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2018 World Manufacturing Forum Report

Recommendations for the Future of Manufacturing

September 27 – Villa Erba, Cernobbio
Marco Taisch – WMF Scientific Chairman

World Manufacturing Forum

Believes

Manufacturing Stakeholders Have Unprecedented Opportunities to Build Global Wealth Creating:

- Jobs for All
- Resilient Economy
- Sustainable Development
- Socially-Oriented Goods and Services
- Strong Partnerships and Collaborations

Manufacturing is a Peacekeeper

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2018 WMF Report

Recommendations for the Future of Manufacturing

A White Paper to Enhance the Impact of Manufacturing

- Identify a Desirable Future where Societal Prosperity is for All
- Envision the impacts affecting Sustainable Growth
- Propose How to Act to the Key Manufacturing Stakeholders

Time to Act is Now

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Manufacturing in Numbers

- Reaching More End-Users
- Continuous Investment in R&D
- Creation of New Job
- Operators 4.0 & Skills Reallocation
- Alignment with Circular Economy Paradigm

Societal Megatrends

- Aging Population
- Upgrading Status of Minority Populations
- Worsening Scarcity of Natural Resources
- Steady Migration and Mobility of Young Talents
- Digitising Interconnection and Cyber Threats
- Progressive Global Warming

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Manufacturing Challenges

- Competences & Skills Gap for Advanced Manufacturing
- Zero-Waste Manufacturing
- Global-Agile Supply Chain Networks
- Energy & Resource Efficiency
- Mass Personalisation
- Integration of IT, OT and ET
- Data Security and Data Authority
- The Paradox of SMEs Digital Divide

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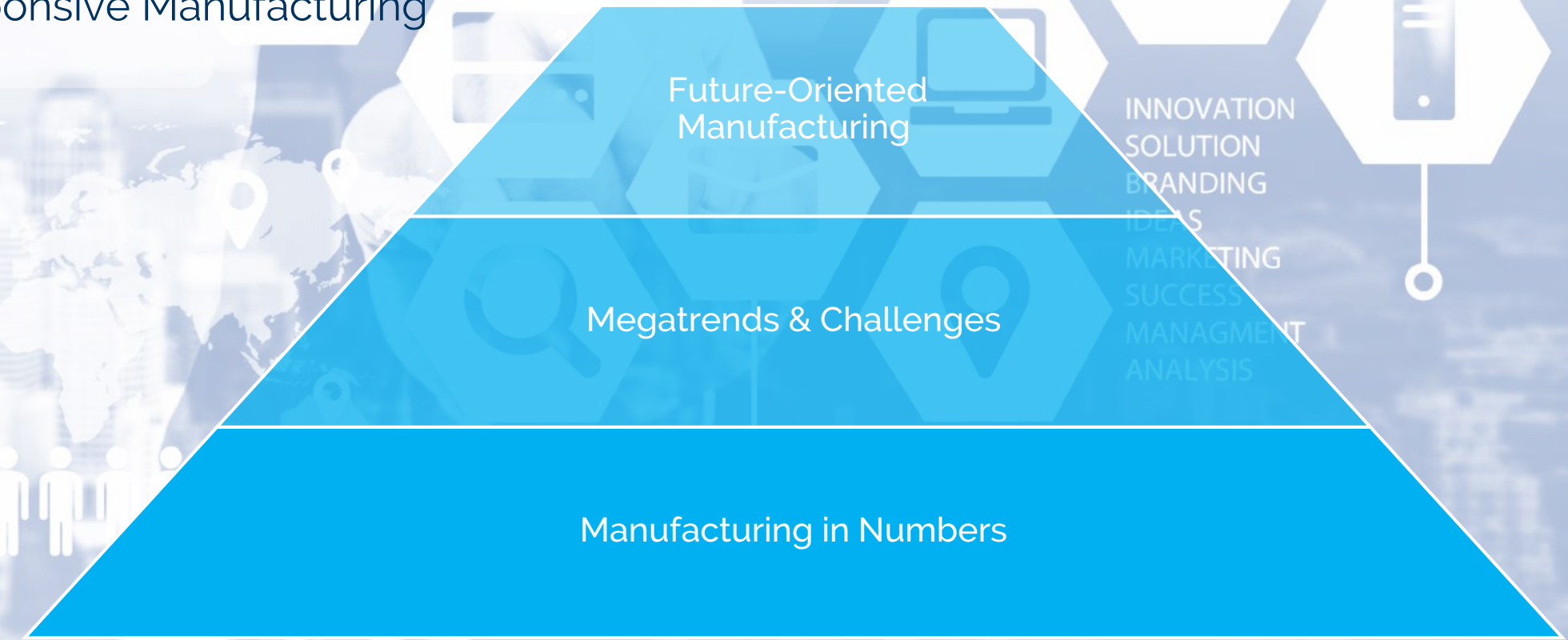
Future-Oriented Manufacturing

- Cognitive Manufacturing
- Hyper-Personalised Manufacturing
- Global Risks-Resilient Manufacturing
- Circular Manufacturing
- Inclusive Manufacturing
- Rapidly Responsive Manufacturing



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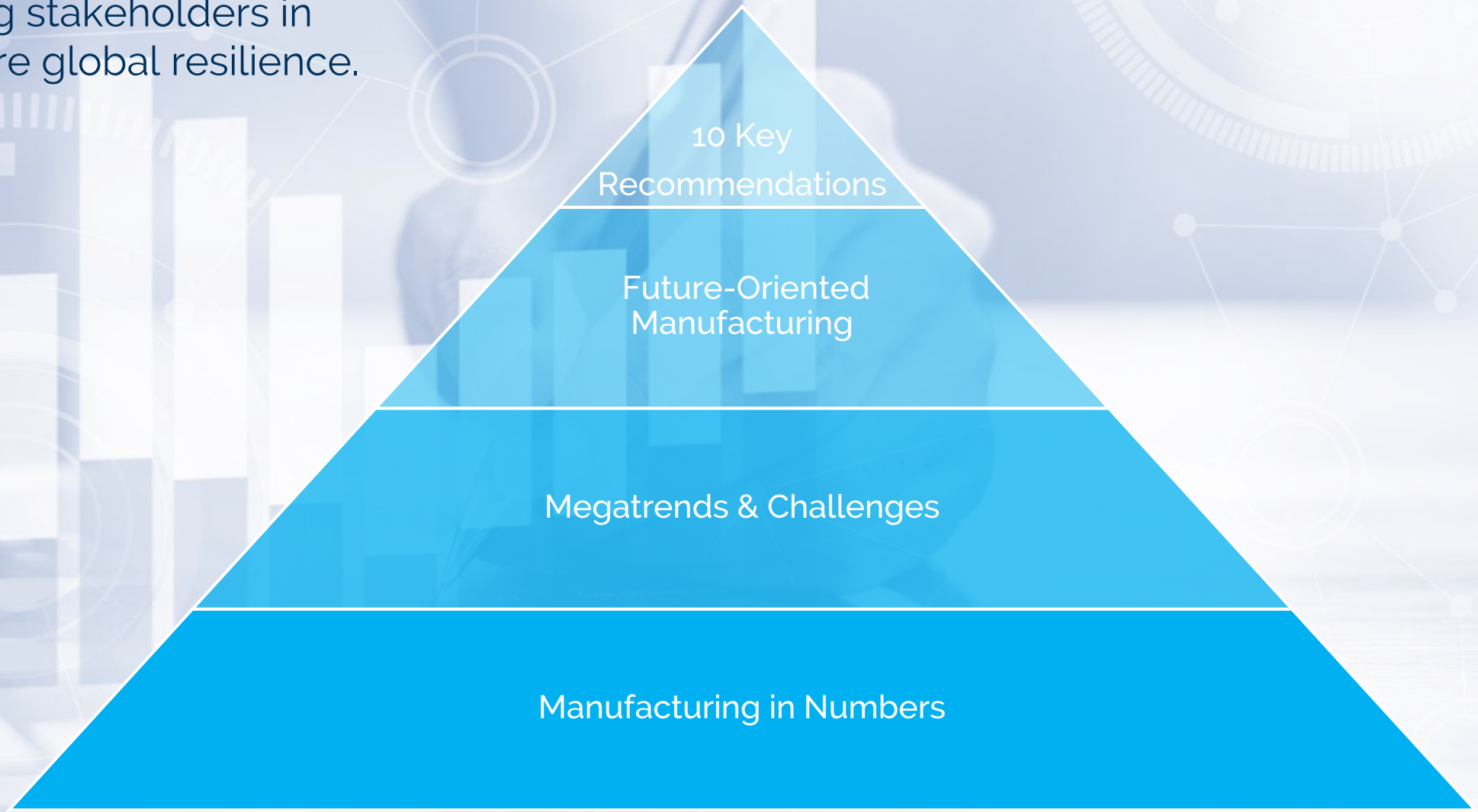
2018 WMF Report

Recommendations for the Future of Manufacturing

- Top recommendations for key manufacturing stakeholders in order to ensure global resilience.



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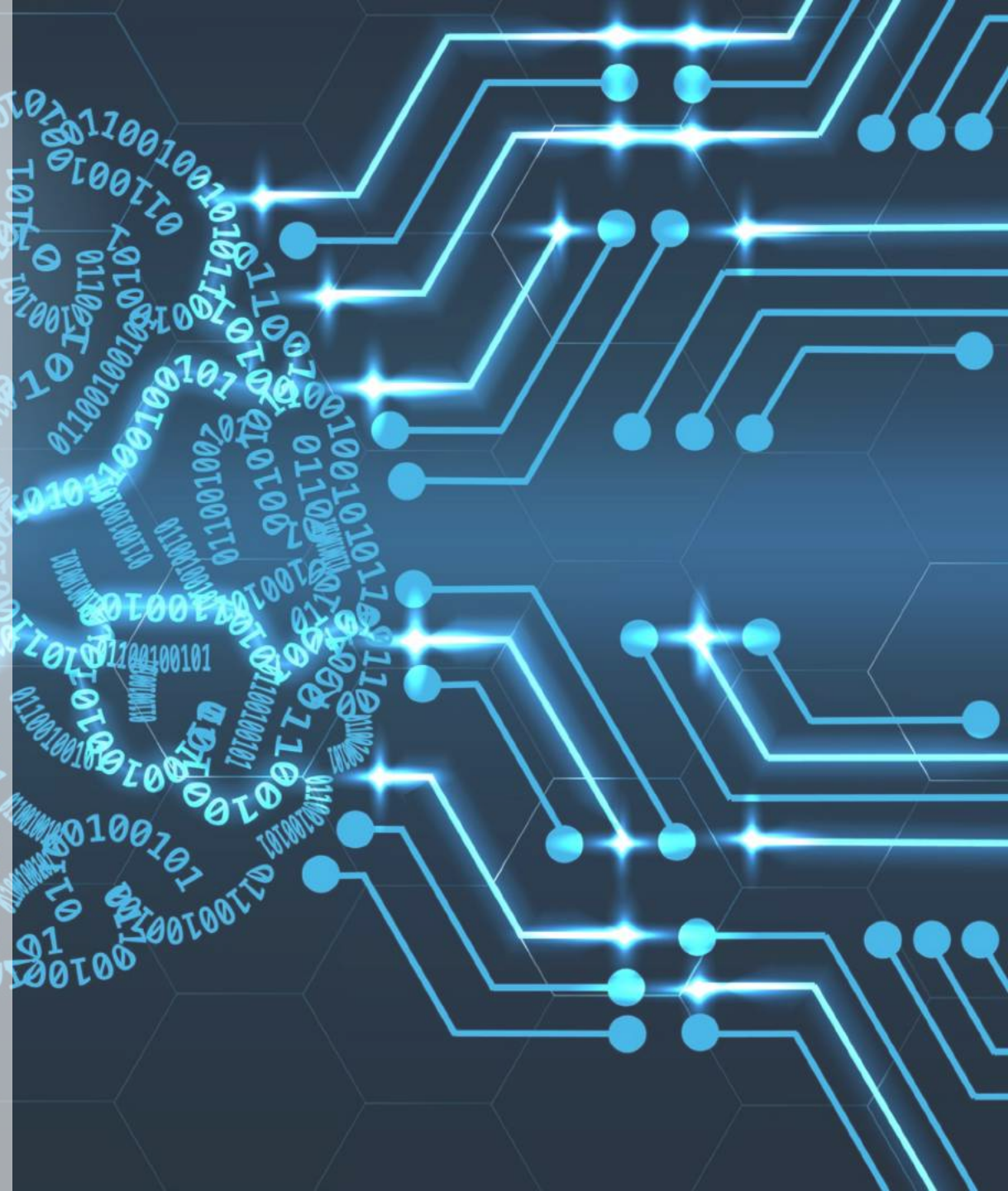
Cognitive Manufacturing

- Hyper-Connected Intelligence Machine
- AI-Driven Operations
- Manufacturing as a Service
- Smart Optimisation of Resources



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Hyper-Personalised Manufacturing

- Embed sensors into goods & create mechanism to use direct feedback on usage
- Create flexible manufacturing processes to adapt products to consumer trends
- Develop ways to involve customers in the design of products
- Use 3d printing to accelerate prototyping and testing

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Global Risk-Resilient Manufacturing

- Reinforce CyberSecurity
- Integrate Blockchain Technologies
- Exploit Social IoT Systems
- Respond to Off-Shore Threats
- Involve Stakeholders in the Digital Value Chain

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Circular Manufacturing

- Shift to Renewable Raw Materials
- Redesign Products & Material Selection
- Implement Service-Based Model
- Conserve & Recover Resources
- Develop New Ways of Production

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Inclusive Manufacturing

- People-Oriented Innovation
- Technology-Oriented Innovation
- Environment-Oriented Innovation

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Rapidly Responsive Manufacturing

- Repetitive Manufacturing Ability
- Rapid Product Realisation
- Digitally Empowered Factory Operations
- Agile, Adaptive, Responsive & Robust Manufacturing Capabilities
- Flexible Production System & Supply Chains

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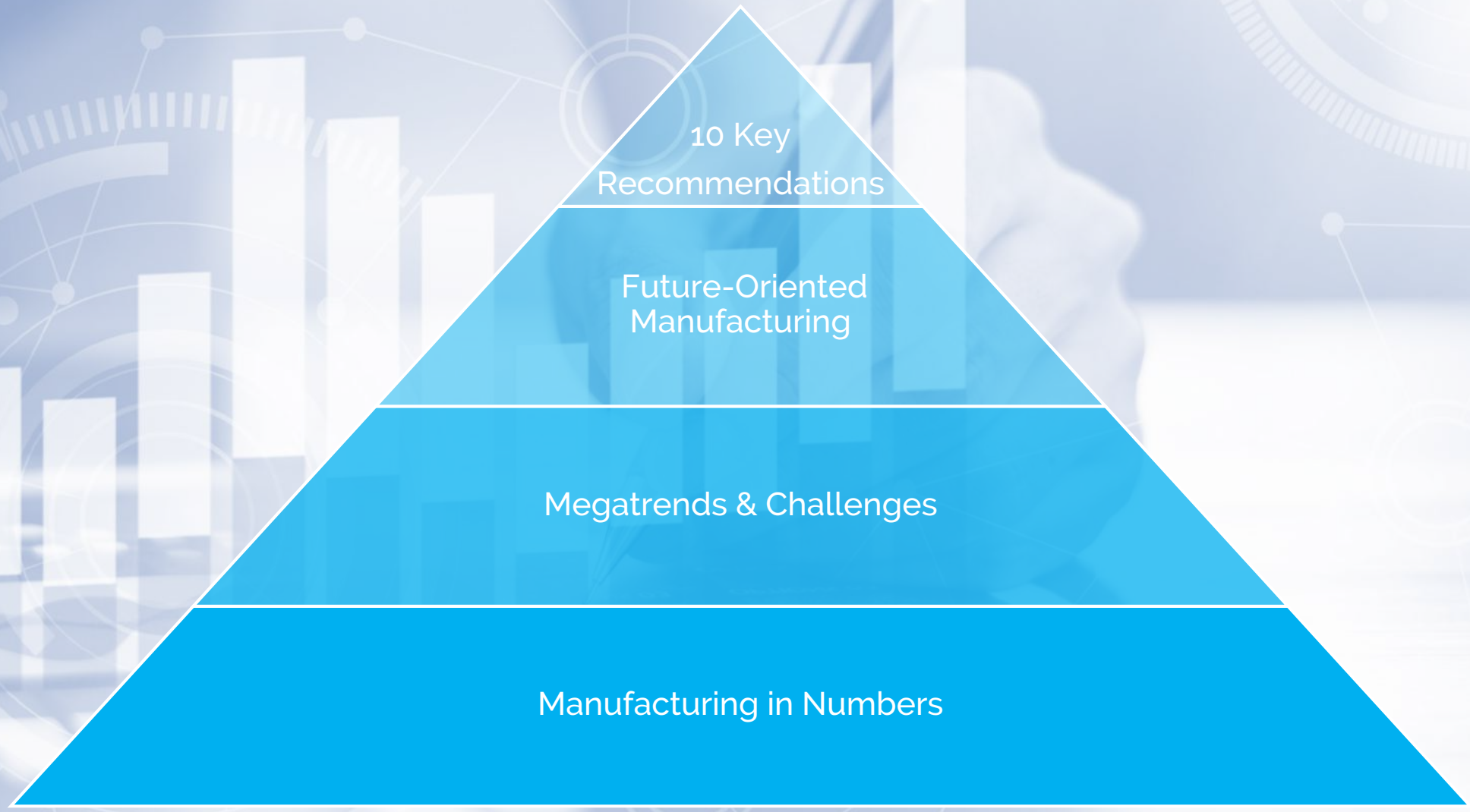
10 Key Recommendations



Cultivate a Positive Perception of Manufacturing

1

- Create awareness in the Society
- Explain the role of Manufacturing to citizens
- Explain the careers opportunities
- Attract talents
- Cover the skills gap

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Promote Education and Skills Development for Societal Well-Being

2

- Retrain and up-skills workers
- Cognitive-based skills
- Educate the whole society to help to deal with the pervasiveness of the technology
- New training approaches for multidisciplinary

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Develop Effective Policies to Support Global Business Initiatives

3

- Clear regulations and policies
- New funding schemes
- Global standards and regulations
- Responsible trading policies
- Do not stop innovation: AI, Data Privacy and Security

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Strenghten and Expand Infrastructures to Enable Future-Oriented Manufacturing

4

- Digital infrastructures are the backbone of the 4th Industrial Revolution
- Digitalisation enables the sharing and the circular economies
- Prevent the national, regional and cultural digital divide
- CyberSecurity is a Must

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Encourage Eco-System for Manufacturing Innovation World Wide

5

- Disruptive and paradigm-changing innovation is needed
- New socially-oriented and cultural-divide aware products
- New forms of collaboration, partnership, knowledge-sharing and co-innovation among a vast network of trusted actors
- Foster start-up oriented eco-systems led by large companies

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Create Attractive Workplaces for All

6

- Be appealing to talent and workers
- Virtuous circle on Manufacturing attractiveness
- Health, safety, comfort, positive socialisation, diversity and fair compensation are the key drivers
- Inclusion regardless race, colour, religion, gender, age, disability, sexual identity and national origin
- Human centric Manufacturing paradigm jointly with a Urban Manufacturing

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Design and Produce Socially-Oriented Products

7

- Address specific segments of the society
- Public authorities are encouraged to create ad-hoc innovation policies
- Academia is encouraged to educate people regarding the importance of socially-oriented products

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Assist SMEs with Digital Transformation

8

- SMEs are a vital part of the manufacturing business globally
- Assisting SMEs with digital transformation is key promoting a robust global manufacturing sector
- Digital transformation is an opportunity but can easily become a threath for SMEs
- Global knowledge-sharing Labs, Competence and Technology transfer Centers and Hubs are envisaged to spread locally

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Explore the Real Value of Data-Driven Cognitive Manufacturing

9

- Understand the value of data
- Data as factor of production such as raw material, capital, labour and energy

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Promote Resource Efficiency and Country Specific Environmental Policies

10

- Environmental health and sustainability is still a major issue
- Country specific policies are needed
- Education and awareness on environmental and sustainability initiatives
- Companies remain financially healthy while they adhere to environmental policies
- Academic communities are encouraged to keep working on performance indicators for sustainability

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