

DIGITAL TRANSFORMATION IN INDUSTRIAL MANAGEMENT: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

This research examines the impact of digital transformation on industrial management and investigates the challenges and opportunities that arise with the adoption of digital technology. Through a qualitative approach, this research involves literature analysis regarding industrial players who have implemented digital transformation. The research results show that digital transformation in industrial management makes a significant contribution to increasing operational efficiency, product innovation and the organization's ability to compete in the global market. Despite being faced with challenges such as changing organizational culture, data security, and a lack of technology skills, organizations that successfully implement digital transformation gain benefits in increasing production efficiency, responding more quickly to market changes, and optimizing cross-border partnerships. This research provides a deeper understanding of the importance of digital transformation as a strategy to strengthen organizational competitiveness and continuity in an ever-changing industrial era.

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INTRODUCTION

Although the concept of applying digital technology to improve operational excellence has become an integral part of company strategy, unfortunately, there are still limitations in budget allocation for digital transformation initiatives, especially in the process industry and manufacturing sectors (Aisha, 2022). Despite the potential benefits, many companies in this industry still encounter challenges in designing and implementing effective digital transformation strategies. This may be caused by uncertainty regarding investment outcomes, required changes in organizational culture, and a lack of full understanding of the potential opportunities that can be generated (Sulksono & Nursyamsi, 2022).

Investments in digital transformation are often considered a significant financial commitment, and some companies may be reluctant to allocate adequate budgets to these projects (Prathama & Yustika, 2021). However, it needs to be recognized that this investment is a critical step towards long-term sustainability and competitiveness. In the context of process and manufacturing industries, where operational efficiency and technological innovation have a major impact, increasing the budget for digital transformation can be a decisive strategic step (Rizqi & Himawan, 2022)

A holistic approach is needed to overcome these obstacles, including increasing awareness about the concrete benefits that can be obtained, developing a clear investment

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plan, and creating an organizational culture that supports change (Tahar et al., 2022). By taking these steps, companies in this industrial sector can maximize the potential of their investments in digital transformation, achieve operational excellence, and position themselves to face the challenges and opportunities in the industry 4.0 era (Kadim, 2017).

Market changes and shifting consumer preferences have been the main drivers behind the surge in large-scale investment in digital transformation in recent years (Rohida, 2018). Changing market dynamics, including the rapid growth of e-commerce, increasing focus on digital customer experiences, and consumer demand for more efficient solutions, have pushed companies to accelerate the adoption of digital technology (Raharjo, 2021).

In this context, companies are realizing that to remain relevant and compete effectively, they need to adapt their business models quickly. Digital transformation is the key to increasing responsiveness to market changes, optimizing supply chains, and providing the best customer experience (Wakil et al, 2022). Changing consumer preferences leading to greater demand for personalization, digital convenience, and product innovation are also strong drivers for investing resources in digital technology (Ngamal & Perajaka, 2022).

By recognizing that markets and consumers are becoming increasingly digital and connected, companies feel the need to invest significantly in digital technology solutions in order to anticipate and meet customer expectations, while gaining competitive advantage amidst intense global competition (Lestari, 2019). Thus, digital transformation is not only a necessity, but also a proactive strategy to position companies to be able to face market changes and meet consumer expectations in this digital era (Jamaludin et al, 2022).

Recent commodity price fluctuations have had a significant impact on process industry revenues. As a sector that is substantially dependent on the value of commodities, these price fluctuations create economic uncertainty and place extra pressure on the finances of companies in this industry (Amanda et al., 2018). Additionally, process industries often feel the brunt of pressure to reduce capital spending consistently year after year. This is a serious challenge, especially because this industry has a large number of assets that require regular maintenance and replacement (Julyanthry et al, 2020).

Meanwhile, increasing competitive dynamics and consolidation trends in the process industry emphasize that speed is a determining factor for success. Companies are required to adapt quickly to changing market conditions and optimize their operational processes to remain competitive (Fauziyyah, 2022). Additional challenges arise from generational shifts in the workforce, with a new generation of tech-savvy but less experienced workers replacing veteran workers. This creates a gap in knowledge and experience, which must be addressed so that the expertise and history of the industry is maintained (Junita, 2021)

In addition, in facing a new generation of technology-savvy workers, digital transformation also supports knowledge and skills management by utilizing digital learning platforms and knowledge management systems (Wakil et al, 2022). By leveraging artificial intelligence to match worker skills to job requirements, companies can address experience gaps and ensure the effective transfer of knowledge from veteran workers to younger generations (Goleman, 2007).

Furthermore, digital transformation also enables the personalization of solutions to meet increasingly high customer expectations. The application of technology such as customer behavior analytics and platform-based solutions helps companies respond more quickly to changing consumer preferences and create more customized experiences (Prabandari & Handrito, 2022). By understanding and responding to market needs more adaptively, companies can gain a competitive advantage in this ever-changing industry. Thus, digital transformation is not only a strategic response to industrial challenges, but also the key to creating sustainable added value in process industry management (Santoso, 2003).

METHOD

This kind of research is known as qualitative research, which aims to understand the phenomena experienced by the subject in depth. Examples of qualitative research include behavioral research, perception, motivation, and action research which describes phenomena in natural contexts using various natural methods (Gunawan, 2013). Descriptive research, on the other hand, aims to collect comprehensive information about a particular problem or situation, with the aim of gaining an in-depth understanding of the topic being investigated (Soendari, 2012). This research, which is classified as descriptive research, was carried out with the main aim of providing an accurate and systematic description of the facts and qualities of the object or subject being studied. Researchers utilize primary data sources from political sociology as the main literature center. Secondary data sources, which are also known as social reality data sources, are obtained by researchers directly in the field or through media such as newspapers and discussions. By combining primary and secondary data, this research aims to comprehensively describe the phenomenon being investigated and provide an in-depth understanding of the research topic.

RESULTS AND DISCUSSION

Digital transformation is a new use of digital technology to accelerate business strategies. It is about applying digital technology to empower people, optimize processes and automate systems of an organization to radically reorient its business performance. Digital transformation in industrial management brings a number of challenges and opportunities that organizations need to pay attention to. The following are some examples of these challenges and opportunities:

Challenges of digital transformation in industrial management

Organizational Culture Change

Changing the mindset and culture of an organization to embrace technological change is a challenge that requires a strategic and comprehensive approach. There is natural resistance from employees who have become accustomed to conventional work methods and view change as a threat to job stability or the skills they have developed. Organizational leaders need to realize that successful digital transformation depends not

only on the implementation of technology, but also on the ability to overcome internal resistance.

Supporting the transformation process requires effective and transparent communication. Leaders must clearly communicate the benefits of change, motivate employees to adapt, and provide necessary support. A comprehensive training program to improve digital skills and knowledge of technology can also help reduce resistance. Additionally, involving employees in the transformation planning and implementation process can create a greater sense of ownership, reduce fear, and increase acceptance of change.

Additionally, building an environment that supports innovation and experimentation can help change an organization's culture. Providing space for new ideas, motivating creativity, and celebrating success in adopting new technology can change negative perceptions of change. Thus, leaders need to view resistance as a normal part of the transformation journey and take proactive steps to create an environment that supports acceptance of change and growth.

Data Security

As the adoption of digital technology becomes more widespread, attention to data security risks becomes increasingly urgent. Increased connectivity and data storage in digital environments presents new challenges related to vulnerability to security breaches. Organizations must strengthen the protection of their sensitive information to be able to face increasingly complex and often organized cyber threats.

Protection of sensitive data is not just a necessity, it is a critical priority. Data security breaches can have a serious impact on a company's reputation, lose customer trust, and can even result in legal sanctions. Therefore, companies need to invest sufficient resources to develop and implement a strong security system. This involves the use of advanced encryption technology, state-of-the-art security software, and implementation of best practices in cyber risk management.

Apart from that, employee awareness and training are also key in maintaining data security. Organizations need to build a security culture across the enterprise, ensuring that each individual understands their role in maintaining the confidentiality and integrity of data. Security incident planning and response must also be well prepared, including data recovery measures and effective communication strategies. By recognizing the complexity of data security risks, organizations can design a holistic and proactive approach to protecting their information assets from evolving threats.

Limited Human Resources

The lack of skills and expertise in the field of digital technology creates significant challenges in facing digital transformation. As technological change accelerates, many employees may feel left behind and ill-equipped to adopt new software, digital platforms and other technology solutions. These obstacles can make it difficult for organizations to optimize the potential of technology to increase productivity and efficiency.

To overcome this skills shortage, employee training and human resource development are crucial. Comprehensive training initiatives should be designed to provide a

deep understanding of digital technologies, including an introduction to the latest tools, an understanding of data analysis, and the skills necessary to adapt to technological change. This training is not just about mastering the tools, but also includes understanding the basic concepts behind digital technologies and how to apply them in a business context.

In addition, human resource development needs to focus on creating an environment that supports continuous learning. An organizational culture that encourages innovation, experimentation and collaboration can stimulate employees to continuously improve their skills in an ever-evolving digital environment. Measures such as mentoring, job rotation programs and support in taking external training or online courses can also help build employees' digital capabilities. Thus, organizations can overcome the obstacles of lack of skills with targeted and sustainable human resource development strategies.

Large Financial Investment

Digital transformation, as a critical step towards modernization and competitiveness, often demands significant financial investment from organizations. This change process involves the adoption and integration of advanced technologies, innovative software, and often fundamental restructuring of business operations. However, the challenge many organizations face is the difficulty in allocating adequate funds to support these digital transformation projects. Budget constraints can stem from competing priorities, restrictive spending policies, or concerns about financial risk.

To overcome these challenges, organizations need to develop wise financial strategies focused on long-term value. The first step is to create a clear and comprehensive business plan for digital transformation, which includes estimated costs, expected benefits and long-term financial impact. By presenting a strong argument about the value of the investment, organizations can more easily convince stakeholders and gain support for adequate funding allocation.

Additionally, seeking alternative funding sources, such as strategic partners, external financing, or government subsidy programs for digital transformation, can help reduce financial stress. Financial risk management is also important; Companies can consider a phased approach to digital transformation, starting with small projects that add value quickly, while continuing to gain buy-in and demonstrate positive results to stakeholders. By designing a smart and strategic financial approach, organizations can overcome funding constraints and ensure long-term success in their digital transformation journey.

Digital Transformation Opportunities in Industrial Management

Increased Operational Efficiency

The implementation of digital technology is the main pillar in efforts to increase the efficiency of the company's operational processes. By adopting advanced technology solutions, organizations can automate many aspects of their operations, reducing reliance on manual processes that are prone to human error. Automated production management systems, real-time monitoring via the Internet of Things (IoT), and advanced data analysis can work together to improve production processes. This can result in significant improvements in efficiency, reduce production cycle times, and automatically adjust operations to increase smoothness and responsibility.

Not only that, the use of digital technology also has a positive impact on supply chain and logistics management. Automation systems can provide better visibility of the entire supply chain, allowing companies to respond quickly to changing market conditions or customer demands. The use of smart technology in inventory management and distribution can also minimize inventory costs and ensure products can reach consumers quickly and efficiently.

Apart from operational efficiency, the implementation of digital technology can also reduce overall operational costs. Replacing manual processes with automated solutions can reduce labor costs, minimize production errors and optimize resource use. While the initial investment may be significant, the long-term benefits in efficiency, productivity and reduced operational costs can bring a substantial return on investment. Thus, the implementation of digital technology not only brings improvements in daily operational processes, but also creates a strong foundation for organizational sustainability and growth in an ever-changing business environment.

Product and Service Innovation

Digital transformation is not only a tool for improving operational efficiency, but also an important catalyst for the innovation of new products and services. By leveraging the latest technologies such as artificial intelligence, big data analytics, and the Internet of Things (IoT), organizations can create more sophisticated products and more personalized services. The ability to combine consumer data with powerful analytical tools allows companies to gain a deep understanding of customer preferences and behavior. This opens the door to designing products and services that better suit customer needs and expectations, providing significant added value.

In addition, digital transformation also allows organizations to respond quickly to dynamic market changes. With adaptive technology integration, companies can monitor market trends in real-time, analyze data quickly, and identify new opportunities. These capabilities enable organizations to be more responsive to customer demand, reduce product development time, and launch innovations more quickly to market. This provides a significant competitive advantage in an ever-changing business environment.

In other words, digital transformation not only changes the way we operate, but also opens up new opportunities to create value for customers and achieve sustainable growth. Product and service innovation supported by digital technology can help organizations to remain relevant, competitive and leading in facing dynamic market challenges.

Deep Data Analysis

Utilizing sophisticated data analysis is key to gaining a deep understanding of various aspects of an organization's operations. By collecting, processing, and analyzing data thoroughly, organizations can detail their internal processes, identify efficiencies and imperfections, and find opportunities for improvement. Data analysis also enables real-time monitoring of operational performance, providing instant insight into the effectiveness of implemented strategies and policies.

In addition, data analysis is a very effective tool for understanding market trends and consumer behavior. By processing data from multiple sources, including customer

interactions, feedback, and industry trends, organizations can identify shifts in consumer preferences and anticipate market changes. This capability enables organizations to respond quickly to market dynamics, align marketing and sales strategies, and optimize their product or service portfolio according to evolving customer needs.

Overall, sophisticated data analysis gives organizations a strategic advantage. Deep insights gained from data help organizations make better decisions, identify growth opportunities, and improve operational efficiency. By supporting data-based decision making, organizations can achieve higher competitiveness, better adaptability, and excellence in responding to changes in the dynamic business environment.

Competitiveness in Global Markets

Digital transformation not only creates opportunities for advancement on a local scale, but is also key to expanding an organization's reach in the global market. Through the adoption of digital technology, organizations can overcome geographical limitations and exploit the potential of global markets. The internet, e-commerce platforms and other technology solutions enable organizations to spread their business wings across the world more effectively.

Improved communication and connectivity capabilities gained through digital transformation enable organizations to forge cross-border partnerships more smoothly. These partnerships may involve collaboration with foreign companies, participation in global supply chains, or even participating in joint research and development projects. The adoption of digital technology can also give organizations access to global resources, including the best talent in various parts of the world, enriching innovative capabilities and creativity.

By optimizing global market potential, organizations can expand their market share, achieve faster growth and increase competitiveness. This opportunity gives organizations a strategic advantage in navigating competition at the international level. Additionally, through cross-border partnerships, organizations can gain additional resources, reduce business risks, and create stronger networks in a dynamic global business environment. Thus, digital transformation not only opens doors to global markets, but also creates a solid foundation for cross-border collaboration that provides long-term benefits for organizational growth and sustainability.

CONCLUSION

Digital transformation in industrial management challenges organizations to change culture and mindset, improve data security, overcome the lack of technological skills, and allocate significant funds. Internal resistance and budget constraints may be obstacles, however, despite these challenges, opportunities exist for improving operational efficiency. The implementation of digital technology can automate processes, reduce production cycle times, and minimize costs, providing strategic advantages in fierce industrial competition. Additionally, digital transformation opens the door to new product and service innovation, increases responsiveness to market changes, and better meets customer needs. Sophisticated data analysis provides deep insights into operations, market trends and

consumer behavior, empowering decision making. In addition, digital transformation expands an organization's reach in global markets, enables cross-border partnerships, and opens up broader growth opportunities. Although challenges such as commodity price fluctuations and pressure to reduce capital expenditure are present, digital transformation remains the key to creating sustainable added value in process industry management. By overcoming these obstacles and harnessing the potential of digital transformation, organizations can position themselves as leaders in this ever-changing industry.

REFERENCES

1. Aisha, S. A. W. H. A. (2022). *Transformasi Digital: Perspektif Organisasi, Talenta, Dan Budaya Digital*. Dd Publishing.
2. Amanda, R., Utary, A. R., & Defung, F. (2018). Pengaruh struktur modal dan pertumbuhan perusahaan serta harga komoditas terhadap profitabilitas dan nilai perusahaan pada industri pertambangan batu bara di Indonesia. *Jurnal Manajemen*, 10(2), 147-158.
3. Fauziyyah, N. (2022). Efek Digitalisasi Terhadap Akuntansi Manajemen. *Jurnal Akuntansi Keuangan dan Bisnis*, 15(1), 381-390.
4. Goleman, D. (2007). *Social intelligence: ilmu baru tentang hubungan antar-manusia*. Gramedia Pustaka Utama.
5. Gunawan, I. (2022). *Metode Penelitian Kualitatif: teori dan praktik*. Bumi Aksara
6. Jamaludin, M., Sulistianto, S. W., MI, A., MM, M., Marthalia, D., Wikansari, R., ... & Cendikia, M. K. P. (2022). *Transformasi Digital Dalam Dunia Bisnis*. Cendikia Mulia Mandiri.
7. Julyanthry, J., Siagian, V., Asmeati, A., Hasibuan, A., Simanullang, R., Pandarangga, A. P., ... & Syukriah M, E. A. (2020). *Manajemen Produksi dan Operasi*.
8. Junita, A. (2021). KOMPETENSI STRATEGIS SDM 4.0. *SDM Unggul di Industry 4.0*, 41.
9. Kadim, A. (2017). *Penerapan Manajemen Produksi & Operasi di Industri Manufaktur*.
10. Lestari, E. R. (2019). *Manajemen Inovasi: Upaya Meraih Keunggulan Kompetitif*. Universitas Brawijaya Press.
11. Ngamal, Y., & Perajaka, M. A. (2022). Penerapan Model Manajemen Risiko Teknologi Digital Di Lembaga Perbankan Berkaca Pada Cetak Biru Transformasi Digital Perbankan Indonesia. *Jurnal Manajemen Risiko*, 2(2), 59-74.
12. Prabandari, S. P., & Handrito, R. P. (2022). *Bisnis Digital: Teori, Manajerial, dan Studi Kasus*. Universitas Brawijaya Press.
13. Prathama, M. T., & Yustika, A. E. (2021). *Ekonomi Inovasi Taklimat Pembangunan Ekonomi Berbasis Pengetahuan*. INDEF.
14. Raharjo, B. (2021). Fintech Teknologi Finansial Perbankan Digital. *Penerbit Yayasan Prima Agus Teknik*, 1-299.
15. Rizqi, M. A., & Himawan, A. F. I. (2022). Tranformasi Digital Dan Peningkatan Kapasitas Ukm di Majelis Ekonomi Dan Kewirausahaan Muhammadiyah. *DedikasiMU: Journal of Community Service*, 4(1), 14-26.

16. Rohida, L. (2018). Pengaruh era revolusi industri 4.0 terhadap kompetensi sumber daya manusia. *Jurnal Manajemen Dan Bisnis Indonesia*, 6(1), 114-136.
17. Santoso, B. (2003). *Manajemen Proyek*. Penerbit Graha Ilmu, Yogyakarta.
18. Soendari, T. (2012). *Metode Penelitian Deskriptif*. Bandung, UPI. Stuss, Magdalena & Herdan, Agnieszka, 17
19. Sulaksono, A., & Nursyamsi, J. (2022). Perkembangan Erp Bidang Industri Manufaktur Era Transformasi Digital. *Jurnal Akuntansi dan Manajemen Bisnis*, 2(2), 106-119.
20. Tahar, A., Setiadi, P. B., & Rahayu, S. (2022). Strategi pengembangan sumber daya manusia dalam menghadapi era revolusi industri 4.0 menuju era society 5.0. *Jurnal Pendidikan Tambusai*, 6(2), 12380-12394.
21. Wakil, A., Cahyani, R. R., Harto, B., Latif, A. S., Hidayatullah, D., Simanjuntak, P., ... & Sihombing, F. A. (2022). *Transformasi Digital Dalam Dunia Bisnis*. Global Eksekutif Teknologi.
22. Wakil, A., Cahyani, R. R., Harto, B., Latif, A. S., Hidayatullah, D., Simanjuntak, P., ... & Sihombing, F. A. (2022). *Transformasi Digital Dalam Dunia Bisnis*. Global Eksekutif Teknologi.