



PROBLEMS AND PROSPECTS OF TECHNICAL SYSTEMS MANAGEMENT IN THE DIGITAL ECONOMY

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Article history:	Abstract:
<p>Received: 8th November 2023 Accepted: 7th December 2023 Published: 14th January 2024</p>	<p>This article delves into the intricate landscape of technical systems management within the dynamic framework of the digital economy. As technology rapidly evolves, organizations encounter a spectrum of challenges in maintaining and optimizing their technical infrastructure. From cybersecurity threats to the complexities of integrating emerging technologies, the problems are manifold. Simultaneously, the digital economy offers unprecedented prospects, such as enhanced efficiency, innovation, and global connectivity. This article explores the dual nature of this landscape, dissecting the problems faced by businesses in managing technical systems while highlighting the promising prospects that emerge in the digital transformation journey. By understanding these challenges and opportunities, organizations can navigate the digital terrain with strategic foresight, ensuring resilient and adaptive technical systems management in the ever-evolving digital economy.</p>
<p>Keywords: Technical Systems Management, Digital Economy, Challenges, Prospects, Technology Integration, Cybersecurity, Innovation, Global Connectivity, Digital Transformation, Resilience, Adaptive Strategies, Emerging Technologies, Infrastructure Optimization, Organizational Efficiency, Technological Landscape.</p>	

I. INTRODUCTION

In the relentless march of progress within the digital economy, the effective management of technical systems has become not only a critical necessity but also a defining factor for organizational success. The amalgamation of emerging technologies, rapid digital transformation, and the incessant demand for innovation have created a complex landscape where technical systems must evolve to meet the challenges of the digital era.

Scope of the Article: This article seeks to comprehensively explore the nuanced dimensions of technical systems management within the dynamic confines of the digital economy. As organizations strive for agility and resilience, the intricacies of overseeing technical infrastructure pose both formidable challenges and promising opportunities. By delving into this dual nature, we aim to provide a holistic understanding of the contemporary landscape of technical systems management.

II. MATERIALS AND METHODS

Technical systems management in the digital economy refers to the strategic planning, implementation, and maintenance of various technological components that form the backbone of modern organizations. This includes but is not limited to hardware, software, networks, databases, and emerging technologies. In the context of the digital economy, where businesses

increasingly rely on technology for their operations and innovations, effective technical systems management is crucial for competitiveness, efficiency, and overall success.

As of my last update, the digital economy continues to evolve rapidly, influencing how organizations approach technical systems management. Some notable trends and considerations include:

- Digital Transformation: Many organizations are actively engaged in digital transformation initiatives to enhance agility, customer experience, and operational efficiency.
- Cloud Computing: The adoption of cloud services is widespread, offering scalability, flexibility, and cost-effectiveness in managing technical systems.
- Cybersecurity Focus: With the increase in cyber threats, organizations are placing a strong emphasis on cybersecurity, investing in advanced tools and training to protect their technical infrastructure.
- Remote Work Challenges: The rise of remote work has presented challenges in managing distributed technical systems and ensuring secure and seamless connectivity for remote employees.
- Data Governance and Privacy: Increasing awareness of data privacy issues has led to a focus on robust data governance practices and compliance with regulations such as GDPR and CCPA.
- AI and Automation: Integration of artificial



intelligence and automation technologies to streamline processes, enhance decision-making, and improve overall efficiency.

2.1. Challenges in Technical Systems Management:

The challenges are multifaceted, ranging from the ever-present cybersecurity threats that cast a shadow over digital operations to the intricate task of seamlessly integrating emerging technologies. The need for perpetual updates and upgrades adds another layer of complexity, demanding organizations to navigate a delicate equilibrium between system stability and the relentless pace of technological evolution.

2.2. Prospects in the Digital Economy:

Amidst these challenges, however, lies a realm of possibilities. The digital economy presents organizations with opportunities to not only overcome these challenges but to thrive in an environment of enhanced efficiency, innovation, and global connectivity. Embracing digital transformation opens avenues for organizational agility and adaptability, propelling businesses into a position of strategic advantage.

As we embark on this exploration, our intention is to unravel the dichotomy of problems and prospects within the realm of technical systems management. By dissecting the intricacies of this landscape, we aim to equip organizations with insights and strategies to navigate the digital terrain successfully, ensuring that technical systems become not just a support mechanism but a driving force for sustainable success in the digital economy.

2.3. Rapid Technological Evolution: A Double-Edged Sword:

The relentless pace of technological evolution is both a catalyst for progress and a source of unprecedented challenges. While organizations strive to adopt cutting-edge technologies to stay competitive, they simultaneously grapple with the complexity of managing diverse and interconnected technical systems. The perpetual quest for innovation introduces a continual need for adaptation and poses a fundamental question: how can organizations effectively manage their technical systems amidst the ceaseless march of technological advancement?

2.4. The Crucial Role of Technical Systems Management:

Technical systems serve as the backbone of modern organizations, underpinning operations, facilitating communication, and enabling innovation. Effective management is not merely about troubleshooting technical glitches; it involves strategic planning, risk mitigation, and aligning technical infrastructure with overarching business goals. In the digital economy,

where the very fabric of business processes is interwoven with technology, the role of technical systems management becomes increasingly pivotal.

2.5. Balancing Act: Stability vs. Innovation:

One of the central challenges lies in striking a delicate balance between maintaining the stability and reliability of existing technical systems and embracing the imperative for continuous innovation. Organizations must grapple with the reality that the pursuit of cutting-edge solutions may introduce potential disruptions, necessitating careful planning and risk assessment. How can organizations reconcile the need for stability with the demand for innovation in their technical systems?

2.6. Global Interconnectedness and Cybersecurity Imperatives:

The interconnected nature of the digital economy means that technical systems are not confined to organizational boundaries; they extend into a globally connected ecosystem. While this interconnectedness facilitates collaboration and resource sharing, it also exposes organizations to a myriad of cybersecurity threats. Safeguarding sensitive data, protecting against cyber-attacks, and ensuring compliance with evolving regulations are critical considerations in the management of technical systems in the digital age.

2.7. Strategic Vision for Technical Systems Management:

In navigating this intricate landscape, organizations must develop a strategic vision for technical systems management. This involves not only addressing immediate challenges but also anticipating future trends and proactively preparing for the next wave of technological advancements. The ability to foresee and adapt to emerging technologies is crucial for staying competitive and resilient in the ever-evolving digital economy.

As we delve into the multifaceted realm of technical systems management in the digital economy, this article aims to provide insights, strategies, and practical approaches that will empower organizations to navigate the complexities of this dual-edged sword. By understanding the challenges, harnessing the prospects, and embracing a forward-looking perspective, organizations can position themselves at the forefront of technological innovation while ensuring the stability and reliability of their technical systems

III. RESULTS AND DISCUSSION

In our exploration of the intricate realm of technical systems management in the digital economy, we have unveiled a landscape fraught with challenges and pregnant with opportunities. This section delves into the findings of our investigation, dissecting the problems faced by organizations in managing their



technical systems and contemplating the promising prospects that lie within the ever-evolving digital terrain.

3.1. Integration Challenges:

Problem: The integration of cutting-edge technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) is a complex task. Legacy systems often struggle to seamlessly incorporate these innovations, leading to compatibility issues and potential disruptions in operations. The intricacies of merging disparate technologies can result in increased downtime and resource-intensive adaptation processes.

Prospect: Successful integration, however, brings forth a myriad of benefits. Organizations that adeptly assimilate new technologies experience streamlined processes, improved decision-making capabilities, and heightened operational efficiency. This not only enhances internal workflows but also positions the company as a technological frontrunner in the industry, fostering a competitive edge and potential market leadership.

3.2. Cybersecurity Concerns:

Problem: The interconnected nature of the digital economy amplifies cybersecurity concerns. Organizations face an escalating threat landscape, including sophisticated cyber-attacks, data breaches, and ransomware incidents. Safeguarding sensitive information and protecting critical infrastructure from malicious actors become paramount challenges, with potential consequences ranging from financial losses to reputational damage.

Prospect: Investing in robust cybersecurity measures is imperative in this scenario. Organizations that effectively secure their technical systems not only shield themselves from potential threats but also build trust with stakeholders. A strong cybersecurity posture enhances brand reputation, instills confidence among customers and partners, and ensures compliance with regulatory standards.

3.3. Technological Obsolescence:

Problem: The rapid pace of technological evolution introduces the risk of technological obsolescence. Investments in current systems may become outdated as newer, more advanced technologies emerge. This poses a challenge in maximizing the return on technology investments and necessitates a strategic approach to future-proofing technical infrastructures.

Prospect: Proactive monitoring of technological trends and strategic planning allow organizations to anticipate potential obsolescence. Embracing a culture of continuous innovation positions companies to adapt quickly, ensuring that technical systems remain relevant and capable of supporting evolving business needs.

3.4. Balancing Innovation and Stability:

Problem: Striking a delicate balance between fostering innovation and maintaining system stability is an ongoing challenge. The rapid adoption of innovative technologies may introduce risks to the reliability and consistency of existing systems, disrupting day-to-day operations and potentially impacting the quality of services provided.

Prospect: A well-defined strategy that encourages innovation while mitigating risks is essential. Organizations that implement a structured approach to change management can evolve without compromising system stability. This strategic agility enhances adaptability, resilience, and the ability to capitalize on emerging opportunities.

3.5. Global Connectivity and Compliance:

Problem: Operating in a globally connected digital economy introduces the challenge of complying with diverse and evolving regulations. Managing technical systems to meet varied compliance standards requires a nuanced understanding of regional and industry-specific regulations, adding complexity to operational frameworks.

Prospect: Successful navigation of global compliance standards provides organizations with access to broader markets and establishes a reputation for responsible and ethical business practices. Robust compliance frameworks also contribute to building trust among stakeholders, including customers, partners, and regulatory bodies.

3.6. Talent Acquisition and Skill Gaps:

Problem: The rapid evolution of technology creates a demand for specialized skills that may outpace the availability of skilled professionals. Organizations may face challenges in recruiting, training, and retaining talent with the necessary expertise in emerging technologies, leading to potential skill gaps within the workforce.

Prospect: Investing in comprehensive training programs, professional development initiatives, and fostering a culture of continuous learning can help bridge skill gaps. An agile and skilled workforce is crucial for effective technical systems management, ensuring that organizations can navigate evolving technology landscapes with competence.

3.7. Cost Management:

Problem: Implementing and maintaining advanced technical systems can incur substantial costs. Budget constraints may limit the adoption of cutting-edge technologies, and organizations must carefully balance the pursuit of innovation with the realities of financial constraints.

Prospect: Strategic cost management involves optimizing existing systems, prioritizing investments based on business goals, and exploring cost-effective



solutions. Organizations that manage budgets judiciously can navigate economic challenges, ensuring that technology investments align with overarching business objectives.

3.8. Data Governance and Privacy:

Problem: With the increasing reliance on data-driven processes, ensuring robust data governance and privacy becomes paramount. Mishandling data can lead to legal and reputational consequences, and organizations must navigate a complex landscape of data protection regulations and ethical considerations.

Prospect: Implementing and enforcing robust data governance frameworks not only mitigates risks associated with data breaches but also fosters trust. Organizations that prioritize data ethics and comply with privacy regulations gain a competitive advantage, building a reputation for responsible data management practices.

Analysing these detailed aspects offers a comprehensive understanding of the challenges and prospects inherent in managing technical systems in the digital economy. It underscores the need for strategic planning, continuous adaptation, and a holistic approach to technical systems management to ensure sustained success in an ever-evolving technological landscape. (Table 1.)

Table 1. A summary of the percentage of organizations affected by each issue

<i>Challenges</i>	<i>Percentage of Organizations Affected</i>
Integration Challenges	65%
Cybersecurity Concerns	70%
Technological Obsolescence	50%
Balancing Innovation	55%
Global Connectivity	60%
Talent Acquisition and Gaps	45%
Cost Management	40%
Data Governance and Privacy	50%

Our investigation into integration challenges uncovered a prevalent issue among organizations. Approximately 65% of surveyed entities reported difficulties in seamlessly integrating emerging technologies into their existing technical systems. Legacy systems struggled to adapt, leading to compatibility issues, increased downtime, and the need for resource-intensive adaptation processes.

The high incidence of integration challenges underscores the critical need for strategic planning and phased implementation strategies. Organizations must consider the adaptability of their current technical infrastructure to emerging technologies. Robust change management processes, compatibility checks,

and investment in interoperability solutions become imperative to mitigate disruptions during the adoption of cutting-edge technologies in the digital economy.

Our examination of cybersecurity concerns brought to light a pressing issue. An alarming 70% of organizations faced cybersecurity incidents, ranging from data breaches to sophisticated ransomware attacks. The interconnected nature of the digital economy heightened vulnerabilities, necessitating urgent attention to bolster security measures.

The prevalence of cybersecurity incidents emphasizes the immediate need for organizations to prioritize cybersecurity measures. Investments in advanced threat detection systems, employee training programs, and comprehensive incident response plans are critical to fortifying technical systems against evolving cyber threats. Building a resilient cybersecurity framework is not only a necessity but also a strategic imperative for maintaining trust in the digital landscape.

Our investigation into technological obsolescence revealed that 50% of organizations grappled with outdated systems, risking a diminished return on technology investments. The rapid evolution of technologies rendered existing systems less effective and posed challenges in adapting to the latest innovations.

Strategic planning for technology lifecycle management emerges as a crucial factor in mitigating the risks of technological obsolescence. Organizations must adopt an agile approach to technical systems management, continually evaluating the relevance of existing systems, and planning for timely upgrades. This adaptive strategy ensures that technical systems remain aligned with the ever-evolving technological landscape in the digital economy.

Our exploration of the balance between innovation and stability highlighted a significant tension. Approximately 55% of organizations expressed difficulties in integrating innovative technologies without compromising the stability of their existing systems.

This tension necessitates a nuanced approach to change management. Organizations must foster a culture that encourages innovation while implementing safeguards to maintain system stability. A phased approach to innovation, robust testing procedures, and continuous monitoring are critical components of a strategy that enables organizations to reap the benefits of innovation without sacrificing system reliability.

Our investigation into global connectivity and compliance challenges revealed that 60% of organizations faced complexities in managing technical systems to meet diverse compliance standards, particularly in a globally connected digital economy.



Navigating the intricacies of global compliance requires organizations to develop a comprehensive understanding of regional regulations and industry-specific standards. Implementing a centralized compliance management framework and regularly updating policies become essential for organizations seeking to expand their global footprint while adhering to ethical and legal standards.

Our scrutiny of talent acquisition and skill gaps unveiled that 45% of organizations encountered challenges in recruiting, training, and retaining professionals with the necessary expertise in emerging technologies.

Investing in talent development initiatives and fostering a culture of continuous learning is pivotal in addressing skill gaps. Collaboration with educational institutions, mentorship programs, and strategic workforce planning can contribute to building a skilled and adaptable workforce capable of effectively managing evolving technical systems.

Our examination of cost management in technical systems implementation and maintenance indicated that 40% of organizations faced budget constraints, limiting their ability to adopt cutting-edge technologies.

Strategic cost management involves optimizing existing systems, prioritizing investments based on business goals, and exploring cost-effective solutions. Organizations that manage budgets judiciously can navigate economic challenges, ensuring that technology investments align with overarching business objectives. A balance between innovation and cost-effectiveness is crucial for sustained success in the digital economy.

Our investigation into data governance and privacy showcased that 50% of organizations considered data mishandling and privacy issues as significant concerns, with potential legal and reputational consequences.

Robust data governance frameworks and adherence to privacy regulations are critical for organizations aiming to build trust and maintain ethical data management practices. Implementing encryption technologies, regular audits, and employee training on data privacy contribute to a resilient approach that safeguards sensitive information and ensures compliance with evolving data protection regulations.

In the ever-evolving landscape of the digital economy, the management of technical systems stands as a linchpin for organizational success. Our exploration into the problems and prospects of technical systems management has unearthed crucial insights that underscore the complexities and opportunities inherent in this dynamic field.

IV. CONCLUSIONS

In the ever-evolving landscape of the digital economy, the management of technical systems stands as a linchpin for organizational success. Our exploration into the problems and prospects of technical systems management has unearthed crucial insights that underscore the complexities and opportunities inherent in this dynamic field.

Our findings illuminate the pervasive struggles organizations face in integrating emerging technologies into their technical systems. The call for strategic planning, compatibility checks, and robust change management processes is resounding. Navigating integration challenges is not merely a technical endeavour but a strategic imperative for organizations aiming to stay at the forefront of innovation.

The prevalence of cybersecurity incidents reinforces the urgency of fortifying technical systems against evolving threats. Organizations must consider cybersecurity as an integral component of technical systems management, investing in advanced threat detection, employee training, and comprehensive incident response plans to safeguard their digital assets and maintain stakeholder trust.

The risk of technological obsolescence demands proactive planning for technology lifecycle management. Organizations must embrace an agile approach, continually evaluating the relevance of existing systems, and strategically planning for upgrades. This adaptive strategy ensures technical systems remain aligned with the accelerating pace of technological evolution.

Striking a balance between fostering innovation and maintaining system stability emerges as a leadership challenge. Organizations must cultivate a culture that encourages innovation while implementing safeguards to preserve system reliability. The phased approach to innovation, robust testing, and continuous monitoring constitute pillars for achieving this delicate equilibrium.

Navigating global connectivity and compliance challenges requires organizations to become adept at understanding diverse regional regulations. Establishing a centralized compliance management framework and updating policies regularly are imperative for organizations aspiring to expand globally while adhering to ethical and legal standards.

Addressing talent acquisition and skill gaps necessitates a commitment to ongoing learning and strategic workforce planning. Collaboration with educational institutions and the implementation of mentorship programs contribute to building a skilled workforce capable of effectively managing evolving technical systems.

Strategic cost management is pivotal for organizations facing budget constraints. It involves optimizing



existing systems, prioritizing investments, and exploring cost-effective solutions. Achieving a balance between innovation and cost-effectiveness is foundational for sustained success in the digital economy.

Robust data governance frameworks and privacy compliance are non-negotiables in the digital landscape. Organizations must implement encryption technologies, conduct regular audits, and prioritize employee training on data privacy to build trust and ensure compliance with evolving data protection regulations.

As organizations grapple with these challenges, they must also recognize the prospects embedded within them. Each challenge is an opportunity for growth, innovation, and strategic advancement. Technical systems, when managed adeptly, become not just operational support but strategic assets propelling organizations into a future defined by resilience and adaptability.

In conclusion, the journey of technical systems management in the digital economy is marked by hurdles and horizons. Organizations that navigate the challenges and embrace the prospects will position themselves as pioneers in a landscape defined by constant evolution and unparalleled opportunities

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