

Digital Factory and Federated Network of Platforms in Smart Industries

Future Readiness for **Resilient Future (FR 4 RF)**

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Introduction to the Topic

- The rapid digitalization of industries and public administrations introduces opportunities for Business Growth and new cyber risks
- Business Agility by Design embeds success measures from the start of Business Model design to ensure robust systems
- This presentation explores how Digital Factories and Federated Network of Platforms contribute to Digital Transformation and Business Growth
- IT and Business Governance: A Critical Relationship

Overview of Digital Transformation(DX), Artificial Intelligence (AI) Cyber Security (CS) in Smart Industries

- **Smart Industry** concept is often used in Critical Infrastructures (energy, transport, healthcare...) and increasingly interconnected and exposed to cyber risks.
- **Challenges** include speed up of digital transformation and usage artificial intelligence, cybersecurity threats, regulatory compliance, and the complexity of digital platforms.
- **Focus:** Straightening innovation and efficiency while Protecting operational systems

Strategic Capabilities of Organizations

- Management: Business Agility
- Organization: Digital Factory
- Technology: Federated Network of Platforms

Digital Ecosystem for Open Innovation and Talent Attraction

Strategic Priorities on State Level

- Industry Transition (Smart Industry development and usage)
- Digital Transformation of Public Administration
- Social Transformation
5-Helix cooperation (government, businesses, academia, media and NGO)

McKinsey
& Company

How do companies create value from digital ecosystems?

As part of its strategic partnership with Viva Technology, McKinsey & Company is publishing a series of articles looking at seven areas of technology that are potentially the most disruptive: Quantum computing, Cybersecurity, Connectivity & 5G, Cloud computing, AI, Digital ID, and Biotechnologies; as well as two major shifts for society: Future of work and Digital ecosystems.

August 2020



VentureBeat



Guest

Why prompt engineering is one of the most valuable skills today

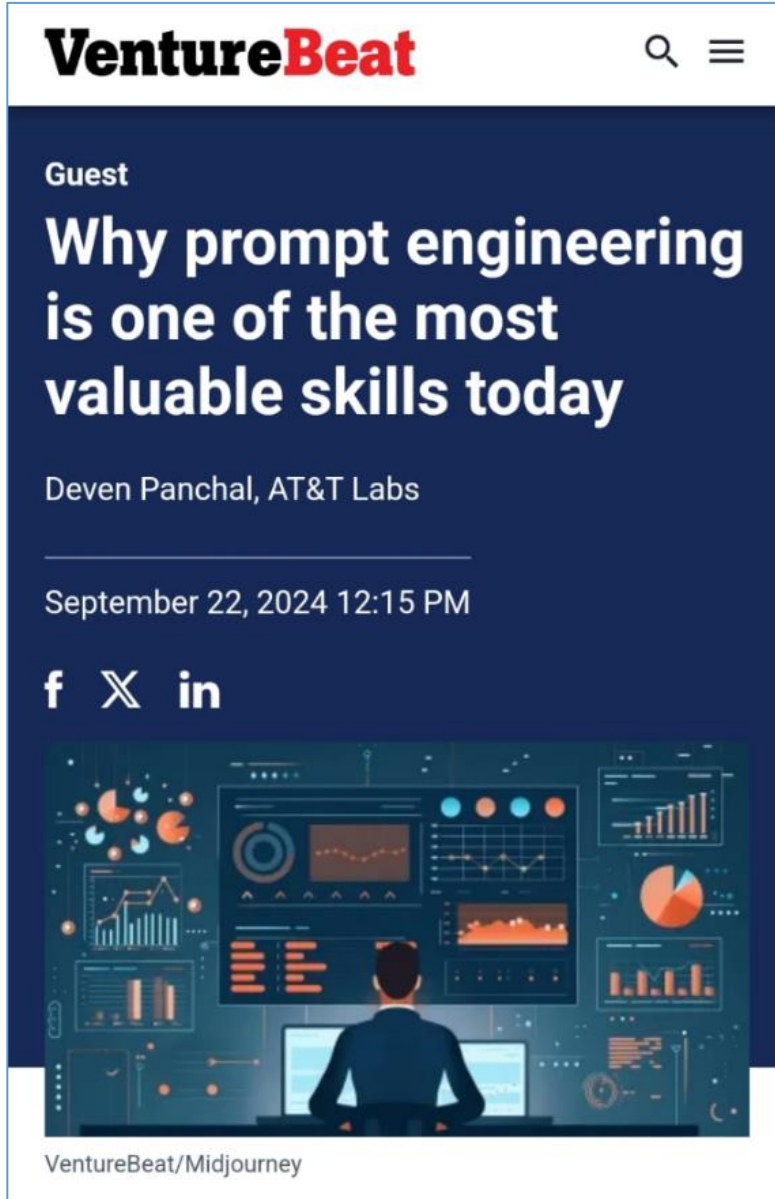
Deven Panchal, AT&T Labs

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VentureBeat/Midjourney



Digital Triple Play for All

Digital Triple Play:

- Digital Transformation (DX)
- Artificial Intelligence (AI)
- Cyber Security (CS)

Digital Service Infrastructures (EU CEF DSI)

The most important digital technologies applicable to Smart Industries are:

1. Cloud Computing
2. Mobile Technologies
3. Social Networks
4. Big Data
5. Internet of Things (IoT)
6. Virtual/Augmented Reality
7. Cyber Security

In the realm of the 4th and 5th Industrial Revolution (IR) technologies, the key technologies for Smart Industries are:

1. Artificial Intelligence (AI)
2. Robotics
3. Drones
4. 3D Printing
5. Energy Storage
6. Blockchain
7. Autonomous Systems
8. Digital Twins

AI and Smart Industries (SI)

- Artificial Intelligence - **AI** is becoming critical for enhancing operational excellence in Smart Industries
- AI usage spans data analysis, Smart Product design and improving operational efficiency.
- AI readiness includes AI-ready security, data, and well-defined principles.

Gartner.

Map Your AI Use Cases by Opportunity

Ready the IT team to
drive success.



EU Regulations: CIP, NIS2, CER, DORA, CSA, CRA, AI

- **CIP** (Critical Infrastructure Protection): Focuses on protecting essential services (e.g., energy, healthcare) from physical and cyber threats to ensure resilience and availability.
- **NIS2** (Network and Information Security Directive 2): Expands cybersecurity requirements across more sectors, including healthcare and energy, enhancing risk management and incident reporting.
- **CER** (Critical Entities Resilience Directive): Aims to improve resilience of critical entities providing essential services, such as water and energy, ensuring they can continue operating amid threats.
- **DORA** (Digital Operational Resilience Act): Ensures financial sector resilience to ICT disruptions by establishing risk management, incident reporting, and third-party management requirements.
- **CSA** (Cybersecurity Act): Establishes a European framework for cybersecurity certification of digital products and services, aiming to unify standards across the EU.
- **CRA** (Cyber Resilience Act): Sets cybersecurity requirements for products with digital elements to enhance the security of connected devices throughout their life cycle.
- **EU AI Act** (Artificial Intelligence Act): The AI Act is a proposed regulation that seeks to create a framework for the development, commercialization, and use of AI technologies in the EU. It introduces a risk-based approach to AI regulation, classifying AI systems into different levels of risk (minimal, limited, high, and unacceptable) and imposing requirements accordingly.

Gartner®

IT Roadmap for Cybersecurity

Excerpt

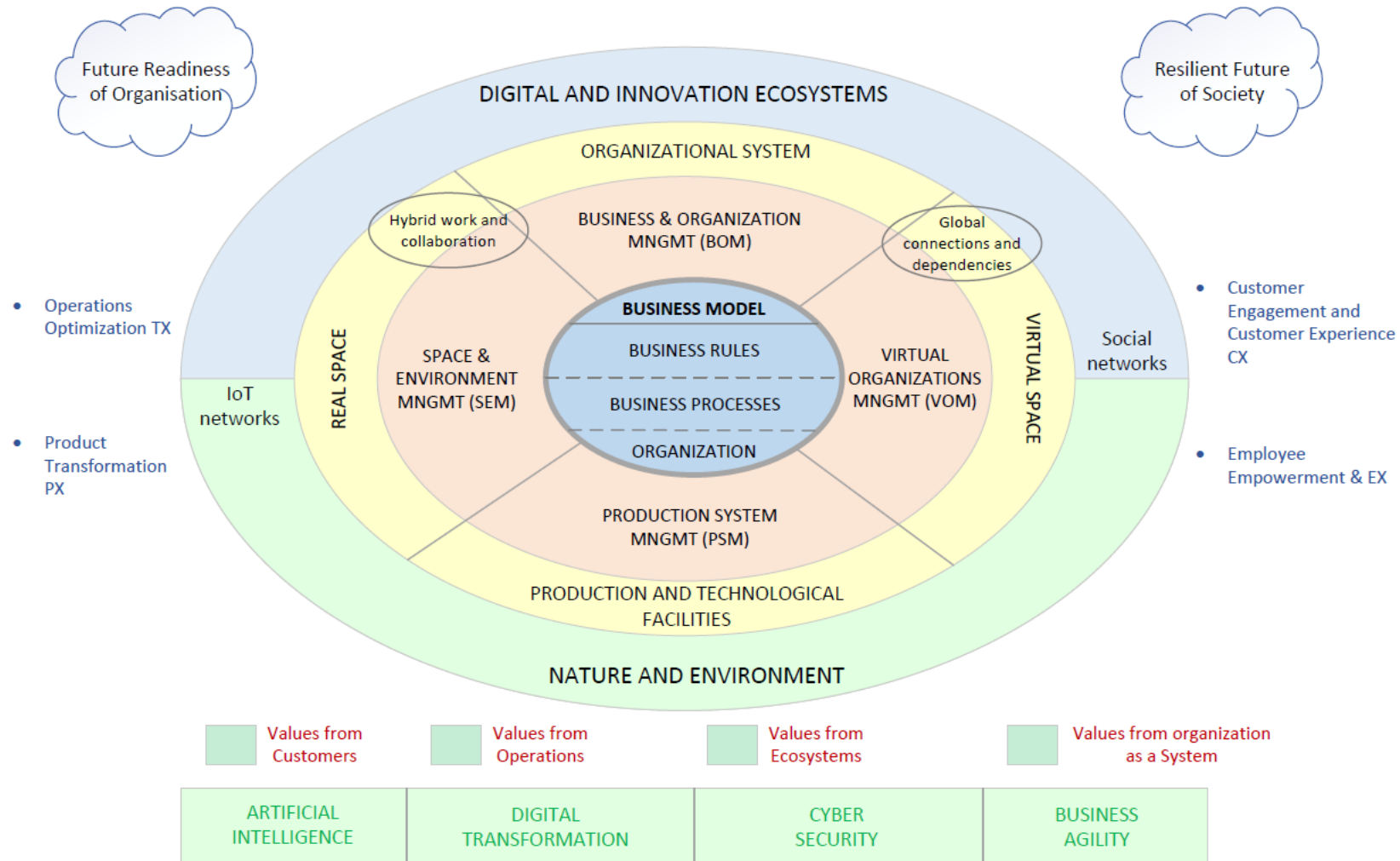
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Digital Factory Concept

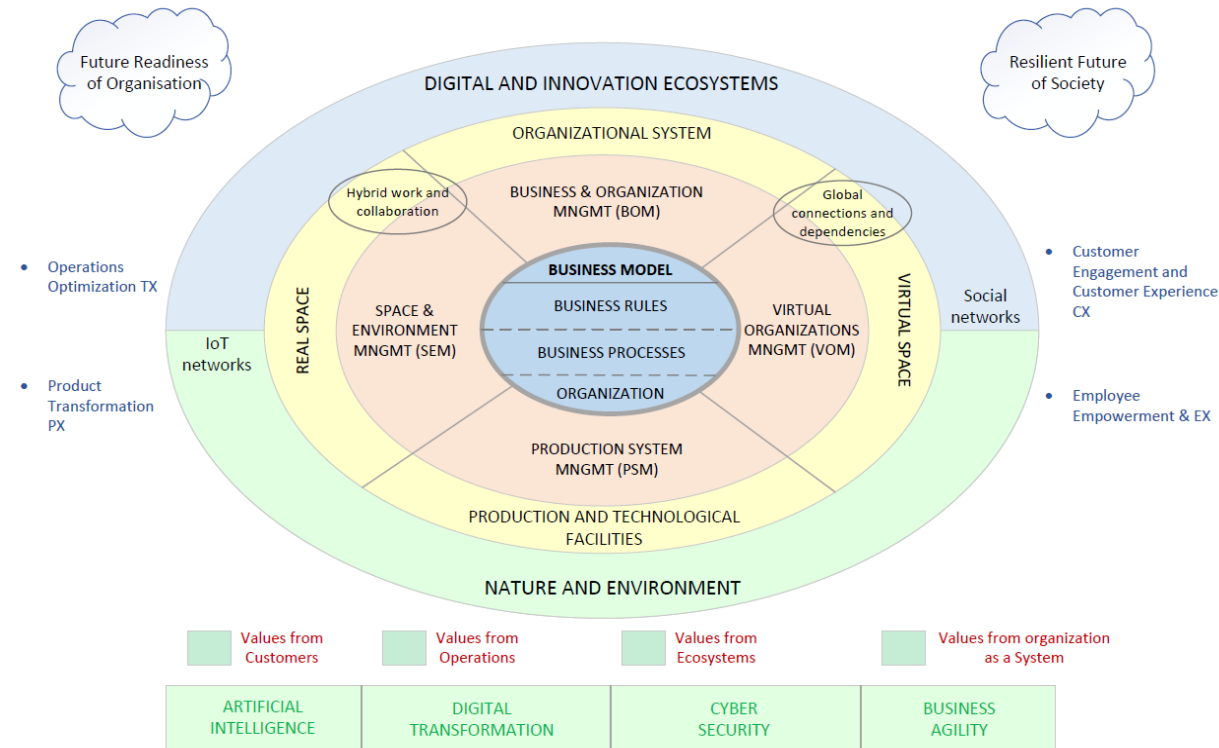
- A Digital Factory leverages AI, automation, and IoT to create flexible, scalable production environments.
- Built with modularity and adaptability in mind, it allows quick responses to market changes and disruptions and unexpected events
- Key Focus: Integration of digital platforms to enhance efficiency and security.
- Shifting from project to product is key for digital factory success and growth.
- Benefits include faster value realization, improved customer satisfaction, and enhanced agility.
- Product management is central to driving organizational digital transformation.

Business model and management systems



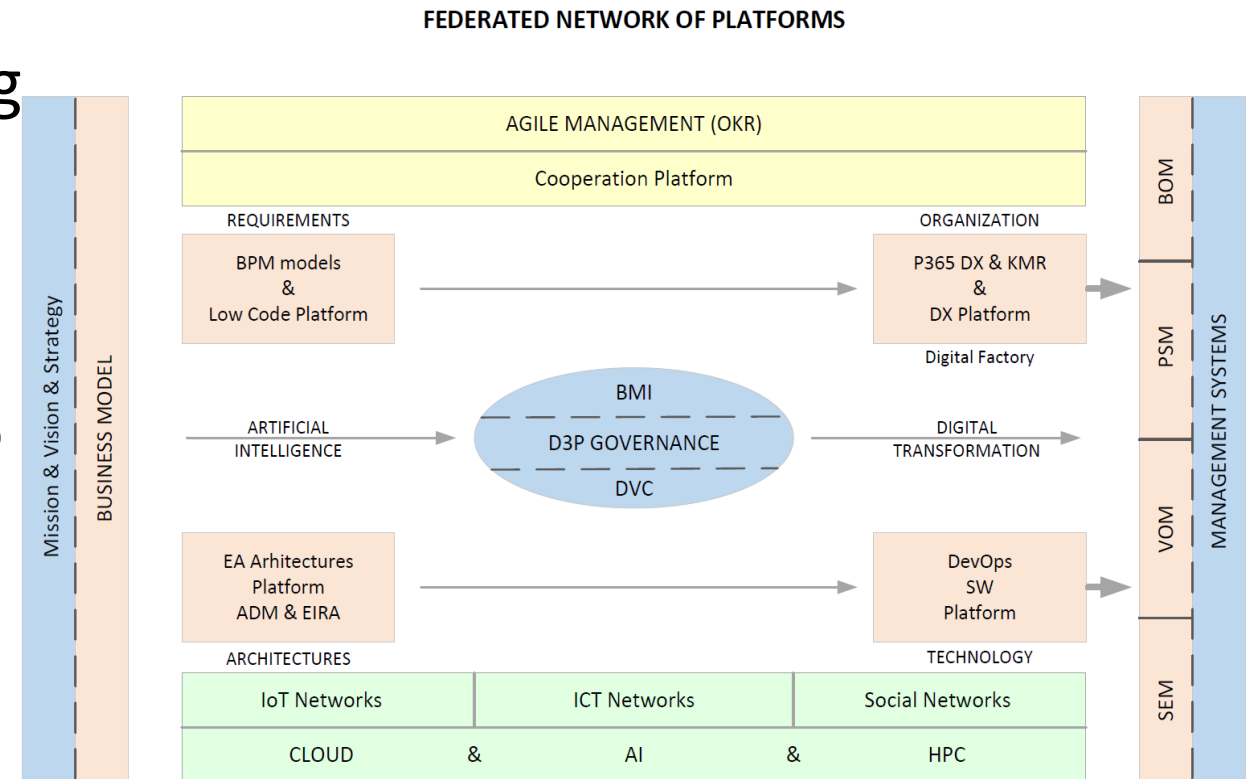
Integrated Management Systems in the Business Model

- The business model integrates four management systems:
 1. Business & Organization Management (BOM)
 2. Production System Management (PSM)
 3. Space & Environment Management (SEM)
 4. Virtual Organizations Management (VOM)
- These systems ensure comprehensive digital transformation and adaptability.



Federated Network of Platforms

- A Federated Network connects different digital platforms, allowing secure data exchange and collaboration.
- Ensures interoperability and resilience by enabling platforms to work together independently.
- Key Advantage: Strengthened collective cybersecurity and faster incident responses.



Federated Network of Platforms and Collaboration in Ecosystems

- The "Federation of Platforms" supports management systems and digital platforms.
- Collaboration with ecosystem participants ensures data security, innovation, and talent development.
- Continuous cybersecurity assurance is essential.

Strategic Goals of Digital Factories

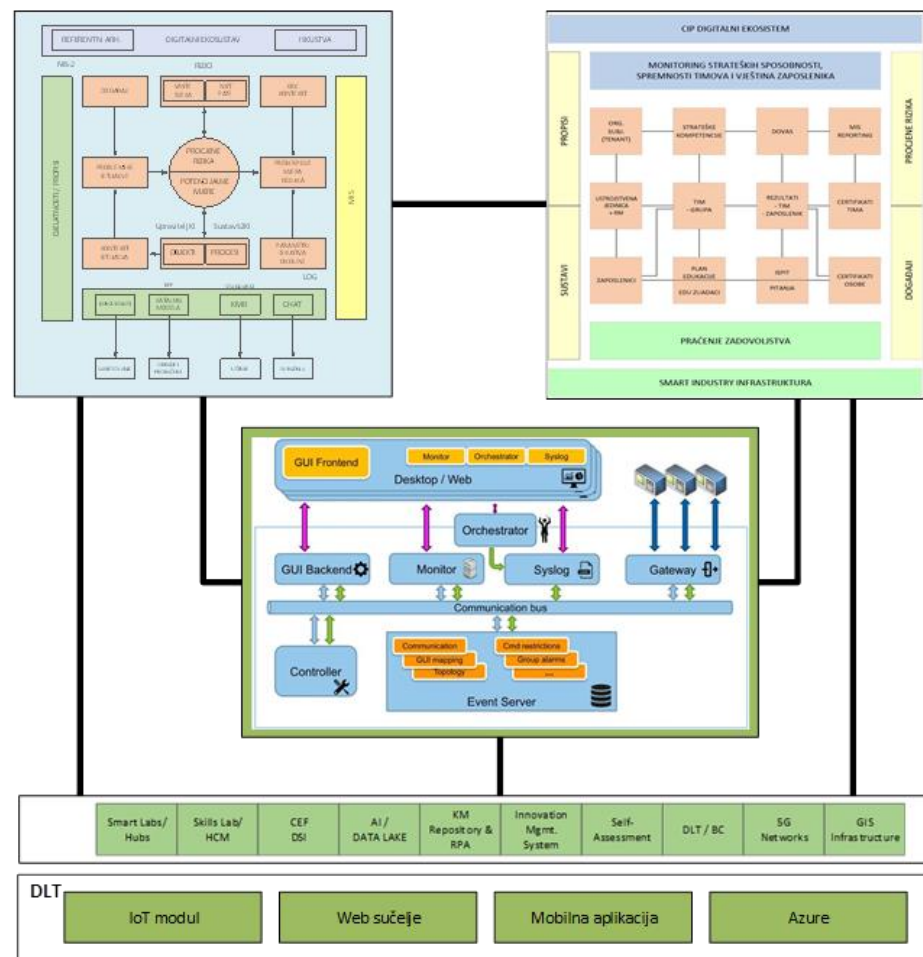
- Business Agility: Ability to pivot and adapt to disruptions.
- Operational Resilience: Built-in mechanisms for real-time risk detection and response.
- Digital Growth: Leveraging AI to accelerate innovation and optimize industrial processes.
- Business growth driven by Business Model Innovation

Key Enablers: AI and Cybersecurity

- AI optimizes production, forecasts risks, and improves decision-making.
- Cybersecurity ensures the integrity of industrial systems against evolving threats.
- Together, they form the backbone of resilient digital factories, enhancing both efficiency and protection.

CIP4SI Digital Platform: A Practical Application

- The CIP4SI project demonstrates how a digital platform can be used to protect critical infrastructure.
- It integrates security, compliance, and operational management into a single framework.
- Provides an ecosystem for resilient, secure solutions for industrial processes.

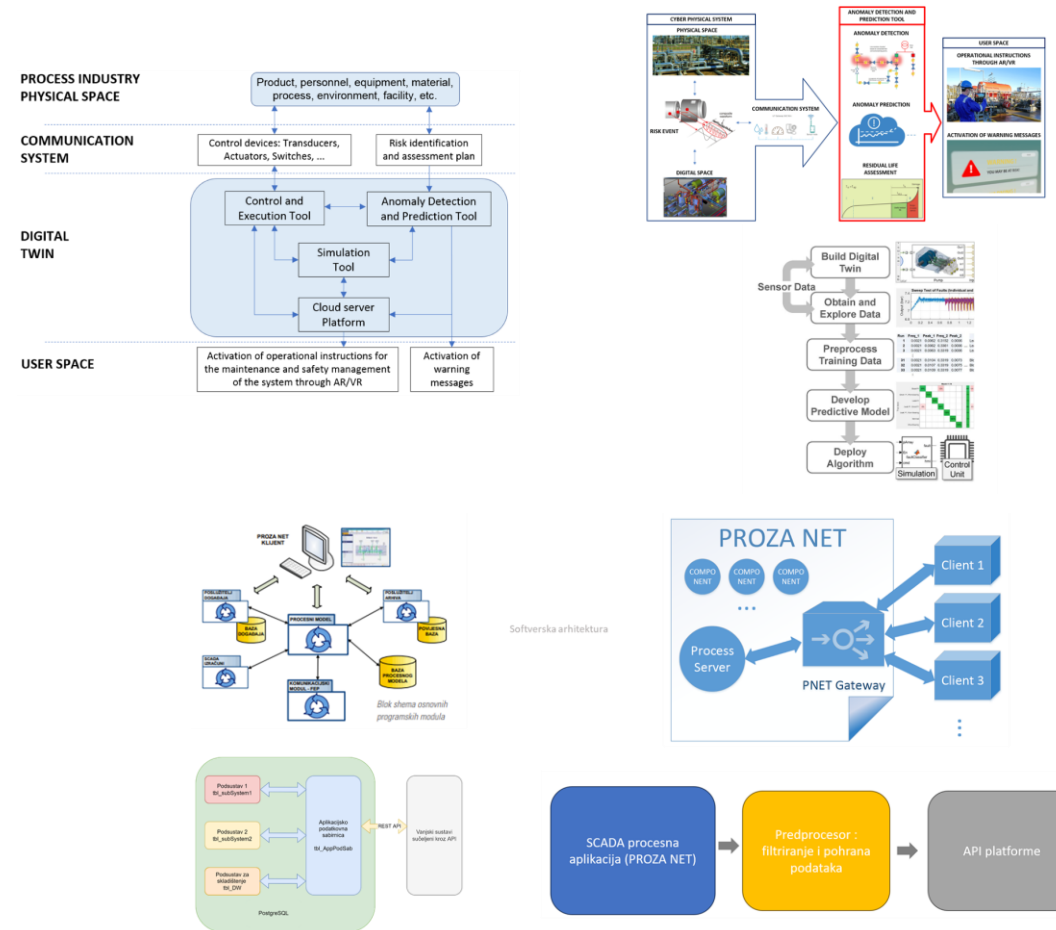


Governance and Organizational Alignment

- Effective governance aligns Digital Transformation (DX), AI and Cybersecurity efforts.
- Ensures initiatives are synchronized across teams and timelines, facilitating continuous improvement.
- Governance is key to resilient, scalable operations.

Operational Synergies and Network Integration

- Digital Factories thrive on synergies created by integrating diverse platforms, IoT, and ICT networks.
- Real-time data sharing enhances decision-making and predictive capabilities.
- Integration fosters collaborative innovation, reducing risks and improving scalability.



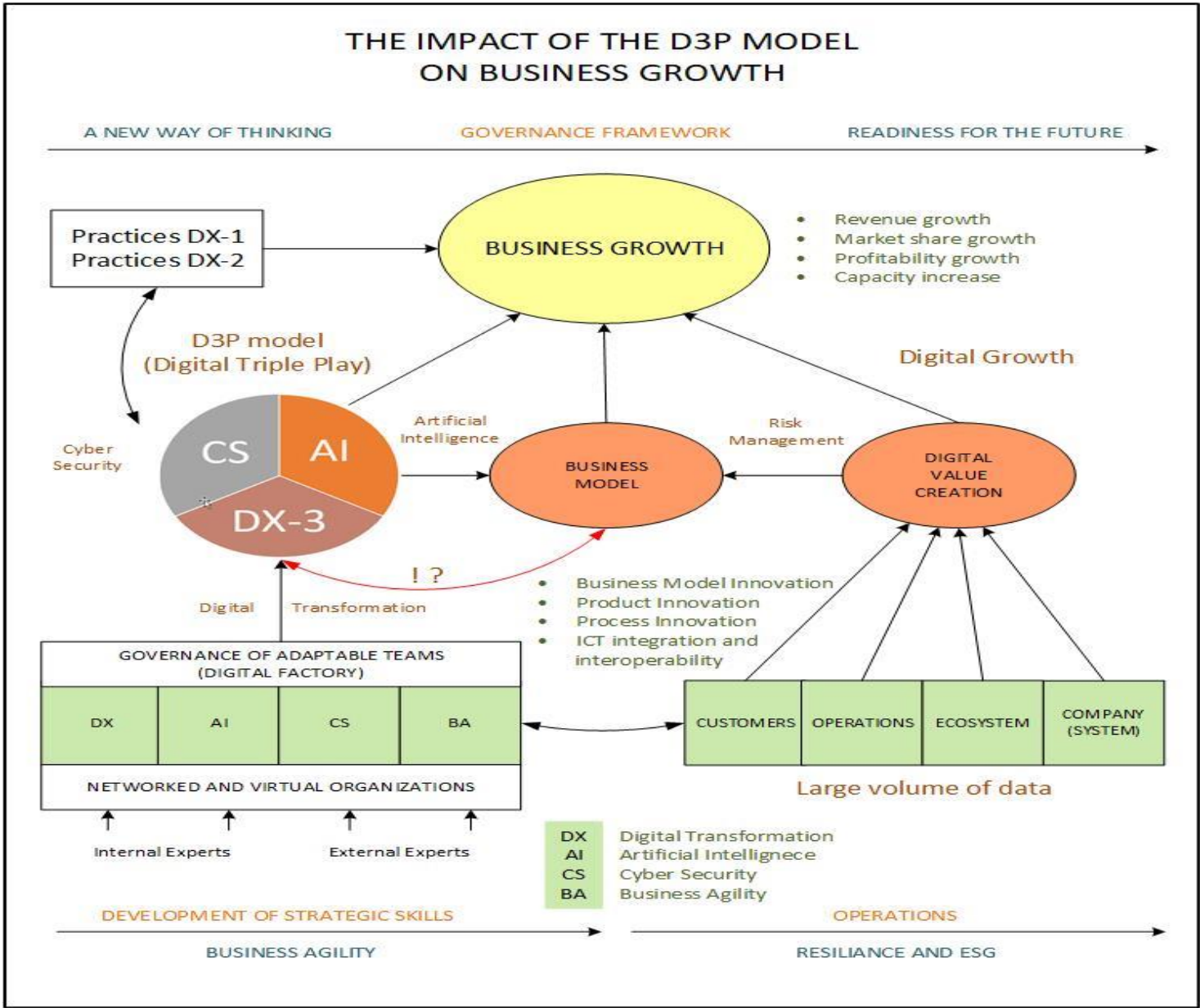
IT and Business Governance: A Critical Relationship

- **IT infrastructure is a crucial component of critical infrastructure protection (CIP)**
 - As reliance on technology grows, so does the need to safeguard IT systems from cyber threats.
- **Key Considerations:**
 - **Vulnerability Assessment:** Regularly assess IT systems for potential weaknesses.
 - **Incident Response Planning:** Have a well-defined incident response plan in place.
 - **Access Control:** Implement strong access controls to prevent unauthorized access.
 - **Data Backup and Recovery:** Regular backups and a robust recovery plan are crucial.
 - **Employee Training:** Provide training on cybersecurity best practices.

The Role of IT in CIP

- **IT professionals play a vital role in CIP by:**
 - Identifying and mitigating cybersecurity risks.
 - Developing and implementing security policies and procedures.
 - Responding to and recovering from cyberattacks.
 - Ensuring compliance with relevant regulations and standards.
- **Challenges and Opportunities:**
 - The complexity of IT systems and evolving cyber threats pose challenges.
 - Technology, such as AI-powered security solutions, offers opportunities for enhanced protection.

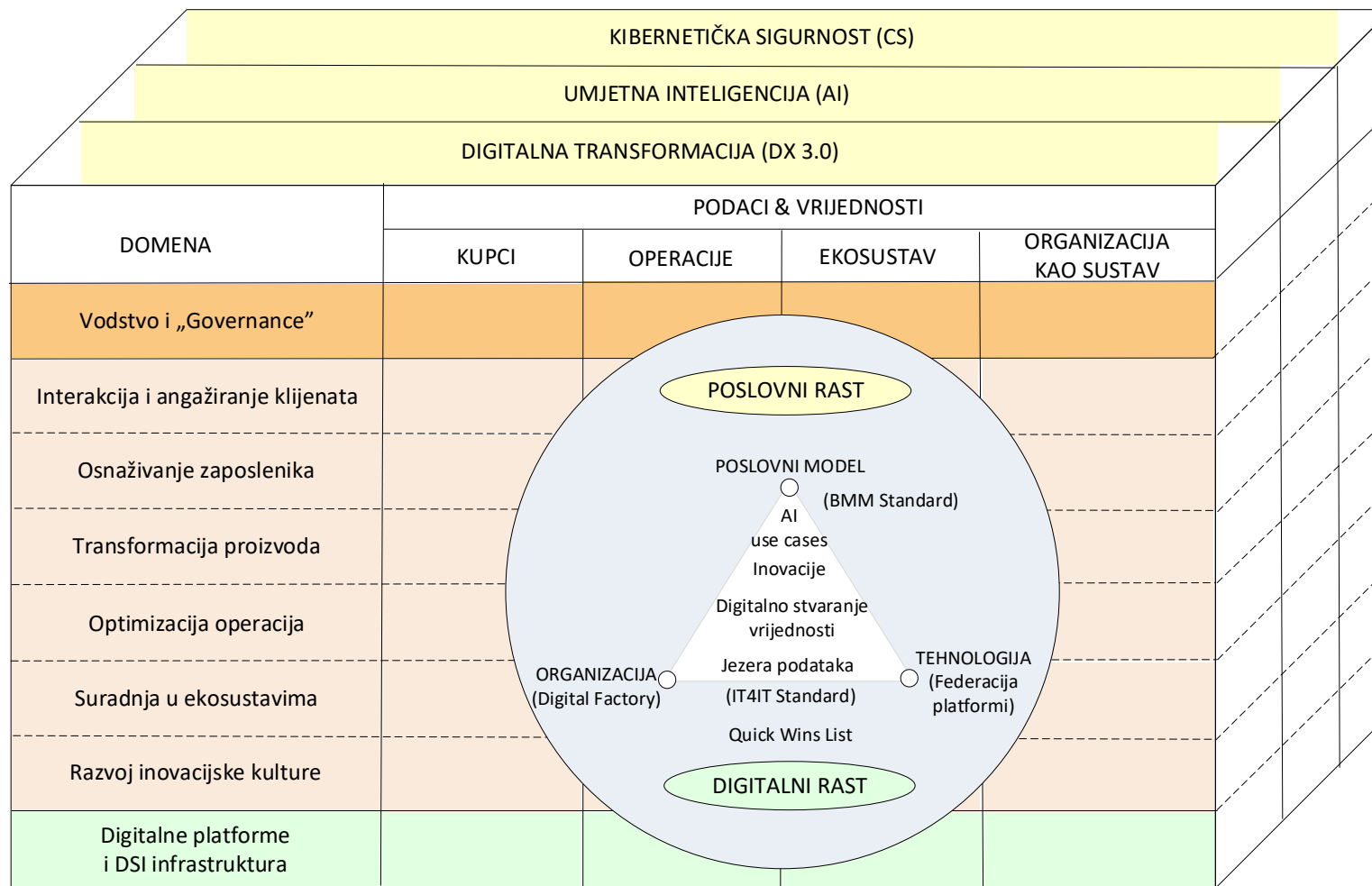
The Impact of the D3P model on business growth



Overall Recommendation: D3P Framework

- Management functions and algorithms must be adaptable and quickly adjustable in response to unexpected events in the environment.
- All management systems are governed by rules, processes, and data, which are algorithmically stored in digital products that must be capable of being changed "on the fly.,,"
- Digital value creation must fully leverage sources of value, such as customers, operations, ecosystems, and the organisation as a system.
- Prompt engineering with generative artificial intelligence (GenAI) should enable diagnostics, prediction, and decision-making by capturing data and content, primarily from external sources.
- Collaboration and coexistence with business ecosystem participants should ensure the security of large volumes of data, facilitate open innovation, talent development, the application of GenAI, the development and exploitation of platform federations, and continuous cybersecurity assurance.

„Digital triple play”: D3P



Standardi: BMM & IT4IT Standard
 Organizacijski model: Digital Factory
 Tehnologija: Federacija digitalnih platformi
 Digitalna infrastruktura: CEF DSI standardi i komponente
 Kapaciteti: Cloud Computing & HPC

STRATEŠKE SPOSOBNOSTI:
 - **Digital** - Innovative
 - Open - Agile
 - Virtual - **Smart**

Conclusions and Future Outlook (1/2)

- „**Resilience by Design**” is crucial for the future of Smart Industries.
- **Digital Factories** and **Federated Platforms** will continue to play a key role in meeting regulatory requirements while driving growth.
- **Digital Factories** and **Federated Platforms** will protect critical infrastructures while driving growth.
- Organizations are encouraged to **adopt integrated resilience strategies** to stay competitive and secure in an evolving threat landscape.
- Call to action: **Adopt this model** to stay competitive and secure in the digital age.

Conclusions and Future Outlook (2/2)

- The Digital Triple Play (D3P) approach is key to business success
- Accelerating digital transformation
- Practical AI use cases
- Cybersecurity: Protection by Design
- Business Agility for Future Readiness

SMART INDUSTRY ACCELERATORS (1/2)

1. **Digital Ecosystem** for a "Smart Response" by Society
2. **Collaboration within Academia** for Complex Projects in 5IR Development
3. **Public Knowledge Repository** for All Economic Associations, Entrepreneurs, and Lifelong Learning
4. **State Incentives** for the Economy through the S3 Strategy for 5IR Development and the ITP Programme
5. **Cultures and Practices of Experimentation** and the Development of DIHs and EDIHs
6. **Digital Infrastructure** for Smart Industries and Digital Platforms

SMART INDUSTRY ACCELERATORS (2/2)

- 7. **Talent Integration into Smart Product Development and Laboratories** Across Counties, Cities, and Municipalities
- 8. **Implementation of CEF DSI Standards and Components** for the Economy and Access of Exporters to the EU DSM Market
- 9. **Development of Capabilities to Operate in Crises and Disruptions**, and Increasing Resilience
- 10. **Building Future Readiness and Business Agility**
- 11. **Smart Products and Digital Twins**
- 12. **Inclusion of Rural Areas** in Research and Development Projects
- 13. **Social Innovations** Supported by Smart Industries

Sectors of high criticality

1. Energy
2. Transport
3. Banking
4. Financial market infrastructures
5. Health
6. Drinking water
7. Wastewater
8. Digital infrastructure
9. ICT service management (business-to-business)
10. Public administration
11. Space

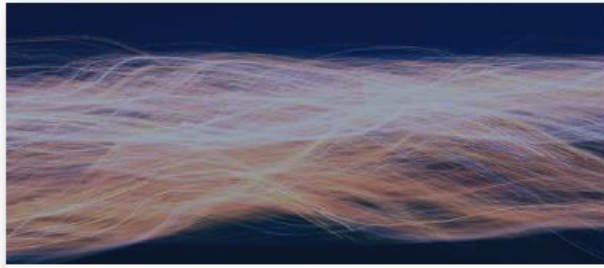
Other critical sectors

1. Postal and courier's services
2. Waste management
3. Manufacture, production and distribution of chemicals
4. Production, processing and distribution of food
5. Manufacturing
6. Digital providers
7. Research



Semantics

Discover how semantics facilitates the data reuse.



Open Source Software

Discover the power of open source software in the development of European digital public services.



Observatories

Explore the reports on the state of play of digital public administration and interoperability activities.



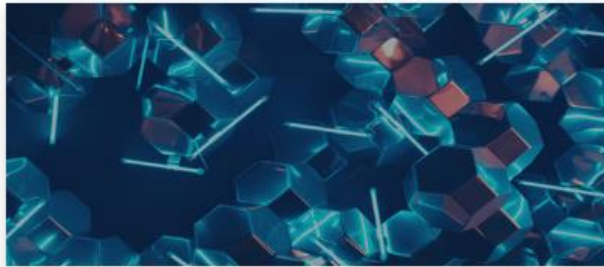
Digital-ready policymaking

Digital-ready policymaking considers digital aspects from start to finish to create policies that are future-proof and interoperable.



Tools

Discover the tools and specifications to help achieve interoperability in the EU digital public services.



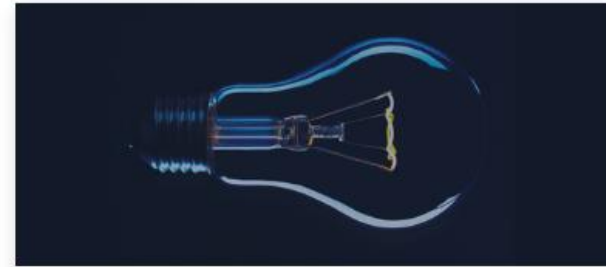
Reusable Software Components

Discover reusable software, services and specifications to facilitate interoperability in digital public services.



Smart cities

Discover how "Smart Cities" contribute to the well-being of their citizens and businesses.



Digital innovation

Discover how innovation (AI, Blockchain, GovTech) plays an important role in serving citizens better.

Resilient Future of Society

- for -

**Future Readiness of
Organisation**