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# Questionnaire-based Approach on Theoretical Framework for Digital Transformation and Technology Ecosystem in Enterprise Data Storage Organizations: Facilitating the Adoption of Emerging Technologies

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**Abstract**

This research paper explores the pivotal role of digital transformation and technology ecosystems in the data storage industry, focusing on the adoption of emerging technologies. The study constructs a comprehensive theoretical framework through a questionnaire-based approach by integrating the Technology Acceptance Model (TAM) and extending it with the Stimulus Theoretical Framework. The primary aim is to identify critical factors influencing successful adoption, considering the current state of digital transformation and the dynamics of technology ecosystems within organizations.

The literature review explores influential theories like TAM, Diffusion of Innovations, Theory of Task Technology Fit, and the Unified Theory of Acceptance and Use of Technology, informing the research's framework with insights into consumer acceptance of new technologies.

Using a mixed-methods approach, the study incorporates qualitative insights from a multi-case study employing systematic thematic content analysis, categorizing user acceptance of 5G, Artificial Intelligence, Cloud Computing, and Edge in major storage entities: Dell Technologies, IBM, HPE, Hitachi Vantara, and NetApp.

For the quantitative aspect, a structured questionnaire based on the Technology Acceptance Model (TAM) and the Stimulus Theoretical Framework was used to gather insights on digital transformation, technology ecosystems, perceived usefulness, ease of use, and intention to use from senior and mid-level employees in storage organizations. A pilot study with 45 responses was conducted, utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS 4. The Confirmatory Factor Analysis, employing the same software and sample size, evaluated the loading of items onto their respective constructs. The five key constructs include digital transformation, technology ecosystem, Perceived Usefulness (PU), Perceived Ease of Use (PEU), Intention to Use (IU), and technology adoption outcome. Our findings shed light on the intricate dynamics within these constructs and highlight the importance of early detection and rectification of questionnaire deficiencies.

The results and discussion section emphasizes the impact of digital transformation and technology ecosystems, with perceived usefulness and ease of use as key motivators influencing employees' responses and intention to adopt. The study systematically analyzes expected technology adoption outcomes, contributing to a deeper understanding of successful technology integration in the enterprise storage sector.

***Keywords**: Digital Transformation, TAM, Pilot Study, Partial Least Squares Structural Equation, Confirmatory Factor Analysis, Reliability, Validity*

Digital transformation is a crucial aspect for organizations operating in the data storage industry. It enables these organizations to stay competitive, adapt to market changes, and meet the evolving needs of their customers(Verhoef et al., 2021). We have designed a questionnaire to understand better the digital transformation process and its impact on data storage enterprises. This research paper employs a questionnaire-based approach to develop a comprehensive theoretical framework focusing on digital transformation and technology ecosystems within enterprise data storage organizations. The primary objective is to identify key factors influencing the successful adoption of emerging technologies in this context.

To achieve our research objectives, we will be using a structured questionnaire that covers various dimensions related to digital transformation(Nambisan et al., 2017) and the technology ecosystem(Adomavičius et al., 2008). The questionnaire will consist of questions related to the following topics:

1. Current state of digital transformation in data storage enterprises: This section aims to gather information about the current state of digital transformation in data storage enterprises(Chakraborty & Nandi, 2022). It will explore the level of digital maturity, the extent of technology adoption, and the use of emerging technologies in these organizations.

2. Approaches utilized, and results achieved for Technology Adoption: This section aims to identify the strategies employed by the enterprise storage organizations for different technology adoption initiatives. It will assess the effectiveness of these approaches and gather data on the outcomes achieved in terms of technology adoption and implementation success.

The questionnaire will also assess the stance of leading enterprise storage firms that have already undergone or are in the process of digital transformation, capturing their insights on the challenges and advantages linked with the process. The gathered data will undergo analysis to construct a theoretical framework delineating the primary factors influencing successful technology adoption in enterprise data storage organizations.

## Literature Review

Theoretical frameworks play a crucial role in understanding and analyzing complex phenomena such as digital transformation and technology ecosystems. These frameworks provide a structured and conceptual understanding of the relationships between different elements and variables involved. They help researchers organize their thoughts, guide data collection, and interpret the findings(Veldhoven & Vanthienen, 2021). The choice of a theoretical framework will shape the methodology used and ensure that the conclusions are compatible with the organization's goals and culture by choosing the appropriate theoretical framework, researchers can ensure that their research methods align with the goals and culture of the organization being studied(Dash et al., 2023). To understand employees' acceptance of new technologies and their intention to use, it is essential to study the theories proposed in the field of technology adoption and usage. One of the most prominent theories in this area is the Technology Acceptance Model, developed by Davis in 1989. This model suggests that users' intention to use a technology is influenced by their perceived usefulness and perceived ease of use. Another relevant theory is the Diffusion of Innovations theory(Rogers, 1962), which explains how new technologies spread and are adopted within a social system. Several theories related to the adoption of technologies and their intention to use have emerged such as the Theory of Task Technology Fit (TTF)(Goodhue & Thompson, 1995), the Theory of Reasoned Action(Fishbein & Ajzen, 1975), the Theory of Planned Behavior(Ajzen, 1991), Technology Acceptance Models (TAM, TAM2, and TAM3)(Davis, 1989;Venkatesh & Davis, 2000; Venkatesh & Bala, 2008), and the Unified Theory of Acceptance and Use of Technology Theory (UTAUT)(Venkatesh et al., 2003). Studying these theories will provide valuable insights into the factors that drive employees' acceptance of new technologies and their intention to use them. It will also help in developing a comprehensive theoretical framework that can guide the research in understanding the adoption of emerging technologies in the context of data storage enterprises. In the context of this research on digital transformation and technology ecosystems in enterprise data storage organizations, the theoretical framework will be centered around the Technology Acceptance Model.

One theoretical framework that can be applied to understand the impact of digital transformation and technology ecosystem in enterprise data storage organizations during the adoption of emerging technologies is the Stimulus Theoretical Framework(Lai, 2016) based on the Technology Acceptance Model (TAM). The TAM framework, initially developed by Davis in the 1980s, focuses on explaining the factors that influence individuals' acceptance and usage of information technology. It suggests that an individual's intention to use a technology is primarily influenced by two key factors: perceived usefulness and perceived ease of use(Yang et al., 2014). The Stimulus Theoretical Framework for novelty technology posits that the stimulus embodies the strategieswiththe infrastructure, while the perceived ease of use and perceived usefulness act as motivating factors, representing the organism(Lai, 2017). Our research seeks to enhance the Stimulus Theoretical Framework by incorporating digital transformation and the technology ecosystem as influential factors in utilizing the mediator (refer Fig. 1). We will examine the direct and indirect relationships between these factors and organizations' intentions to adopt emerging technologies, limited to 5G, artificial intelligence, cloud computing, and edge computing. The use of the Stimulus Theoretical Framework based on the Technology Acceptance Model in understanding the impact of digital transformation and technology ecosystem in enterprise data storage organizations can provide valuable insights into the adoption of emerging technologies.

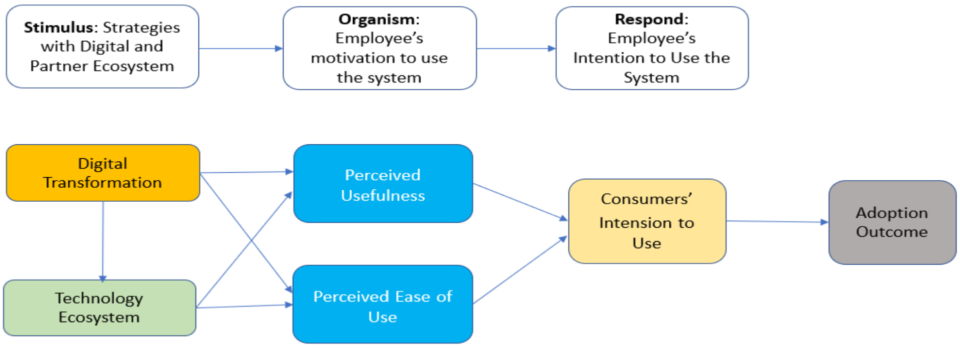


Fig. 1.Stimulus Theoretical Framework for Digital Transformation and Technology Ecosystem Stimulus

## Methodology

In conducting a comprehensive study, the integration of both qualitative and quantitative research methods is crucial for obtaining a well-rounded understanding of the research topic. Qualitative methods provide in-depth insights into the nuances, perceptions, and experiences of participants, allowing for a rich exploration of the context (Creswell & Creswell, 2018). On the other hand, quantitative methods, involving statistical analyses and surveys, offer the ability to quantify data and identify patterns or trends across a larger sample, enhancing generalizability(Trochim, 2002). As Creswell & Creswell (2018)argued, combining these approaches can lead to a more robust and nuanced interpretation of research findings, as each method compensates for the limitations of the other, ensuring a more comprehensive and rigorous exploration of the research question. Therefore, for this study, we will employ a mixed methods research approach to gather both qualitative and quantitative methods to comprehensively understand and assess the effectiveness of techno-strategic decisions influencing the adoption rate of emerging technologies. The objective is to analyze and establish correlations between these emerging technologies and their utilization by major enterprise storage organizations. This investigation aims to shed light on how these organizations stay relevant and achieve growth in the competitive market, striving for sustained leadership.

### Qualitative Method

In order to capture an accurate depiction of the phenomenon and explore questions related to "how" or "why" along with potential causal associations, this study adopts an exploratory multi-case study methodology as suggested by Yin (2018). The data collection approach involves analyzing textual and narrative sources, following the methodology outlined by Carter and Hendeson (2005). This analysis will involve identifying recurring themes, patterns, and insights within the data to gain a deeper understanding of the factors influencing the adoption of emerging technologies in enterprise data storage organizations.

### Research Design

The study involved a thorough examination and categorization of a total of 170 sources, including published articles, reports, blogs, news, press releases, etc., spanning the years 2018 to 2023. Out of this pool, 99 sources were specifically selected for analysis, focusing on four key emerging technology areas: 5G, artificial intelligence, cloud computing, and edge computing. The study specifically delved into the application of these technologies by five major enterprise storage organizations, namely Dell Technologies, IBM, HPE, Hitachi Vantara, and NetApp.
A thematic content analysis is performed by using secondary data to comprehend the paradigm in terms of initiatives and strategies employed by the major data storage organizations toward their journey to digital transformation.

### Quantitative Method

In the current study, we will utilize a questionnaire-based design coupled with quantitative analysis to thoroughly investigate the variables within the adoption model. This approach allows for a systematic and structured inquiry, enabling us to gather numerical data and employ statistical techniques to discern patterns and relationships among the identified variables(Creswell & Creswell, 2018). The integration of questionnaire design and quantitative analysis enhances the precision and rigor of our research, providing a comprehensive understanding of the factors influencing the adoption model under scrutiny.

**Research Design**

This study centered around gathering perspectives and opinions regarding the role of digital transformation and the technology ecosystem implemented by five prominent enterprise data storage organizations namely Dell Technologies, IBM, HPE, Hitachi Vantara, and NetApp. The insights were sought from both senior and mid-level employees within these organizations. Therefore, a questionnaire has been devised as a research instrument for data collection. The design and development of the questionnaire draw upon the foundational principles of the Technology Acceptance Model (TAM) and the Stimulus Theoretical Framework. The survey is structured into five sections. The initial part is dedicated to gathering respondent information, followed by the second section containing questionnaires related to digital transformation and the technology ecosystem. Subsequent sections address Perceived Usefulness (PU), Perceived Ease of Use (PEU), and Intention to Use (IU), while the final part involves a questionnaire concerning the outcome of adopting emerging technologies. The Likert scale, ranging from 1 to 7, was employed as a measurement tool, allowing respondents to provide their responses based on the posed questions.

## Results and Discussion

The Confirmatory Factor Analysis conducted in our data analysis employs SmartPLS 4 software, utilizing a sample size of 45 in a pilot study to assess the loading of each item (variable) onto its corresponding constructs. Our study comprises five constructs: digital transformation, technology ecosystem, Perceived Usefulness (PU), Perceived Ease of Use (PEU), Intention to Use (IU), and technology adoption outcome. These constructs are measured through various items: DT1, DT2, DT3, DT4, DT5, DT6, TE1, TE2, TE3, TE4, TE5, TE6, TE7, PU1, PU2, PU3, PU4, PU5, PU6, PEU1, PEU2, PEU3, PEU4, PEU5, PEU6, IU1, IU2, IU3, IU4, IU5, AO1, AO2, AO3, AO4, AO5, AO6, and AO7.This study aims to formulate and structure various categories for examining user acceptance of emerging technologies, including 5G, Artificial Intelligence, Cloud Computing, and Edge. The focus will be on prominent enterprise storage organizations, namely Dell Technologies, IBM, HPE, Hitachi Vantara, and NetApp.

**Digital Transformation and Technology Ecosystem**

Serving as the stimulus, digital transformation and technology ecosystems (digital and partner ecosystem) manifest as strategies and initiatives compelling enterprise storage organizations to introduce and deploy new products, offerings, or platforms through the adoption of emerging technologies.

**Perceived Usefulness**

The concept of perceived usefulness reflects an individual's assessment of the extent to which employing a specific technology would be advantageous. It serves as a key motivating factor driving individuals to use a specific technology, ultimately influencing employees' responses toward utilizing the technology.

**Perceived Ease of Use**

Perceived ease of use refers to the extent to which an individual believes that using a specific technology requires minimal effort. This aspect serves as a motivating factor, reflecting the convenience experienced by employees when utilizing the technology.

**Intention to Use**

Intention to use pertains to the employees' conscious willingness or inclination to adopt a specific technology, indicating that they have formulated deliberate plans to utilize it.

**Technology Adoption Outcome**

It involves a systematic analysis of the expected impact of a specific technology, ultimately contributing to its successful adoption.

Table 1. Digital Transformation and Technology Ecosystem Items

| **Construct** | **Measured Items** |
|---|---|
| Digital Transformation (DT) and Technology Ecosystem (TE) | DT1: The digital transformation initiatives in our organization effectively enhance data storage, management, and processing capabilities. |

| | |
|---|---|
| | DT2: Adopting emerging technologies (e.g., 5G, AI, Cloud, Edge) by our organization contributes significantly to our digital transformation efforts.<br>DT3: Our digital transformation initiatives have led to tangible improvements in efficiency and productivity within the organization.<br>DT4: We use standardized data formats and protocols effectively for data exchange within the ecosystem.<br>DT5: Our organization demonstrates agility in responding to changes in technology and market trends.<br>DT6: Our organization invests in developing its employees' digital skills and capabilities.<br>TE1: The technology ecosystem in our organization effectively supports data storage, management, and processing needs.<br>TE2: We have integrated modern technology platforms such as cloud computing and virtualization intoour infrastructure.<br>TE3: Partner onboarding processes are efficient and effective in our technology ecosystem.<br>TE4: We collaborate frequently with external partners within our technology ecosystem, enhancing our data storage capabilities.<br>TE5: Our systems integrate seamlessly with those of our partners and within our technology ecosystem.<br>TE6: Our technology ecosystem can effectively scale with increasing data storage demands and changing partner network size.<br>TE7: I am confident in the security measures in place to protect data within our technology. |

Table 2. Perceived Usefulness Items

| **Construct** | **Measured Items** |
|---|---|
| Perceived Usefulness (PU) | PU1: I believe that digital transformation initiatives in implementing digital transformation initiatives in 5G, Artificial Intelligence, Cloud Computing, and Edge technologies would significantly improve our organization's data storage and management operations processes.<br>PU2: I believe that establishing a robust technology ecosystem, encompassing both digital and partner ecosystems, in the realms of 5G, Artificial Intelligence, Cloud Computing, and Edge technologies, would conveniently enable the seamless integration and implementation of emerging technologies.<br>PU3: I believe that the integration of 5G, Artificial Intelligence, Cloud Computing, and Edge technologies would significantly improve scalability and flexibility within our data storage solutions.<br>PU4:I believe that leveraging 5G, Artificial Intelligence, Cloud Computing, and Edge technologies would prove highly effective in optimizing decision-making processes.<br>PU5: I believe that the integration of 5G, Artificial Intelligence, Cloud Computing, and Edge technologies would be instrumental in enhancing data processing speed and mitigating latency issues.<br>PU6: I believe that integrating 5G, Artificial Intelligence, Cloud Computing, and Edge technologies would be useful in enhancing data transmission speeds. |

Table 3. Perceived Ease of Use Items

| Construct | Measured Items |
|---|---|
| Perceived Ease of Use (PEU) | PEU1: I believe that Digital Transformation initiatives make the adoption and utilization of new technologies, such as 5G, Artificial Intelligence, Cloud Computing, and Edge technologies, easy to use and adapt.<br>PEU2: I believe that an easy-to-use Technology Ecosystem significantly simplifies the implementation and integration of emerging technologies, including 5G, Artificial Intelligence, Cloud Computing, and Edge technologies.<br>PEU3: I believe 5G, Artificial Intelligence, Cloud Computing, and Edge technologies are easy to use with user-friendly interfaces and intuitive features.<br>PEU4: I believe that 5G, Artificial Intelligence, Cloud Computing, and Edge technologies offer easy-to-use solutions for streamlining decision-making processes.<br>PEU5: I believe the integration of 5G, Artificial Intelligence, Cloud Computing, and Edge technologies offers easy-to-use upgrades, simplifying existing data processing methods<br>PEU6:I believe incorporating 5G, Artificial Intelligence, Cloud Computing, and Edge technologies provides an easy-to-use upgrade to existing data transmission systems. |

Table 4. Intention to Use Items

| Construct | Measured Items |
|---|---|
| Intention to Use (IU) | IU1: I intend to participate in digital transformation initiatives on 5G, Artificial Intelligence, Cloud Computing, and Edge technologies within our organization to improve data storage operations in the future.<br>IU2: I intend to use solutions based on 5G, Artificial Intelligence, Cloud Computing, and Edge computing within our organization in the future.<br>IU3: I intend to use 5G, Artificial Intelligence, Cloud Computing, and Edge computing solutions to optimize decision-making processes within our organizations in the future.<br>IU4: I intend to leverage 5G, Artificial Intelligence, Cloud Computing, and Edge computing solutions within our organization for improved data processing speed and reduced latency in the future.<br>IU5: I intend to leverage 5G, Artificial Intelligence, Cloud Computing, and Edge computing solutions to enhance data transmission speeds within our organization in the future. |

Table 5. Technology Adoption Outcome Items

| Construct | Measured Items |
|---|---|
| Adoption Outcome (AO) | AO1: The organization has gained a competitive advantage post-introduction of digital transformation and building a robust ecosystem.<br>AO2: The introduction of digital transformation and building a robust ecosystem has enhanced productivity within the organization.<br>AO3: The new ecosystem built through digital transformation is scalable.<br>AO4: Digital transformation has played a role in diversifying our product or service offerings.<br>AO5: The adoption of new technologies through digital transformation has significantly reduced the time to market our products and services.<br>AO6: The integration of our technology ecosystem yields tangible benefits, including a boost in revenue. |

AO7: The return on investment (ROI) from our technology and partner ecosystem integration efforts is satisfactory

**Measurement Model**

The study gauges the quality of constructs by scrutinizing the measurement model. The evaluation of the factor loadings marks the commencement of assessing the quality criteria, succeeded by the establishment of construct reliability and validity.

**Factor Loadings**

The evaluation of the measurement model, presented in Table 6, aimed to establish the reliability and validity of the constructs. Initially, most of the items in the model demonstrated factor loadings exceeding the minimum acceptable value of 0.50(Hairet al., 2010). While a factor loading of over 0.7 is considered ideal (Vinzi, et al., 2010), social science studies often yield weaker outer loadings (<0.70). In such cases, rather than automatically discarding indicators, researchers should explore the effects of item removal on composite reliability, content, and convergent validity. Typically, items with outer loadings ranging from 0.40 to 0.70 are considered for removal only if their elimination leads to an improvement in composite reliability or average variance extracted (AVE) beyond the recommended thresholds (Hair et al., 2021). Consequently, TE7 and PU6, with loading values of 0.389 and 0.401, respectively, were excluded to enhance AVE. In the current study, even though the factor loading for the items DT2, PU4, PU5, and TE1 were 0.608, 0.673, 0.597, and 0.581 respectively, their removal would not have significantly increased the composite reliability and AVE, as the values for the construct were already above the recommended threshold.

**Reliability and Validity**

In Table 6,reliability, evaluated through Cronbach's alpha, rho_a, and composite reliability, yielded statistics exceeding the recommended threshold of 0.700 (Wasko & Faraj, 2005). The rho_a value, falling between Cronbach's alpha and composite reliability (Hair et al., 2021), also surpassed 0.70, indicating good reliability (Henseler et al., 2016). Convergent validity was deemed satisfactory, with the Average Variance Extracted (AVE) surpassing 0.500.

Table 6. Reliability Analysis

| **Constructs** | **Items** | **Loadings** | **Cronbach's alpha** | **Composite reliability (rho_a)** | **Composite reliability (rho_c)** | **Average variance extracted (AVE)** |
|---|---|---|---|---|---|---|
| Digital Transformation | DT1 | 0.886 | 0.887 | 0.905 | 0.915 | 0.647 |
| | DT2 | 0.608 | | | | |
| | DT3 | 0.702 | | | | |
| | DT4 | 0.870 | | | | |
| | DT5 | 0.885 | | | | |
| | DT6 | 0.832 | | | | |
| Technology Ecosystem | TE1 | 0.581 | 0.902 | 0.924 | 0.926 | 0.680 |
| | TE2 | 0.828 | | | | |
| | TE3 | 0.869 | | | | |
| | TE4 | 0.807 | | | | |
| | TE5 | 0.927 | | | | |
| | TE6 | 0.891 | | | | |
| Perceived Usefulness | PU1 | 0.867 | 0.799 | 0.838 | 0.860 | 0.556 |
| | PU2 | 0.829 | | | | |
| | PU3 | 0.728 | | | | |
| | PU4 | 0.673 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | PU5 | 0.597 | | | | |
| Perceived Ease of Use | PEU1 | 0.837 | 0.894 | 0.901 | 0.919 | 0.655 |
| | PEU2 | 0.770 | | | | |
| | PEU3 | 0.806 | | | | |
| | PEU4 | 0.834 | | | | |
| | PEU5 | 0.867 | | | | |
| | PEU6 | 0.735 | | | | |
| Intention to Use | IU1 | 0.775 | 0.859 | 0.906 | 0.896 | 0.635 |
| | IU2 | 0.798 | | | | |
| | IU3 | 0.711 | | | | |
| | IU4 | 0.916 | | | | |
| | IU5 | 0.771 | | | | |
| Adoption Outcome | AO1 | 0.880 | 0.940 | 0.952 | 0.951 | 0.735 |
| | AO2 | 0.925 | | | | |
| | AO3 | 0.806 | | | | |
| | AO4 | 0.761 | | | | |
| | AO5 | 0.845 | | | | |
| | AO6 | 0.902 | | | | |
| | AO7 | 0.872 | | | | |

In Table 7, all constructs demonstrate Composite Reliability (CR) values exceeding 0.70, while their Average Variance Extracted (AVE) values surpass 0.500. Discriminant validity was assessed by comparing the correlations among the latent variables with the square root of AVE (Fornell & Larcker,1981) for each construct in the relevant rows and columns. Minor discrepancies were identified for the constructs of Digital Transformation, Technology Ecosystem, Perceived Usefulness, Perceived Ease of Use, and Adoption Outcome. Nevertheless, these differences are negligible, with values of 0.048, 0.001, 0.013, 0.050, and 0.002, respectively, and can be considered insignificant (Rahim & Magner, 1995). In summary, the measurement model demonstrates acceptable discriminant validity, supporting distinctions between the constructs.

Table 7. Discriminant Validity: Fornell and Larcker Criterion

| **Constructs** | **DT** | **TE** | **PU** | **PEU** | **IU** | **AO** |
|---|---|---|---|---|---|---|
| Digital Transformation | **0.804** | | | | | |
| Technology Ecosystem | 0.790 | **0.825** | | | | |
| Perceived Usefulness | 0.759 | 0.682 | **0.746** | | | |
| Perceived Ease of Use | 0.765 | 0.772 | 0.590 | **0.809** | | |
| Intention to Use | 0.573 | 0.651 | 0.628 | 0.627 | **0.797** | |
| Adoption Outcome | 0.852 | 0.826 | 0.660 | 0.859 | 0.688 | **0.857** |

Referring to Table 8, highlighted values (in bold) indicate potential issues with discriminant validity, as revealed by the heterotrait–monotrait ratio of correlations (Henseler et al., 2014). These findings suggest collinearity problems among latent constructs, particularly evident in the Digital Transformation-Adoption Outcome and Perceived Ease of Use-Adoption Outcome pairs. This implies potential redundancy in item measurement, likely stemming from respondents' misinterpretation of questions necessitating revisiting and reframing the questions to mitigate overlap. Moreover, broader sample sizes may provide a more accurate representation of results.

Table 8. Discriminant Validity: Heterotrait Monotrait (HTMT) Criterion

| **Constructs** | **DT** | **TE** | **PU** | **PEU** | **IU** | **AO** |
|---|---|---|---|---|---|---|
| Digital Transformation | | | | | | |
| Technology Ecosystem | 0.864 | | | | | |
| Perceived Usefulness | 0.842 | 0.764 | | | | |
| Perceived Ease of Use | 0.840 | 0.848 | 0.672 | | | |
| Intention to Use | 0.626 | 0.701 | 0.758 | 0.645 | | |
| Adoption Outcome | **0.931** | 0.893 | 0.704 | **0.924** | 0.704 | |

Cross loadings serve to evaluate whether an item, associated with a specific construct, exhibits a robust loading on its intended construct rather than on other constructs in the study. As depicted in Table 9, the factor loadings for all items demonstrate a stronger association with the underlying construct to which they belong, as opposed to other constructs in the study (Wasko & Faraj, 2005). Consequently, the assessment of cross loadings supports the conclusion that discriminant validity has been achieved.

Table 9. Discriminant Validity: Crossloadings Criterion

| | **DT** | **TE** | **PU** | **PEU** | **IU** | **AO** |
|---|---|---|---|---|---|---|
| DT1 | 0.886 | 0.765 | 0.641 | 0.595 | 0.457 | 0.721 |
| DT2 | 0.608 | 0.468 | 0.616 | 0.384 | 0.503 | 0.512 |
| DT3 | 0.702 | 0.508 | 0.481 | 0.477 | 0.491 | 0.615 |
| DT4 | 0.870 | 0.726 | 0.708 | 0.745 | 0.490 | 0.709 |
| DT5 | 0.885 | 0.651 | 0.625 | 0.778 | 0.431 | 0.800 |
| DT6 | 0.832 | 0.644 | 0.580 | 0.632 | 0.436 | 0.724 |
| TE1 | 0.438 | 0.581 | 0.268 | 0.444 | 0.439 | 0.444 |
| TE2 | 0.830 | 0.828 | 0.691 | 0.645 | 0.373 | 0.737 |
| TE3 | 0.601 | 0.869 | 0.507 | 0.624 | 0.551 | 0.661 |
| TE4 | 0.527 | 0.807 | 0.602 | 0.556 | 0.578 | 0.640 |
| TE5 | 0.688 | 0.927 | 0.586 | 0.772 | 0.722 | 0.818 |
| TE6 | 0.737 | 0.891 | 0.623 | 0.719 | 0.571 | 0.719 |
| PU1 | 0.831 | 0.622 | 0.867 | 0.544 | 0.563 | 0.717 |
| PU2 | 0.747 | 0.607 | 0.829 | 0.536 | 0.345 | 0.637 |
| PU3 | 0.516 | 0.592 | 0.728 | 0.381 | 0.358 | 0.375 |
| PU4 | 0.338 | 0.364 | 0.673 | 0.387 | 0.628 | 0.363 |
| PU5 | 0.199 | 0.279 | 0.597 | 0.292 | 0.476 | 0.206 |
| PEU1 | 0.815 | 0.665 | 0.525 | 0.837 | 0.438 | 0.787 |
| PEU2 | 0.744 | 0.626 | 0.611 | 0.770 | 0.425 | 0.710 |
| PEU3 | 0.474 | 0.549 | 0.267 | 0.806 | 0.441 | 0.578 |
| PEU4 | 0.580 | 0.637 | 0.490 | 0.834 | 0.663 | 0.777 |
| PEU5 | 0.550 | 0.683 | 0.496 | 0.867 | 0.629 | 0.725 |
| PEU6 | 0.520 | 0.568 | 0.440 | 0.735 | 0.414 | 0.548 |
| IU1 | 0.426 | 0.382 | 0.426 | 0.384 | 0.775 | 0.532 |
| IU2 | 0.231 | 0.408 | 0.414 | 0.284 | 0.798 | 0.375 |
| IU3 | 0.311 | 0.320 | 0.509 | 0.277 | 0.711 | 0.336 |
| IU4 | 0.642 | 0.738 | 0.592 | 0.742 | 0.916 | 0.765 |
| IU5 | 0.517 | 0.588 | 0.528 | 0.605 | 0.771 | 0.573 |
| AO1 | 0.772 | 0.744 | 0.555 | 0.825 | 0.586 | 0.880 |
| AO2 | 0.883 | 0.718 | 0.684 | 0.767 | 0.624 | 0.925 |

| | | | | | | |
|---|---|---|---|---|---|---|
| AO3 | 0.685 | 0.681 | 0.549 | 0.691 | 0.499 | 0.806 |
| AO4 | 0.645 | 0.722 | 0.447 | 0.620 | 0.353 | 0.761 |
| AO5 | 0.670 | 0.522 | 0.605 | 0.631 | 0.661 | 0.845 |
| AO6 | 0.703 | 0.697 | 0.462 | 0.768 | 0.600 | 0.902 |
| AO7 | 0.743 | 0.898 | 0.615 | 0.827 | 0.697 | 0.872 |

**Conclusion**

This research endeavors to contribute valuable insights into the adoption of emerging technologies within enterprise data storage organizations by employing a comprehensive approach that integrates both qualitative and quantitative methodologies. The study aims to enhance our understanding of the factors that influence successful technology adoption, utilizing established theoretical frameworks.

While the measurement model evaluation confirmed the satisfactory reliability of the findings, it is crucial to acknowledge the need for revisions and re-evaluation of the questionnaire used in the survey for the pilot study. The questionnaire demonstrated issues in establishing discriminant validity, particularly when assessed against Fornell and Larcker's criterion and the cross-loadings. To address this, the study advocates for the adoption of the Heterotrait-monotrait (HTMT) criterion, which offers greater sensitivity and specificity in detecting discriminant validity problems. The use of HTMT criterion is essential to ensure that the interpretation of causal effects in the modeling analysis is accurate and not misleading.

In conclusion, the incorporation of the HTMT criterion is recommended for a more nuanced assessment of discriminant validity issues in the questionnaire. This refined framework is poised to provide valuable insights and guidelines for organizations in the data storage industry, assisting them in navigating the digital transformation journey and effectively adopting emerging technologies. The findings not only contribute to strategic decision-making within organizations but also offer a foundation for future studies to build upon. As the technological landscape continues to evolve, the information gleaned from this research will inform strategies for organizations to stay relevant and competitive in a rapidly changing environment. Future studies should further validate these insights by expanding the sample size, ensuring a more robust empirical foundation for this approach.

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