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Digital Fluency and Its Role in Achieving Competitive Advantage: An Exploratory Study of the Opinions of a Sample of Managers at North Oil Company in Kirkuk

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Abstract

Digital fluency is among the recent managerial developments and has been described as a new approach whose primary objective is to comprehend and keep pace with developments in business strategies. Its influential role in managing the dynamics of digital transformation and achieving competitive advantage has quickly intensified. The main objectives of digital fluency are considered long-term goals and are determined by the top managerial levels. These objectives should focus on achieving alignment with environmental changes, starting from the adoption of digital technologies, progressing through the cultivation of digital thinking, and ultimately reaching digital creativity.

Based on the above, the current research aims to clarify the role of digital fluency in achieving competitive advantage. To achieve the research objectives, a questionnaire was designed in line with the study's goals and distributed within the organization under investigation North Oil Company in Kirkuk targeting a selected sample of managers at the unit manager level and above. A total of 55 questionnaires were distributed, with 47 returned and valid for analysis, yielding a response rate of 85%. The field data were analyzed using correlation coefficients and linear regression models, which facilitated reaching a set of results. Based on these results, a series of conclusions were drawn, the most notable of which is the generalizable importance of digital fluency, given its significant correlation and impact across its various dimensions in achieving competitive advantage.

In light of these conclusions, the study provided several recommendations, the most important being the emphasis on the necessity for the investigated organization to focus on leveraging its digital fluency to adopt and integrate strategic thinking as a priority in dealing with the competitive environment. Digital fluency should become an integral part of managerial practices, and efforts should be made to raise awareness and train employees to make technological fluency, digital thinking, and digital creativity key pillars in achieving competitive advantage.

Keywords: *Digital Fluency; Competitive Advantage.*

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1. Introduction

Digitalization and its tools have gained significant importance in contemporary organizations due to their active and substantial role in providing a foundation for effectively managing competition and achieving superiority. Digital technologies within an organization are considered a critical resource that cannot be overlooked. Today's organizations are built upon digital technologies and their tools, and for this digitalization to have a strategic impact, it requires management that actively oversees and directs it correctly to achieve organizational objectives.

However, the reality indicates that attention to digital aspects has not fully revealed the true role of digital fluency in achieving competitive advantage. Existing studies have provided only partial or fragmented insights, often focusing on classifications of digital tools and digital transformation in general, with incomplete details and features.

Based on this, the research aims to study digital fluency and its dimensions in Iraqi industrial organizations to develop an appropriate approach related to the application of digital fluency by the management of the investigated organization, representing a framework for leveraging this approach to achieve competitive advantage.

To comprehensively determine the role of strategic digital fluency in achieving competitive advantage from both theoretical and practical perspectives, the study addresses the topic through four main axes: The first axis presents the general framework and methodology of the research. The second axis summarizes the theoretical background based on available sources and references. The third axis focuses on the field study following the methodology of the research. Finally, the fourth axis presents the research conclusions and recommendations.

2. Chapter One: General Framework of the Research and Its Methodology

2.1 Research Problem

The issue of protecting organizations from the negative impacts of competition has become one of the most prominent concerns for management, particularly in industrial organizations. This is due to the rapid depletion of many natural resources within competitive environments and the widespread phenomenon of the decline and withdrawal of many governmental organizations from their industrial sectors, resulting in negative consequences for economic and social development alike.

This situation, faced by the Iraqi environment in general and the industrial sector in particular, necessitates identifying the best approaches to positively engage with digital developments. Consequently, it is not surprising that digital fluency has emerged as a key approach of interest to international organizations, governments, and business entities alike, aimed at sustaining organizational growth, continuity, and ultimately achieving competitive advantage.

The research problem can be summarized by the main question: *What is the role of digital fluency in achieving competitive advantage in the investigated organization?* Based on this, addressing the following sub-questions can help clarify the dimensions and content of the research problem:

1. What is the relationship between digital fluency and achieving competitive advantage in the investigated organization?
2. What is the effect of digital fluency on achieving competitive advantage in the investigated organization?
3. Do the relative importance and impact of the dimensions of digital fluency vary in achieving competitive advantage in the investigated organization?

2.2 Research Significance

The significance of this study is evident through its focus on digital fluency as a modern cognitive approach in the field of industrial organizational practices, particularly in leveraging competitive advantage. This significance is manifested in two dimensions:

- **Academic Significance:** The theoretical framework of the research discusses the conceptual underpinnings of digital fluency and its dimensions, in addition to exploring the concepts of competitive advantage. This linkage represents a modest but valuable scientific contribution, particularly within the industrial sector of the investigated organization.
- **Practical Significance:** The study evaluates and diagnoses the relationship between the research variables within the environment of the investigated organization, specifically concerning digital fluency and competitive advantage, by examining the role of digital fluency dimensions in achieving competitive advantage.

2.3 Research Objectives

Based on the research problem and its significance, the study aims to achieve the following objectives:

1. Describe and diagnose the research variables, with digital fluency as the independent variable and competitive advantage as the dependent variable.
2. Examine the nature of the relationship between digital fluency and achieving competitive advantage.
3. Assess the impact of digital fluency on achieving competitive advantage.
4. Provide recommendations that may guide the investigated organization and related organizations in prioritizing the most important aspects of leveraging their digital knowledge assets to achieve competitive advantage more effectively.

2.4 Research Model

To fulfill the methodological requirements for addressing the research problem and questions, and in light of the theoretical framework, a hypothetical model was adopted to reflect the main research variables. This model assumes potential relationships between digital fluency and achieving competitive advantage in the investigated organization. In accordance with the research hypotheses and requirements for testing them, the adopted model (Figure 1) includes two main variables: the first variable represents the dimensions of digital fluency as the independent (“explanatory”) variable, while the second variable represents competitive advantage as the dependent (“responsive”) variable.

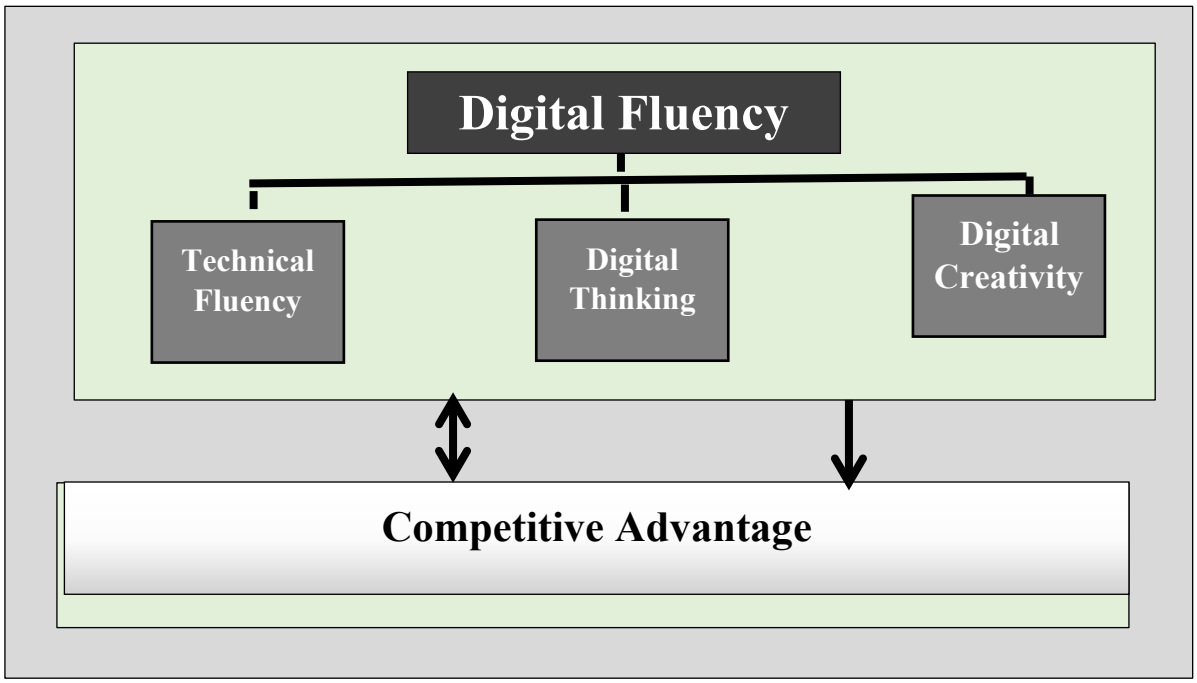

Figure (1)
Hypothetical Research Model

Source: Prepared by the researchers

2.5 Research Hypotheses

To achieve its objectives and test its model, the study relied on a main hypothesis stating: *(There is a role for digital fluency in achieving competitive advantage in the investigated organization).*

To clarify the dimensions of this role, the following sub-hypotheses were derived:

1. There is a statistically significant correlation between digital fluency and achieving competitive advantage in the investigated organization.
2. Digital fluency has a statistically significant impact on achieving competitive advantage in the investigated organization.
3. The relative importance of the impact of digital fluency dimensions varies in achieving competitive advantage in the investigated organization.

2.6 Study Boundaries

- **Temporal Boundaries:** The theoretical framework of the study was prepared in 2025, while the field study began on 10/6/2025. The questionnaire was distributed on 27/6/2025 and collected until 14/7/2025.
- **Spatial Boundaries:** The study was conducted at North Gas Company in Kirkuk, under the Iraqi Ministry of Oil.
- **Human Boundaries:** Managers at the unit manager level and above were selected as the study sample, assuming that this target group possesses sufficient knowledge of the study variables and their dimensions.

2.7 Description of the Study Sample

Given the importance of the research variables, their content, and dimensions, the managers holding administrative positions in the investigated company were selected as the study population. This selection was based on the logical assumption that holders of these positions are capable of understanding the administrative concepts and terms addressed in the current study. The study sample included the following administrative levels:

- Senior management and their advisors at the headquarters in Arfa/Kirkuk.
- Middle management at the administrative level.
- Sub-unit managers.

A total of 55 questionnaires were distributed, of which 52 were returned. After reviewing and verifying the returned questionnaires, 5 were found incomplete and excluded. Therefore, the actual number of questionnaires used in the study was 47, representing 85% of the study population.

2.8 Research Methodology and Techniques

The study adopted the descriptive-analytical method, along with the techniques of this approach to collect the necessary research data. Data were obtained using a suitably designed questionnaire, prepared in accordance with scientific standards for questionnaire design. The questionnaire included three sections:

- **First Section:** Focused on collecting personal data of the respondents, including gender, age, educational qualification, years of service, and training courses.
- **Second Section:** Measured the variables of digital fluency, consisting of 15 items distributed across three sub-dimensions representing digital fluency.
- **Third Section:** Measured the variables of competitive advantage, consisting of 12 items.

Regarding statistical analysis techniques, the study relied on the available functions of the SPSS software to calculate frequencies, percentages, arithmetic means, standard deviations, correlation coefficients, and simple and multiple regression analyses.

3. Chapter Two: Theoretical Framework

3.1 First: Digital Fluency

3.1.1 Concept of Digital Fluency

Digital fluency relies on the proper use of information and its characteristics, safe internet browsing, understanding privacy, and all issues related to information usage. As businesses increasingly shift toward digital technologies, it becomes essential to foster digital fluency in conducting online meetings, mastering email communications, understanding internet ethics and etiquette, critically interpreting news, and identifying misinformation. These skills also facilitate safe and confident navigation of digital environments.

Digital fluency is defined as a dynamic, evolving, and progressive ability that enables users of digital technologies to reach high levels of digital expertise and produce meaningful work through exploring, accessing, organizing, interpreting, evaluating, implementing, and creating digital information and ideas. This process enhances learning in other areas and allows successful participation in society (Sinay, 2018:13).

Tohara et al. (2021:3347) indicated that digital fluency involves an individual's proficiency with diverse digital skills, understanding the basics of computers, using networks, participating in social media and online communities, adhering to behavioral norms, and locating, collecting, and evaluating information.

Sanches (2022:476) defined digital fluency as the ability to access, find, consume, understand, share, and produce information to generate new understanding amid highly variable information quality.

According to Makhafola et al. (2025:2), digital fluency is almost instinctive in using digital technologies to achieve desired outcomes. Individuals with digital fluency can adapt to new technologies, apply them in different contexts, and critically evaluate and appropriately use digital tools.

Anjum et al. (2025:166) viewed digital fluency as the ability to efficiently interpret information, discover meaning, design content, create knowledge, and communicate ideas in a technologically interconnected world through digital skill sets that optimize technology usage.

Joseph et al. (2025:10–11) described digital fluency comprehensively as an individual's capacity to interact effectively and critically with digital technologies in various contexts. It includes elements integrating foundational digital knowledge, such as technical competence, critical evaluation, creative application, effective communication, and responsible ethical use.

Al-Qabbani (2025:292) defined digital fluency as a digital skill that contributes to digital literacy, encompassing knowledge of when and where to use technology productively, adapting to technological changes in daily life, and achieving intended outcomes from technology use.

3.1.2 Importance of Digital Fluency

In recent years, digital fluency has been considered an essential set of skills and abilities that individuals must possess to succeed in the digital era. Digital fluency contributes to creating, reshaping, and correctly using digital technologies. It relies on individuals' ability to access information, evaluate its quality, and learn emerging technologies, thereby generating a wealth of digital information that can be leveraged to achieve competitive advantages for companies capable of processing, implementing, and accessing information in real-time. Individuals with high digital proficiency maintain broader social networks and use relationship management technologies more effectively compared to those with lower digital proficiency (Wei et al., 2020:68801).

Digital fluency also facilitates information fluency. In an information-rich world, it has become more critical than ever to quickly locate, filter, and evaluate information for problem-solving purposes. Digital fluency enables individuals to responsibly harness information to ask new questions, formulate new hypotheses, and answer previously unanswerable questions (Fleming et al., 2021:45).

Digital fluency helps individuals keep pace with continuous digital transformation, making this capability highly important for both modern companies and their employees. It significantly enhances engagement in digital activities and improves performance in work environments (Glase, 2023:2).

Digital fluency drives fundamental transformation, emerging from motivation, choice, flexibility, agility, and participation. When examining individuals' interactions with and within digital environments, digital fluency takes into account behavioral and cognitive aspects, supporting a growth mindset through digital progression. Practice, support and guidance from others, experience with purposeful approaches, motivation, and well-being all contribute

to success. Digital fluency ensures that individuals acquire the skills sought by industry not only technical or specialization-specific skills but also transferable professional competencies, including digital literacy (Cain & Coldwell, 2024:42–47).

3.1.3. Dimensions of Digital Fluency

The researcher relied on the study of Geae et al. (2023:126-127) to identify the dimensions of digital fluency, which are: **technical fluency, digital creativity, and digital thinking**. These dimensions are briefly explained below:

1. Technical Fluency: Technical fluency refers to an individual's ability to access and evaluate information from various sources using digital tools and technologies at a high technical level (Geae et al., 2023:128). Campbell et al. (2023:20) described technical fluency as the ability for creative expression, knowledge reshaping, synthesizing new information, and integrating it with prior knowledge. In the context of smart technologies, it represents a set of competencies enabling individuals to critically evaluate artificial intelligence technologies, communicate and collaborate effectively, and use them as online tools in various aspects of life.

Neubauer et al. (2024:2-4) defined technical fluency as a competency encompassing cognitive and non-cognitive traits, enabling individuals to use, synthesize, and adapt new technologies creatively to enhance performance. It involves qualities related to ease, mastery, and adaptable behaviors. The qualitative shift from a basic technology user to a fluent user entails technical creativity. Technically fluent individuals are highly connected and can integrate technology seamlessly into all aspects of life, preferring adaptive, participatory, and interactive learning environments. Generation Z exhibits high technical fluency as they interact visually, prefer watching videos summarizing issues over reading articles, are highly engaged with private social networks, are technology-saturated, and globally connected (Sulistyorini et al., 2024:277).

2. Digital Thinking: In the digital era, characterized by major social and economic transformations, critical thinking is essential to navigate the flood of information and identify negative aspects, such as fake news, misinformation, and echo chambers. Reliable content evaluation systems enable individuals to assess online information regarding its credibility, relevance, and accuracy, supporting informed decision-making and preventing susceptibility to misinformation (Lissitsa, 2025:2-3).

From a production perspective, with the advent of the Fourth Industrial Revolution (4.0) and the resulting globalization and open market economy, technology has merged with the internet, ICT, and physical machinery, with concepts such as IoT, robotics, big data, and virtual manufacturing. Customers, as key participants, can oversee development, provide feedback, and share ideas digitally at any stage of product development, ensuring better acceptance, longer product lifecycle, and greater business sustainability. Digital thinking encompasses three main aspects for addressing real-world problems: solving defined problems, designing systems usable by communities, and understanding human behavior based on computing concepts (Kumar et al., 2020:6).

Sari et al. (2021:284) defined digital thinking as a cognitive process used by individuals to generate new ideas or processes using smart digital technologies to solve problems. Digital thinking reflects mental skills that positively impact the individual and society through digital tools, supporting critical and creative thinking, identifying biases and assumptions in digital information and media, effectively communicating critical and creative ideas, and analyzing, evaluating, and summarizing information in digital contexts (Geae et al., 2023:130). Ibrahim (2022:83) described digital thinking as an individual’s mental capacity to communicate effectively, maintain socially organized interactions, and utilize a set of technical, cognitive, social, and emotional abilities to use digital tools efficiently, understand their digital identity, rights, and duties, address digital problems, and adapt to digital life requirements to ensure safety and security.

3. Digital Creativity: Lee & Chen (2015:1) defined digital creativity as creativity manifested in all its forms and reliant on digital technologies, contributing to the generation of new and useful ideas in knowledge-based work contexts. Digital creativity predominantly occurs through technology or in digital environments, using digital devices for various creative activities. Al-Qahtani (2021:103) described digital creativity as the use of digital technologies to generate business models, create, and design innovative applications using software through digital technology-based creative skills.

Digital creativity is an essential component of the modern world, aiding technology development, improving overall quality of life, and supporting the creation of diverse digital products and services. It can be classified into types such as creativity in application design and programming, website design, digital game creation, digital video and audio production, and digital content creation (Al-Qahtani, 2022:148).

Mulyono et al. (2023:583-584) defined digital creativity as an individual's ability to produce new and valuable ideas through digital technologies, which are used to enhance creativity among individuals and groups in organizational contexts. Digital creativity involves the creative production of digital applications and online activities, sharing creative behavior, and expressing ideas, feelings, or interests. Geae et al. (2023:129) described digital creativity as the ability to think creatively and generate new ideas using digital tools and technologies, with confidence in applying these tools to develop innovative solutions to problems.

According to Cojocariu & Boghian (2024:1-2), digital creativity emerges at the intersection of digital competence and creativity. In the literature, it is considered part of digital competence, as digital competence supports digital creativity through using tools and technologies to explore new ideas and work innovatively. Digital creativity is a skill that enables the creation of new and innovative products and services to achieve optimal outcomes in individual and group work.

3.2 Second: Competitive Advantage

3.2.1 Concept of Competitive Advantage

The concept of competitive advantage gained prominence through the work of Tom Peters & Robert Waterman in their book *In Search of Excellence* (1982). They consider excellence as critical, defining it as an organization's reliance on a flexible approach that focuses on listening to customers and providing them with added value (Ghers & Baali, 2024:2158).

Competitive advantage is a modern concept that has received wide attention in business management literature. Researchers and authors have defined it from various perspectives (Sadeghi et al., 2024:104). Raouf (2020:304) defines competitive advantage as the extent to which organizations rely on a set of strategies focused on cost leadership, differentiation, or both, enabling them to offer distinctive products to customers in ways competitors cannot match. Achieving this requires unifying the efforts of subordinates to ensure organizational success. In contrast, Hosseini et al. (2018:2) define competitive advantage as the value possessed by organizations that attracts customers. Mahdi (2024:244) and Al-Maadhedee & Al-Sabaawe (2018:89) describe it as an organization's ability to establish leadership positions in its field by optimally leveraging interconnected standards, technology, human skills, and internal resources to deliver unique services.

Benrahmoune & Benrahmoune (2025:64) view competitive advantage as an organization's ability to utilize its internal strengths in performing activities to generate value that exceeds or cannot be matched by competitors.

Generally, researchers use the terms competitive advantage and competitive edge interchangeably to indicate relative superiority in skills and resources. However, competitive advantage represents the ultimate goal organizations aim to achieve through strategies that support the competitive edge. Thus, competitive advantage is the organization's objective, while competitive edge is the means to achieve it.

3.2.2 Characteristics of Competitive Advantage

The characteristics of competitive advantage stem from the challenges organizations face today, making it crucial to distinguish themselves in terms of activities, capabilities, or resources to survive and compete in the current environment. Organizations must strive to achieve competitive advantage through training and developing employees (AbdalShihabi et al., 2024:160) and delivering products in new competitive ways. The key characteristics of competitive advantage can be highlighted as follows (Mahdi et al., 2023:479):

1. Competitive advantage is relative, not absolute.
2. It provides the organization with an edge over competitors.
3. It creates value within the organization.
4. Competitive advantage is reflected in organizational performance and product efficiency.
5. It fosters awareness and perception among customers regarding the organization and its products.
6. Focusing on excellence and developing methods to achieve it can ensure its sustainability.

3.2.3 Sources of Competitive Advantage

Paying attention to external changes and identifying ways to respond to them represents a major challenge for organizations. Regardless of the size or type of business, the goal is to find means to achieve advantage in a changing environment. Today, the real challenge facing organizational leaders is how to transform a relative advantage into a sustainable competitive advantage.

Accordingly, Mohamed & Al-Ayash (2018:40-41) indicate that sources of competitive advantage are limited to two main types:

1. **Internal Sources:** These include continuous renewal of organizational structure and resources, as well as the activities and skills performed by the organization, in addition to organizational culture.
2. **External Sources:** These relate to the external environment and the industry structure in which the organization operates. The organization's strengths and weaknesses become evident when compared with external environmental factors.

4. Chapter Three: Practical Framework

4.1 First: Testing the Research Hypotheses

4.1.1 Testing the First Main Hypothesis:

The first main hypothesis states: *"There is a statistically significant correlation between digital fluency and competitive advantage in the researched organization."*

The data presented in Table (1) indicate a significant correlation between digital fluency (independent variable) and competitive advantage (dependent variable), with a correlation coefficient of **0.783** at a significance level of **0.05**. This result reflects the importance of digital fluency in achieving competitive advantage in the researched organization.

Furthermore, the correlation results show that among the dimensions of digital fluency, **digital thinking** has the strongest correlation with competitive advantage, with a value of **0.835** at a significance level of **0.05**. This finding reflects the forward-looking logic of digital fluency, enabling the organization to anticipate surrounding events and adopt a proactive approach to prepare for and adapt to environmental changes.

Based on these findings, the first main hypothesis, stating that *"There is a statistically significant correlation between digital fluency and competitive advantage in the researched organization,"* is accepted, and the alternative hypothesis is rejected.

Table (1): Results of Correlation Analysis between Digital Fluency and Competitive

Independent Variables / Dependent Variable	Technical Fluency	Digital Thinking	Digital Creativity	Overall Index
Strategic Advantage	**0.614***	**0.835***	**0.628***	**0.783***

Source: Table prepared by the researchers based on SPSS statistical program results, at a significance level of **0.05**.

4.1.2 Testing the Second Main Hypothesis:

The second main hypothesis states: *"There is a statistically significant effect of digital fluency on achieving competitive advantage in the researched organization."*

The data in Table (2), which analyzes the effect of digital fluency on achieving competitive advantage, indicate a statistically significant effect. The calculated **F-value** is **139.428**, which is greater than the critical value of **4.05** at degrees of freedom (1, 44) and a significance level of **0.05**. The coefficient of determination ($\mathbf{R^2}$) is **0.698**, indicating that digital fluency (independent variable) explains approximately **69%** of the variance in achieving competitive advantage, while around **31%** of the variance is not accounted for by the current study model.

Table (2): Effect Relationship of Strategic Knowledge in Managing Crisis Stages

Dependent Variable / Independent Variable	Competitive Advantage				
	F		t		R^2
Digital Fluency	Calculated	Tabular	Calculated	Tabular	0.698
	139.48	4.05	18.29	1.68	

df= (1,45) **N=47** **P<0.05**

Source: Prepared by the researchers based on the results of the statistical program (SPSS).

This result reflects the respondents' perception of the importance of digital fluency in achieving competitive advantage. Overall, and based on the foregoing, the second main hypothesis, which states *"There is a statistically significant effect of digital fluency on achieving competitive advantage in the researched organization,"* is accepted, and the alternative hypothesis is rejected.

4.1.3 Testing the Third Main Hypothesis:

The third main hypothesis states: *"The relative importance of the effects of digital fluency dimensions on achieving competitive advantage in the researched organization varies."*

The data in Table (3) indicate the following:

a. **Digital Creativity Dimension:** Ranked first as the most influential dimension in achieving competitive advantage, with a coefficient of determination (**R^2**) of **0.726**, meaning that **72.6%** of the variance in competitive advantage is explained by digital creativity in the researched organization. This is supported by the calculated **F-value** of **96.732**, which is greater than the tabular value of **2.84**.

b. **Digital Thinking Dimension:** Ranked second, explaining **36.4%** of the variance in achieving competitive advantage, reflecting the importance of digital thinking for the researched organization. The calculated **F-value** is **128.651**, which exceeds the tabular value of **2.61**.

c. **Technical Fluency Dimension:** Ranked third, being the least influential dimension in the organization. The **R^2** value is **0.279**, indicating that the effect of technical fluency accounts for only **27.9%** of the variance in achieving competitive advantage. The calculated **F-value** is **144.583**, which is greater than the tabular value of **2.45**.

These results indicate that the researched organization prioritizes **digital creativity** in driving competitiveness in the workplace, followed by **digital thinking**, and finally **technical fluency**.

Overall, the relative importance of the effects of digital fluency dimensions varies from one dimension to another. Therefore, the third main hypothesis, stating *"The relative importance of the effects of digital fluency dimensions on achieving competitive advantage in the researched organization varies,"* is accepted, and the alternative hypothesis is rejected.

Table (3): Relative Importance of the Effects of Digital Fluency Dimensions on Achieving Competitive Advantage in the Researched Organization

Independent Variables / Dependent Variable	Technical Fluency		Digital Thinking		Digital Creativity	
Competitive Advantage	**R^2**	**D.F**	**R^2**	**D.F**	**R^2**	**D.F**
	0.279	1 45	**0.364**	**2** **44**	**0.726**	**3** **43**
	F					
	Calculated	**Tabular**	**Calculated**	**Tabular**	**Calculated**	**Tabular**
	144.583	**2.45**	**128.651**	**2.61**	**96.732**	**2.84**

At a significance level of 0.05, N = 47

Source: Prepared by the researchers based on the results of the SPSS statistical program.

5. Axis Four: Conclusions and Recommendations

5.1 First: Conclusions

1. The results of the correlation analysis indicated a significant relationship between digital fluency and competitive advantage. This outcome suggests that enhancing digital capabilities increases the potential to achieve competitive advantage more effectively within the researched organization. Moreover, the correlation results showed that the strongest relationship with competitive advantage was with the dimension of **digital thinking**, reflecting the logic of digital fluency in anticipating future changes and interpreting events surrounding the organization. Digital fluency adopts a proactive approach to addressing and preparing for environmental challenges.
2. The statistical analysis of the effect relationship showed a significant impact of digital fluency on achieving competitive advantage within the studied organization. This result highlights the necessity of digital fluency

to enhance organizational capabilities for optimally meeting the requirements of achieving competitive advantage, positioning it as a contemporary managerial tool for modern organizations.

3. The relative importance of digital fluency in explaining competitive advantage varies across its dimensions within the researched organization. This finding reflects the organization's rationale in prioritizing and ranking its approaches to meeting the requirements for achieving competitive advantage.
4. The results regarding the relative importance of the effects of digital fluency dimensions on competitive advantage revealed a logical sequence: the organization adopts a proactive approach in handling digital technologies and digital fluency. **Digital creativity** ranked first as a tool for applying digital innovations in the appropriate contexts, followed by **digital thinking** to express patterns of strategic thinking using digital technologies and their developments, while **technical fluency** came last, reflecting the practical application of digital technologies as a tool for achieving competitive advantage.

5.2 Second: Recommendations

Based on the presented conclusions, this section provides the most important recommendations for the studied organization, along with suggestions for implementing them.

1. The organization should pay attention to the overall concept of digital fluency, with particular emphasis on developing digital fluency in multiple areas and interests aligned with the nature of the organization's work and potential crises. This knowledge can be provided by:
    - Engaging managers in training courses and specialized workshops on digital transformation in general and digital fluency in particular, aiming to expand participants' understanding of different types and levels of digital fluency and their fields of specialization, thereby enabling managers in the organization to enhance their knowledge, skills, and diversify their expertise.
2. The organization should strengthen its focus on analyzing the components of competitive advantage and studying them to derive lessons for future application. This can be achieved by:
    - Establishing and updating a specialized information system within the organization that collects, classifies, and organizes knowledge and information into dedicated databases, facilitating quick access to required indicators during a crisis, while providing appropriate digital technologies to handle competitive environments efficiently.
3. Given the strong correlation between digital fluency and competitive advantage, the organization's management should work on reinforcing a strategic perspective within its digital work system to enhance its ability to respond to competitive pressures. This can be achieved by:
    - Leveraging academic staff through collaboration between academic institutions and organizations to build robust knowledge bases, and developing the best methods to document and preserve this knowledge effectively.

6. Conflict of Interest

The authors declare that they have no conflict of interest.

7. Funding Declaration

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8. References:

Al-Qabbani, N. H. (2025). The effect of interaction between support source (human/intelligent) in a ubiquitous e-learning environment and personality type (open/introvert) on developing digital fluency skills and attitude toward the learning environment among pre-service teachers. *Scientific Journal of General Education, Applied Sciences*, 8(24), 283–420.

Al-Qahtani, K. N. (2022). The effectiveness of a proposed STEAM-based unit in developing digital creativity among students of the College of Education at the University of Tabuk. *Journal of Educational and Human Studies*, 14(4), 133–186.

Al-Qahtani, N. (2021). 21st-century skills in university education: A field study on a sample from the best Saudi universities according to the 2021 QS World University Rankings. *Faculty of Education Journal in Educational Sciences*, 45(3), 61–144.

Hamad, S. T., & Al-Ayyash, A. A. A. H. (2018). The role of electronic money in achieving competitive advantage: An applied study on a sample of government banks. *Gharee for Economics & Administrative Sciences*, 15.

Ibrahim, R. M. (2022). Analytical thinking and habits of mind as predictors of digital intelligence among preparatory school students. *Journal of the Faculty of Education (Assiut)*, 38(12.2), 71–120.

Foreign references:

Abd alShihabi, A. F., Ibrahim, N. K., & ALChalabi, H. S. A. H. (2024). Job burnout and its relationship to achieving competitive superiority among the employees of the University of Baghdad. *Heritage and Sustainable Development*, 6(1), 157–168.

Al-Maadhedee, M. W., & Al-Sabaawe, Y. M. K. (2018). The reality of electronic coopetition process analytical study for opinions of a sample of managers in Zain Al-Iraq Co. for telecommunication in Kirkuk Governorate-Iraq. *Journal of Kirkuk University For Administrative and Economic Sciences*, 8(1), 62–91. https://iasj.rdd.edu.iq/journals/uploads/2024/12/06/6497986378bcb3715772e36aada8c04c.pdf

Anjum, S. A., Sial, A., & Adil, H. M. (2025). Effect of digital fluency on the usage of social media: An empirical study of research students of the University of the Punjab. *Competitive Research Journal Archive*, 3(1), 166–182.

Benrahmoune, S., & Benrahmoune, D. (2025). SWOT model as a mechanism for achieving competitive superiority: Case study of Ben Houhou mills-Chetma-Biskra. *مجلة الاقتصاد والتنمية المستدامة*, 8(1), 61–77.

Cain, K., & Coldwell-Neilson, J. (2024). Digital fluency–a dynamic capability continuum. *Australasian Journal of Educational Technology*, 40(1), 42–56.

Campbell, S. G., Nguyen, R., Bonsignore, E., Carter-Browne, B., & Neubauer, C. (2023). Defining and modeling AI technical fluency for effective human machine. In *Human factors in robots, drones and unmanned systems* (pp. 19–34). AHFE International.

Cojocariu, V. M., & Boghian, I. (2024). A literature review on digital creativity in higher education toward a conceptual model. *Education Sciences*, 14(11), 1196. https://doi.org/10.3390/educsci14111196

Fleming, E. C., Robert, J., Sparrow, J., Wee, J., Dudas, P., & Slattery, M. J. (2021). A digital fluency framework to support 21st-century skills. *Change: The Magazine of Higher Learning*, 53(2), 41–48.

Ghers, M. A., & Baali, H. (2024). The role of intellectual capital as a mediating variable in the influential relationship between knowledge management and competitive superiority: A case study of operating banks in Annaba, Algeria. *International Journal of Economic Perspectives*, 18(12), 2153–2177.

Glase, E. M. (2023). *Digital fluency-inspecting the role of supporting factors in the organizational context: A multi-level approach* (Publication No. 12345) [Doctoral dissertation, Universität Konstanz]. Institutional Repository.

Hosseini, A. S., Soltani, S., & Mehdizadeh, M. (2018). Competitive advantage and its impact on new product development strategy (Case study: Toos Nirro technical firm). *Journal of Open Innovation: Technology, Market, and Complexity*, 4(2), 17. https://doi.org/10.3390/joitmc4020017

Joseph, C., Rahmat, M., Sikayu, S. H., Norizan, S., & Enggong, T. S. (2025). Exploring digital fluency skills among the business organizations' workforce as a competitive advantage tool: Quest for sustainability. *Business and Economic Research*, 15(1), 10–32.

Kumar, K., Zindani, D., & Davim, J. P. (2020). *Design thinking to digital thinking*. Springer Nature.

Lee, M. R., & Chen, T. T. (2015). Digital creativity: Research themes and framework. *Computers in Human Behavior*, 42, 12–19. https://doi.org/10.1016/j.chb.2014.04.001

Lissitsa, S. (2025). Generations X, Y, Z: The effects of personal and positional inequalities on critical thinking digital skills. *Online Information Review*, 49(1), 35–54.

Mahdi, A. M. A. (2024). The role of strategic monitoring in achieving competitive superiority: An analytical study of the opinions of a sample of working in the Iraqi Insurance Company. *Journal Port Science Research*, *7*(2), 219–236.

Mahdi, H. T., Kamel, S. B., & Hassan, L. M. (2023). Multi-level marketing strategies as a mechanism to achieve competitive superiority (exploratory research of the opinions of a sample of workers in the Al-Wareth factory for the production of refrigeration. *Eximia*, 12, 474–485.

Makhafola, L., van Deventer, M. J., Holmner, M. A., & Van Wyk, B. (2025). A scoping review of digital literacy, digital competence, digital fluency and digital dexterity in academic libraries' context. *The Journal of Academic Librarianship*, 51(3), 103053. https://doi.org/10.1016/j.acalib.2025.103053

Mondigo, G. H. T., Balbao, E. O., Pagurayan, L. R. C., & Paglinawan, J. L. (2023). Digital fluency on students' problem-solving skills. *School of Education Research Journal*, 4(1), 45–60.

Mulyono, H., Bátyi, S., & Mukminin, A. (2023). An analysis of EFL teachers' digital creativity and its relation to their instructional creativity: A case of Indonesian primary and secondary schools. *Journal of Asia TEFL*, 20(2), 582–597. https://doi.org/10.18823/asiatefl.2023.20.2.58

Neubauer, C., Pollard, K. A., Benbow, K., Rabin, A. H., Forster, D. E., Nguyen, R., & Campbell, S. (2024). Measuring and predicting technical fluency: How knowledge, skills, abilities, and other behaviors can contribute to technological savviness. *Journal of Applied Psychology*. Advance online publication.

Raouf, A. R. A. (2020). Achieving competitive superiority within the framework of adoption of some sustainable manufacturing strategies: An exploratory study at the General Company for Textile and Leather Industries/Baghdad. *Tikrit Journal of Administrative and Economic Sciences*, 16(51, Part 2), 445–465.

Sadeghi, M., Al-Sabaawe, Y. M. K., Sharifi, S., & Ebrahim, M. A. (2024). Sustainable development and consumption: Sustainable consumption model in Iraq's commerce. *University of Kirkuk Journal For Administrative and Economic Science*, 14(1), 95–118. https://iasj.rdd.edu.iq/journals/uploads/2024/12/15/df0ccdc3ccf0f32a21613cf58b8e5b3f.pdf

Sanches, T. (2022). Digital fluency and ethical use of information: The role of higher education librarians. *Qualitative and Quantitative Methods in Libraries*, 11(3), 473–487.

Sari, N. K., Budiarto, M. T., & Rozhana, K. M. (2021). Students' digital thinking skills in solving mathematics problems. *Journal of Physics: Conference Series*, 1720(1), 012005. https://doi.org/10.1088/1742-6596/1720/1/012005

Sinay, E. (2018). *Global competencies in deeper learning environments enabled by pervasive digital technologies: Evolving framework for theoretical foundation and developmental evaluation*. Toronto District School Board.

Sulistyorini, N., Puspitasari, D., Khasanah, A., & Perdhana, M. S. (2024). Expectations of generation z in the world of work towards a golden Indonesia 2045. *Research Horizon*, 4(4), 275–280.

Tohara, A. J. T., Shuhidan, S. M., Bahry, F. D. S., & Nordin, M. N. B. (2021). Exploring digital literacy strategies for students with special educational needs in the digital age. *Turkish Journal of Computer and Mathematics Education*, 12(9), 3345–3358.

Wei, C., Pitafi, A. H., Kanwal, S., Ali, A., & Ren, M. (2020). Improving employee agility using enterprise social media and digital fluency: Moderated mediation model. *IEEE Access*, 8, 68799–68810. https://doi.org/10.1109/ACCESS.2020.2983484