



# Assessing the impact of digital transformation dimensions on the development of social security services – Case study of the National Fund for Social Insurance for Workers in the State of Constantine



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## Abstract

This research seeks to examine how digital transformation influences the advancement and enhancement of social security services. , where the analytical descriptive curriculum was adopted .To fulfill the research objectives, a questionnaire was distributed to a sample of 52 employees working at the National Social Insurance Fund in the province of Constantine. Statistical analysis was also carried out using SPSS 27 software.

The study produced several results, notably a statistically significant moral link between human resources skills and the development of the Fund's services. The availability of the necessary technologies and infrastructure has been shown to have a positive and statistically significant impact on the improvement of these services., in addition, the findings showed that the Fund's management follows an efficient method of data management, which has played a significant role in streamlining many processes.

## Keywords

influence;  
Digital transformation ;  
development of services;  
Social Security Fund services ;  
Constantine State .

## الكلمات المفتاحية

أثر؛  
التحول الرقمي ؛  
تطوير خدمات ؛  
صندوق الضمان  
الاجتماعي ؛  
ولاية قسنطينة.

## تقييم أثر أبعاد التحول الرقمي في تطوير خدمات الضمان الاجتماعي- دراسة حالة الصندوق الوطني للتأمينات الاجتماعية للعمال الأجراء لولاية قسنطينة

## ملخص

تهدف هذه الدراسة إلى استكشاف أثر التحول الرقمي على تطوير خدمات الضمان الاجتماعي، حيث تم اعتماد المنهج الوصفي التحليلي. ومن أجل ذلك قمنا بتوزيع استبيان ثم توزيعه على عينة 52 موظفا يعملون بالصندوق الوطني للتأمينات الاجتماعية بولاية قسنطينة لتحليل البيانات احصائيا عن طريق استخدام برنامج spss  
وقد أظهرت تحليلات الدراسة مجموعة من النتائج، من أبرزها وجود ارتباط معنوي ذو دلالة إحصائية بين مهارات الموارد البشرية وتطوير خدمات صندوق الضمان الاجتماعي. كما تبين أن توفر التقنيات والبنى التحتية اللازمة له تأثير إيجابي ودال إحصائيا على تحسين هذه الخدمات. بالإضافة إلى ذلك، أثبتت الدراسة أن إدارة الصندوق تتبع أسلوبا كفء في إدارة البيانات، مما كان له دور كبير في تبسيط العديد من العمليات.

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## I- Introduction :

In recent years, there has been a notable rise in the focus on digital transformation due to its crucial role in advancing information technology and promoting globalization, making it essential in various economic activities. This technology has become a key part of all sectors, including the financial sector. In addition to innovations based on technologies such as artificial intelligence and big data analysis, the digital transformation has brought about considerable changes in the organizational framework of financial institutions.

Digital transformation has also changed ways of providing services to the public, as most organizations no longer rely on traditional ways of processing time-consuming information, but on information technology using software and tools that contribute to faster and more effective decision-making.

Thanks to the benefits provided by digital transformation techniques, financial institutions are increasingly seeking to leverage and implement these technologies as best as possible to achieve the desired goals by improving internal processes, enhancing security and providing innovative services.

Algeria's social security system has continued to evolve since its inception, specifically after the country's independence in 1962. Significant progress has been made, with emphasis on mainstreaming social protection by extending it to a larger number of citizens, while facilitating actions related to obtaining entitlement to social security benefits.

In order to stay aligned with technological advancements, the National Social Insurance Fund has implemented various electronic services. One of the most notable of these services is the Al-Shifa Card. and the Al-Hana Space Platform, which aim at facilitating and streamlining procedures for participants and bringing the services provided by the Fund closer to them.

### What is the impact of digital transformation dimensions on the development of social security services of the state of Constantine?

#### - Study hypotheses:

- There is a statistically significant moral correlation of human resource skills with the development of Social Security Fund services.
- There a statistically significant moral correlation of technologies and infrastructure with the development of the Social Security Fund's services.
- There is a statistically significant moral correlation of data with the improvement of the Social Security Fund's services.

#### -Importance of study:

Through this research, we aim to highlight digital transformation and analyze the factors that contribute to it and causes that motivate the Social Security Fund to adopt these technologies, as well as its role in improving and developing their services.

#### - Objectives of study:

- Clarification the key concepts of digital transformation
- Demonstrate the benefits and advantages digital transformation techniques for subscribers within the Social Security Fund.
- An evaluation of how digital transformation is being implemented within the Social Security Fund

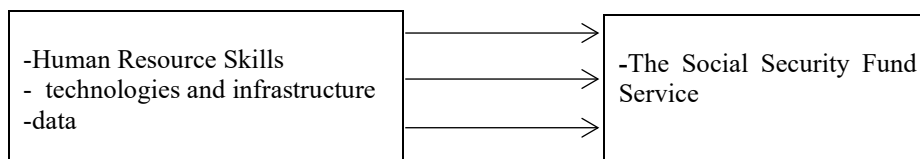
#### - Methodology of study:

To complete our study, we have utilized the analytical approach descriptive curriculum to present the concept of digital transformation and social security, their functions, and we have also used the statistical curriculum to collect data and test the study's hypotheses.

#### - The research Model:

The conceptual framework of this study comprises three independent variables and one dependent variable, which are specified as follows:

Figure 1. Study Model



## **II– Literature Review**

We will address the concept of digital transformation and its importance, highlighting its main dimensions. We will also address the definition and characteristics of social security, explaining its role and impact in society.

### **II –1 Definition of digital transformation**

We can suggest the following definitions:

“It is a comprehensive initiative of the Government project aimed at digitizing all services provided by various institutions and sectors within the State. It is based on transforming basic and vital services serving individuals, institutions and diverse investments from its traditional form into a smart electronic model, leveraging cutting-edge technologies to enhance efficiency and improve the quality of services provided” (Chaouchi & Khelouf, 2023)

“An enterprise's transition from traditional style to digital means shifting from paper to electronic transactions, through the adoption of modern technology in various aspects of work. This shift aims to enhance performance efficiency, accelerate task delivery and reduce costs, ensuring that the organization's objectives are achieved effectively and in a timely manner”

### **II –2 benefits of digital transformation:**

- Reducing government costs on service delivery while improving its quality and introducing innovative services, as the provision of online services reduces expenses associated with traditional methods such as mail and mobility. (Uoud, 2024)
- Enhancing the integration of systems by connecting different government agencies, facilitating the exchange of information between departments and reducing the frequency of actions.
- Accelerating the pace of public service delivery while improving its accuracy and flexibility, as the portals contribute to enabling citizens to access services easily, thereby reducing the time and effort required to complete transactions, as well as reducing the proportion of errors. (Vicent & Vivier, 2017)
- Raising productivity and improving product quality by adopting modern technologies such as the Internet of Things (IoT) and robots, which contributes to increasing manufacturing efficiency and reducing waste. (Gartezen, Van der, & Steyen, 2022)
- Application of advanced business management systems to monitor performance, detect weaknesses, and work to improve them.
- Ensure the speed and ease of implementation of new services using scalable technical platforms, allowing the expansion of services efficiently and flexibly. (Al-Ayed, Adnan, & Alashjaee, 2023)

### **II -3Dimensions of digital transformation:**

#### **II -3-1Human resources:**

Experts and knowledge professionals constitute the core component of the e-governance system, representing its human and functional structure. They lead analysis and management of knowledge resources and prepare intellectual capital within the organization. This category includes digital leaders, managers, agents and assistants, who oversee planning, organization, guidance and oversight, as well as programmers and data officials who contribute to the operation and improvement of technical systems (Mokhtar & Boufriris, 2022)

#### **II -3-2 Technologies and infrastructure:**

Digital transformation is implemented by integrating a range of devices, operating systems, storage media, and software that operate within sophisticated technical environments and data centers that support continuous operation with high efficiency. This transformation also requires a distinct level of service for all beneficiaries within and outside the organization, including employees, customers and suppliers. To ensure this, specialized teams are responsible for the management of technical infrastructure, whether based on local or cloud solutions. (Ben atalaah & Tamirez, 2024)

#### **II -3-3 Data:**

Organizations should adopt a systematic and effective approach to data management and conversion, while ensuring accurate, comprehensive information and reliable procedures. It should also develop advanced tools for statistical analysis, data exploration and forecasting of future trends. In addition, continuous follow-up of data is essential to ensure its constant flow and utilization in line with the organization's objectives and aspirations. (Lyon, 2004)

### **II -4 Definition of social security**

"It is a mandatory system in which employed individuals, employers and the State participate by paying periodic contributions to the government entity responsible for managing the community's funds. This entity invests these

contributions to ensure monthly income for individuals when they stop working, whether due to disability, reaching retirement age, or contributing to treatment expenses. The system also guarantees financial support to dependants of workers after their death.” (Selmi & Fellag, 2015)

## **II -5 Social Security Characteristics:**

- A compulsory system that includes all workers in the state and employers, so that it is everyone's duty to participate in it.
- In accordance with the principle of social solidarity, both employees and employers contribute to the payment of contributions.
- while the state provides financial support to social insurance funds to offset increases in pensions caused by inflation. (Semati, 2014)
- Covers all workers and employers, in addition to providing temporary support to the unemployed during transition periods until they get a new job. (Djaroun, 2020)

## **III -: Field research**

In our study focus will how digital transformation has contributed to enhancing the services provided by the Social Security Fund, through an analysis of its implementation in the Wilaya of Constantine. . This will be done by distributing a questionnaire to a sample of the Fund's staff to collect the necessary data.

### **III- 1Presentation of the Social Security Fund:**

The National Fund for Social Insurance for Working Workers is a privately administered public institution, in accordance with article 49 of Act No. 88-01 of 12 January 1988, containing the Directive Act on Public Economic Institutions, which enjoys moral personality and financial independence.

It is a public institution with a unique nature, regulated by its own set of law. , with moral personality and financial exploitation. (CNAS, 2024)

#### **III-2Functions of the Fund**

These are: (CNAS, 2024)

- The administration of social insurance services covering illness, maternity, disability, death, workplace accidents, and occupational diseases within the social insurance system.
- The administration of family grants for States.
- Collection of contributions.
- Control and disputes over collection of contributions to fund performance
- The granting of a national registration number for social insured persons as well as employers;

**The Electronic services provided by the Social Security Fund:** it is (Ministry of Employment and Social Solidar, 2024)

- The Al-Shifa system is based on the production of a chip card called Al-Shifa This system is part of the broader effort to modernize the social security sector..
- Remote authorization permit allows employers of tele-permit services
- Electronic payment that allows remote payment of contributions
- Al-Hana Platform: Allows to bring the Fund's services closer to the insured by providing binding information about the compensation payable.

## **IV - Data & Methodology**

### **IV- 1 The Research Population and Sample**

The study population consists of the employees working at the Social Security Fund in Constantine. Participants were selected using a simple random sampling method. . 60 questionnaires were distributed randomly to the Fund's staff. 52 questionnaires were retrieved, representing a response ratio of 86.66% out of the total dispersed questionnaires, which is a high proportion that allows the study to be carried out reliably

#### **IV-2 The Study Tool**

We utilized a questionnaire as our measurement tool, employing a 5-point Likert scale. The analysis was carried out using SPSS software, employing both descriptive and inferential statistical techniques.

The questionnaire was structured into two main sections:

**Section One:** The characteristics pertain to the individuals within the sample.

**Section Two:** Comprises four key dimensions:

- First dimension: Human Skills and Competencies
- Second dimension: Technologies and Infrastructure
- Third dimension: Data Management
- Fourth dimension: Social Security Fund Services

**IV-3The descriptive statistics Results.**

**IV-3-1Personal characteristics of the study sample :**

An analysis of the frequency distribution and percentages will be used to present the personal characteristics of individuals including gender, academic qualification, and professional experience.

**Table 1. Characteristics of sample personnel**

Gender	Frequency	Percentage
Male	39	75
Female	13	25
<b>Educational Qualifications</b>		
B.A	33	63.5
Master	10	19.2
Other	9	17.3
<b>Professional Experience</b>		
5 years and less	7	13.47
6-10 years	14	26.93
10 and more	31	59.6
<b>Total</b>	<b>52</b>	<b>100</b>

**Source:** Prepared by the researcher based on the SPSS 27 output

The distribution by gender reveals that male employees comprise a larger share of the workforce in the studied fund. Specifically, out of 52 employees, 75% are male, while females account for 25%.

Regarding educational qualifications, the majority of respondents hold a bachelor's degree, representing 63.5% of the sample. Next come master's degree holders, representing 19.2%, while those with other certifications make up 17.3%. This distribution reflects an appropriate educational background for responding to the questionnaire.

In terms of professional experience, the largest group of respondents falls within the category of highly experienced employees, comprising 59.6% of the sample. This is followed by employees with 6 to 10 years of experience, who represent 26.93% of the total.

**IV -3-2The Descriptive Statistics Results of the human resource skills dimension ;**

Presented below are the mean and standard deviations for the responses concerning the first dimension.

**Table 2. Results of The Arithmetic Mean and standard deviations of individual answers at the human resource dimension**

Items	Arithmetic mean	The standard deviations	Ranking
Management of the Social Security Fund is given to employees who possess distinct skills	3.580	1.180	3
Staff members at the Social Security Fund are equipped with high-level skills	3.800	0.916	1
The Fund's administration takes occupational specialization into account when allocating job positions.	3.747	1.002	2
The officials at the Social Security Institution possess various interpersonal skills in dealing with employees.	3.562	1.163	4

-The results presented in Table (2) indicate that the second item ranked first, achieving the highest arithmetic mean of 3.810 with a standard deviation of 0.917. This result reflects the presence of highly skilled employees within the Social Security Fund.

- Meanwhile, the third item came in second place, with an arithmetic mean of 3.786 and a standard deviation of 1.071. This outcome highlights the significant role played by the Fund's management in the effective assignment of employment roles.

-The first item comes in third place, With a mean of 3.580 and a standard deviation of 1.180 reflecting the administration's commitment to selecting individuals possessing outstanding skills

- The fourth statement came in last place, with a mean score of 3.562 suggesting a consensus among respondents on the necessity for officials at the Social Security Fund to possess strong interactive skills when engaging with employees.

#### IV-3-3 The Descriptive Statistics Results of the Technologies and Infrastructure dimension

In the following table, we show the arithmetic mean and the standard deviation related to the responses to the second dimension;

**Table 3. Results of The Arithmetic Mean and standard deviations of individual answers at Technologies and Infrastructure dimension**

Items	Arithmetic mean	Standard Deviation	Ranking
The Fund's management maintains a comprehensive communication system that connects it with stakeholders from other sectors.	3.648	1.121	2
The Social Security Fund has a network of internally connected computers through the Intranet system	3.344	1.173	3
The Internet plays a role in enhancing the services offered to the Fund's subscriber ensuring faster and more efficient service delivery.	3.932	1.047	1
The Social Security Fund administration relies on e-mail as the main channel of communication with customers, enabling efficient information exchange and quicker response times..	3.047	1.387	4

- The data reveals that the third statement come firstt, with a mean of 3.932 and a standard deviation of 1.047. This demonstrates the fundamental role of the Internet in improving and progressing the Fund's services offered by the Fund.

-Following in second place, the first item has a mean of 3.648 and a standard deviation of 1.121, indicating that developing a network of connections with other organizations enhances coordination and fosters collaboration.

-In third place, the second item scores a mean of 3.344 and a standard deviation of 1.173, pointing to respondents' acknowledgment of the Fund's intranet.

-In conclusion, the fourth item is ranked fourth, with an average score of 3.047 and a standard deviation of 1.387, reflecting the views expressed by the respondents. consensus that the Fund's management utilizes modern communication tools, such as email, to improve response efficiency

#### IV-3-4 Descriptive Statistics Results of the Data Management

In the following table, we show the arithmetic averages and the standard deviations of the responses to the third dimension:

**Table 4. Results of The Arithmetic Mean and standard deviations of individual answers at Standard Deviation of Data Management dimension**

Items	Arithmetic mean	Standard Deviation	Ranking
The management of the Social Security Fund depends on computers to complete its activities.	3.757	1.002	2
The Department of Social Security uses sophisticated devices to collect and disaggregate data	3.558	1.247	3

In some cases, the Social Security Fund relies on mobile phone for certain operations.	3.466	1.214	4
The devices used in the box are highly flexible in use	4.094	1.007	1

- The final item holds the top position, with a mean score of 4.094 and a standard deviation of 1.007, indicating a strong consensus among respondents regarding the Fund's dedication to safeguarding data.

- Coming in second the first item, which has a mean of 3.757 and a standard deviation of 1.002. The second item is ranked third, with a mean of 3.558 and a standard deviation of 1.247, this highlights the participants' recognition of the Fund's adoption of advanced tools for data collection."

-Finally, the third item is positioned fourth, recording a mean of 3.466 and a standard deviation of 1.214, showing consensus among participants on the Fund's practice of conducting periodic security assessments to reinforce data protection measures against cyber threats.

#### IV-3-5 Descriptive Statistics Results of the Dependent Variable

**Table 5. The arithmetic Averages and the Standard Deviations of the Dependent Variable**

Items	Arithmetic mean	Standard Deviation	Ranking
The Fund's management aims to provide cutting-edge models that effectively meet current and future needs	4.037	0.927	4
The Fund aims to innovate in services provided that are accessible to individuals	3.805	0.822	5
Al Shifa Card simplifies procedures for obtaining compensation	4.338	0.552	1
The Al-Hana platform allows the Fund's services to be brought closer to the insured by providing the necessary information about the compensation payable.	4.110	0.853	3
Electronic payment facilitates transactions quickly and accurately, reducing waiting time and improving overall efficiency	4.133	1.002	2
Remote clearance service allows beneficiaries to provide the necessary remotely declarations and information, without the need to visit the service centers, thereby saving time and effort in data processing	3.525	1.419	6
The Social Security Fund uses a variety of communication channels to promote its services	3.500	1.173	7

- Occupying the top rank, the Chifa card was recognized by all respondents as crucial in simplifying and speeding up the process of obtaining reimbursements. with a mean score of 4.338 and a standard deviation of 0.552.

- In the second place, the sample participants , Agreed on the positive impact of electronic payment in speeding up transactions, with a average of 4.143 and Degree of variability of 1.002.

- Thirdly, the section addressing on the Al-Ha 'a platform highlights its role in enhancing the proximity of the Social Security Fund to its subscribers, with a mean score of 4.110. Ranked four, the first section with a mean score of 4.037 and a standard deviation of 0.927 In fifth place, participants noted the importance of providing the Social Security Fund with innovative services for participants, with the mean of 3,805 and a standard deviation of 0.822. Ranked sixth is the paragraph of the remote clearance service in guaranteeing the ponctuel execution of the Fund's tasks where the mean value 3.525 and a standard deviation was 1.419. Occupying the final position is the last item,. This reflects the perceived importance of the Social Security Fund's of diverse communication channels to ensure effective outreach to beneficiaries and strengthen engagement with them."

#### IV-4 Hypotheses Testing:

A simple linear regression model will be employed to test the study's hypotheses, aiming to determine the existence of a statistical relationship between the independent variables and the dependent variable.

To assess the study's assumptions, null hypotheses will be proposed and tested. for acceptance or rejection. In cases where the significance value (sig) is greater than the specified 5% level, the null hypothesis (H0) will be accepted. Conversely, if the significance value falls below this level, the null hypothesis will be rejected.

#### IV-4-1 First hypothesis test results:

H0: There is no statistically significant moral correlation of human resource skills with the development of Social Security Fund services.

H1 : There is a statistically significant moral correlation of human resource skills with the development of Social Security Fund services.

We verify if the hypothesis is correct through the following table

**Table 6. First hypothesis test results**

The variable	R	R <sup>2</sup>	Test F	SIG	Coefficient $\beta$	T T-est	SIG
hypothesis 1	0.757	0.635	90.246	0.00	0.629	8.498	0.00

The results indicate that the value of the correlation coefficient  $R = 0.757$  is statistically significant, reflecting a strong association between the first independent variable and the dependent variable.

- The coefficient of determination ( $R^2$ ) value of 0.635 represents the explanatory power of the independent variable, accounting for 63,5% of the variance in the dependent variable, which is considered hig.
  - The T-test result reached a value of 8.498 at the significance level of 0.00, indicating the presence of an impact relationship between the two variables.
  - The  $\beta$  coefficient, recorded at 0.629, reflects a positive and statistically significant effect.
- As a result the null hypothesis is not supported while the alternative hypothesis is validated confirming a statistically significant relationship between human resource skills and the development of Social Security Fund services..

#### IV-4-21 Test results for the second hypothesis:

H0: "There is no statistically significant moral correlation of technologies and infrastructure with the development of the Social Security Fund's services"

H1:" There is a statistically significant moral correlation of technologies and infrastructure with the development of the Social Security Fund's services"

Evidence supporting the hypothesis is provided by the information displayed in the following table :

**Table 7. Test results for the second hypothesis**

The variable	R	R <sup>2</sup>	F- Test	SIG	Coefficient $\beta$	T- Test	SIG
Hypothesis 2	0.817	0.618	11.58	0.00	0.627	3.165	0.00

By analyzing the results of the test measuring the impact relationship between the two variables, a strong correlation was confirmed, with a correlation coefficient of  $R = 0.817$

- The coefficient of determination ( $R^2$ ) was 0,618 indicating that the second dimension is capable of explaining 61.8% of the changes occurring in the dependent variable. This result is statistically significant at the 0.05 significance level.
- Additionally, the T-test value reached 3.165, indicating a strong effect with a significance level of 0.00, which is lower than 0.05.
- The  $\beta$  coefficient is 0.627, indicating a positive and significant impact.

- The null hypothesis is rejected, and the alternative hypothesis is accepted, which states that" There is a statistically significant moral correlation of technologies and infrastructure with the development of the Social Security Fund's services ".

#### IV-4-3 Third hypothesis test results:

H0: There is a no significant moral correlation of data with the improvement of the Social Security Fund's services"

H1: "There is a significant moral correlation of data with the improvement of the Social Security Fund's services"

The accuracy of the hypothesis is verified using the following table:



**Table 8. Test results for the third hypothesis**

The variable	R	R <sup>2</sup>	F-Test	SIG	Coefficient $\beta$	T- Test	SIG
Hypothesis3	0.628	0.387	77.796	0.00	0.581	8.869	0.00

The correlation factor recorded a value of  $R = 0.628$ , indicating a solid relationship between the third independent variable and the dependent variable

- Determination values  $R^2 = 0.3870$  demonstrated the explanatory power of the variables of the autonomous variable on the dependent variable.
- The T test value of 8,869 at an indicative level of 0.00 is less than 0.05. The results are therefore acceptable.
- The degree of  $\beta$  coefficient is 0.581, signifying a positive and substantial impact.
- Based on these findings, the null hypothesis is rejected, and supporting the alternative hypothesis

## V- Conclusion:

In our research, we identified the following key findings:

- Digital transformation plays a crucial role in accelerating and optimizing processes, which leads to increased productivity, cost reduction, and shorter completion times for tasks.
  - Digital transformation technologies are highly effective in strengthening data security, enhancing transparency, and fostering trust in the execution of transactions.
  - The Social Security Fund possesses advanced infrastructure that supports sophisticated applications and digital platforms, significantly improving its ability to offer new services that effectively address the needs of its participants.
- A statistically significant relationship exists between human resource skills and the development of Social Security Fund services, thereby supporting the validity of the first hypothesis.
- The findings revealed that the that the use of modern technology significantly contributed to improving the Fund's activities, which supports and confirms the second hypothesis.
  - A notable correlation between use of data and the enhancement of Social Security Fund services has been established, supporting the third hypothesis.

### - Recommendations

- Fund management should pay great attention to providing high quality training programs for old employees, with the aim of enhancing their ability to use modern technologies efficiently.
- Launch awareness campaigns online and media to demonstrate how to benefit from digital services, use applications and the organization's website.
- The establishment of an integrative system linking social security institutions and other governmental systems, ensuring the rapid and secure exchange of data and contributing to the provision of integrated services to citizens.

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