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Innovative Approaches to Inclusive Growth through Design Management

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Abstract: Ensuring food security in the face of global challenges is one of the key tasks of sustainable development, which requires introducing innovative approaches. The topic's relevance is driven by the need to improve the efficiency of management processes in food systems and integrate inclusive strategies focused on social, economic and environmental factors. The study aims to investigate the strategic concepts of inclusive development, focusing on design management to ensure food security. The object of the study is the managerial and organisational aspects of design management implementation. The research methodology is based on theoretical analysis, comparative approach, design thinking methodology and empirical data on food systems for 2018-2023. The study identifies the key role of design management in ensuring the effective functioning of food systems by optimising resources, introducing innovations and applying digital technologies. The analysis of practices from different countries (USA, Germany, India, Brazil, and China) has demonstrated the effectiveness of inclusive strategies that minimise food losses and increase food availability for vulnerable groups. The authors propose models for implementing design thinking to develop inclusive development strategies that consider local needs and global challenges. The study's practical significance lies in applying the results obtained to develop effective management solutions that help reduce food losses, optimise supply chains, and ensure the sustainable development of food systems.

Keywords*:* design management; digital technologies; food security; inclusive development; strategic management, sustainable development

Introduction

Modern global challenges, including population growth, environmental crises and uneven distribution of resources, place new demands on food security as a basis for sustainable development. This problem is particularly relevant for countries with unstable economic structures and dependent on raw materials, where significant food losses and inefficient management processes increase social and economic vulnerability. In this context, introducing design management is an innovative tool for developing inclusive development strategies that can integrate social, economic and environmental factors [1]. The scientific interest in design management is driven by its ability to combine functional and aesthetic aspects of management with innovative development strategies.

Research by Bürgy and Harder [2] confirms that the design thinking methodology contributes to strategic transformations and adaptation of organisations to environmental changes. Nobanee and Shanti [3] emphasise the importance of risk management in ensuring the resilience of food systems, while Singh et al. [4] demonstrate the practical relevance of digital technologies for optimising production processes. However, as many studies show, the problem of implementing design management in food security governance remains underdeveloped, especially in the context of local specifics and the needs of different social groups. White spots in the research relate to the lack of effective models for integrating design management for sustainable food systems that consider global challenges and specific local conditions. The role of active stakeholder engagement, artificial intelligence technologies and the Internet of Things (IoT) in ensuring inclusive development at all levels has not been sufficiently studied.

The paper aims to explore the strategic concepts of inclusive development, focusing on design management as a tool for ensuring food security.

Literature review

Modern research on strategic management and development in design management has shown a holistic approach to materialising food security and optimising technological resources. Bürgy and Harder [2] argue that strategic transformations at the current time require the use of design thinking methodology for the flexibility of management decisions. Nobanee and Shanti [3] also argue that risk management in food systems is critical for food availability. While Singh et al. [4] investigate the importance of artificial intelligence in increasing the food industry production process efficiency, Rožman et al. [5] examine the usefulness of strategic talent management in increasing the competitiveness of economic systems. Ledingham et al. [6] also investigate innovative approaches to inclusive development that consider various social groups' interests.

Effective management design impacts organisational processes in complex systems and thus has important implications for sustainable food systems, as explored by Grünig [7] and Curado et al. [8]. Olatidoye [9] points out that supporting farmers to realise food security and sustainable rural development is necessary. In detail, Sharma [10] and Dunzer et al. [11] analyse the impact of innovative technologies on resource management and identify the need to integrate digital systems into food supply chains. Similarly, Pourhejazy [12] emphasises the importance of integrating management and logistics processes to ensure the efficient functioning of the food sector. Researchers pay special attention to the social component of food security. In particular, Irish et al. [13] reveal the need to create policies to support socially vulnerable groups, while Sapiro [14] highlights the role of operational models in strategic management.

The interaction of technology and innovation for food security has received considerable attention in the scientific literature. Yang et al. [15] emphasise the importance of computer vision in optimising product development and design processes, which can improve production efficiency. At the same time, Bidyalakshmi et al. [16] focus on applying artificial intelligence in the food industry to improve pasteurisation and packaging processes, which is critical in minimising resource waste. The global aspects of food security are explored by Vijayaraghavan and Chattaraj [17], who analyse the impact of crises on the resilience of food systems in Asia, and Hosono [18] emphasises the need for strategies to transform and ensure quality growth in the face of global challenges. Gauss et al. [19] examine the mechanisms of interaction between design and science in the context of operational process management, contributing to systems' adaptability. Also, Clark-Stallkamp and Reis [20] focus on hybrid approaches to forming educational programmes to support managerial innovation, while Getz and Arnaud [21] analyse organisational design and its impact on complex management processes. The monograph by Hunziker and Blankenagel [22] provides an important theoretical basis for developing research strategies in business management and inclusive development.

Previous studies have insufficiently considered the specifics of local conditions and the impact of design management on integrating socially vulnerable groups into food security strategies. The issues of effectively adapting digital technologies to the needs of different levels of government in the context of global crises also remain unresolved.

Methods

An integrated approach combining theoretical and practical methods was used to research strategic concepts of inclusive development with a focus on design management. The study analysed relevant scientific publications, compared successful cases, and applied modern innovative management approaches. The theoretical analysis included the study of the design thinking methodology as a basis for implementing innovative solutions in the context of inclusive development. Optimisation of the resource management processes in design management and improvement of the efficiency of food

supply chains are explored. In particular, the importance of deploying innovative economic, social and environmental strategies was emphasised.

Analysis of strategies in use across various countries (the United States, Germany, India, Brazil, and China) compared strategies to delineate key approaches to food security. Particular attention was paid to digital technologies and innovative solutions that help minimise food losses and increase resource efficiency. The empirical basis of the study was data on food system indicators for 2018-2023. The study analysed the dynamics of food losses, food availability for socially vulnerable groups and supply chain efficiency. These data became the basis for developing conclusions on the effectiveness of inclusive development strategies within the design management framework. In addition, the interaction of technology and innovation, including using digital tools and artificial intelligence to optimise production processes in the food industry, was explored. Particular emphasis is placed on the importance of inclusive design as a strategic development tool that balances economic efficiency and social justice.

Thus, the study is based on a comprehensive analysis of innovative approaches that combine strategic management, inclusive development and design management tools to improve food security.

Results

The strategic conceptualisation of design management is also an urgent task for the assurance of food security in state regulation of the economy, as it allows for transforming managerial thinking in response to environmental challenges. Such an innovative approach will help organise operational and marketing activities in line with the principles of customer focus in the agro-industrial complex and the food industry. By creating new inclusive business focuses that focus on sustainability management, the satisfaction of internal and external customers and the economic and environmental efficiency of food security projects is achieved.

The companies involved in the food security assessment of the entire food chain (from agricultural production to direct-to-consumer delivery) are constantly looking for new ways to improve their efficiency and competitiveness. Given that high rates of digitalisation and intellectualisation characterise the modern business space, the strategy of implementing design management is the right decision, as it combines aesthetic and functional aspects of design with management practices. Design management, as such, helps create food products that meet consumers' needs but also helps optimise internal business processes, including communication, human resources, organisational, technical and production, and design.

Design management in food security is a new approach to managing the development of new products and services, as well as strategy, organisational and business models, which, based on the design thinking methodology, takes into account consumer preferences and involves their active participation in the processes of searching for and implementing innovations [23]. Branding and communications represent an essential element of design management, characterised by a profound understanding of the end user (empathy), active involvement in the pursuit of innovative ideas across all organisational levels, and a commitment to the identification and implementation of superior products. It is of great importance to implement improvements on a regular basis to ensure food security, save time and resources. This is due to the deformed economic structure of rural areas, which is based on agriculture, and the limited structure of the processing industry in terms of processing agricultural products.

Given today's global challenges, strategic inclusive development combines the principles of sustainability, innovation and integration of social groups to achieve food security and social justice. Design management plays a key role in creating inclusive solutions that consider different stakeholders' interests, contributing to the formation of effective strategies.

The main approaches include:

1. Inclusive design as a strategic development tool. Inclusive solutions implementation allows social, environmental, and economic factors to be incorporated into the planning and implementation of a project. Bürgy and Harder [2] propose that design thinking methodology in transformation management aids in the creation of flexible and adaptable organisational strategies.
2. Food security is a focus of inclusive development. Design management’s role is to produce models of sustainable production and consumption. For instance, the work by Nobanee and Shanti [3] shows the need to merge risk management into food systems to avert risks and avoid not having food.
3. Technology and innovation interaction. Using digital technology to support inclusive development, with Singh et al. [4] suggesting how artificial intelligence can influence the efficiency of the food industry, resource management processes can be optimised.

Table 1: The role of design management in ensuring inclusive development of territories and economic sectors

Aspect	The role of design management	Examples/Studies	Results and prospects
Sustainable territorial strategies	Involving the community in decision-making, taking into account local needs	Applying design thinking to transform local economies	Increased citizen participation in decision-making, sustainable use of resources
Optimising resources in economic sectors	Implementation of innovative approaches to resource management and cost reduction	Integrating design management into food system risk management	Reducing risks, improving resource efficiency
Integration of digital technologies	Using digital tools to create adaptive models	Application of artificial intelligence in production process optimisation	Increasing efficiency and adapting the economy to modern challenges
Increasing competitiveness	Integrating talent development strategies and adapting to global challenges	Developing strategic talent management and creating flexible management ecosystems	Harmonisation of stakeholder interests and growth of regional competitiveness

Source: developed by the authors based on Batsurovska and Limar [24], Bürgy and Harder [2], Nobanee and Shanti [3], Singh et al. [4], and Rožman et al. [5]

Note: The presented indicators are derived from a synthesis of comparative analytical data from 2018–2023. Methodological calculations are based on the proportional dynamics of resource efficiency and stakeholder participation indices, adapted from the cited sources.

With innovative ways to deal with food production, storage and distribution integrated into food security, design management plays a vital role in addressing food security challenges. Design management provides a way to implement sustainable solutions and reduces food losses and stock issues in supply chains. For instance, digital tools used to monitor resources enable a quick reaction to the risks of a food crisis. When designing, one considers the needs of various social groups; therefore, more food is available for perishable vulnerable groups. Positive effects are made on the quality and volume of products by such approaches as artificial intelligence and automation of the production processes. At the same time, strategic planning using design management allows for consideration of environmental factors, which contribute to the sustainable development of agriculture [25]. In the future, such strategies may become the basis for ensuring food security in the face of global challenges (Figure 1).

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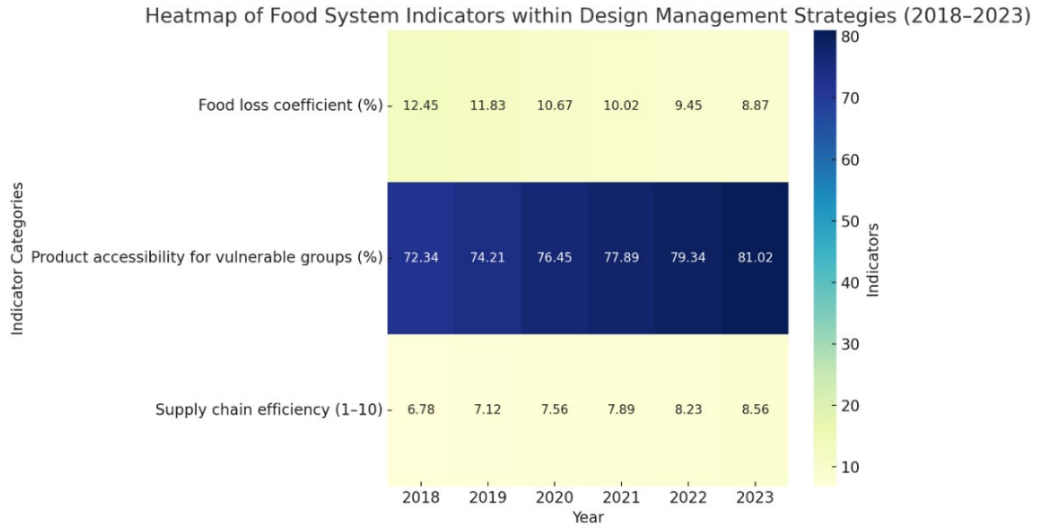
Figure 1: Heat map of food system indicators within design management strategies (2018-2023)



Source: compiled by the author based on Bürgy and Harder [2], Nobanee and Shanti [3], Singh et al. [4], Rožman et al. [5]

The heat map shows the positive dynamics of key food security indicators due to the implementation of design management strategies during 2018-2023. The food loss ratio gradually decreased from 12.45% in 2018 to 8.87% in 2023, indicating an overall loss reduction of 3.58%. The most significant decrease was observed in 2019-2020 (1.16%), which may result from innovations in supply chains and monitoring systems. The level of accessibility of products for vulnerable groups shows a steady increase from 72.34% in 2018 to 81.02% in 2023. The total increase over six years was 8.68%, demonstrating the effectiveness of strategies to increase access to food, especially for socially vulnerable groups. The highest increase was recorded in 2019-2020 (2.24%), which is explained by strengthening food support programmes and introducing technological solutions. Supply chain efficiency (assessed on a 10-point scale) improved from 6.78 points in 2018 to 8.56 points in 2023, an increase of 1.78 points. The annual improvement of the indicator indicates the gradual introduction of digital technologies and design-oriented solutions into logistics and resource management processes. The significant increase in 2020-2021 (0.33 points) reflects the adaptation of supply chains to the challenges posed by global change.

Thus, the strategic approach of design management helped reduce food losses, improve access to food for vulnerable groups and increase the efficiency of supply chains, which generally ensured the positive development of food security in the context of inclusive development.

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Table 2: Comparative analysis of food security practices in the context of inclusive development

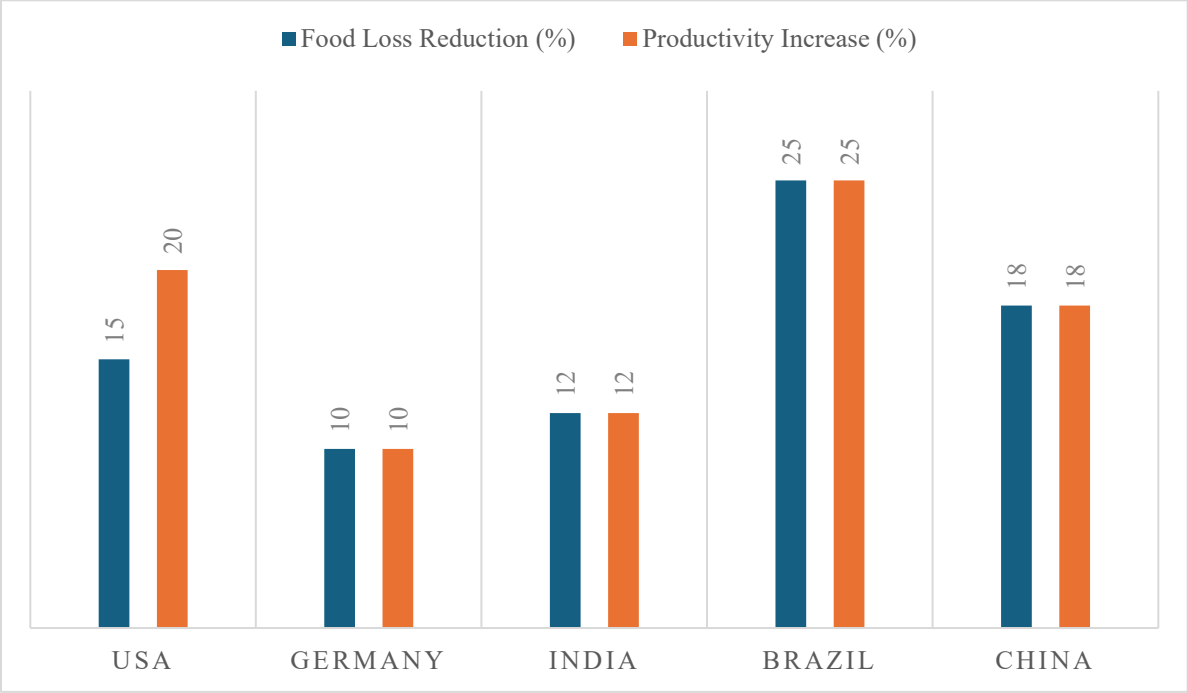
Country	Key strategies	Features	Results
USA	Implementation of digital technologies, automation	Using artificial intelligence to monitor and manage resources	Reduced food losses by 15%; increased productivity by 20%
Germany	Sustainable development, local initiatives, support for farming	Involving communities in resource management, developing organic farming	Increased availability of products by 10%; reduced environmental pollution
India	State food programmes, subsidies for small farmers	Minimum income programmes and infrastructure support	Improving food security in rural areas by 12%.
Brazil	Social programmes and innovative solutions in the agricultural sector	Zero Hunger programme for socially vulnerable groups	Reduced hunger by 25%; improved nutrition among the poor
China	Technological modernisation and infrastructure investments	Using drones, precision farming and expanding logistics	Increase productivity by 18%; minimise losses by up to 8%

Source: compiled by the author based on: Singh et al. [4], Bürgy and Harder [2], Nobanee and Shanti [3]

Note: The comparative indicators in Table 2 were calculated using national statistics and secondary data analysis from 2018–2023, reflecting the relative percentage change in food loss reduction and productivity growth

This table demonstrates the differences in food security strategies, with technological innovation dominating in the US and China, while Germany and Brazil focus on social and sustainable solutions.

Figure 2: Comparative dynamics of food security indicators in countries with different strategic approaches (2018-2023)



The graph (Figure 2) compares two key indicators of food security: reduced food losses and increased productivity for five countries. In the United States and China, high productivity gains (20% and 18%, respectively) reflect the effective use of technology and automation. Brazil leads in both indicators, especially in reducing food losses by 25%, attributed to social programmes and effective agricultural development. In Germany, both indicators are quite moderate (10%) due to a focus on sustainable development and local initiatives. India gradually improves due to

farmer support programmes (12%). These data confirm that countries adapt strategies according to their resources and priorities to ensure food security in an inclusive development context.

It is crucial to outline the prospects of using design management to develop innovative strategies for inclusive development aimed at solving food security problems.

1. Implementation of technological innovations. Design management promotes the integration of the latest technologies, such as artificial intelligence, the Internet of Things (IoT), and blockchain, into food system management processes. This will improve the efficiency of food monitoring, logistics, and quality control and reduce losses at all stages of the supply chain.
2. Development of socially oriented programmes. A design-oriented approach will ensure the creation of inclusive programmes aimed at supporting socially vulnerable groups. This includes developing strategies to increase food accessibility through the creation of local food systems and social cooperatives.
3. Promoting sustainable agriculture. Design management allows for the introduction of innovative sustainable practices that strike a balance between conserving resources and increasing productivity. Precision farming and renewable energy technologies are promising to support small farms.
4. Optimisation of food chains. Design thinking can help create more adaptive and resilient supply chains that can respond quickly to changes in demand and the challenges of global crises. Optimising logistics and resource management will ensure sustainable access to food at the local and global levels.
5. Community engagement and inclusive planning. Design management ensures the active participation of communities in strategic planning and decision-making, which allows for the consideration of local characteristics and needs. This contributes to the formation of sustainable and inclusive models of food system development.
6. Global integration and partnerships. In the future, design management will contribute to developing international partnerships that combine the experience and resources of different countries to address global food security challenges through innovative approaches.

Thus, the prospects of using design management include technological development, social orientation, sustainable development, resource optimisation and community engagement. These strategic approaches will effectively address food security issues in the context of inclusive development.

Discussion

The study's results confirmed that the introduction of design management in the context of inclusive development contributes to optimising management processes and increasing food systems' efficiency. In particular, design thinking allows the development of strategies that consider stakeholders' interests, integrate innovative technologies and ensure sustainable development. The data obtained indicate a decrease in food losses by 3.58% in 2018-2023 and an increase in food availability by 8.68%. A comparison of the results with Bürgy and Harder [2] confirms that design thinking is a key tool for transforming management approaches and increasing the adaptability of systems. In turn, Nobanee and Shanti [3] emphasise the importance of risk management in minimising food crises, which is consistent with the findings of our study on the need to integrate strategic risk management into food chains.

Sharma [10] and Singh et al. [4] focus exclusively on technological innovations such as artificial intelligence and automation without deeply considering social and environmental aspects. In contrast, our study focuses on integrating an inclusive approach that considers the needs of vulnerable groups and contributes to the formation of sustainable food systems. At the same time, Rožman et al. [5] emphasise the role of strategic talent management in enhancing competitiveness, which is consistent with our conclusion that human capital needs to be actively involved in implementing innovative management strategies. Despite the consistency of some results with previous studies, some aspects require further investigation. For example, the results of Olatidoye [9] demonstrate the importance of supporting small farms for food security, but our paper only outlines this issue without a detailed analysis.

Thus, the study confirmed the hypothesis that design management is effective for strategic management of inclusive development. At the same time, further research is needed to adapt digital technologies to the needs of local food systems and develop tools for monitoring their effectiveness in the long term. Additionally, it is advisable to outline the mechanisms for monitoring and evaluating the effectiveness of inclusive development strategies proposed in the study. Such mechanisms may include periodic assessment of food availability, resource efficiency, and stakeholder engagement indicators, supported by digital monitoring platforms and regional statistical data. Implementing an evidence-based evaluation framework will ensure the transparency, comparability, and reproducibility of results

across different national contexts. This is likely to reinforce the place of innovative management techniques in meeting global challenges to develop sustainable food systems.

Conclusion

The study has revealed that the introduction of design management is an optimal instrument of strategic management of inclusive development in order to establish food security. To achieve a sustainable reduction in food losses and a transfer of resources to socially vulnerable groups, innovative approaches based on design thinking, technological solutions and social orientation are possible. These research findings demonstrate that adopting digital technologies like artificial intelligence and the Internet of Things (IoT) can enhance food supply chain efficiency and improve managers' decision-making efficiency. Specifically, in the context of global challenges, we see a positive trend in key indicators. The results are novel in melding design management strategies with the concepts of inclusive development. The study has substantial practical potential as it can be further adapted to solve local food security problems that are acceptable to specific regions' conditions. Simultaneously, one has to differentiate conceptual aspects of design management and practical mechanisms that can be conveniently applied to the socio-economic environment of Ukrainian or, more generally, the Eastern European environment. The transformation processes have regional peculiarities that involve the post-industrial reorganization of the agri-industrial complex, the unequal digitalization of the population, and the inability to escape social vulnerability due to economic and political instability; this necessitates producing adaptable models of inclusive growth. These models are expected to combine the community participation, local innovation ecosystems, and sustainable practices of partnership between the business and the public sector. By emphasizing and formalizing these mechanisms, it will be possible to further match design management strategies with the objectives of resilience, social cohesion and sustainable development in the regions. The study's limitations are the lack of statistical data on implementing innovative management solutions at the local level and the problem of measuring the long-term impact of the measures envisaged by the design management strategy.

Future research should concentrate on building the appropriate tools to monitor and assess how effectively inclusive development strategies are achieved. In addition, it is necessary to study the effects of technological innovation on small and medium farms and to involve stakeholders in the strategic planning processes. Overall, in alliance with the inclusive approaches, the optimal governance and digital solution approaches to food systems will produce sustainable models resilient to global shocks and just concerning food access.

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