, high potential value but alignment-dependent

Table 15: Adoption feasibility among the institutional archetypes across the three dimensions of the TOE framework.

6.2 Process-level value realization and value loss

As shown previously, adoption feasibility varies between different institutional archetypes. However, the empirical findings also reveal that institutional feasibility alone does not explain how or where value is created. Within the same institutions some processes could be well adopted while others were struggling and caused friction. For instance, one institution could have digital registration or data records, but still struggle with fee management or the student-facing transparency. Moreover, the digitalisation of one process could cause subsequent issues in another process. On this path, it is therefore natural to move the analysis from institutional level to process-level. In line with the process-level perspective from Chapter 3.3.3, explaining how the DAS does not create uniform value across the institution, it is essential to understand that different types of value are created depending on the process structure, stakeholder relations and levels of usage.

Following the distinction introduced in Chapter 3.3.1, the analysis separates implementation, adoption and utilisation to ultimately compare workflows and stakeholder roles. If an institution has access to a DAS, it does not necessarily imply benefits and value creation. The value is realized when the system is integrated with the daily operations and workflows, meaning value should be traced to actual utilisation in workflows. Because of this, different types of value should be considered in the analysis. This is why value will be separated into operational value, information value, governance-related value and user-perceived value, see Chapter 3.1.2. As a result, value realization could be considered as a result of the processes, rather than as a general effect of the system. Value realization could appear through decreased time cycles, increased data quality, improved reporting or transparency. Value loss could appear when expected outcomes are suppressed by manual workarounds, additional validations, decreasing trust or through increased support burden.

To clarify how value realization is analysed at process level, *Figure 6*, presents a study-adapted version of the IS Success logic. The figure shows that system quality, information quality and service quality do not automatically produce value. Instead, these quality dimensions influence how the system is utilised across specific administrative workflows. The system output is therefore based on workflow standardization, stakeholder alignment, trust in the system outputs and support requirements.

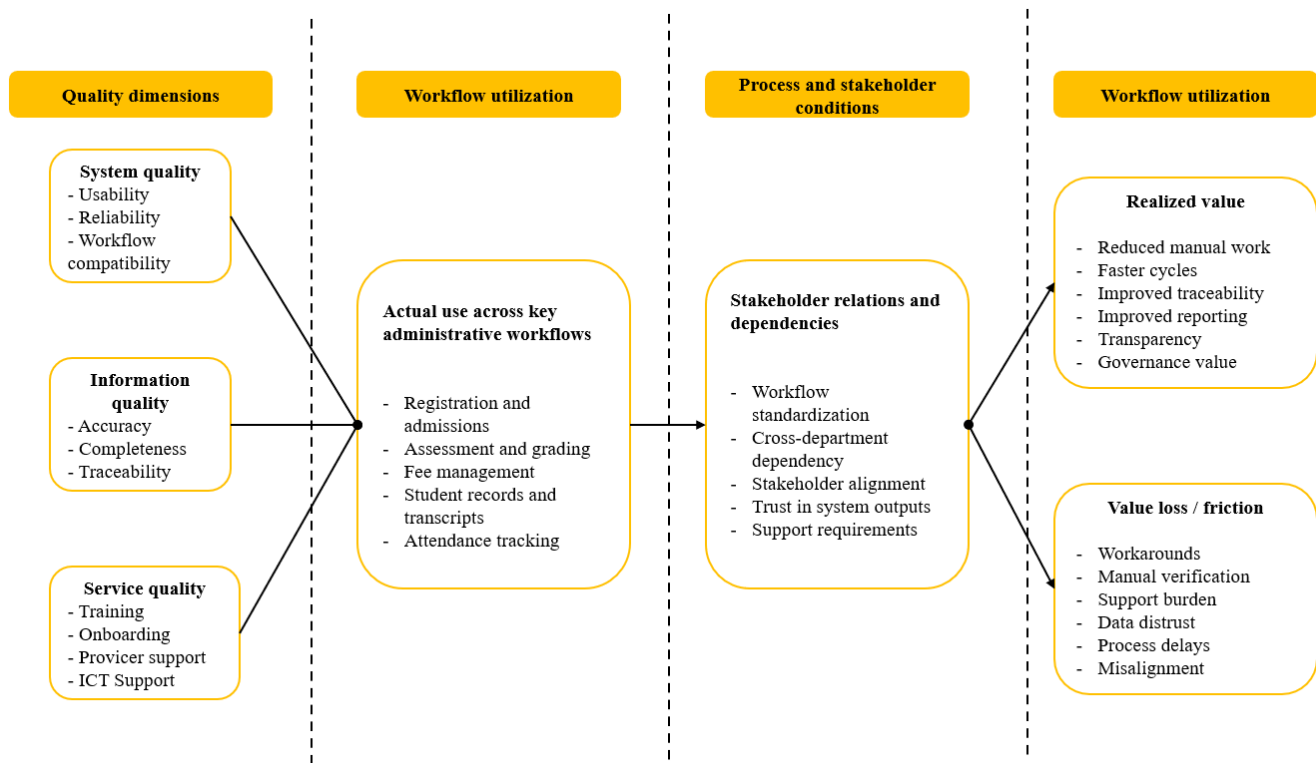


Figure 6: Study-adapted IS Success model for analysing value realization and value loss across administrative workflows, adapted from DeLone and McLean (2003, pp. 23-26) and based on the analytical dimension presented in Chapter 3.5.2.

Based on the theoretical distinction between value realization and value loss, workflows can be analysed based on their potential value realization and potential value loss. With process variability, workflow alignment and value loss in mind, three clear categories of processes were shaped. The first category is **(1)** processes with high value potential and relatively low friction, for instance registration or student records. The second category **(2)** consists of processes with high value potential but high risk of value loss, for instance fee management, assessment and grading and result visibility. The third category is **(3)** conditional processes, such as attendance tracking, where the value is strictly dependent on contextual utilisation, teaching format and operational routines. These categories are used in analysing why certain processes realize value more efficiently and to explain why others require stricter alignment and maintenance. The categories are used as analytical categories rather than fixed classifications.

The processes with the most apparent value realization potential had several common traits. They often tended to be relatively standardised, had a clear ownership structure and the produced outputs were easily observable. Registration exemplifies this through a clear sequential order: application, admission, account

activation and ultimately registration. Student records are another example, with the value being found in data storage, accessibility and verification. These processes have a clear system function that directly reduces paperwork, decreases search time, centralises data and improves traceability. Beyond that, the measurable output is easily perceived by the users. In relation to the STS approach introduced in Chapter 3.1.1, value appears to be more prone for realization when technical workflows are aligned with social and organisational workflows. Rather than redefining the administrative process, the system should support existing structures and activities.

In the sections below, each previously identified key process will be categorized and analysed based on the three distinctions:

Registration and student records – Category (1)

Registration and student records illustrate that value realization can be multi-dimensional. Registration is operational directly through faster onboarding and decrease of manual labour. The value is event-driven and often measurable. Student records on the other hand, creates value through a secondary supportive function, such as accessibility. As a result, other processes and departments can experience improved alignment. While registration mainly creates operational value, student records create information and governance-related value. These two processes exemplify that process-level value should be considered beyond direct effects such as time savings.

The two processes also differ regarding friction and risk of value loss. Especially in relation to fee management, assessment and some aspects of reporting. These processes display a greater complexity due to the involvement of several departments and stakeholders. As a result, a minor error in one end can cause great issues in another. This entanglement is constant over time and needs constant precaution to avoid additional needs of support or manual verifications.

Fee management – Category (2)

Fee management represents category 2: a high value potential but also a high risk of value loss. The potential value is apparent through improved payment traceability, revenue control and transparency towards users. This corresponds to all the types of value discussed in 3.1.2: operational, informational, governance-related and perceived value. Several stakeholders benefit simultaneously, such as finance staff, management and students.

But the stakeholder complexity could also cause potential friction and value loss. Unlike registration, which has a binary output, fee management is consistently dependent on maintenance, and the output is constantly reviewed by users. In the event of errors, the process does not only risk to raise distrust in the system but also cause direct consequences for the users. This process therefore extends beyond technical functionality and is dependent on how information is perceived by the users.

Fee management may be one of the strongest value realizers, but also one of the processes associated with the highest risk. If the information quality, stakeholder confidence and workflow integration are weak, the risk of value loss could be of significance.

Assessment and grading – Category (2)

Assessment and grading illustrate another category 2 workflow. The potential value is found in reduced reporting cycles and decreased manual labour for academic staff. However, the process is a clear example of process dependency, as discussed in Chapter 3.3.4. The output is highly dependent on the outputs from previous processes in the same workflow. It requires student data to be correct in the system, course registration to match and the system templates to be integrated into the daily routines. When errors occur, ICT and support staff need to be connected quickly to reduce value loss. Value loss can appear through missing data, delayed visibility or through growing system distrust among students. This illustrates how the grading process extends beyond the academic offices, creating a process flow that stretches to administrators, management, ICT and ultimately students.

In the STS approach and workflow alignment, grading only realizes value once the technical template is aligned with the academic practices. As shown in the empirical material, several teachers opted for manual workarounds when the system template did not match the practice. Some cases could potentially be linked to user-level adoption, see Chapter 3.2.4, with the perceived value being affected by the misalignment between technical and social structures. Other cases could be traced to inconsistent data from other processes. Regardless, the consequences were the same: a decreasing trust in the system and additional use of manual workarounds.

Reporting and compliance – Category (2)

Reporting also displays a high potential value tied to a high risk of value loss. The potential informational value is highly dependent on other processes. In a way, reporting evaluates the entire system's data quality. When underlying processes, such as registration, fee management and grading work seamlessly, the reporting can generate governance-related value by providing an overview, accountability and traceability.

However, system users potentially have to double validate information if the underlying data is inadequate. This does not only create additional manual labour but also increases the distrust in the system.

Reporting could therefore be interpreted both as a potential value area and a performance metric of data quality in other workflows. On the other hand, the information quality assessment should be viewed with caution as potential manual efforts and workaround could increase the data quality. As a result, potential value loss in other processes could go undetected.

Attendance tracking – Category (3)

Attendance tracking is the process closest to the third category: conditional processes. Attendance should be reviewed differently as it can create value in certain contexts, where participation and practical classes are highly valued. Possibly in TVETs that need consistent tracking of class attendance and exam participation. In the empirical data, attendance often appeared as a less mature process that was dependent on the tutoring context.

Several respondents mentioned workarounds such as WhatsApp, Excel or other external tools. The utilisation of external tools indicates a weak utilisation, as previous administrative processes proceed outside of the system domain. These patterns can create additional friction, and the partial usage could create distrust in the system.

However, not all institutions in the empirical data emphasized equal importance of the process. The same function may be valuable in practical settings or when attendance is prioritized but only generate lesser value in other contexts. As a result, attendance could be considered a conditional process that could realize value in certain institutional conditions but does not appear to be a general driver of value realization.

Three themes of process-value realization

After diving into different processes and their value generation and value loss, three main themes emerged. The first one being standardization, processes with a general sequential order and direct outputs appeared to realize value to a greater extent. One possible explanation could be the direct feedback to the user, increasing the direct and perceived value. This relates to process-level realization from Chapter 3.3.3, as standardised workflows are easier to translate into consistent system use and measurable outputs.

The second theme is stakeholder complexity. As soon as a process includes additional processes, the risk of misalignment and integration issues risks causing immediate friction. Even if the system functions

technically, the dependency could lead to value losses greater than the potential gains if not taken into consideration. This theme relates to the stakeholder perspective in Chapter 3.4, where value depends on the alignment and interaction between participating users.

The third theme is trust sensitivity. Processes affecting finance, results, registration status or access have a sensitive nature. Even minor data errors can cause significant direct consequences for users. In light of the user-perceived value dimensions in Chapter 3.1.2, building trust in the system is highly dependent on the output's accuracy, completeness and reliability.

The value dimensions based on the IS can explain the system's success. However, the findings suggest that system success is defined on a process-level rather than system-wide. These process-level insights identify where value is most likely to be created and lost, but they do not fully explain how or why the value is being created. In order to understand that the analysis has to dive one dimension deeper into the dynamics of stakeholders. The processes with the highest risk of potential value loss were typically processes with multiple different stakeholders. In these processes, they are dependent on the same type of data but perceive the system and its value differently. To exemplify, fee management creates visibility and overview for management while it could mean additional work for the staff and risk creating uncertainty for students. Assessment and grading increase the traceability for management and administration, but if implemented incorrectly it risks creating transparency and trust concerns among students. In order to understand these dynamics further, the next section will analyse the stakeholder alignment as a condition for value realization.

6.3 Stakeholder alignment as a condition for realized value

The previous sections have shown that adoption feasibility and value realization are shaped by institutional conditions and administrative workflows. However, the empirical material also indicates that value realization cannot be fully understood without analysing the stakeholder relations surrounding the system. This follows the analytical framework presented in Chapter 3.5, where stakeholders are treated as a cross-functional dimension affecting both the adoption feasibility and realized value. DAS are not used by one actor, but by multiple groups with different responsibilities, expectations and exposure to consequences. As discussed in Chapter 3.4.1, stakeholder theory is therefore relevant because different actors may influence the system in different ways. This makes stakeholder alignment a condition for realized value rather than a secondary implementation issue.

The empirical findings presented in Chapter 5.5 connect to the role-based variation that was theoretically introduced in Chapter 3.4. Stakeholders may differ in power, legitimacy and urgency depending on the specific process and institutional context. A function that creates value for one stakeholder may create additional work or friction for another. For example, a reporting function may provide administrative management with better overview and governance value, while requiring administrative staff to perform additional validation if the underlying data is incomplete or not trusted. This links directly to the concept of value loss defined in Chapter 3.5.2, where expected benefits may be reduced through workarounds, support burden, data distrust and process breakdowns.

The following chapters will therefore not only include why stakeholders perceive value differently, but also how workflows distribute responsibility and consequences differently.

6.3.1 Role-dependent perceptions of system value

The empirical material supports the theoretical view presented in Chapter 3.4: stakeholders should not only be identified but also analysed according to their interaction with the system and their position in the administrative workflow. Decision-makers, operational users, ICT staff and students do not simply represent different opinions, they depend on different outputs from the system. For decision-makers, value is often realized when the system produces reliable institutional data. For operational users, value is realized when manual work is reduced and workflows become easier to execute. For students, value is realized when the system provides accurate and accessible information that reduces uncertainty.

This distinction is important because stakeholders' values are not always aligned. In fact, most times they appeared not to be aligned. A system can be successful from a managerial perspective if it improves reporting and control, while simultaneously considered problematic by students if balances, grades or records are difficult to access. The same system can also be considered useful by administrators if it centralises information, while teachers may perceive it as a burden if grading templates are difficult to use or if student lists are incomplete. These examples connect to the process findings in Chapter 5.4.3 and 5.4.4, where the same workflow produced both value and friction depending on the stakeholder position. Realized value is therefore not only a question of whether a function exists, but whether the function produces meaningful and trusted outputs for all the stakeholders who depend on it.

This links back to the IS success logic introduced in Chapter 3.1.2. Where system success is understood through the interaction between system quality, information quality, service quality, system use, user

satisfaction and net benefits. From this perspective the stakeholder variation becomes analytically important. Different stakeholders use the system differently, may perceive system usefulness differently and may have different needs. This is especially true for workflows when one actor enters information, another owns the process and a third depends on the output. Workflows like this can explain why a DAS may create value and friction simultaneously within the same institution.

6.3.2 Process-dependent stakeholder salience

Stakeholder salience, introduced in Chapter 3.4.1, helps explain the differences between stakeholder groups based on the traits of power, legitimacy and urgency (Mitchell, Agle and Wood, 1997, pp. 869, 872-873). The theory becomes analytically relevant when applied at process level. A stakeholder may be less prioritised in a strategic decision, yet they can be highly salient in the same workflow if the output affects their responsibilities, workload, access to information or consequences.

In DAS adoption, stakeholder salience should therefore be understood as process dependent. Decision-makers may appear as definitive stakeholders during procurement and resource allocation but are not necessarily the most central actors in daily system use. On the other hand, students may have limited formal power, yet their salience increases in processes where the output affects fee balances, registration rights or data accessibility.

Fee management illustrates this dynamic. Finance staff hold legitimacy as they are responsible for the process, while students gain urgency because of their dependency on the output. ICT staff have power as they can resolve technical problems. Lastly, management has both power and legitimacy through decision-making authority and revenue reporting. Similar distributions of salience appear in other processes as well. Moreover, the salience may shift within the same workflow over time and should therefore be considered continuously. This suggests that processes that involve a more complex distribution of salience pose a greater risk of friction.

Salience should therefore be considered at process level rather than on an institutional basis. When mapping stakeholders, it is important to not only consider the involved parties, but also which stakeholder groups become salient when the workflow fails or creates value. Such insights can be valuable in understanding why and how friction is transferred between departments. The involvement of several salient stakeholders, dependent on the same workflow output, can create situations with unclear responsibilities or inconsistent data quality. This can ultimately create confusion, misalignment and friction. Salience theory further underlines the argument that stakeholder alignment is a condition for potential value realization.

6.3.3 Misalignment, transferred friction and support burden

The stakeholder misalignment was notably present in workflows with cross-departmental boundaries. In Chapter 5.6.3, it was presented that friction appeared most clearly in processes dependent on several departments and system outputs. In such processes, the person entering the data, the person responsible for validation and the person affected by the output may all be different people. Fee management is the clearest example. Finance staff may verify payments, students experience the consequences of incorrect or delayed balances, admission may depend on fee clearance for registration, management wants revenue visibility and ICT receives support requests/tokens when system outputs are questioned. This means that friction is not contained within one department but could be created in between workflows.

This reflects the interaction perspective introduced in Chapter 3.4.2. The IMP approach emphasizes that value is shaped through ongoing interaction, adaptation and exchange rather than through a single transaction or technical delivery. Applied to DAS, this means that adoption depends on the quality of interaction between departments, users, technical support and system providers. When these interactions are aligned the system can support coordination. When they are misaligned, the system may instead expose unclear responsibilities and create additional coordination work.

The empirical material shows several examples of this transferred friction. ICT staff often became the recipient of problems originating in finance, grading, student experience or workflow configuration. This is visible in Chapter 5.5, where ICT and technical gatekeepers are described as a bridge between users, departments and the system developers. In these cases, the support burden should not be understood as a purely technical problem. It reflects weak alignment between workflows, stakeholder expectations and system configuration.

This means that stakeholder misalignment could be a mechanism of value loss. As defined in Chapter 3.5.2, value loss refers to situations where expected benefits are reduced or disappear during implementation or use. The empirical findings in Chapter 5.4.7, showed this across several workflows. Fee management created traceability but also problems with balance statements. Reporting provided an overview but also created manual double-checking. Grading and assessments saved time through shorter cycles but also led to template and data issues. These findings suggest that friction often appeared where system outputs were shared across several stakeholder groups, but where the responsibility for data quality, validation and correction remained unclear.

6.3.4 Trust as a condition for continued system use

A central analytical implication is that stakeholder trust is a condition for continued system use. Trust is not created by the existence of a digital system alone, but by the perceived accuracy, visibility and usefulness of system outputs. This follows the argument in Chapter 3.1.2 that information quality and user satisfaction are central dimensions of information system value. It is also visible empirically in Chapter 5.6.5, where stakeholder trust shaped system use across student, finance staff, teachers, managers and ICT.

Students trusted the system when balances, results and records were accessible and correct. Finance staff trusted it when payment data, debtors and balances matched external records. Teachers trusted it when student lists, grading templates and uploaded marks were accurate. Managers trusted it when reports gave a reliable overview. This could mean that trust was not abstract but attached to different system outputs and specific workflows. The process overview in Chapter 5.4.7 illustrates that each workflow had a distinct value area, but also distinct friction points related to data, visibility and reliability.

When the trust was weak, users relied on parallel routines such as Excel, printed copies, WhatsApp, email, local files or manual verification. These workarounds were summarized in Chapter 5.6.4, where digital systems were shown to reduce visible paperwork while simultaneously creating new coordination work. From the perspective of the analytical framework in Chapter 3.5.2, such workarounds represent value loss because they reduce the benefits expected from system adoption. The organisation may have implemented and adopted the system, but if users continue to rely on parallel workarounds, the system does not fully produce the intended value.

Overall, stakeholder alignment appears to be a condition for realized value. The stakeholder theory and IMP help to understand different actors and their relations. However, the empirical findings showed that the system creates value first when different stakeholder groups can rely on the same data, understand their roles in the process and trust the outputs generated by the system. When alignment is weak, digitalisation may still reduce paper or centralise information, but expected value is partly lost through support burden, workarounds, distrust and repeated verification.

6.4 Adoption stage and maturity, why mature use does not eliminate friction

The empirical findings indicate that adoption maturity should not be understood as a linear or institution-wide condition. A DAS may be implemented in an institution without being fully adopted by all departments. It may be used regularly in some workflows while remaining problematic in others. This supports the theoretical distinction between implementation, adoption and utilisation presented in Chapter 3.3.1.

This distinction is central to the analysis because the empirical findings in Chapter 5.3 show that several institutions had moved beyond implementation without achieving complete utilisation. In some cases, systems were available but only used in selected modules. In other cases, the system was actively used in several workflows, while manual routines continued as usual. Even mature digital environments displayed active friction in admissions, finance, result visibility, student records and cross-departmental coordination. This pattern is summarized in Chapter 5.6.6, where mature use is shown not to eliminate value loss. Therefore, adoption maturity should not be treated as an institutional label.

6.4.1 From institutional maturity to process maturity

A key analytical finding is that maturity should be assessed at process level rather than only institutional. This builds on Chapter 3.3.3, where process-level realization is introduced as a necessary perspective for understanding how value is created or lost across specific administrative workflows. An institution may appear digitally mature because it has established infrastructure, internal systems or high levels of system use. However, this does not necessarily mean that all administrative workflows are equally mature. For example, an institution may have mature reporting routines but still experience friction in student-facing transparency, fee reconciliation or result publication. Similarly, registration may be well digitalised while attendance tracking remains inconsistent or dependent on manual routine.

This means that the adoption stage is not a fixed institutional label. Instead, adoption varies across workflows, departments and stakeholder groups. The empirical findings in Chapter 5.3, show that usage could range from early adoption and pilot programs to active use and mature in-house systems. However, Chapter 5.4, demonstrated that this variation also exists at the process level. Registration, grading, fee management, reporting and student records did not show identical levels of maturity even within the same institutional setting. This supports the analytical framework in Chapter 3.5.2, where value realization is analysed through specific workflows rather than through system adoption as one uniform outcome.

The public university archetype showed mature digital infrastructure and governance-oriented systems, but the student use was still moderate and not fully integrated into daily academic life. The private university archetype showed active digital use across departments, but continued friction in processes such as finance, admission, results visibility and student-facing transparency. The empirical patterns, presented in Chapter 5.6.6, suggest that institutional maturity can coexist with process-level immaturity. Therefore, the questions extend beyond whether an institution has adopted a DAS. It also concerns which workflows have reached stable utilisation and which ones that remain dependent on manual or hybrid routines.

6.4.2 Hybrid use, workarounds and uneven utilisation

The empirical material also shows that hybrid use is common across all adoption stages. Institutions in early adoption often relied on manual routines because the system was only partially implemented or because the user had not yet been fully onboarded. This is described in Chapter 5.3, where partial adoption and module-specific use are presented as recurring patterns. However, workarounds were not limited to early-stage institutions. Excel sheets, printed copies, WhatsApp, email, local files and manual verification also appeared in more mature settings, as summarized in Chapter 5.6.4. This indicates that workarounds are not only signs of non-adoption, but also symptoms of weak process fit, low trust or incomplete utilisation.

From an analytical perspective, this means that value loss can occur even after adoption has taken place. This follows the definition of value loss in Chapter 3.5.2, where value loss refers to expected benefits from reduced workarounds, support burden and data distrust. However, a system may reduce visible paperwork while accidentally creating additional coordination challenges. For example, digitalising fee management may provide better traceability, but if payment data from external sources do not align with system balances the finance staff may still need to perform manual checks. In these cases, the system is used but the expected value is reduced. This is analytically important because it shows that adoption and value realization are not identical. The distinction between implementation, adoption, utilisation in Chapter 3.3.1, helps to explain why a system can be formally implemented and used while still generating value loss in particular workflows. The process overview in Chapter 5.4.7, supports this claim by showing that each administrative workflow had both value and friction generating characteristics.

Mature use should therefore not be considered as an end goal that no longer requires maintenance. Friction does not disappear and needs to be continuously considered. Mature use may reduce some forms of manual work, but it also reveals more advanced forms of friction. As institutions become more dependent on the system, errors in data, weak integration or unclear responsibilities may have larger consequences. This is

especially visible in student-facing processes such as fee balances, registration clearances, results and transcripts. Even small data problems can lead to significant perceived friction for students, as shown in Chapter 5.5.

6.4.3 Maturity as continued adaptation

The findings therefore suggest that maturity should be understood as continued adaptation rather than as an end state. DAS require recurring onboarding, training, support and configuration as workflows change; users rotate and needs change. This follows from Chapter 5.6.8, which showed that training and provider support were repeatedly described as important for adoption continuity. Especially when users struggled to complete workflows independently or when system configuration did not fully match the institutional needs.

This is particularly important in complex TE institutions because administrative workflows are affecting each other. As shown in Chapter 5.6.3, friction appeared most clearly in cross-departmental processes. Registration may depend on fee clearance, grading may depend on correct course registration, reporting may depend on reliable data from multiple sources and records may depend on accurate migration from the previous system. These dependencies also reflect the process-level perspective introduced in Chapter 3.3.3, where value realization is understood as dependent on the function of specific workflows in practice.

Maturity therefore not only depends on whether users have accepted the system, but also whether the system is integrated into the whole administrative chain. A system may be mature in reporting but immature in student-facing transparency. It may be mature in internal governance but immature in student-facing service delivery. It may be mature in storing records but still produce value loss if those records are incomplete, difficult to verify or mistrusted. This interpretation is consistent with the empirical findings in Chapter 5.4.6, where digital records created long-term value through traceability and accessibility, but also remained vulnerable to data quality problems.

Mature use does not eliminate friction because maturity is uneven across workflows and stakeholders. The analysis shows that adoption should be understood as a continuing process in which value can be created, constrained or lost over time. This means that institutions cannot be assessed only by whether they have implemented a system. They must also be assessed by the extent to which specific workflows are utilised, trusted and supported in practice. This conclusion will be presented further in-depth in upcoming synthesis in Chapter 6.5, where adoption feasibility and value potential are assessed together across institutional archetypes.

6.5 Synthesis: Assessing segments by adoption feasibility and value potential

The analysis has shown that DAS in Kenyan TE cannot be assessed only by the presence of administrative need. Across the empirical material, the need for digitalisation was generally high, but feasibility of adoption and the likelihood of realized value varied substantially between institutional contexts, workflows and stakeholder groups. This section synthesizes the analysis by assessing the four institutional archetypes in relation to adoption feasibility and realized value potential. The synthesis builds on the analytical framework in Chapter 3.5.2, where adoption feasibility, process-level realization, value realization and value loss are defined as the core analytical dimensions of the study.

The synthesis also builds directly on the cross-case empirical patterns in Chapter 5.6. By connecting these empirical patterns to the analysis in Chapter 6.1-6.4, this section provides a structured assessment of which institutional contexts appear more or less feasible for DAS adoption and where realized value potential appears strongest.

The archetypes used in this synthesis should not be understood as statistically representative market segments. As explained in Chapter 2.2, the participating institutions were grouped into four institutional archetypes based on institutional type and ownership: public TVETs, private TVETs, public universities and private universities. Chapter 5.1 further clarifies that these archetypes function as analytical organizing categories rather than statistically significant representations. Therefore, the synthesis does not claim that all institutions within one archetype behave identically. Instead, the archetypes are used to compare patterns of adoption conditions, workflow complexity and value realization while recognizing that size, digital maturity, governance, resources and stakeholder alignment also shape outcomes within each archetype.

6.5.1 Adoption feasibility and value potential as separate dimensions

A central analytical implication is that adoption feasibility and value potential must be assessed separately. Adoption feasibility concerns whether an institution has the organisational, technological and environmental conditions required to implement, adopt and maintain system use over time. This definition follows Chapter 3.5.2, where adoption feasibility is assessed through organisational capacity, technical infrastructure, workflows and stakeholder alignment. Value potential concerns where the system can create operational, informational, governance related or user perceived value. These two dimensions may overlap, but they are not identical.

To synthesize the analysis, *Figure 7* positions the four institutional archetypes according to two dimensions: adoption feasibility and realized value potential. The positioning is qualitative and based on the preceding analysis of institutional conditions, workflow characteristics, stakeholder alignment and value-loss risk. The figure should therefore be interpreted as an analytical synthesis rather than a quantitative ranking.

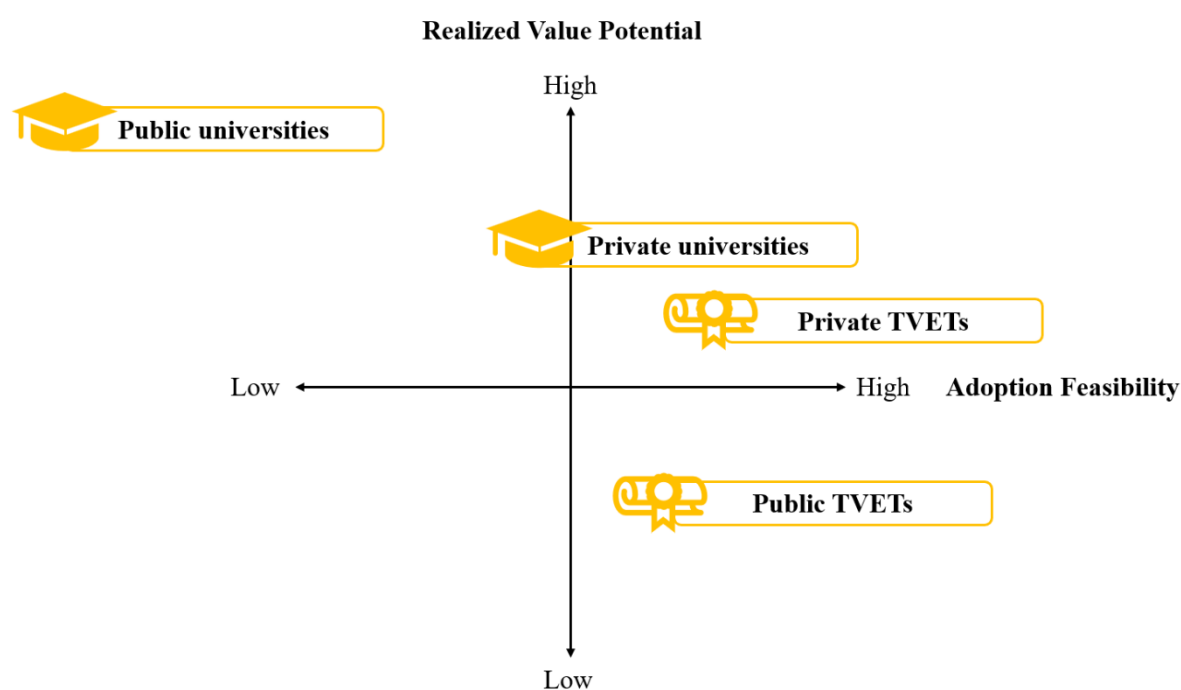


Figure 7: Analytical synthesis of institutional archetypes by adoption feasibility and realized value potential, developed by the authors based on the analysis in Chapter 6.1-6.4.

Public TVETs may have high value potential because digital systems can reduce paper-based administration, improve records and support basic reporting. However, as discussed in Chapter 6.1, adoption feasibility could be constrained by funding, approval structures, infrastructure and governance dependencies. In contrast, public universities may have a strong digital infrastructure and high value potential due to scalability and governance demands. Yet, the external system adoption could be difficult because of increased complexity, ties to legacy systems and security requirements. This confirms the empirical pattern in Chapter 5.6.1; high digital need does not automatically mean high readiness. This distinction is important because institutions with the strongest demand are not necessarily the most compatible, while institutions with the highest maturity are not necessarily the most accessible. The analysis in Chapter 6.2 showed that value is realized at process-level rather than at system level. Chapter 6.3 showed that stakeholder alignment shapes whether this value can be captured or not. Chapter 6.4 then showed that

mature use does not eliminate friction because maturity varies across workflows and stakeholder groups. Taken together, these findings suggest that the most analytically promising segments are not simply those with high demand. Instead, it points towards those where need, adoption feasibility and process-level value potential align.

6.5.2 Segment assessment across institutional archetypes

The table below summarizes the analytical assessment of the four institutional archetypes. The ratings should be understood as qualitative interpretations of the empirical material and not as quantitative measurements. The table synthesizes the institutional variation described in Chapter 5.2, the process-level findings in Chapter 5.4.7, stakeholder findings in Chapter 5.5 and the cross-case patterns in Chapter 5.6.

Institutional archetype	Adoption feasibility	Realized value potential	Main friction	Analytical implication
Public TVETs	Low/Medium	High	Funding, approval structure, infrastructure, public governance dependencies	Strong digital need, but slower and more externally constrained adoption
Private TVETs	Medium/High	Medium/High	Limited capacity, training needs, partial adoption, modular use	Promising early adoption context if system is simple, support intensive
Public universities	Low/Medium	High	Scale, legacy system, governance, security, integration complexity	Strategic but resource intensive context: high long-term value but difficult entry and adaptation
Private universities	Medium	High	Cross-departmental alignment, student-facing transparency, finance and grading friction	High value potential, but implementation must manage internal coordination and stakeholder trust

Table 16: Analytical assessment of institutional archetypes by adoption feasibility and realized value potential, developed by the authors based on: Chapter 5.2, 5.4.7, 5.5, 5.6 and analytical framework in Chapter 3.5.2.

Public TVETs appear to represent a high need but constrained adoption context. Their value potential lies in basic administrative digitalisation, including registration, attendance, grading, reporting and records. This follows the empirical findings in Chapter 5.2, where public TVETs were linked to core administrative

processes but also to governance limitations. However, adoption feasibility is reduced by public governance structure, funding limitations, approval processes and infrastructure constraints. This also connects to Chapter 5.6.7, where institutional type and ownership are shown to matter, but not explain outcomes alone. Public TVETs may therefore be important from a development and policy perspective, but adoption may require longer time horizons, external support and alignment with public approval structures.

Private TVETs appear more feasible in early adoption contexts. Chapter 5.2 describes private TVETs as having stronger operational flexibility and a clearer focus on workload reduction and efficiency. This makes adoption feasibility easier for private than public TVETs, especially where the system can be introduced gradually across selected modules. However, the adoption potential depends on training, modular fit and support capacity, which connects to Chapter 5.6.8 on training and provider support as continuity factors. Private TVETs therefore appear analytically promising where the system is simple, modular and supported by recurring onboarding.

Public universities represent a strategic but complex adoption context. The large scale and governance need create strong value potential, particularly in reporting, auditability, records and institutional oversight. This is visible in Chapter 5.2, where public universities were described through the traits of mature in-house systems, governance demands and security concerns. It was also revealed in Chapter 5.4.6, with student records and transcripts being linked to long-term traceability and institutional reliability. Chapter 5.6.6 showed that mature use does not remove all friction. Existing digital infrastructure, internal systems, security requirements and integration complexity may reduce feasibility for external providers. This archetype may therefore be less suitable for simple implementation models, but highly relevant for long-term strategic partnerships or specialized integration solutions.

Private universities show high value potential because they combine administrative complexity with student-facing service demands. DAS can create value through admission coordination, fee transparency, grading, reporting and student records. This is visible in the process-level findings in Chapter 5.4, especially Chapter 5.4.4 on fee management and Chapter 5.4.3 on assessment and grading. At the same time, the empirical material indicates that private universities are exposed to cross-departmental friction, especially where finance, admission, academic departments, ICT and student depend on the same data. This connects directly to the stakeholder analysis in Chapter 6.3, where value realization was shown to depend on alignment and trust between stakeholder groups. Private universities therefore have high value potential, but adoption feasibility is conditional on workflow alignment and student-facing trust.

6.5.3 Analytical implications

The synthesis shows that market implications are derived from the relationship between adoption feasibility and value potential, rather than through institutional type alone. Public/private and TVET/university differences matter, but they do not fully explain adoption outcomes. As shown in Chapter 5.6.7, size, workflow complexity, adoption stage, digital maturity, stakeholder alignment and training also shaped the empirical outcomes. This means that institutional archetypes should be treated as a starting point for analysis and not as fixed market segments. This creates three broader analytical implications. Firstly, DAS creates the clearest value where workflows are repetitive, standardised and data dependent. This implication follows from Chapter 5.6.2 and the process-level analysis in 6.2. Secondly, the greatest value loss occurs where processes cross departmental boundaries and where the stakeholder trust in the system output is weak. This follows from Chapter 5.6.3, 5.6.5 and the stakeholder analysis in 6.3. Thirdly, adoption continuity depends on training, support and adaptation after implementation, that follows from Chapter 5.6.8 and the maturity analysis in 6.4.

Building on these implications, it has become apparent that the theories introduced in Chapter 3 need to be combined in order to understand the findings. The various theoretical approaches cover different aspects of the adoption and potential value realization. The TOE framework helps to explain why adoption feasibility varies between different institutions, but it does not identify workflows that drive value realization. The IS Success Model and the derived value dimensions help to separate operational, informational, governance-related and user-perceived values but on a system level rather than through specific workflows. The STS, stakeholder theory and IMP-perspective all explain why technical implementation needs to be understood in relation to social, organisational and interactive relationships. Yet, the empirical findings suggest that stakeholder alignment is also relevant for screening, segmentation and scaling. Finally, the analysis successfully separates implementation, adoption and utilisation while also raising the complexity level. Maturity was shown to be process-specific and unevenly distributed rather than linear and institutional.

These insights provide the bridge towards the discussion, from empirical implications to more general analytical contributions. The key analytical contribution is that DAS adoption in heterogeneous educational contexts should be assessed through the combined lens of institutional readiness, process-level value potential and stakeholder alignment. This connects back to the purpose of the study in Chapter 1.7, where adoption feasibility and value realization/loss are central. It also prepares the discussion in Chapter 7, where these analytical findings will be translated into analytical and practical implications for system providers, institutions and external actors within these environments. Lastly, the theoretical implications are discussed further in Chapter 8.1, while related future research opportunities are addressed in Chapter 9.3.

7. Discussion

This chapter discusses the findings in relation to the purpose and research questions, before translating them into provider-oriented implications for segment assessment and implementation.

7.1 Revisiting the purpose and research questions

Returning to the study's purpose and research questions, the analysis shows that adoption and utilisation of DAS in Kenyan TE should be understood as more than technical implementation. Rather than assessing whether the system can be implemented, the central issue is whether institutions have the conditions required to use the system in ways that generate realized value. The purpose is therefore met through a combination of three dimensions: institutional adoption conditions, process-level value realization and stakeholder alignment.

The first central finding is that the demand for DAS appears to be high across the empirical material, but that the market should not be treated as homogeneous for that reason. Institutions described similar administrative problems, such as paper-heavy routines, inconsistent data records or long reporting cycles. However, demand alone is not a sufficient market criterion. For a system provider, the central issue is not where need is greatest, but where need overlaps with adoption feasibility.

Adoption feasibility should be understood as the institution's ability to proceed from implementation to adoption and ultimately long-term utilisation. This ability depends on technical infrastructure, organisational capacity, workflow fit and stakeholder alignment. Institutions may express a strong need for digitalisation while still being constrained by surrounding conditions. In contrast, an institution with less visible administrative pressure could be attractive from an adoption perspective due to shorter decision-making processes, clearer workflows and the availability of internal resources.

The analysis also shows that implementation should not be confused with realized value. A DAS may be formally implemented without being fully adopted. Therefore, realized value potential should not be assessed based on the system's presence, but through actual workflow utilisation. This also means that value is realized at a process-level. Registration and student records showed a clear and direct operational value, mainly due to the processes being standardised, data-driven and having directly measurable outputs. Fee management, assessment and reporting also displayed high value potential but also sensitivity and dependency on data quality, stakeholder relations and institutional alignment across different departments.

Thus, the most urgent processes are not necessarily the simplest to digitize, and the most urgent problems are not necessarily the best entry-points for system providers.

The value does not only vary between workflows, but also between stakeholders. The same system function can be perceived differently depending on which stakeholder group uses or depends on it. Decision-makers tend to value overview, reporting and accountability, while operational users primarily value workload, usability and system integration into daily workflows. ICT staff are affected by support demands and system stability while students perceive value through transparency, access and reliability. When friction occurs, it likely happens where information is being transferred from one stakeholder to another, especially if this information is inconsistent or flawed.

Stakeholder alignment should therefore be considered a direct condition for realized value, not just an organisational concern. Workflows such as fee management, grading and reporting show how the system output depends on the involvement of several stakeholders. If the involved stakeholders have different expectations of the system, or if the responsibilities are undefined, the technical function may exist without realizing value. In these instances, value loss could appear through double validation, manual workarounds, increased support demands or declining trust in system outputs.

The analysis also questions digital maturity as a unified institutional trait. Institutions can appear digitally mature in some areas such as reporting or digital records, while having recurring friction in others such as fee management or student-facing transparency. This shows that digital maturity should be related to processes and stakeholders, rather than treated as a general trait of institutions. Therefore, it is important to understand which workflows are used in alignment with the system, which are managed through parallel external solutions and in which processes users experience friction.

The analysis implies that market implications should not be derived from institutional type or administrative need alone. Ownership (public/private) and institutional type (university/TVET) are relevant starting points as they capture important differences regarding governance, approval structures and organisational complexity. However, they are insufficient as complete criteria for segmentation. In order to assess which segments or candidate institutions are most attractive, these archetypes need to be complemented with additional dimensions such as adoption feasibility, workflow value potential, value-loss risk and

stakeholder alignment. The following section therefore develops how these findings can be translated into a practical prioritization logic for system providers.

7.2 From archetypes to segment prioritization

This section translates the analytical findings into prioritization logic for system providers. It explains how institutional archetypes can be used as a first screening step before adding more specific dimensions related to adoption feasibility, workflow value potential, value-loss risk and stakeholder alignment.

7.2.1 From archetype to screening dimensions

Chapter 7.1 showed that the market for DAS in Kenyan TE cannot be understood through demand-based logic alone. For a system provider the practical question is therefore not to locate the administrative problems, but to identify where these problems intersect with realistic adoption feasibility and a clear value potential. The aim is to illustrate how the institutional archetypes can be used as an initial segmentation step, followed by the addition of second-layer prioritization dimensions for further provider prioritization.

Building on the empirical organisation of the cases introduced in Chapter 5.1 and methodologically motivated in Chapter 2.2, the four institutional archetypes capture an initial set of differences between institutional contexts. The label TVET or university implies information about the different institutional functions, the process logic and the administrative complexity. The TVETs in the empirical data appear to be more closely connected to core processes such as registration, attendance, grading and basic reporting. The universities on the other hand, displayed additional organisational layers, more internal departments and complex student-facing processes. Furthermore, separating public and private, captures a difference in governance, funding, approval structures and the level of organisational flexibility. The introduction of the archetypes also shows the relevance of the other dimensions, as multiple differences were quickly revealed within the archetypes.

The additional dimensions, which are based on the empirical adoption conditions from Chapter 5.2, found support by the stakeholder findings in Chapter 5.5. They help understand how and why the institutions differ and are focused on size, adoption stage, digital maturity, technical capacity, governance and workflow complexity. The workflow complexity was shown to be closely connected to the stakeholder complexity. These insights provide a more practical understanding of readiness, which extends beyond the institutional logic captured by the archetypes. For instance, one segment may display large administrative issues, but due to the funding or approval structure these may be difficult to access for the provider. Another

institution may display digital maturity at first glance but might lose adoption feasibility due to complex workflows and stakeholder misalignment. There is a clear difference between demand, feasibility and the potential to realize value.

The proposed segmentation logic is therefore a two-step approach. The first step is the use of archetypes based on institutional type and ownership. It distinguishes the governance structure, the flexibility, the academic orientation and complexity. The second step is prioritization filtering, to assess adoption feasibility and potential value realization more directly. It is central to analyse adoption feasibility, workflow value potential, value-loss risk, stakeholder alignment and strategic accessibility.

Figure 8 illustrates how the empirical variation is translated into analytical screening dimensions for segment prioritization. The empirical variables build primarily on the institutional variation discussed in Chapter 5.2, while stakeholder complexity is further supported by Chapter 5.5 and the analysis in Chapter 6. Through analysis in Chapter 6.1-6.4 and the synthesis in Chapter 6.5, these variables are condensed into five provider-oriented screening dimensions: adoption feasibility, workflow value potential, value-loss risk, stakeholder alignment and strategic accessibility.

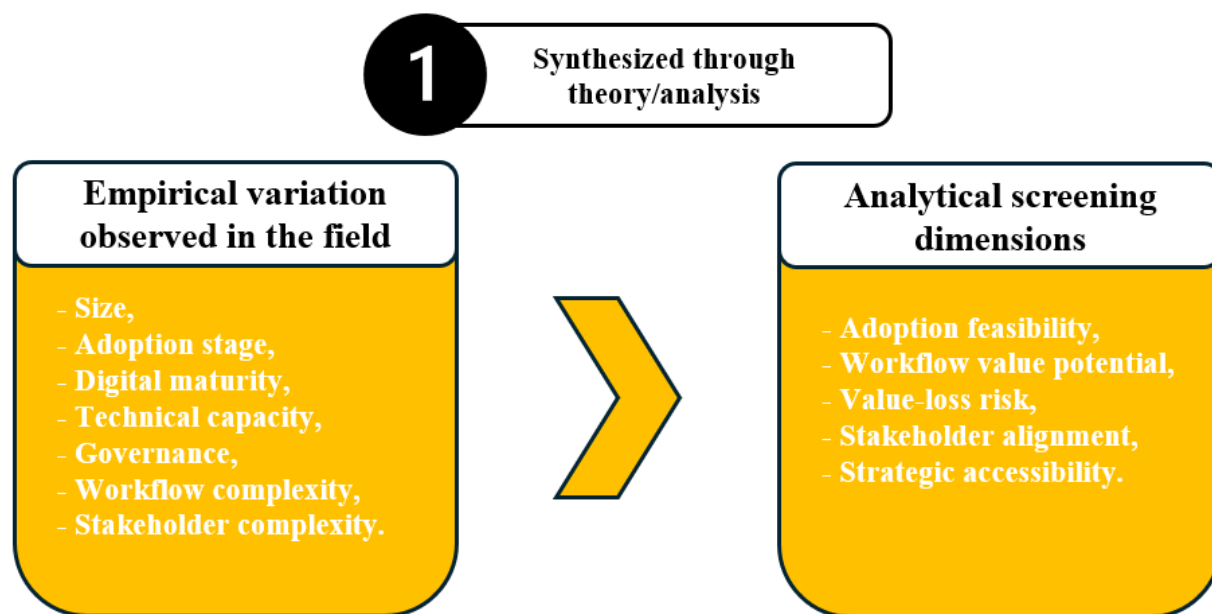


Figure 8: A visual representation of the synthesis of empirical variables into analytical provider-oriented screening dimensions, developed by the authors based on Chapter 5.2, 5.5 and 6.1-6.5.

7.2.2 Applying the screening dimensions

The adoption feasibility will determine if the institution realistically can proceed from implementation to stable utilisation. The workflow potential captures where value can be identified and measured. Value-loss risk identifies where expected benefits risk being reduced through workarounds, increased support burden, inconsistent data or declining trust. Stakeholder alignment helps to assess whether involved parties are sufficiently coordinated regarding system utilisation and system data. The strategic accessibility ensures the segment is commercially and organisationally accessible for a system provider.

In order for the analytical screening dimensions to be feasible in practice, they should be interpreted as screening questions rather than analytical terms. For the system provider, this means not only to pinpoint the archetype of the institution but also assess the institution's performance along the five screening dimensions. For instance, adoption feasibility could be assessed through the presence of management support, ICT capacity, funding structure, process ownership and realistic implementation capacity. Workflow value potential could be assessed by identifying the manual, time-consuming or other key processes that can generate clear value relatively early. The value-loss risk could be evaluated by identifying workarounds, by assessing the system trust or the support intensity. Stakeholder alignment could be assessed by mapping the relevant roles for various processes in the system. The last dimension, strategic accessibility, could be evaluated through identification of approval structures, funding conditions and the system provider's accessibility to the institution.

It is important to note that these dimensions should not be used in isolation. An institution with high value potential is not necessarily to be considered attractive if adoption feasibility is low or if the institution displays weak stakeholder alignment. In similar fashion, an institution that displays high adoption feasibility may be of less strategic importance if the workflow value potential is limited. Because of this, the most attractive institutions should be the ones where need, potential realized value, manageable friction and capacity overlaps. The relevant provider question is therefore: *Where can the system not only be sold or implemented, but actually be utilised in a way that generates and preserves value?*

7.2.3 From screening dimensions to prioritization outcomes

To answer this question, the screening dimensions can be put to practice. The goal is not to numerically rank each institution but rather help the system provider understand what type of candidate an institution represents. The four prioritization outcomes come from different combinations of adoption feasibility, process-level value potential, stakeholder alignment, value-loss risk and implementation complexity.

An institution with a relatively high adoption feasibility, clear process value and limited value-loss risk may be interpreted as an early-entry candidate. An institution with high value potential but higher stakeholder complexity and greater risk for value loss might be interpreted as a high value but complex candidate. Institutions with a clear need, but funding or approval limitations, may be considered candidates for partnership or phased entry. Lastly, large institutions with scalability and long-term value potential, but limited by substantial implementation requirements, could be considered strategic long-term candidates. *Figure 9* summarizes the prioritization sequence. A system provider can approach candidate prioritization through the following steps:

1. Firstly, the provider should assess whether the institution is realistically accessible and capable of adopting the system. This is captured through adoption feasibility and strategic accessibility.
2. Secondly, the provider should assess whether the institution contains workflows where visible value can be created, such as registration, student records, fee management, grading or reporting. This is captured through workflow value potential.
3. Thirdly, the provider should assess whether expected value may be reduced through workarounds, inconsistent data quality, increased support burden or through stakeholder misalignment. In this step, value-loss risk and stakeholder alignment function as risk filters.

An attractive candidate is therefore not only an institution with a demand, but an institution where adoption feasibility, accessibility and workflow value overlap, while the potential friction is manageable.

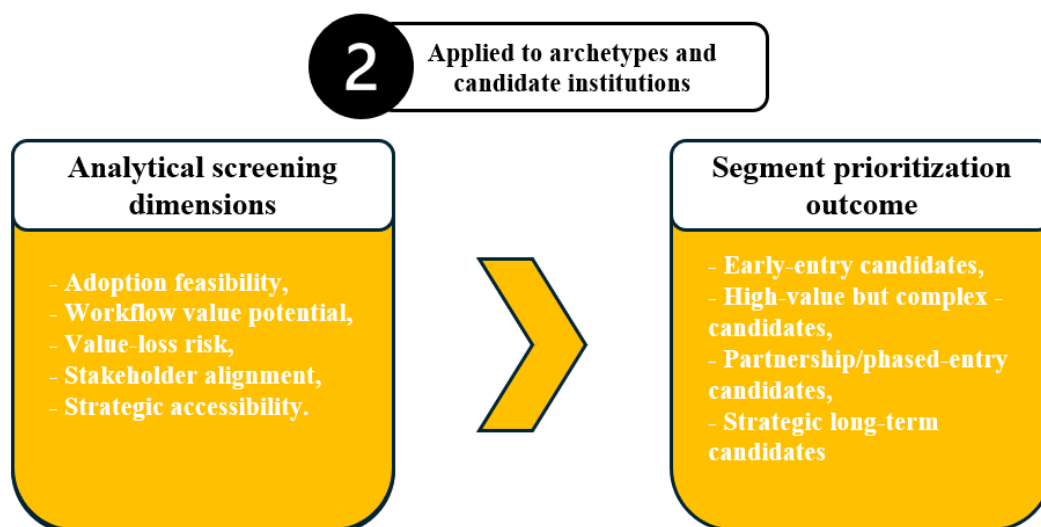


Figure 9: A visual representation of how the screening dimensions were translated into a segment prioritization, developed from the screening dimensions from Figure 8.

To further illustrate how these steps can be used in practice, *Table 17* presents how the screening can be applied to differentiate between different types of institutional candidates. This table should not be considered a fixed scoring framework, but rather a structured assessment tool to identify and differentiate institutions:

Prioritization outcome	Screening of dimensions	Practical identification	Provider Implications
Early-entry candidate	Decent adoption feasibility, clear potential value in workflows, manageable value-loss risk, strategically accessible.	Shorter approval structures. Visible manual pain points in workflows. Potential to quickly demonstrate proof-of-value to build trust.	Suitable for pilots to quickly gain market traction. Potential implementation in phases.
High value but complex candidate	Medium adoption feasibility but high workflow value potential. Relatively high stakeholder complexity and value-loss risk.	Strong needs in complex workflows such as finance processes, grading, reporting or student-facing transparency. Dependency of several departments and stakeholders in these processes.	Attractive due to high value potential. Requires mapping of process- and stakeholder relationships. The system needs to be integrated with respect to complicated existing workflows.
Partnership or phased entry candidate	Existing demand and value potential, constrained due to external factors.	Public or county-linked governance. Dependent on funding and approvals. Constrained by resources and infrastructure.	Potential phased implementation or through partnerships. Suggestion is institutional support structures for maintenance post-implementation.
Strategic long-term candidate	High long-term value, large scale and complex structure. Difficulties to access.	Large volumes, focused on governance and reporting. Tied to legacy systems, complex integration and procurement. Multiple dependent stakeholders.	High-yielding candidates but likely difficult to access. Once accessed, implementation and maintenance is resource heavy.

Table 17: Segmentation prioritization outcome based on the screening dimensions, how they are identified and the implications for a system provider.

The table illustrates that no segment is by default better than others. Instead, it shows that different segments are attractive in different contexts. An early-entry candidate might be suitable to quickly demonstrate proof-of-value and build initial trust. A high value but complex candidate could have a higher strategic value but requires more support. A partnership/phased-entry candidate could require additional institutional support. A strategic long-term candidate might be important in an expansion but may be less suitable as an initial entry point. Prioritization therefore depends on timing, provider capacity and implementation conditions.

The developed framework, with the five dimensions of screening, should therefore be understood as a qualitative prioritization tool. For a provider such as SchoolTry, the framework can yield insights into which segments and candidate institutions are not only relevant in terms of demand, but also realistically targetable and capable of adopting the system. To answer that, the next section will cover the market entry implications.

7.3 Market entry implications for system providers

Building on the segment prioritization logic in Chapter 7.2, the findings are translated into provider-oriented market entry implications. It focuses on how system providers can reduce implementation risk with entry logic, adoption feasibility, workflow value potential and stakeholder alignment.

7.3.1 From segment to entry logic

Once the prioritization is completed and the system provider has identified the candidate profile for the institution, the candidate profile has to be translated into an actionable entry logic. In other words, the entry logic should be regarded as an institution-tailored process where the approach is dependent on the segment's adoption feasibility, value potential, value-loss risk and stakeholder conditions.

Through the analysis and its synthesis, adoption feasibility has been found to vary between archetypes, and these archetypes have different implications for entry logic. Early-entry candidates, for instance private TVETs, should be approached with a limited scope, quick proof-of-value demonstration and a structured onboarding. The high value but complex candidates, which could be a private university, may require additional mapping of workflows and stakeholder relationships to prepare for potential friction. Partnership or phased-entry candidates, for instance public TVETs, may require an extended time frame, funding logic and collaboration with external actors. Lastly, the strategic long-term candidates, such as bigger public universities, could prove strategically important for future expansion, but are less suitable as first entry points without sufficient integration resources.

7.3.2 Entry through visible-value workflows

In Chapter 5.4 it was presented that value is not realized on a system level and the subsequent analysis in Chapter 6.2 revealed that value is rather tied to specific workflows or processes. System providers should align the entry towards specific workflows rather than immediate full-scale adoption. The system should be positioned as the solution for the processes where the most apparent value can be realized, to quickly establish proof-of-value and to build trust. For the most suitable initial processes, it is likely operational value and user-perceived value that can be captured relatively early. Information value and governance-related value is often tied to the alignment of several workflows and stakeholders.

From the results and analysis, the most convincing workflows for market entry was registration, student records and basic reporting. Registration often had a clear workflow, from application and admission to account activation and subsequent course registration. Because of this, the time savings and reduced manual labour can likely be experienced relatively quickly. Student records could increase the data accessibility, traceability and verification which in return can increase the perceived system-value from users in other workflows. The basic reporting raises the complexity level and thus also the friction. These processes often connect several workflows and could require additional alignment. However, the upside directly influences management and decision-makers, which could increase the user-perceived value of the system substantially.

From the empirical findings and analysis, it has been shown that the most value-intensive processes do not necessarily qualify as the best entry points. Fee management, assessment and grading all display great value potential, but also a substantial risk for value loss. These processes are particularly sensitive as they are data-dependent, and errors may have direct consequences for the system users. Students risk being locked out of courses and academic staff risk additional manual labour or continued reliance on workarounds if the system is not properly integrated. These processes should be considered as areas of expansion once the system trust, data quality and stakeholder alignment are established.

7.3.3 Managing adoption through phases and stakeholder alignment

Considering implementation does not result in adoption or utilisation by default, and because value loss can often be traced to process friction or stakeholder misalignment, the market entry should be phased in stages in many cases. This distinction was confirmed in the empirical data, see Chapter 5.3, where several institutions displayed phased adoption and process variation. A system could be technically implemented yet exist alongside manual routines or usage of external tools. The strategic implication is therefore to treat

implementation as the beginning of adoption, rather than as the end point. It should be considered a gradual adoption, where the provider builds confidence gradually by ensuring data quality and utilisation over time. This was shown to be important in Chapter 6.2, as value is not created by the mere existence of the system, but rather through the direct use in specific administrative workflows.

If a provider decides to proceed with phased implementation, the initial stages should not necessarily concern the most complex or value-sensitive processes. In accordance with the analysis in Chapter 6.2, the provider should rather focus on the workflows where value can be realized and measured relatively early. Ideally, these workflows should be less exposed to process and stakeholder complexity. To exemplify such processes, consider registration, student records and basic reporting. While not entirely frictionless, they display a clear logic and sequence in combination with observable outputs and a direct link to user-perceived value. A phased implementation with these processes initially, is an opportunity to swiftly generate proof-of-value in a restricted workflow prior to a broader system launch. Furthermore, it allows the users to become familiar with the system and local process problems can be identified prior to the broader launch. This makes phased implementation a way to reduce value-loss risk while gradually building system trust.

Returning to the value-loss risks, phased implementation can reduce the risk of manual and external workarounds. Several of the case organisations used external tools such as Excel, WhatsApp or LMS tools. This is not a failure per se as these systems could complement the system. However, it can be a problem if these alternatives substitute the system functions. If processes such as student records, payment confirmation or grading are handled externally, the system is only partially utilised. The institution then faces the risk of data fragmentation, duplication of work and weakened trust in the system. The system provider needs to gain an understanding of which processes the system is supposed to serve, which are substituted externally and why this is happening.

In a staged implementation, it is essential to understand the stakeholder environment. The findings in Chapter 5.5 suggest that stakeholder groups perceive value and friction differently. The best way to exemplify this is that one stakeholder may be responsible for the input to a workflow, while another is responsible for the process and a third depends on the output. Finance may be responsible for verifying payments, students are affected by the output, management is dependent on the output for decision-making while ICT is given the burden of support in the event of errors. The provider needs to map out the stakeholder relationships and roles in these processes to understand the responsibilities for inputs, the process function and for the potential outputs. A lack of understanding for the stakeholder salience can

result in a system optimized for certain stakeholder groups without considering how others are affected which ultimately risks friction and value loss.

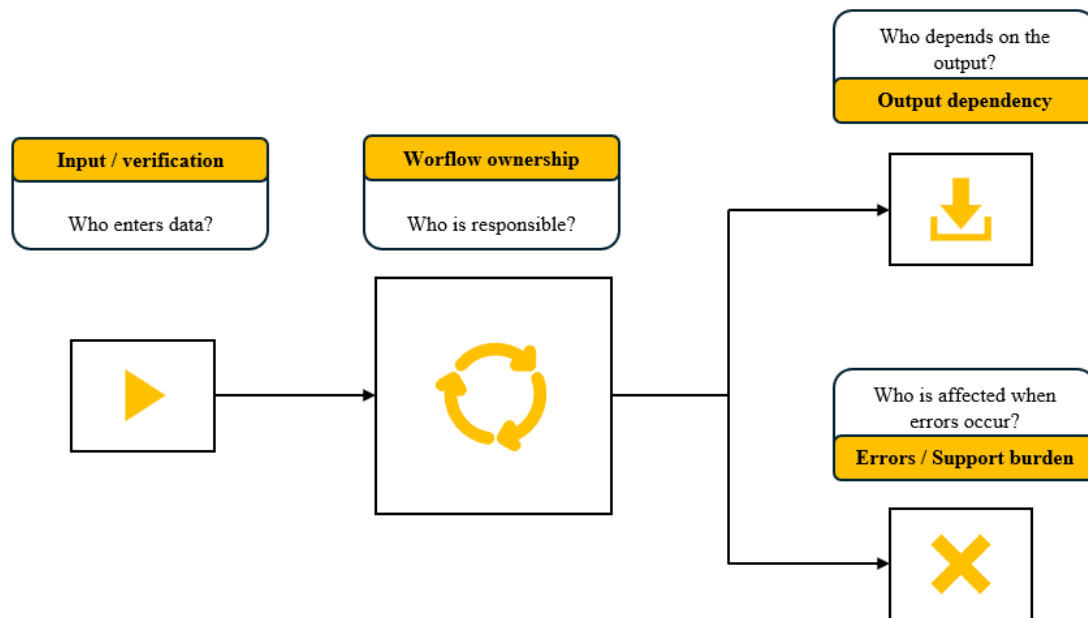


Figure 10: An overview of stakeholder relationships and value dependencies in cross-functional administrative workflows, developed by the authors.

Stakeholder alignment is likely to become critical during implementation. DAS are generally procured and approved by decision-makers while being adopted and used by operational users. If the provider only considers the value from the managerial perspective, the system risks not meeting the needs of the operational users. The empirical findings in Chapter 5 suggests that operational users value workload, usability and system fit to daily routines. ICT focuses on system reliability, integration and support burden. The students value transparency, accessibility and reliability. As a result, the system must be translated to different value logics and aware of shifting stakeholder salience. Without sufficient understanding of the organisation, the system risks being limited to a formal adoption rather than reaching a stable utilisation.

For the system provider to adapt the value proposition to several groups of stakeholders, the provider can return to the value dimensions introduced in Chapter 3.1.2: Where is operational value generated? Where is informational value generated? Where is governance-related value generated? Where is user-perceived value generated? By translating the same system into different value logics, based on stakeholder role, the system provider can identify overlooked value and friction points.

Once the initial workflows are established, the system can scale towards the more complex and sensitive workflows such as fee management, grading and advanced reporting. For the four institutional archetypes this implies that private TVETs could be suitable for pilot entries, especially if the approval structures are short and flexible. Private universities may offer a higher value potential but are likely to require additional stakeholder coordination and process configuration. The public TVETs and universities should also be considered, but these may require phased entry or external partnerships over a longer period of time. With this in mind the provider should consider a staged expansion: first to identify candidate institutions where value potential and adoption feasibility overlap. Secondly, implement a limited workflow scope and only scale once utilisation is stable enough to preserve long-term value. This connects market entry to the central argument of the study; value is realized through sustained utilisation across workflows and stakeholder alignment.

8. Contributions and Limitations

This chapter presents the contribution and limitations of the study. The chapter first discusses the theoretical and analytical contribution, followed by the practical and managerial contributions. It then presents methodological and empirical limitations and clarifies how the findings should be interpreted in relation to the study's qualitative, field-based and context-specific design.

The purpose of this study was to analyse how adoption feasibility and value realization of DAS in Kenyan TE are shaped by institutional conditions, administrative workflows and stakeholder alignment. The findings show that DAS should not be assessed only through technical implementation or demand. Instead, adoption feasibility and value realization need to be understood through interaction between institutional readiness, process-level use and stakeholder alignment.

8.1 Theoretical and analytical contribution

Building on the analytical synthesis in Chapter 6.5.3, this section discusses the study's theoretical and analytical contribution. The contribution is not found in any single framework. Instead, it comes from the application of multiple established theoretical perspectives in combination within a specific and underexplored empirical context. The TE sector in Kenya is a heterogeneous and comparatively underexplored empirical setting for studying DAS adoption. The context is further complicated because digitalisation, organisational capacity, administrative workflows and stakeholder relationships all influence the study. By linking adoption feasibility, process-level value realization and stakeholder alignment, the study shows how DAS can be understood as more than a technical solution or commercial offering. Value appears first when institutional conditions, workflows and stakeholder relations align.

A first contribution is that the study has extended the link between adoption feasibility and segment prioritization. The established theoretical frameworks, such as TOE, are mostly used to understand why different organisations display different conditions for adopting a new technology. But it does not explicitly explore where value is actually realized. TOE could help explain why the adoption feasibility varied, for instance between the archetypes, yet the theory was insufficient on its own in explaining why certain parts of the institution generated value or friction. This study contributes theoretically by extending TOE-logic, shifting it from adoption readiness to a more practical segmentation logic. This also extends adoption feasibility by linking it to potential value realization and risk of value loss. The analysis showed that a high demand is insufficient to indicate that a segment should be considered attractive. Demand needs to be

assessed together with organisational capacity, technical infrastructure, financial conditions, approval structures and stakeholder management. Taken together, the study therefore contributes with a segmentation logic that regards market attractiveness as the overlap between demand, adoption feasibility and potential value realization.

A second contribution is the narrowing of potential value realization from system level to process level. This is based on an extension of the IS Success Model, which proved useful in identifying different value dimensions. However, these dimensions needed to be connected to specific workflows to understand how net benefits were created. In the end, it comes down to which processes and which stakeholder relationships that generate value or loss. The contribution is important as it illustrates how the same system could prove successful in one workflow while being problematic in another. Therefore, the process-level understanding is important to actually understand value realization. This extends further as various workflows could be identified and prioritized depending on the current phase of the implementation, meaning that net benefits could be interpreted dynamically depending on the adoption context.

A third contribution of this study is that stakeholder alignment should be considered prior to implementation and not simply post-implementation. Through salience, stakeholder alignment could affect the conditions for potential value realization and hence also the market-entry. While the stakeholder theory and the IMP interaction perspective provide an understanding of different actors and relationships, they do not consider in which phase this evaluation is performed. The existing theory explains why various actors perceive the system differently, but this study contributes by underlining that stakeholder alignment should be considered a conditional term prior to implementation and scaling. This moves stakeholder alignment from an implementation concern to a market and adoption dimension. Instead of asking how, the question moves to if and why.

A fourth and final theoretical contribution is that maturity has been found to be a shifting state that may be more complex than a unified institutional label. The theoretical phases of implementation, adoption and utilisation are foundationally sound but could appear overly linear in certain contexts. The empirical findings suggest that institutions can have well-established systems for certain processes, displaying a high degree of maturity. Despite this, other workflows or aspects can be the complete opposite. The study therefore contributes by illustrating that utilisation and maturity could be unevenly distributed over workflows and stakeholders.

To conclude the contributions, the analytical contribution of this study is the combination of institutional readiness, process-level value potential and stakeholder alignment. By combining these perspectives, the study developed an analytical framework to understand and prioritize DAS implementations in heterogeneous market contexts. It can provide an understanding of whether the identified demand can be converted into realizable value and sustainable utilisation.

8.2 General contributions

While the study is empirically limited to Kenyan TE, several of the findings could potentially be transferred into more general analytical insights on digitalisation in organisationally heterogeneous and resource-constrained contexts. Due to the nature of this study, these insights are not statistically generalizable but rather of analytical significance through the thematic analysis. This study does not deliver a blueprint for all educational institutions, but the declared analytical dimensions could help in understanding similar digitalisation challenges in other contexts.

The first general contribution is that digital transformation should not be decided based on an existing need, but rather if this need can be converted into utilisation and realization of value. This insight extends beyond SchoolTry and Kenya. A notable administrative problem and high demand could be a weak case for digitalisation if the organisation lacks funding, governance support, technical capacity or stakeholder alignment. Thus, the study contributes to a broader context by separating the direct link between digital demand and feasibility.

Secondly, value should also be considered more granular than on a system level. This study illustrates that both value and friction can be generated on a workflow level, which potentially could be true beyond the educational sector in external contexts. In institutional contexts, and likely other organisations as well, certain workflows are more complex than others. Because of this, it could be beneficial to evaluate system value by identifying which processes generate observable value and which processes that are prone to cause friction.

The third general contribution regards stakeholder alignment, which should be considered as part of the digital readiness. This term is often associated with implementation but in light of this study, it should be considered several stages earlier. The processes with the highest risk were processes with one actor providing the input data, another responsible for the process and a third dependent on the output. Such

processes illustrate that DAS need to consider stakeholder readiness to complement technical and organisational readiness.

As stated formerly, digitalisation in heterogeneous contexts should be understood by combining institutional readiness, process-level value and stakeholder alignment. Furthermore, this also extends to Chapter 9.3, which explores if future research could examine if the same analytical dimensions are of relevance in other contexts such as countries, educational levels or entirely different administrative or digital systems.

8.3 Managerial implications

The findings of this study have practical implications for providers such as SchoolTry. The implications mainly concern market assessment, entry prioritization, implementation and scaling. The findings suggest that successful market entry requires more than identifying administrative problems and a demand for digital solutions. Providers need to assess whether these problems can realistically be converted into value realization and sustainable system use.

Implication 1: Use archetypes as an initial market map, not as final segmentation

The four institutional archetypes developed in the study are useful as an initial market approach. They provide insight into institutional differences regarding governance structure, funding, workflow complexity and administrative scope. However, the archetypes are not sufficient to assess whether a candidate is feasible, as substantial variations were discovered within each archetype, such as size, digital maturity, technical capacity, workflow maturity and governance conditions. Providers should therefore use archetypes as a first mapping layer, followed by a more granular assessment of candidates through feasibility dimensions.

Implication 2: Screen candidates through five prioritization dimensions

After the initial archetype mapping, candidates should be screened and selected beyond the greatest demand, the largest institution, the most digitally mature or the highest willingness to pay. Instead, providers should screen potential candidates through five prioritization dimensions:

- Adoption feasibility
- Workflow value potential
- Value-loss risk
- Stakeholder alignment
- Strategic accessibility

This reduces the risk of prioritizing institutions based on visible administrative problems. Instead, the most attractive candidate was found to be the one where the five dimensions overlap, where feasibility aligns with clear workflow value, manageable friction and realistic access to the institution.

Implication 3: Enter through visible-value workflows

In the analysis, certain workflows were found to offer clearer and more accessible value. Processes such as registration and admission, student records and transcripts, and basic reporting had fewer complex structures, relatively standardised workflows and measurable outputs. By approaching these processes initially, the system provider may quickly display proof-of-value while gradually building user confidence. Other processes displayed increased complexity, such as fee management, assessment and grading, and advanced reporting. The underlying reason was the data dependency, increased stakeholder involvement and potential technical support burden. Because of this sensitivity, these processes should be assessed more carefully prior to implementation.

Implication 4: Phased adoption rather than full technical launch

The fourth implication is that providers should treat the implementation as a phased adoption rather than a technical launch. By phasing the implementation, a limited initial scope can increase the effectiveness of onboarding, training, data migration, system integration and value realization prior to scaling. This is especially important in larger institutions with workflows that are dependent on multiple stakeholders, where each role perceives the system and its value differently.

Implication 5: Stakeholder alignment prior to scaling

Before a larger rollout, system providers should map workflows with regard to which stakeholders input data, own the process, depend on the output and manage the support burden. The value proposition needs to consider that various stakeholders can value the same process differently. Management may value overview and reporting while finance may value control and payment traceability. Operational users may value reduced workload and integration with daily routines. ICT may value technical reliability and integration while students value transparency, accessibility and information reliability. As a result, the findings suggest that stakeholder alignment should be ensured prior to scaling to avoid friction and to mitigate the risk of value loss.

8.4 Methodological limitations

The first methodological limitation concerns the knowledge produced by the qualitative and explorative research design. As described in Chapter 2.1, the study was conducted as a qualitative, field-based case study with a comparative multi-case logic. This research design was appropriate because the purpose of the study was to understand processes, conditions, stakeholder perspectives and value realization rather than to measure statistically generalizable outcomes. However, it also limits the study's ability to measure adoption outcomes with statistical precision or establish causal effects. The findings should therefore be understood as analytical interpretations of how adoption feasibility, workflow-level value realization and stakeholder alignment may interact in different contexts, rather than statistically measured effects.

A second methodological limitation concerns the use of interviews as the primary empirical source. Interviews made it possible to capture different stakeholder perspectives, including managers, teachers, administrative staff, ICT, students and policy or governance actors. This was important because the study aimed to understand how DAS are experienced differently across roles. However, interview data also involves limitations. Respondents may describe processes differently depending on their role, memory, expectations, position or interest in presenting their institution in a certain way.

For this reason, the findings should be interpreted as stakeholder-based accounts of adoption and value creation rather than as direct measurements of system performance. This is relevant when respondents described time savings, workload reduction or improvements. Such estimates were useful for identifying perceived value and comparing patterns across cases. They are not, however, independently verified through system logs, time measurements or data. Reported improvements should therefore be understood as indicative empirical observations rather than exact quantitative evidence.

A third limitation concerns the quantitative elements included in the study. The study used interval-based estimations and respondent-based comparisons to support the analysis, but the research design remained mostly qualitative. These quantitative elements helped structure comparisons between cases and workflows but were not sufficient to establish measurable effects.

A fourth methodological limitation concerns the use of institutional archetypes. The four archetypes were useful for organizing the empirical material and comparing adoption conditions. However, they should not be treated as fixed or statistically representative market segments. As discussed in the analysis, institutional type and ownership matter but do not explain adoption outcomes alone.

The archetypes should therefore be understood as analytical organizing categories rather than predictive classifications. This is important for understanding the segment prioritization logic developed in Chapter 7. The framework can help identify relevant dimensions for assessing institutions but should not be used as a mechanical scoring model without further empirical validation.

8.5 Empirical limitations

This section concerns the empirical scope of the study and the domains to which the findings can be transferred. The first empirical limitation concerns the geographical and sectoral scope of the study. The study is limited to Kenyan TE and does not include primary schools, secondary schools or other national educational contexts. This focus was necessary to study DAS in a specific and complex setting. However, it also means that the findings cannot automatically be transferred to other education levels or countries.

The Kenyan context is characterized by specific conditions related to digital development, institutional heterogeneity, public and private ownership, funding structures, infrastructure variation and uneven digital maturity. These conditions shaped the findings and should be considered when assessing their broader relevance. The findings may therefore be relevant for other heterogeneous or resource-constrained education contexts, but this requires careful contextual comparison.

A second empirical limitation concerns access to institutions and respondents. As explained in Chapter 2.2, access was mostly facilitated through collaboration with SchoolTry. This collaboration made it possible to approach relevant institutions and stakeholders, but it may also have influenced which institutions were

included in the study. The inclusion of institutions in different adoption stages, including institutions not using SchoolTry, reduced this risk, but did not remove it entirely.

A third empirical limitation concerns the number and structure of interviews. The empirical material consists of 27 documented interview cases and respondent interactions. However, the exact number of individual respondents varied across interview settings, since some interviews included multiple respondents or represented a broader stakeholder interaction. For this reason, the empirical material should be understood as a set of documented interview cases and respondent interactions rather than a statistical respondent sample.

A fourth empirical limitation concerns the distribution of empirical material across institutional types, adoption stages and workflows. The empirical coverage was not equally distributed across all processes or stakeholder groups. Some workflows were more visible in the material than others. This uneven empirical coverage affects how the findings should be interpreted. The process level findings identify important patterns, but they do not provide a complete representation of every administrative workflow in Kenyan TE.

A fifth empirical limitation concerns the study's market-related scope. The thesis discusses implications for system providers and segment prioritization, but it does not develop a complete GTM strategy. As stated in Chapter 1.10, the study does not include pricing, channel strategy, competitor analysis, procurement or financial forecasting. The market-related implications are instead derived from the analysis of adoption feasibility, workflow value potential, value-loss risk, stakeholder alignment and strategic accessibility.

This means that the study can support provider-oriented market assessment and prioritization but should not be treated as a complete commercial strategy for SchoolTry or any other provider. The framework helps identify where demand may overlap with adoption feasibility and potential value realization, but additional commercial analysis would be required before making final strategic decisions.

A final empirical limitation concerns the focus on administrative systems rather than broader educational technology. The study focuses on DAS and administrative workflows such as registration, fee management, grading, reporting and student records. It does not analyse LMS or other pedagogical digitalisation in depth. This focus was necessary to answer the research questions, but it means that the findings primarily concern administrative digitalisation rather than digital learning more broadly.

9. Conclusions and Future Research

This final chapter answers the research questions and summarizes the study's key conclusions on adoption feasibility, process-level value realization and stakeholder alignment. It also outlines directions for future research based on the study's limitations and findings.

9.1 Answers to the research questions

This section answers the four research questions based on the empirical findings presented in Chapter 5, the analysis in Chapter 6 and the discussion in Chapter 7. Together the answers show how the purpose of the study has been addressed.

Research question 1: *How do contextual characteristics shape the conditions for adopting digital administrative systems?*

In the study, the Kenyan tertiary education sector was found to be heterogeneous. To structure this variation, four institutional archetypes were used: public TVETs, private TVETs, public universities and private universities. These were based on institutional type and ownership. Together, these dimensions capture initial differences in administrative complexity, governance, funding and flexibility.

However, the archetypes were insufficient as an explanation on their own. Within each archetype, variation was found in size, technical capacity, digital maturity, internal resources, management support and workflow maturity. This suggests that the institutional archetypes provide an initial understanding, but adoption feasibility requires a more granular assessment.

Research question 2: *What organisational, technological and environmental factors affect adoption feasibility?*

The organisational factors found to affect adoption feasibility were administrative capacity, management support, workflow ownership and readiness for change. Furthermore, technical factors such as ICT capacity, integration possibilities, data migration, user access and system reliability were found to be influential as well. Lastly, environmental factors such as funding, governance, approval structures and regulations could also be linked to adoption feasibility.

Taken together, adoption feasibility was found to vary from one institution to another, depending on processes, resources and stakeholders. The analysis indicates that some institutions displayed limited

adoption feasibility despite high demand, while others appeared digitally mature but still faced stakeholder-related friction which hindered sustainable utilisation. Overall, the findings suggest that adoption feasibility is based on the balance between the organisational, technological and environmental conditions.

Research question 3: *How is value realized or lost across key administrative workflows?*

Value realization was found to be better assessed at process level rather than at system level, as some processes generated value differently. Processes such as registration and admission were found to enable value relatively quickly because of a direct and measurable output. Once the system was implemented, the effects were often less paperwork, shorter cycles and visible operational value. Another workflow that was relatively visible was student records and transcripts. After implementation, several institutions reported improved accessibility, traceability and reliability which ultimately provided early informational and governance value.

In contrast, some processes displayed high value potential but also significant risks, such as fee management. While having the potential to reduce process cycle times and increase data transparency and transaction traceability, increased stakeholder complexity can cause friction, leading to distrust and potentially value loss. Assessment and grading were another process with high potential through shorter result cycles but was simultaneously dependent on correct input data, integration into daily routines and system alignment. Reporting and compliance displayed clear governance value when underlying data was reliable but could generate additional validation work when data was inconsistent. In essence, value loss can occur through manual work, workarounds with adjacent external systems, additional validation, increased support burden, inconsistent data or distrust. The same system can realize value in one process but cause friction in another.

Research question 4: *How do stakeholder roles and interactions influence perceived value, trust and implementation friction?*

In the study, it was found that stakeholders perceive value and the system differently. Decision-makers may prioritize overview, reporting and governance while operational users may value workload, usability and integration into daily routines. Students may prioritize transparency and accessibility, while ICT staff may prioritize reliability and support burden. Finance staff tended to value control, payment traceability and transactional data storage. This is because stakeholder alignment affects trust, which in turn affects utilisation and ultimately value realization. This means that stakeholder alignment is a condition for whether

system outputs are actually trusted and converted into value realization. Stakeholder alignment is therefore not only relevant during implementation, but also prior to implementation in assessing market candidates as well as post-implementation for subsequent and sustainable utilisation.

9.2 Key conclusions

The Kenyan TE sector was found to be heterogeneous. While the findings revealed a recurring demand for DAS, the conditions for adopting a system vary significantly in terms of institution type, ownership, governance, resources, technical capabilities, digital maturity and workflow complexity. As a result, the adoption of the same system can yield substantially different outcomes depending on the context.

In order for DAS to realize value, demand needs to be converted into utilisation. Demand itself is not sufficient to generate value. Instead, the value realization of DAS should be understood through the intersection of institutional conditions, process-level value and stakeholder alignment. This socio-technical and process-dependent understanding of value is especially important in the studied contexts. In conclusion, the central finding is that institutional assessment should shift from asking whether a system can be implemented to asking whether it can be adopted, trusted and utilised in ways that realize sustainable value.

9.3 Future research

This study has developed an analytical way of framing DAS adoption through the combination of institutional conditions, process-level value realization and stakeholder alignment. At the same time, the established theories used in this study could not fully explain the studied phenomenon on their own. Future research should therefore not only validate these findings empirically but also examine how established frameworks could be combined or further developed. As illustrated in Chapter 6.5.3 and in Chapter 8.1, the use of frameworks such as TOE, IS Success, STS and IMP each provided insights into different parts of the adoption. However, even in combination there remain unexplored areas regarding institutional readiness, workflow-level value, stakeholder alignment and adoption maturity.

A first direction for future research is to validate if the analytical framework displayed in this study could be applied in various other contexts. Since this study is limited to Kenyan TE it cannot be determined whether the framework can be directly transferred to other countries, educational levels or other sectors. Future research should therefore assess if this combination of adoption feasibility, workflow value potential, value-loss risk and stakeholder alignment can be of relevance in other resource-constrained or organisationally heterogeneous environments. For instance, one could study if this relationship is specific

to Kenya or conduct comparative studies to include other East African countries or similar contexts in other parts of the world. This may be particularly relevant in contexts where TE systems are expanding while digital infrastructure and funding remain unevenly distributed.

An additional direction for future research is to develop improved ways of measuring and understanding information system success on a process level. While the IS Success literature analyses the system quality, information quality, service quality, use, user satisfaction and net benefits, the findings of this study show that value tends to be realized unevenly in the system. While a DAS can create value in one process, it can simultaneously create friction in another. Because of this, future research could develop process-level models of value realization and value loss. This could involve before-and-after studies of processing time, administrative workload, reporting quality, user or student satisfaction, fee management, transcript transparency or system usage frequency. Such research could help distinguish operational value from governance-related value and user-perceived value. Moreover, it may contribute to a process-level extension of the IS Success Model, which could potentially be applied to systems beyond the realm of DAS.

Future research could also evaluate how the TOE framework could be complemented with process-level and workflow-level logic. In the current state, TOE helps in understanding adoption based on technical, organisational and environmental conditions. However, the framework is less specific regarding which workflows should be digitalised first, how adoption feasibility shifts during implementation and how value loss occurs. Future research could therefore develop models that position TOE in relation to workflow complexity, stakeholder alignment and value potential. This could potentially shift the focus from institutional readiness to a more dynamic understanding of the adoption feasibility, one that captures changes during implementation, adoption and utilisation.

One of the key findings of this study was the suggestion of considering stakeholder alignment as a condition prior to implementation rather than a consideration during or post-implementation. An initial starting point could be complex and trust-sensitive workflows such as fee management or assessment and grading. These workflows often involve one actor that produces the input, one that owns the process and one or several stakeholders who depend on the output. Because of this, future research should examine how stakeholder roles, process ownership, responsibilities and output dependencies influence the adoption outcomes. As an effect, stakeholder alignment could potentially be assessed prior to implementation, rather than only managed once friction has already occurred.

Over time, future research could follow institutions over an extended period of time to further analyse the long-term dynamics of implementation, adoption and utilisation. This study showed that mature use does not eliminate friction and that digital maturity could be unevenly distributed across workflows. A longitudinal research study could assess how specific processes are stabilized, how workarounds appear or disappear and how stakeholder trust changes over time. This could clarify whether implementation, adoption and utilisation should be understood as different stages of maturity or as uneven and process-related developments.

Lastly, future research could examine public and private collaboration in educational digitalisation. Since external system providers may play an important role in supporting institutions with implementation, onboarding, training and maintenance, further research could explore how providers, public institutions and governance actors could coordinate DAS adoption. This could be significant in resource-limited contexts, where the digital demand is high, but adoption feasibility is limited due to financial, governance-related or infrastructural constraints. Moreover, the screening dimensions developed in this study regarding adoption feasibility, workflow value potential, value-loss risk, stakeholder alignment and strategic accessibility could be of relevance in these types of studies. These dimensions could potentially be converted into a more practical framework such as diagnostic templates or direct provider assessment tools.

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Appendix A: Interview Guide

This interview guide was used as a semi-structured guide during the fieldwork. Questions were adapted depending on respondent role, institutional context and adoption stage. This means that not all questions were asked in the same form or order for every interview. The guide reflects the main themes used to structure the interviews rather than a fixed questionnaire applied identically across all cases.

Intro:

We are master's students from Lund University studying administrative processes in tertiary education institutions. We are not evaluating individuals or representing any vendor. We are interested in understanding how administrative work is organized and how digital systems affect that work in practice.

Confirm consent for participation and recording.

Part 1: Case matrix

Ground data

- Case ID
- Institution name
- Location (county)
- Institution type (TVET / college / university)
- Size (approx. students)

Respondent

- ☐ Principal / Manager
- ☐ Admin / Registrar
- ☐ Teacher
- ☐ Student (18+)

Adoption stage

☐ Non-user

☐ In adoption

☐ Mature user

Processes, scope:

☐ Student registration

☐ Attendance tracking

☐ Assessment & grading

☐ Fee management

☐ Reporting & compliance

☐ Student records / transcripts

1. Administrative workload (Now)

Which administrative processes take the most time in your daily or weekly work?

Could you walk me through one of these processes step by step?

Follow-up questions:

Who is involved?

How many steps are there?

Where do approvals take place? - e.g. Stamps from superiors or where decisions are made

Where does it typically slow down? - e.g. Bottlenecks

2. Current time requirements and resource use

For the chosen process:

Approximately how many hours per week does this take?

(<2, 2–5, 5–10, 10+)

(How many staff members are involved?)

How often do errors or disputes occur?

(rarely, monthly, weekly, daily)

How long does reporting typically take (in days)?

3. Data quality and control (Now)

How is information stored?

Can you trace who has made changes to records?

How confident are you in the accuracy of the data?

(low, medium, high)

Where do errors usually originate?

Part 2: Change and system use

For users (in adoption / mature)

Processes in scope:

☐ Student registration

☐ Attendance tracking

☐ Assessment & grading admin

☐ Fee management

☐ Reporting & compliance

☐ Student records / transcripts

4. Change over time per process in scope (Where applicable)

Before the system was introduced, how was this process handled?

Compared to today, would you say it required more time, less time, or about the same?

If more or less – can you estimate roughly how much difference there is?

Core Metrics:

Process: Student registration	Before	After	Unit
Admin processing time			h/week
Manual data handling			low/medium/high
Reporting cycle time			Days
Error/Dispute Frequency			n / month
Data Traceability			low/medium/high
Process: Attendance tracking	Before	After	Unit
Admin processing time			h/week

Manual data handling			low/medium/high
Reporting cycle time			Days
Error/Dispute Frequency			n / month
Data Traceability			low/medium/high
Process: Assessment & grading	Before	After	Unit
Admin processing time			h/week
Manual data handling			low/medium/high
Reporting cycle time			Days
Error/Dispute Frequency			n / month
Data Traceability			low/medium/high
Process: Fee management	Before	After	Unit
Admin processing time			h/week
Manual data handling			low/medium/high
Reporting cycle time			Days
Error/Dispute Frequency			n / month

Data Traceability			low/medium/high
Process: Reporting & compliance	Before	After	Unit
Admin processing time			h/week
Manual data handling			low/medium/high
Reporting cycle time			Days
Error/Dispute Frequency			n / month
Data Traceability			low/medium/high
Process: Student records transcripts	Before	After	Unit
Admin processing time			h/week
Manual data handling			low/medium/high
Reporting cycle time			Days
Error/Dispute Frequency			n / month
Data Traceability			low/medium/high

5. Usage and implementation (Where applicable)

Which processes changed the most?

Which features are used daily?

Are there features that are rarely used?

What was most difficult during implementation?

What would you not want to go back to?

6. Alternative systems (Where applicable)

Are you familiar with other administrative systems or providers?

If yes: What would you say is the biggest difference between the systems?

(For manager), did you ever consider selecting another system?

Why did you select the current system or provider over alternatives?

How does the process in selecting a system work?

B. For non-users

How is the process currently handled without a digital system?

Which administrative process would benefit most from digitalisation?

What concerns exist regarding adoption?

What evidence would be required to justify adoption?

Who makes the decision?

What could block implementation?

Part 3: Role-specific questionnaire

Manager:

Which KPIs matter most?

What are the main reporting challenges?

Are there any budgetary constraints?

Are there any political or other constraints?

Decision making

How was the decision to adopt (or not adopt) the system made?

Who were the key decision-makers?

What were the main criteria?

Was cost the main factor, or functionality, or compliance?

If you were to recommend such a system to another institution, what would matter most?

Administrative staff:

Where do disputes most often occur?

Which processes are still manual?

Where do you double-check work?

Teacher:

How much time is spent on attendance or grading administration?

Are there recurring data-related issues?

What is the main challenge as a teacher with the digital implementation?

Administrative work?

Tutoring with online lectures?

Exams? (Cheating / Online assessments etc)

Closing questions

If you could improve one administrative process within the next year, which would it be and why?

Is there anything important about administrative work here that we haven't asked about? Or other related topics?