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CONCEPTUAL MODEL OF DIGITAL TRANSFORMATION OF BUSINESS MANAGEMENT ON THE EXAMPLE OF COMPANIES FOR SALE OF AIR CONDITIONING PRODUCTS

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Abstract. The relevance of the problem is caused by the rapid growth of digital technologies which transform management methods in companies-manufacturers and sellers of air conditioning. In the competitive market with significant seasonality of demand, digital transformation of business is becoming a crucial condition for increased efficiency and stability. The main problem is that digitalization is implemented unevenly in various business processes (management, logistics, service), and the capabilities are not realized completely. The aim of the study is to create a conceptual model of digital transformation of business management of companies that install air conditioning systems. The object of the study is the management processes of the studied companies, the subject is digital tools and methods of their introduction into the business environment. To enable the generalize world practices on digitization it applies comparative analysis; to reveal connections of essential business processes – system analysis; to choose important digital tools it applies expert appraisals method; to create integrated concept model – modeling. Analyzed current level of digitalization of the industry, identified problematic spots in the management and service processes, prepared a list of the key digital solutions and built a model for digital transformation. Based on the study results it can be claimed that the proposed model is applicable for more precise planning, better logistics performance and better customer service quality. In digital transformation the phased approach has to be used. First, it would be necessary to audit digital maturity and implement the CRM system with analysis, after that, automate warehouse and service operations, followed by systematic skill development.

Keywords: digital transformation, business management, air conditioning market, digital tools, process automation, CRM system, logistics optimization, service digitalization, business modeling.

JEL Classification: O33, M15, L81

1. Introduction

Present trends in the world lead to the conclusion that digital transformation of enterprises of any scale and branch of business becomes a prerequisite for the development and sometimes existence of the company. According to statistics 2024 more than 74% of companies EU are at the stage which can be called the 'digital intensity basic level' and among small and medium sized enterprises is 73% (Eurostat, 2024). However according to the results of the survey on digital implementation into SMEs 47% companies report increase of the inner turnover, 41% of expansion to customers' network and around 40% of improvement of the productivity (OECD, 2024). These stats show the vital importance of the digital tools' systemic application for the enterprise. At the same time in niche market, like sale of air conditioning equipment digital transformation usually applied fragmentarily with no strategic complex approach thus its effectiveness is lower.

Despite the apparent benefits of digital technologies, businesses in the air conditioning sales industry often have to deal with the reality of their piecemeal digitalization. The digital tools are implemented arbitrarily, outside a logical system, separate from the main management, logistics and servicing processes. Air conditioning products are characterized by: seasonal demand, the need for precise forecasting and inventory management,

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complex logistics, high demands placed on expert consulting and post-sales service. It is under these conditions that the lack of a unified conceptual approach to digital transformation results in unsuccessful investments in digital solutions, a decline in competitive strength and a delay in growth.

A relevant necessity arises for scientific researches of the digital business management transformation approaches, taking into account specific nature of the companies functioning in air conditioning market. It is worthwhile to study how to implement the digital technologies into the main business processes of these companies in such a way as to ensure integrity of business processes, the highest transparency of management, the most efficient logistic and service work. As a result it is possible to determine ways of enhancing performance and competitiveness of the enterprise in an highly dynamic business circumstances and make a ground for further research.

2. Overview of Recent Research and Literature

The importance of the problem of digital transformation is evidenced by the number of research and articles dealing with the organizational, management, technical and market issues of this process. The problems of the stability of management decisions and financial mechanisms are discussed in works by Bugrov O., Bugrova O. and Luk'yanchuk I. (2021); digital activity and stability of Ukrainian enterprises by Onyshchenko S., Masliy O., and Panas V. (2024); transformation of business processes of trade enterprises by Grosul V. and Shynkarenko I. (2023). Technological aspect of digitalization is covered in work of Lavrenchenko G.K. and co-authors (2023), and global issues of digital development of economic spheres are considered by Li C., Chandio A.A., Abid N. and Ahmad F. (2025). An important contribution to the theory of digital transformation is also represented by Huy P.Q., Phuc V.K. (2025), Shpakov A.V. and co-authors (2021), Liu L., Long J., Liu L. (2025), and the issue of forming personnel digital competence is illuminated by the work of Durman S., Iyiola K., Alzubi A.B., Aljuhmani H.Y. (2025) and Zhivko Z., Petrukha N. (2023). In terms of innovative development of Ukrainian enterprises, an important work by Tomakha V.V., Sigaeva T.Ye. and Martynenko M.V. (2023).

3. Results

The present level of enterprise digitalization in the AC products market is determined by the high level of competition, growing customers' demands for speed of service and by dynamics of technological changes occurring in the sphere of general trade of equipment. A characteristic for the market is sharply expressed seasonal demand that prompts companies more active use digital technologies for forecasts, inventory control, logistics, individual client interaction. Despite on the overall modernity process, level of digitalization varies and companies tend to limit only on "simple" solution: catalogs, basic CRM functionalities, and on-line contact (Onyshchenko, Maslii & Pantas, 2024).

It is important to note that digitalization in this industry is often done in isolated way: different company implement certain tool not communicating between themselves and not having a coherent strategy. Especially the lack of integrated system of CRM or integrated warehouse analytics greatly influences the effectiveness of inventory management during peak times (OECD, 2024). Some company still use partially-automated process: data on spreadsheet or so-called boxed systems, not adaptable for certain industry specificities. This causes loss of data, duplication of information, slow communication with customer and decrease in customer service level (Hrosul & Shinkarenko, 2023).

Another one of the key difficulties is the lack of financial resources for investments, particularly in small and medium companies, which are the dominant ones in the air conditioner sales market. Investment into modern ERP, WMS or omnichannel solutions are too costly in their opinion, and these purchases are therefore postponed indefinitely. Furthermore, there is a shortage of qualified personnel who could process big data, work in modern analytical systems or with automated solutions. The creation of digital skills in companies takes place rather slowly, and sometimes even under the resistance of the staff accustomed to work within old systems (Zhyvko & Petrukha, 2023).

Another point to be observed is the technical issues with combining different digital solutions into one technology circle. Most of companies do not have technological match among accounting programs, delivery service, CRM systems and websites. This would bring "digital gaps" among the decision-making chain. For instance, lacking the all-

around data analyze system makes it unable to plan the potential demand, seasonal sales and stocking volume. It will lower the agility and enhance the operation costs especially among the time of season transition.

In this way, the present level of the digitalization of the enterprises dealing in air conditioning systems may be characterize as transient: there is a clear understanding of the necessity of the application of the digital technologies and a tendency to move to the new technological level; however, the technological systems themselves are developing slowly due to financial, human resources and organizational problems. absence of the systemic approach to the digital transformation prevents from the full application of the digital technological capabilities, which has defined the relevance of the in-depth studies of this problem.

Approaches to the digital transformation of business management are formulated in a modern study at the junction of several scientific schools – strategic management, the theory of organizational change, dynamic capabilities, the process approach. In works published abroad, digitization is understood more often not as the application of individual IT projects, but as profound changes in the business model and the principles of managing business. For example, in (Huy & Phuc, 2025) it is noted that digital technologies are fundamentally altering the logic of decision making and strategic planning. This approach is also followed in studies of the digital business strategy and innovation in production systems, including in (Liu, Long & Liu, 2025). Some studies have shown that dynamic capabilities of the company for adaptation of changes are a key element for successful digital transformations (Durman, Iyiola, Alzubi & Aljuhmani, 2025).

By extrapolating scientific principles to business management processes the digital transformation of business management can be viewed as a multi-component process occurring in a staged manner, involving strategy, the structure of the organization, the internal procedures, human resource skills and knowledge and technologies. This combination of theoretical approaches has enabled us to create a conceptual framework to investigate the digitalization processes in an enterprise, in particular in the business of selling climate control systems.

Specifics of industry can be traced back to the process of digitalization of companies in the area of sales of air conditioners. Type of market, customer behavior, need for support of technical service and logistics constitute a set of factors that define speed and range of adoption of digital technologies. Defining these specific features enables to justify necessity of dedicated digital solutions and locate the directions of increase of efficiency.

From the analysis it is clear that the air-conditioning sellers has to face several industry specific issues that have a great impact in the way digital tools are implemented: seasonality, complexity of logistics, assistance to customers in technical assistance, and high expectation for services quality. These aspects allow a better understand on which are the digital solution that can be the most valuable for the sector and how they can allow more efficient operations, and a competitive advantages.

Digital tools in the area of management of companies involved in selling air-conditioning systems allow a substantial increase in the efficiency of basic business processes. The CRM systems, the one most impacting among the most efficient tools, are integrated areas of interaction with the customer, which help register transaction histories, demands, service requests, and allow us to satisfy the consumer demands much faster and more accurately. CRM systems can prove especially useful in highly seasonal companies, because they make it possible to predict peak workloads, to make personalized offers and to make the sales representatives' work more efficient. The central client base will make a service improve, as managers will have complete data on how they work with each of their clients (Kaur, Bedi & Singh, 2024).

An equally significant direction in digitalization is the automation of logistic processes. The performance of logistics is a decisive factor in the competitive standing of an enterprise for an air conditioner market, for which the product is oversized and requires special conditions for its transport and has a complicated movement cycle from warehouse to the ultimate consumer. Use of the specialized WMS and TMS helps reduce errors in order creation, optimize routes, manage inventory balances and inventory levels in real-time, and diminish costs stemming from surplus inventory or equipment downtime. These systems lay the foundation for the visibility and predictability of logistics processes and are especially important in periods of peak demand (Tomakh, Sihayeva & Martynenko, 2023).

Table 1
Industry characteristics affecting the digitalization of enterprises in the field of sales of air conditioning products

Industry feature	Essence of the phenomenon	Impact on digitalization
Seasonality of demand	Demand experiences an increased growth in the spring-summer period and thus forms peaks of loads at the warehouse, logistics, services departments, service and consulting channels. During other periods, the growth is relatively weak and impacts resource management.	Automated demand forecasting systems, dynamic procurement planning tools, CRM analytics for modeling seasonal fluctuations, as well as digital solutions for flexible personnel management during peak periods are needed.
Complex logistics and warehouse operations	The air conditioners are bulky. They need special transports and need special accounting processes. The many positions to trade and the seasonal delivery increase the stock control processes in the warehouse.	Need of integrated WMS/TMS, auto stock tracking, QR/barcode scanning, coordination with delivery companies, digital floor plan of warehouse and transport optimization solutions.
The need for technical advice	A majority of clients do not know how to choose air conditioner for technical aspect and require advice about power, energy class, freon type, installation.	The requirement on advice helps the emergence of Chatbot, configuration online, virtual consultation service, electronic encyclopedia, interactive tool for calculation of performance and united support platform.
Service and after-sales service	Sale of AC does not end when consumer buys, installation, guarantee, diagnose, maintenance, cleaning is part of the product's life cycle.	It needs digital systems for processing service requests, optimizing technician's routes, managing digital records, automated reminders for customers and integrating with the CRM.
High competition	There are many sellers on the market, the characteristics of products are largely identical, and the brands can be extremely close in their features and the decision is mainly based on price and service.	This leads to a need of digital marketing systems, analyses of customers information, personalization of marketing offers, automation of advertisement campaigns, tracking of the consumer on the web, etc.
Price sensitivity of buyers	Buyers actively compare prices of sellers and of the market, respond to discounts, dynamically adjust prices.	Drives the introduction of monitoring of competitors prices, of tools of dynamically varying price and of automatic formation of promotional and special offers in CRM and e-commerce systems.
The growing importance of online sales channels	A large share of users search features, price and reviews online; internet and market place sales increase on a yearly basis.	Required modern e-commerce platforms, SEO performance optimization, catalog sync with CRM, comprehensive analytic reporting, online order execution system, automatic marketing messages.

Source: summarized by the author based on (Onyshchenko, Maslii & Pantas, 2024; Hrosul & Shinkarenko, 2023; Li, Chandio, Abid & Ahmad, 2025).

Data analytics is another critical element of the digital transformation since it allows companies to get a better view on their actual business operation. Using BI tools, basic dashboards and forecasting mechanisms, managers are able to view customer behaviors, sales evolutions, company inefficient aspects etc. This is particularly critical for companies with diverse product ranges and service categories in order to plan stocks, marketing promotions, segment the customer groups and conduct marketing actions tailored to those segments.

In addition, online services provide numerous possibilities for businesses in this sector. Increasingly customers start looking for an air conditioner on line and make purchase as well. The Companies that invested in e-commerce (online consultation, product configurator, installation booking system etc.) receive the benefit of reduced purchasing decision time, increased conversion rate and bigger target market. Online tools enable firms to create a seamless service experience (selection-ordering-installation-requesting service) for the customers, making interaction with the company easier.

As a conclusion to all the options the AC sellers are having with the help of digital solutions. The full impact of these instruments can be observed if the company uses them all at the same time. Indeed, CRM systems, automatic logistics and business analytics solutions and services online are not isolated but correlated; they provide for

a transparent business management, accelerate decision-making processes and form a more consistent business structure. By the step-by-step adoption and usage of those systems, the company would have the capacity of adjusting quickly to changes, eliminate additional operating expenses, increase customer satisfaction and maintain a good quality of services; such factors can be critical for the future growth of a sector characterized by high competition and predictable and severe fluctuations in sales.

The building of a concept model of digital transformation of business management is predicated on a preliminary generalization of theoretical propositions and the development of recommendations that take into account both general aspects of digital transformation and industry peculiarities. For the air conditioning products sales market it is typical seasonality of demand, complexity of logistics, the necessity of technical consultancy, and the high level of services expected. All this mandates the need for the creation of an integral system of digital solutions encompassing strategy, processes, personnel skills, and technical infrastructure (Fig. 1).

The general theoretical provisions and developing recommended tools are a methodology for developing a conceptual model of digital

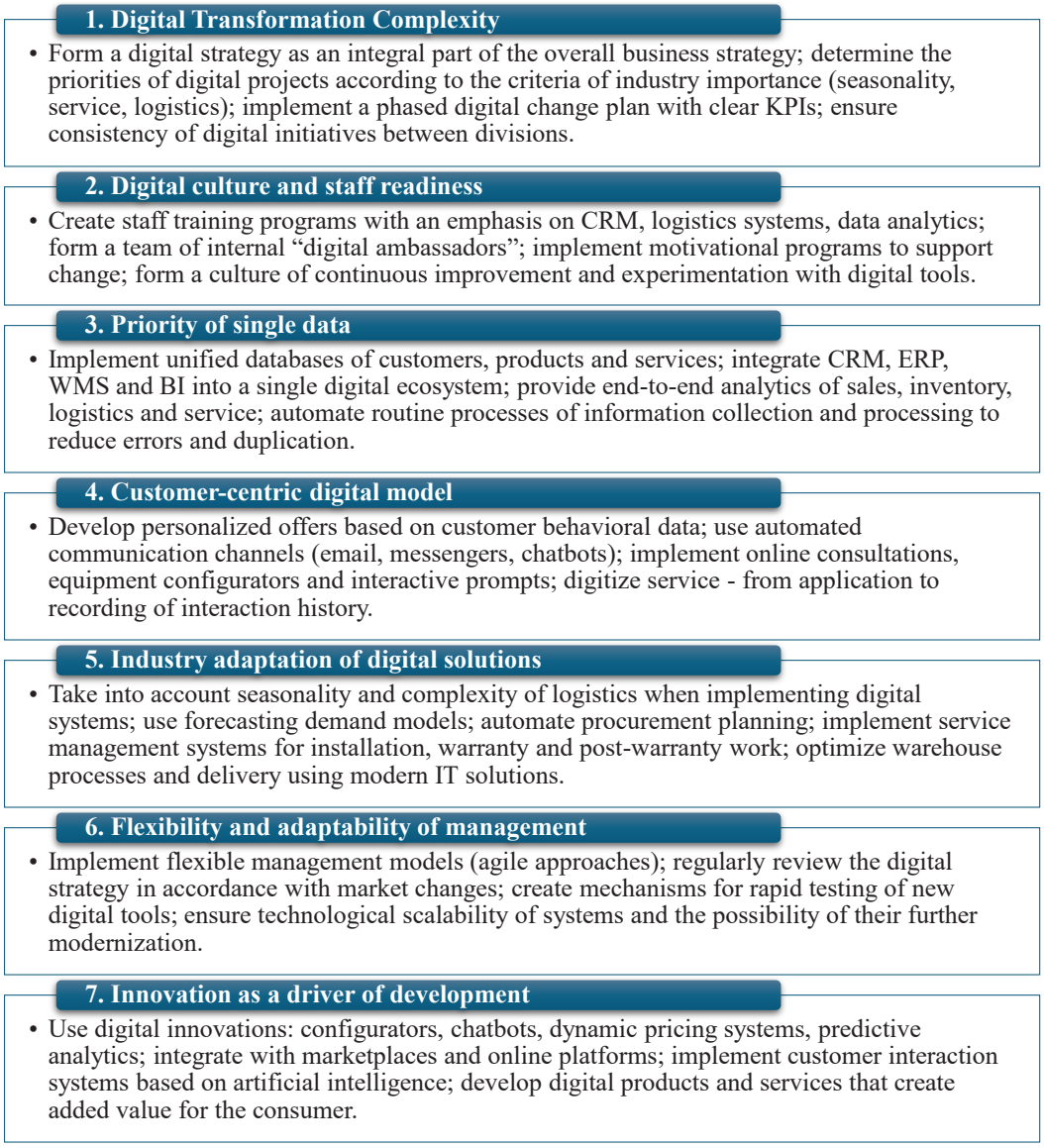

Figure 1. Theoretical provisions and recommendatory approaches to the formation of a conceptual model of digital transformation of business management

Source: generalized by the author based on (Li, Chandio, Abid & Ahmad, 2025; Huy & Phuc, 2025; Liu, Long & Liu, 2025)

transformation of business management in the area of air conditioner products sales. Realization in the entirety will provide mobility, technological unification, increasing of efficiency of business processes and formation of stable competitive advantages on dynamic market conditions.

Regarding the developed theoretical provisions and recommendations, a list of practical directions should be identified that will help translate the digital transformation from a theoretical plane to a practical implementation level. These directions for the business area of selling air conditioning products should consider the features of the industry, changes in demand, complexity of logistics and customer demand for service support. Integrating strategy and digital processes development enables to form a systematic model of implementing digital solutions contributing to raising the efficiency and competitiveness.

The designed model embodies unified, linked logic of digital tools implementation, enhancing business processes within the enterprise and being the foundation of competitive positioning improvement. This model depicts the cyclical nature of digital changes: where each of the factors (CRM, logistics, analysis, e-services, and integration) strengthens the next element and builds a loop: adapting to market, reacting to seasonal fluctuations, supporting excellent customer interaction at all stages.

Practical part of the model consists of introduction of CRM systems to provide a foundation for

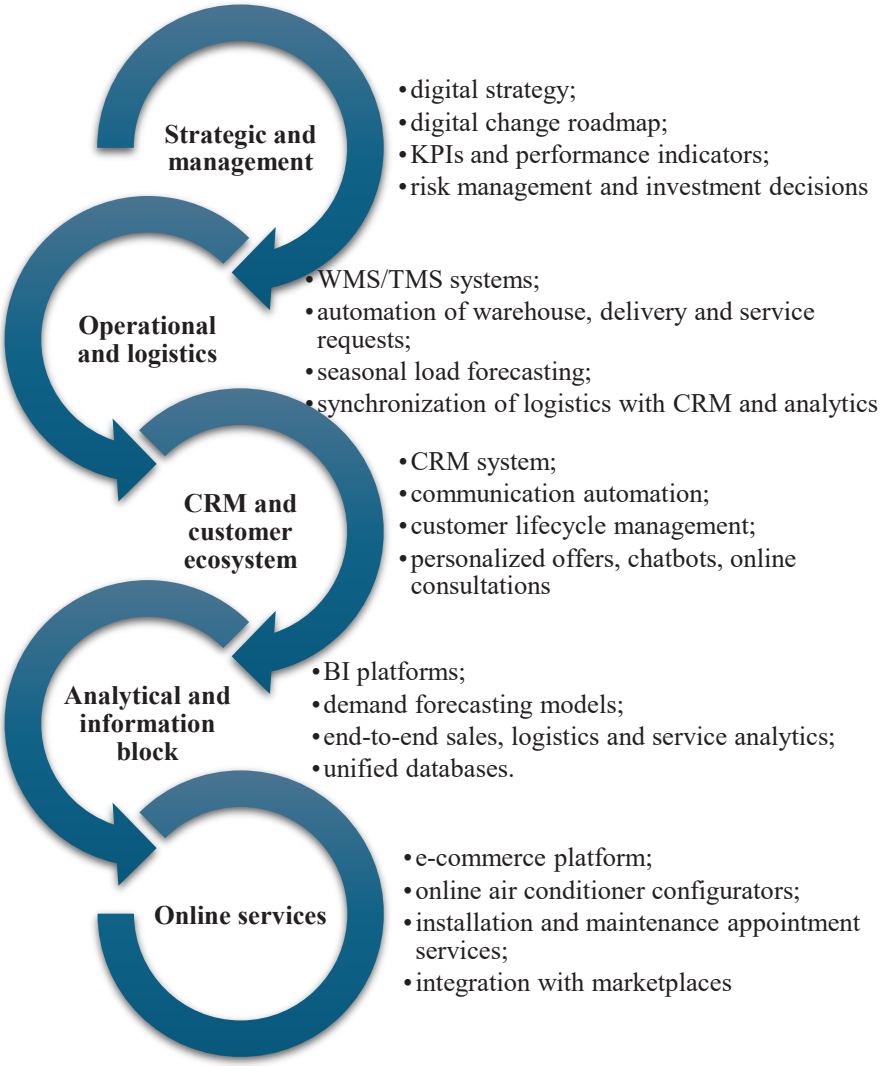

Figure 2. Practical directions for implementing digital tools in the process of digital transformation of business management

Source: summarized by the author based on (Huy & Phuc, 2025; Liu, Long & Liu, 2025; Durman, Iyiola, Alzubi & Aljuhmani, 2025)

customer oriented management, digitalization of logistical and warehouse processes to decrease operating risks, development of analytical solutions in order to make informed decisions by management, online services to extend distribution channels and increase accessibility of services and a unification of all digital tools into the integrated system providing consistency of processes, information flow acceleration and technological stability. The solution suggests that digital transformation needs a system approach between levels of strategic, technological and operational management, that is essential for modern companies working in the air conditioning market.

4. Conclusions

The conducted research confirmed the theoretical bases and practical aspects of the digital transformation of business management in air conditioning products sales, enabling us to create a holistic picture of the potential and problems of the modernization of the market. The identified features of companies' activities – market seasonality, the complex nature of the logistical operations, the necessity of providing technical advice and very high demands regarding the service – dictate the necessity of consistently using of digital instruments, that can provide flexibility, efficiency of operation and customer-orientation. The generalization of the theoretical approaches and market characteristics allowed to present and explain the main components of the digital transformation concept model – management strategic, operational, analytical and servicing elements.

Practical aspects of the implementation of digital solutions – CRM-systems, logistics automation, analytical systems, online services have shown its ability to enhance business processes' efficiency and to improve the competitive position of businesses. Integration of the described instruments into a single digital environment is the basis for further sustainable development of enterprises, cost efficiency and quality of customer interaction improvement. The results of the research can be used as methodological base for further development and enhancement of the conceptual model of the digital transformation and implementation of the digital solutions in the enterprises of the branch.

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