Digital Transformation in Humanitarian Organizations: From Traditional Relief to Digital Humanitarian Response. The Case of the United Nations World Food Programme (WFP)

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Abstract

In recent years, organizations across different sectors have increasingly adopted digital technologies, driven by rapid advances in information and communication technology (ICT) and growing reliance on data and digital platforms. This transformation has introduced new approaches to management and organizational practices as part of the broader shift toward digital transformation. This study examines the current state of digital transformation in humanitarian organizations and its implications for their organizational structures, operational efficiency, and effectiveness in responding to humanitarian needs. It also identifies the main challenges associated with this transformation, using a descriptive-analytical approach and a case study of the United Nations World Food Programme (WFP). The study concludes that digital transformation has become a strategic necessity for humanitarian organizations to improve the efficiency of their operations, strengthen transparency and coordination, and accelerate their response to crises and disasters. However, making the most of digital transformation depends on the ability of these organizations to address the challenges they face in adopting and implementing digital technologies.

Keywords: Digital Transformation, Humanitarian Organizations, Traditional Relief, Digital Humanitarian Response, United Nations World Food Programme (WFP)

La transformación digital en las organizaciones humanitarias: de la asistencia tradicional a la respuesta humanitaria digital. El caso del Programa Mundial de Alimentos (PMA) de las Naciones Unidas

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Resumen

En los últimos años, organizaciones de diversos sectores han incorporado cada vez más tecnologías digitales, impulsadas por el rápido avance de las tecnologías de la información y la comunicación (TIC) y por el uso creciente de datos y plataformas digitales. Esta transición ha dado lugar a nuevos enfoques de gestión y a cambios en las prácticas organizativas, como parte de un proceso más amplio de transformación digital. Este estudio examina el estado actual de la transformación digital en las organizaciones humanitarias y sus implicaciones para sus estructuras organizativas, su eficiencia operativa y su capacidad para responder eficazmente a las necesidades humanitarias. Asimismo, identifica los principales desafíos asociados a este proceso mediante un enfoque descriptivo-analítico y un estudio de caso del Programa Mundial de Alimentos (PMA) de las Naciones Unidas. El estudio concluye que la transformación digital se ha convertido en una necesidad estratégica para que las organizaciones humanitarias mejoren la eficiencia de sus operaciones, refuercen la transparencia y la coordinación y agilicen su respuesta ante crisis y desastres. Sin embargo, el pleno aprovechamiento de sus beneficios depende de la capacidad de estas organizaciones para afrontar los desafíos que plantea la adopción y la implementación de tecnologías digitales.

Palabras clave: transformación digital, organizaciones humanitarias, asistencia humanitaria tradicional, respuesta humanitaria digital, Programa Mundial de Alimentos (PMA) de las Naciones Unidas.

Introduction

In recent years, the world has undergone rapid transformations driven by significant advances in information systems and digital technologies. These developments have led to growing reliance on digital technologies in the planning and implementation of programs and initiatives across both the public and private sectors. In this regard, international organizations have increasingly been required to reconsider their traditional working methods and develop administrative and organizational practices that are better able to adapt to the digital environment. This includes integrating modern technologies and adopting more comprehensive approaches based on digital transformation, thereby enhancing organizational efficiency and effectiveness and improving their ability to respond to rapidly changing conditions and emerging challenges.

While digital transformation has reshaped the work of international organizations in general, its impact is particularly evident in the humanitarian sector, given the nature and complexity of humanitarian crises and the need for rapid response. The rapid development of digital technologies has provided humanitarian organizations with new opportunities to rethink approaches to crisis management and aid delivery, moving from traditional relief models based on direct field operations toward approaches that rely more heavily on data, digital platforms, and advanced technologies. Digital transformation is therefore no longer simply a means of improving the administrative performance of humanitarian organizations; it has become an essential component of developing humanitarian response mechanisms, contributing to a shift toward a new model that can be described as "digital humanitarian response."

Within this context, the United Nations World Food Programme (WFP) stands out as a prominent example of the use of digital transformation in the humanitarian sector. By integrating digital technologies into its response mechanisms and the management of humanitarian operations, the WFP has strengthened its ability to reach affected populations, improve its operations, and respond to humanitarian crises more rapidly and effectively.

Study Objectives:

- To analyze the extent to which humanitarian organizations have adapted to the digital environment and identify the changes in their working methods and management mechanisms for humanitarian response.
- To analyze the impact of digital transformation on the institutional structure of humanitarian organizations and the changes it has brought about in management, coordination, and governance practices.
- To identify the main features and requirements of the transition from the traditional relief model to the digital humanitarian response model, and to examine the role of digital technologies in improving the speed and effectiveness of humanitarian response.
- To analyze the United Nations World Food Programme (WFP)'s experience in digital transformation as a prominent example of integrating digital technologies into humanitarian operations.

Research Problem : This study seeks to answer the following main research question:

To what extent has digital transformation contributed to enhancing the efficiency of humanitarian operations within humanitarian organizations and facilitating the transition from the traditional relief model to the digital humanitarian response model?

To answer this research problem, the following sub-questions are posed:

- What are the main manifestations of digital transformation, and how have humanitarian organizations adapted to the requirements of the digital environment?
- How has digital transformation contributed to developing the institutional structure and patterns of management and coordination in humanitarian organizations?
- How have digital technologies contributed to developing humanitarian response mechanisms and moving them toward a faster and more effective model?
- What are the key challenges facing humanitarian organizations in their transition toward digital humanitarian response?

- What are the main manifestations of digital transformation in the experience of the United Nations World Food Programme (WFP)?

Research Hypotheses: To address the main research question of this study and its sub-questions, the following hypotheses were adopted:

- Main Hypothesis: Digital transformation has contributed to enhancing the efficiency of humanitarian organizations, gradually shifting their operations from the traditional relief model toward a more integrated and flexible model based on digital humanitarian response, despite the institutional, technical, and field challenges associated with this transformation.

- Sub-Hypotheses:

- The adoption of digital technologies has contributed to changing the working methods of humanitarian organizations by developing management and coordination practices, improving resource management, and increasing reliance on data.

- Digital transformation has contributed to improving the speed of access to information, identifying needs, directing resources, and communicating with beneficiaries, thereby enhancing the efficiency of humanitarian response.

Research Methodology: This study is based on two main methodological approaches:

- Descriptive-Analytical Approach: Which was employed to examine and analyze the phenomenon of digital transformation in humanitarian organizations by describing the main manifestations of the use of digital technologies in humanitarian work and analyzing their impact on management and coordination practices and on mechanisms for responding to various humanitarian needs. It was also used to analyze the main challenges that may limit the effectiveness of digital transformation in humanitarian organizations.

- Case Study Approach: This was adopted to analyze the experience of the United Nations World Food Programme (WFP) and examine how it uses data, platforms, and various digital technologies in managing its humanitarian operations, providing insight into the transition from traditional relief practices to the digital humanitarian response model.

Structure of the Study: In order to examine the role of digital transformation in enhancing the efficiency of humanitarian organizations and facilitating the transition from the traditional relief model to the digital humanitarian response model, this study is structured around four main sections:

1. The Conceptual Framework of Digital Transformation and Humanitarian Work of the Humanitarian Organizations.

2. Manifestations of Digital Transformation in Humanitarian Organizations.

3. Challenges of Digital Transformation in Humanitarian Organizations.

4. The Experience of the United Nations World Food Programme (WFP) in Integrating Digital Transformation into Its Humanitarian Work.

1. The Conceptual Framework of Digital Transformation and Humanitarian Work of the Humanitarian Organizations.

Understanding digital transformation in humanitarian organizations and the changes taking place in their work in the areas of relief, aid delivery, and the promotion of human rights requires clarifying the key concepts associated with it. Accordingly, this section examines the concept of digital transformation and the concept of humanitarian organizations, in addition to the concept of humanitarian work and its evolution in the context of the growing use of digital technologies.

1.1. The Concept of Digital Transformation:

In an era defined by advanced technologies and rapid digital innovation, public and private sector institutions are increasingly seeking ways to modernize their operations and enhance organizational efficiency. This involves rethinking traditional working methods and transforming them into interconnected and more effective digital processes. Accordingly, terms such as “digitization” and “digital transformation” have become increasingly common in academic and professional discourse.

Digital transformation has been given several definitions:

- Michael Wade defines it as: “bringing about organizational change through the use of digital technologies and business models to improve performance” (as cited in Karkat & Laachab, 2023, p. 238). This definition highlights that the process involves systemic changes in organizational structure and operational methods rather than just adopting new technology.
- It is also defined as: “the orientation of institutions—whether for-profit, such as banks and commercial and industrial enterprises, or non-profit, such as schools, universities, and various governmental institutions—toward employing information technology in conducting their activities, relying on the electronic exchange of data across computer networks, particularly the Internet” (Mostafa, 2022, pp. 19–20). This definition focuses on the practical and technical dimension of digital transformation, highlighting the importance of the technical dimension in the transformation process and the role of technology in reorganizing and facilitating institutional processes and functions.
- It is likewise defined as: “a process of change associated with the application of digital technology to bring about a fundamental transformation in working methods and in the delivery of services to beneficiaries, in a faster and higher-quality manner. It also represents an integrated organizational transformation aimed at facilitating administrative procedures and improving their quality, in order to reach advanced levels of digital maturity” (Khawathra, 2021, p. 109). This definition is more comprehensive than the preceding ones, as it does not confine digital transformation to the use of technology, but rather views it as an integrated process of institutional change aimed at reconsidering working methods, administrative procedures, and service delivery mechanisms.

In general, digital transformation can be understood as the process through which activities, operations, and services are shifted from their traditional form to a new digital form based on modern technologies and the integration of digital technologies into all aspects of work within institutions, in order to improve performance, increase efficiency, and promote innovation.

In order to define the concept of Digital Transformation precisely, it is necessary to distinguish it from Digitization. Digitization refers to the process of converting information and content from their traditional paper-based form into electronic formats that can be processed by computer systems and software. For example, when an institution converts its paper archives into PDF files or digital databases, or uses scanners to transform paper documents and contracts into digital images, it is engaging in digitization (Gradillas & Thomas, 2025, pp. 120–121). Digital transformation, however, goes beyond this narrow technical dimension, as it represents a broader and more comprehensive institutional process that involves the redesign of operating models and changes in organizational culture to keep pace with the requirements of the digital age (Kotb, 2025).

It can thus be said that the importance of digitization lies in its ability to transfer data from analog formats to digital formats that can be stored and processed using computers and various digital technologies. This facilitates access to and sharing of information and increases efficiency and productivity. Digitization is therefore considered a preliminary step toward digital transformation and helps establish its foundations through the integration of digital technology to bring about comprehensive change across all aspects of institutional work.

1.2. Concept of Humanitarian Organizations:

Humanitarian organizations are defined as international organizations engaged in the fields of relief and humanitarian assistance. They seek to protect individuals and safeguard their rights through legal and peaceful means, while promoting and strengthening the values and culture of human rights worldwide (Bounoua, 2016, p. 56). Accordingly, the protection of human rights constitutes one of the key areas of activity of humanitarian and human rights organizations, through an integrated set of mechanisms and practices aimed at preventing, monitoring, and addressing violations. These activities include monitoring and observation, fact-finding and investigations, preparing reports, advocating with decision-makers, informing public opinion and seeking to mobilize its support, as well as caring for and supporting victims of violations and proposing significant changes to relevant national and international laws and policies concerning human rights (Bounoua, 2016, p. 56).

Based on this comprehensive understanding of humanitarian organizations, their primary purpose can be seen as combining two complementary dimensions: first, providing relief and assistance to populations affected by crises and disasters; and second, protecting, promoting, and defending human rights. Together, these dimensions contribute to safeguarding human dignity and meeting people's basic needs, regardless of the circumstances in which they live.

Within this context, two main types of humanitarian organizations can be distinguished based on their legal nature and sources of funding: Non-Governmental Organizations (NGOs) and Intergovernmental Organizations (IGOs).

- Humanitarian Non-Governmental Organizations (NGOs): These organizations are among the key actors in the humanitarian field, given their important roles in providing assistance, protecting and promoting human rights. They also contribute to spreading and strengthening a culture of human rights at the global level. Their relative independence, flexibility, and ability to intervene rapidly enable them to perform certain tasks that governments may be unable or unwilling to undertake.

- Intergovernmental Humanitarian Organizations (IGOs): These are institutions established by states through international agreements or charters. They include a number of agencies and programs of the United Nations, such as the World Food Programme (WFP) and the United Nations High Commissioner for Refugees (UNHCR). Although, by virtue of their nature, they are subject to institutional procedures and frameworks that may affect the speed of their action and constrain it to some extent compared with non-governmental organizations, they possess resources and institutional capacities that enable them to carry out lar0ge-scale humanitarian operations. This is particularly evident as they benefit from rapid developments in digital technologies to improve their working methods, strengthen their ability to reach areas with larger numbers of affected people, and respond to crises with greater speed, flexibility, and efficiency.

1.3. Concept of Humanitarian Work: From Traditional Relief to Digital Humanitarian Response:

From a Western perspective, humanitarian work is defined as activity aimed at providing assistance and relief to individuals facing threats to their lives, such as hunger, killing, disease, displacement, natural disasters, and other hazards that threaten human life and affect their right to live with dignity. It is based on a set of values and principles, namely humanity, integrity, neutrality, and independence (Bouzidi, 2023, p. 19).

Humanitarian work did not emerge as a distinct field until after the end of the Cold War and the transformations that accompanied it, which brought about a qualitative shift by turning it into an independent field. Its scope expanded and its importance increased at the international level, alongside the growing number

of international organizations and the development of coordination mechanisms among them. In earlier periods, humanitarian work had previously been associated with relief operations of a voluntary and ethical nature, carried out through individual initiatives or limited institutional efforts without clear coordination mechanisms among them, as in the activities of the International Committee of the Red Cross, Doctors Without Borders and Oxfam, it gradually moved during this period toward greater specialization and institutionalization. It also became more professional and systematic as a result of the social dynamics, legal rules, and institutional standards surrounding it (Barnett, 2005, pp. 723–725).

The transformation experienced by the field of humanitarian work necessitated a reformulation of its concept and functions. This occurred amid the political and institutional environment surrounding humanitarian organizations, which was reflected in their roles and practices: these organizations were no longer limited to relief work and the provision of assistance, but gradually expanded the scope of their objectives and areas of intervention to include, alongside relief, concern for human rights and their defence. This reflects the broadening concept of humanitarian work and the evolving functions of its actors (Barnett, 2005, pp. 723–725).

The development of humanitarian organizations' work was not limited to expanding their areas of intervention and diversifying their functions; it also extended to developing crisis response mechanisms, in light of the increasing number and complexity of crises and the diversity of the needs of affected populations. This created a need for responses that were simultaneously faster, more flexible, and more efficient. With the rapid development of information and communication technologies, humanitarian organizations began deploying technical tools across all stages of response, ranging from data collection and needs assessment to coordination, resource management, and ultimately the delivery of assistance and the monitoring of intervention outcomes (Shalash et al., 2022), his gave rise to what became known as "digital humanitarian response," which represents an extension of the development of humanitarian work and its gradual transition from the traditional relief model toward a model that relies more heavily on technology and digital communication. This transition is reflected in various applications of digital technologies, such as digital and biometric identification for registering and verifying beneficiaries, the use of geographic mapping to understand risks and needs, and the use of social media to disseminate information and communicate with beneficiaries (Bryant, 2022, pp. 6–10). Together, these applications contribute to faster response, in particular, and to the promotion of human rights, more broadly.

2. Manifestations of Digital Transformation in Humanitarian Organizations

International organizations operating in the humanitarian field are undergoing increasing structural transformations as a result of the rapid development of digital technologies. The use of technology is no longer merely a technical option for improving efficiency and performance; rather, it has become an institutional transformation that is reshaping models for managing humanitarian work and its various mechanisms. In this context, digital transformation has brought about fundamental changes in the internal structures of humanitarian organizations and the ways in which their work is organized. It has contributed to a gradual shift from traditional working models based primarily on procedures and direct field interventions toward approaches that rely more heavily on digital tools. The main manifestations of this transformation can be highlighted as follows:

2.1. Restructuring Organizational Structure:

Digital transformation has contributed to rethinking traditional organizational structures based primarily on functional divisions and moving toward more flexible and dynamic structures that rely on information flows and

continuous interaction with internal and external developments, thereby enhancing organizational efficiency and effectiveness (Ahmed & Abdel Fattah, 2020). This has been reflected in the emergence of new organizational units and departments responsible for functions associated with the digital environment, such as digital analytics units, artificial intelligence units, information security and protection offices, and teams specializing in big data management, risk analysis, and risk visualization.

2.2. Strengthening Crisis Response Capacity:

Digital transformation has contributed to developing decision-making mechanisms within humanitarian organizations through increased reliance on real-time data and information to monitor crises, assess risks, and identify needs. The use of forecasting tools and platforms has also made it possible to anticipate potential risks and disasters, support early warning and early intervention measures, and shift from responding to crises after they occur toward a more proactive approach capable of mitigating their impacts. This development reflects a shift in humanitarian work from a reactive approach to one based on anticipation and forecasting (Alcayna et al., 2025), highlighting the growing role of digital technologies in reshaping crisis and disaster management.

2.3. Improving Humanitarian Supply Chain Management:

Digital transformation has contributed to saving time and effort and enhancing the efficiency of humanitarian supply chain management through the use of modern digital technologies and artificial intelligence applications at various stages of the process. A humanitarian supply chain refers to an interconnected network of organizations, processes, and activities aimed at delivering assistance and relief supplies to populations affected by crises, beginning with needs identification and quantity estimation, followed by procurement, logistics operations, and storage, and ultimately the distribution of assistance to beneficiaries. Accordingly, this supply chain can be understood as a complex system that requires a high degree of speed, efficiency, and flexibility under the exceptional conditions that characterize crises and disasters (Marić et al., 2022).

Digital transformation has enabled the use of a range of modern technologies to develop this area, most notably blockchain technology, which can be used to track assistance and relief supplies and enhance transparency in donation and resource distribution processes. This technology is based on recording transactions and data in a distributed manner across a network of devices within what is known as a peer-to-peer network. Algorithms are used to verify and authenticate transactions and record them in interconnected blocks that form a chain, making their records difficult to alter or manipulate. This can help reduce the risks of corruption and enhance transparency and trust in the management of humanitarian resources (Laitim, 2022, p. 1230). In this context, the United Nations Children's Fund (UNICEF) began exploring the potential of blockchain technology in 2017 for storing and transferring information in a more transparent manner, while also developing smart contracts with its partners in the areas of financing, donations, and humanitarian assistance (Laitim, 2022, p. 1233). The use of technologies such as blockchain therefore represents one of the most important applications of digital transformation in the humanitarian field, given its potential to improve the efficiency of humanitarian resource management and strengthen trust among organizations, donors, and beneficiaries.

2.4. Developing Coordination and Cooperation Mechanisms among Humanitarian Actors:

The impact of digital transformation is evident in the strengthened capacity of international organizations operating in the fields of human rights and humanitarian work to coordinate, cooperate, and exchange information, particularly with regard to the planning and management of humanitarian assistance. Shared

digital platforms and tools have made it possible to accelerate the flow of information and facilitate its exchange among different actors, thereby supporting faster decision-making and more effective responses to humanitarian needs. The Inter-Agency Standing Committee (IASC) is particularly prominent in this area as a key mechanism for coordination among humanitarian agencies at the international level. It operates under the leadership of the United Nations Emergency Relief Coordinator and provides a framework for coordinating humanitarian policies and efforts and promoting greater coherence in the international response to crises (Lotfi et al., 2016). The use of digital tools and platforms to support coordination and communication among humanitarian partners, therefore, contributes to greater integration and effectiveness in crisis management and response to humanitarian needs.

3. Challenges of Digital Transformation in Humanitarian Organizations

Despite the significant contributions that digital transformation has made to improving the performance efficiency of humanitarian organizations and developing their crisis response mechanisms, the transition to digital systems has been accompanied by a number of challenges that have affected the extent to which their potential can be fully employed. These challenges are multidimensional, encompassing financial resources, infrastructure, and human capacities, as well as issues related to cybersecurity, data protection, and the ethical and legal considerations associated with the use of digital technologies in humanitarian work.

3.1. Limited Financial Resources:

The high cost of digital transformation represents one of the main challenges facing humanitarian organizations, particularly non-governmental organizations (NGOs), which rely heavily on donations for their funding. Digital transformation requires the provision of modern devices, equipment, and software, in addition to the continuous development and updating of digital systems, thereby placing additional financial burdens on these organizations.

3.2. Limited Digital Capacities:

Digital transformation in humanitarian organizations requires human resources with specialized digital skills who are capable of managing new technologies and applying them across different areas of humanitarian work. A shortage of such capacities may slow the transformation process, in addition to the possibility of internal resistance to change among some employees who are accustomed to traditional working methods (Frost et al., 2022, pp. 1, 14).

3.3. Weak Infrastructure and Digital Connectivity:

Humanitarian organizations face the challenge of inadequate infrastructure in a number of their areas of operation, particularly those affected by conflicts and disasters, where communication networks and internet services may be limited or unstable. This affects humanitarian organizations' ability to operate digital platforms and exchange data and information promptly, and may also hinder coordination among humanitarian groups and teams.

3.4. Cybersecurity and Humanitarian Data Protection:

With the increasing reliance on digital systems and platforms, humanitarian organizations have become more exposed to cyber risks, including database breaches, information theft, and the leakage of personal data relating to beneficiaries and staff, as well as contact details and information concerning the locations and

needs of affected populations (Boujemaa, 2025, p. 403). Accordingly, any breach of such data may have consequences that extend beyond the technical dimension. It may threaten the safety of beneficiaries, undermine the principle of confidentiality, weaken the trust of local communities in humanitarian organizations, and affect their ability to safely reach affected populations.

3.5. Ethical and Legal Challenges Associated with the Use of Data:

The inappropriate use of humanitarian data may compromise the privacy of beneficiaries, expose them to monitoring and tracking by parties outside the organization, or result in their information being exploited for political or commercial purposes. Some incidents have highlighted the seriousness of these risks, including the cyberattack targeting the International Committee of the Red Cross (ICRC) and the network of Red Cross and Red Crescent national societies in 2022, which resulted in the breach of personal data relating to more than 500,000 people (Marelli, 2022, pp. 1267–1269).

Despite these challenges associated with the digital transformation of humanitarian organizations, many organizations have succeeded in developing strategies and employing modern technologies to adapt to the requirements of the digital environment and achieve high levels of speed and efficiency in humanitarian response. The United Nations World Food Programme (WFP) represents one of the prominent examples in this field, having developed numerous digital programs and applications that have helped it improve its approaches to managing assistance and responding to humanitarian needs.

4. The Experience of the United Nations World Food Programme WFP in Integrating Digital Transformation into Its Humanitarian Work.

The World Food Programme (WFP) is one of the major humanitarian organizations that have employed digital transformation to develop their working mechanisms and strengthen their capacity to respond to humanitarian needs. The Programme was established in late 1961, with a primary mandate to combat hunger and promote food security worldwide. In pursuit of its goal of ending hunger by 2030, the Programme has adopted a range of digital technologies and solutions that have helped it improve its methods of data collection and analysis and enhance the efficiency of its response. The most prominent manifestations of this approach can be summarized in the following programs and technologies:

4.1. The Use of Blockchain Technology:

The World Food Programme has adopted **blockchain** technology to develop digital solutions for the delivery of food assistance. One of its most prominent applications was its use with Syrian refugees in Jordan, benefiting more than 100,000 Syrian refugees. This initiative enabled refugees to obtain food items from local stores using iris-scanning technology instead of cash payments, with purchases and transfers recorded digitally within a blockchain-based system (Laitim, 2022, p. 1233). This has contributed to enhancing the speed and transparency of assistance delivery and enabling it to be managed more efficiently and securely.

4.2. The Launch of the “HungerMap Live” Platform:

The World Food Programme has developed a global system for monitoring hunger and food security, providing near-real-time data on food security conditions in more than 90 countries. The platform combines a wide range of indicators related to food consumption patterns, nutrition, conflicts, risks, climate, and economic conditions, making it possible to monitor hotspots of food insecurity, analyze their developments, and anticipate their potential trends. The platform also enables data to be presented interactively, thereby

supporting decision-making and the identification of areas most in need of humanitarian intervention (World Food Programme [WFP], 2026).

4.3. The EMPACT Programme:

The EMPACT Programme represents one of the digital initiatives launched by the World Food Programme with the aim of enhancing employment and income opportunities for refugees and young people in host countries. It does so by providing them with digital skills and preparing them to benefit from online employment opportunities and the freelance economy through short and targeted training courses. The programme has contributed to integrating thousands of beneficiaries into the digital labor market (Heinrich, 2021, p. 97). It is evident that the programme has achieved a number of positive outcomes, as increasing employment opportunities for many young people enhances their ability to achieve financial independence and reduces their reliance on humanitarian assistance.

4.4. The Use of Electronic Wallets in Assistance Delivery:

The World Food Programme has adopted this technology to facilitate the delivery of financial assistance to beneficiaries, enabling them to receive **assistance** through electronic wallets. An electronic wallet is a digital financial account accessed through a mobile phone to send and receive money and make purchases electronically. This technology has been gradually introduced among Syrian refugees in Jordan since 2022 (United Nations High Commissioner for Refugees, n.d.). Electronic wallets therefore provide a more flexible alternative to traditional assistance distribution mechanisms, contributing to faster delivery of assistance and improved management of financial transfers.

4.5. The SCOPE CODA Smart Card Application:

The World Food Programme has developed digital solutions for managing beneficiary data through the SCOPE CODA system, which enables the creation of an electronic database linked to beneficiaries and its use in managing assistance and providing humanitarian and health workers with the necessary information. Partners, including governments, United Nations agencies, and non-governmental organizations, can also make use of this data to strengthen coordination and information sharing and support the identification of beneficiaries' health and nutritional needs, particularly those of children (WFP Innovation, 2025).

4.6. The Emergency Services Marketplace Platform:

The World Food Programme (WFP) launched the Emergency Services Marketplace to enable humanitarian organizations to access a range of logistical services required to carry out humanitarian response operations. The importance of this platform became particularly evident during the global response to the COVID-19 pandemic, when the WFP provided transportation and supply services to humanitarian organizations through strategic logistics hubs (Heinrich, 2021, p. 97). This digital solution helped ensure the continuity of humanitarian supply chains amid the restrictions imposed during the pandemic.

4.7. The H2Grow Hydroponics Initiative:

The WFP has employed the H2Grow initiative to strengthen resilience and improve food security. The initiative involves training local communities to establish hydroponic farming systems that allow vegetables and animal feed to be produced in resource-constrained environments. Digital platforms and educational tools have been adopted to transfer knowledge and techniques related to this type of farming to beneficiaries (WFP, 2020, p.

66). The initiative therefore strengthens communities' capacity to produce food locally and adapt to challenging environmental and economic conditions.

4.8. The "ShareTheMeal" Mobile Application:

The WFP developed the "ShareTheMeal" mobile application to facilitate individuals' participation in financing food assistance through mobile phones. The application enables users to make digital donations directed toward supporting various WFP activities, including school feeding programmes, resilience-building initiatives, and responses to food emergencies (WFP, 2023). The application represents an example of the use of digital technology to broaden the base of contributors to humanitarian work, facilitate the donation process, and reach people across different parts of the world.

Overall, it can be said that the preceding digital experiences of the United Nations World Food Programme reveal that digital transformation within the Programme has not been limited merely to the introduction of new technological tools, but has extended to encompass the various stages of humanitarian work — beginning with data collection, analysis, and needs forecasting, proceeding through the management of assistance, resources, and supply chains, and culminating in the delivery of assistance and the participation of individuals from various parts of the world.

This has contributed to a gradual transition from the traditional response model toward what may be termed "digital humanitarian response," wherein reliance on data and technology enhances response speed, improves the accuracy of resource allocation, and increases the efficiency of humanitarian operations.

Conclusion:

In conclusion, this study demonstrates that digital transformation has become one of the fundamental pathways of humanitarian work. It is no longer merely a technical option for improving certain procedures, but has evolved into an institutional approach that influences the various stages of humanitarian response management and contributes to improving its overall quality. The deployment of digital technologies—including artificial intelligence, data analysis, and digital platforms—has contributed to enhancing response speed and decision-making accuracy, improving the efficiency of resource management, and expanding access to affected populations. The experience of the United Nations World Food Programme (WFP) provides evidence of this, demonstrating that the adoption of digital transformation can have a tangible impact on the efficiency of humanitarian response. This experience further confirms that the true value of digital transformation lies not in the possession of technology itself, but in the capacity to integrate it into a coordinated institutional model that serves humanitarian objectives.

This study has reached a set of findings, which can be summarized as follows:

- Digital transformation is not merely a technical update, but an institutional approach whose impact extends to organizational structures, decision-making mechanisms, and resource management.
- Reliance on modern technologies has contributed to enhancing the efficiency of humanitarian response by accelerating the collection and analysis of information, supporting early warning systems and pre-emptive response measures, and improving the identification of needs and the allocation of resources to the most affected populations.
- Humanitarian organizations have become able to reach a wider range of beneficiaries through the use of digital applications and platforms, which have made humanitarian assistance delivery more flexible and faster.
- Digital transformation faces a set of constraints and challenges that may slow its progress and limit its effectiveness, most notably the high costs of investment in digital infrastructure and technologies, the limited availability of digital competencies, and weak telecommunications infrastructure in some countries. In addition,

the risk of data leakage or breaches may threaten the safety and privacy of beneficiaries, consequently undermining trust in humanitarian organizations.

Based on these findings, and in light of the challenges associated with the transition toward digital humanitarian response, this study puts forward the following recommendations:

- Digital investments in technology, data systems, and various artificial intelligence tools must be prioritized, in order to overcome the risks associated with the shift toward digital transformation in humanitarian organizations.
- Humanitarian organizations must develop innovative solutions to protect themselves and their digital data, by engaging partners with high levels of expertise in cybersecurity, and allocating a portion of the financial resources granted to them toward developing their digital infrastructure and information security strategies.
- The process of digital transformation should be accompanied by clear safeguards ensuring the responsible use of data, respect for privacy, and adherence to the principles of human rights protection.
- The success of digital transformation in humanitarian organizations is not merely a matter of introducing modern technologies into working systems; rather, it requires building integrated institutional capacity that combines adequate resources and infrastructure, the development of digital competencies, strengthened cybersecurity, and the establishment of clear ethical and legal frameworks for the protection of data and beneficiaries.

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