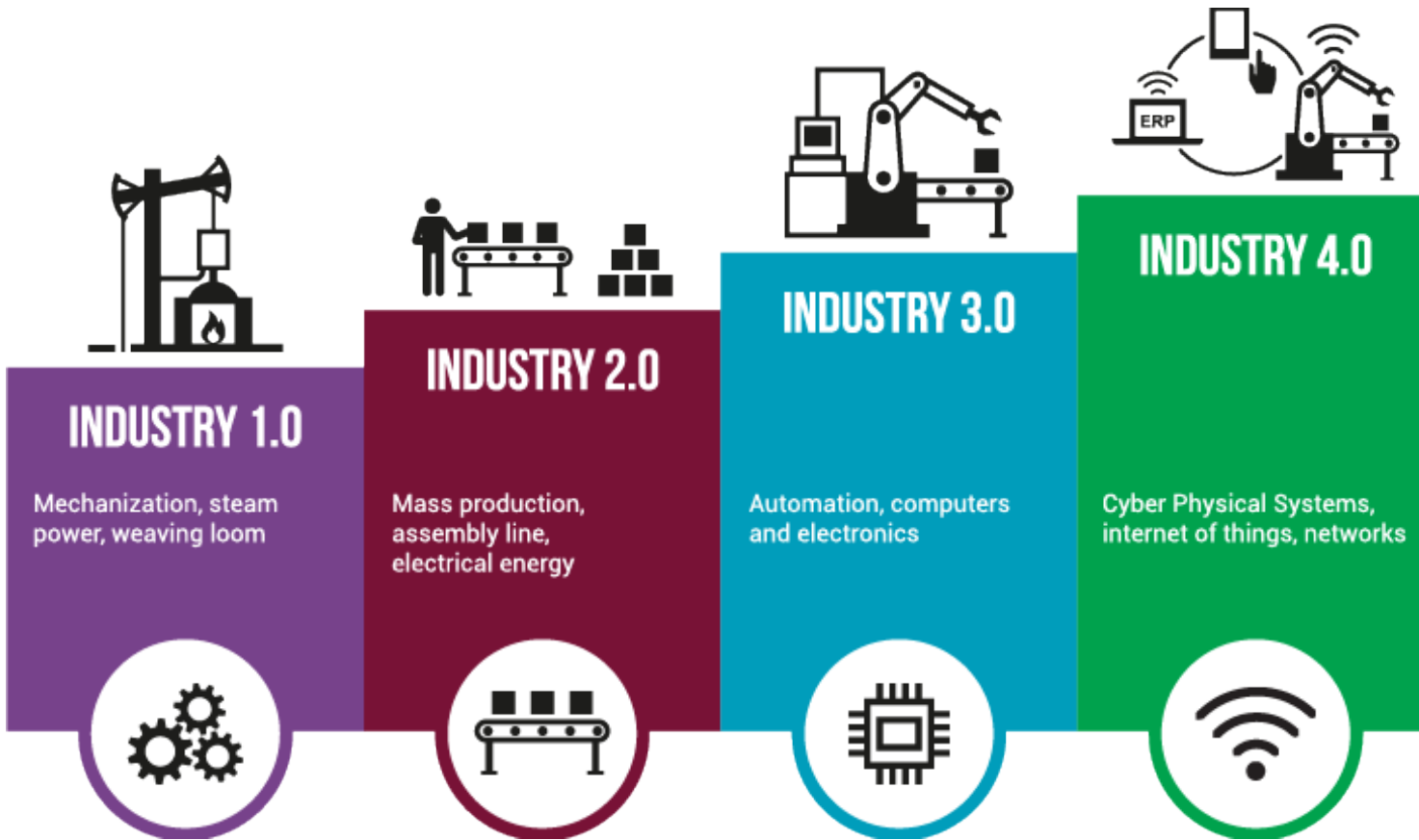




Opportunities and Challenges of Standardization in IR 4.0

Ye Yint Win

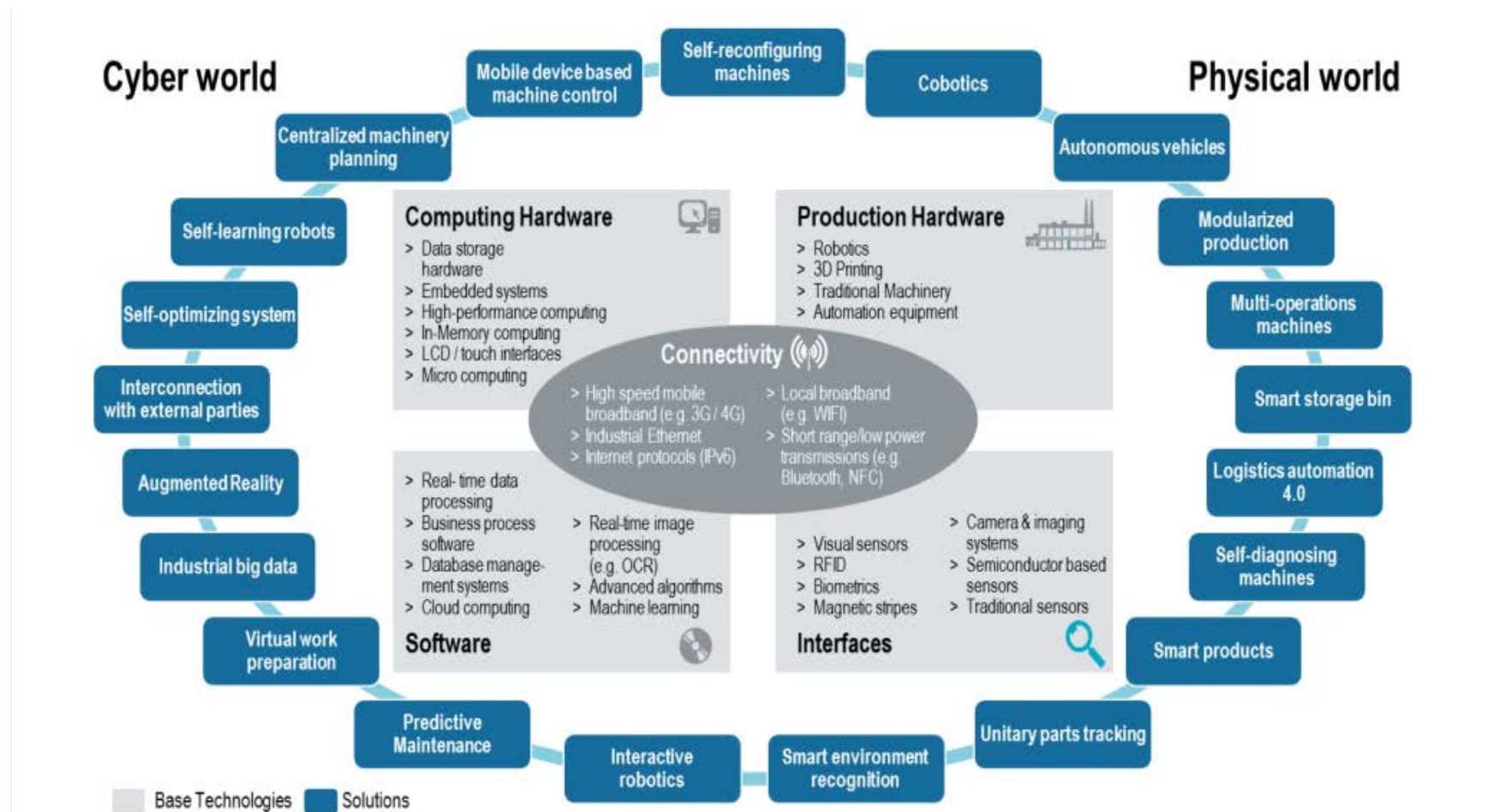
Vice President-Myanmar Computer Federation



Impact of Revolution

- Introducing new product and means of producing existing products
- Disruption of Competitive Status Quo (Both within countries and Companies)
- New Requirements of Workforce and Infrastructure

Potential Industrial 4.0 Solutions



Source: Roland Berger



Process

From Rigid and Manual
To Agile and Automatic



Product

From Standardized
To Customized and Personalized



Scale of Factories

From Large Factories and Centralized Location
To Small Factories and Decentralized location



Supply Chain

Stock Based Planning
Dynamic and Predictive



Success Matrix

Low Cost, High Efficiency
High Return on Capital Employed

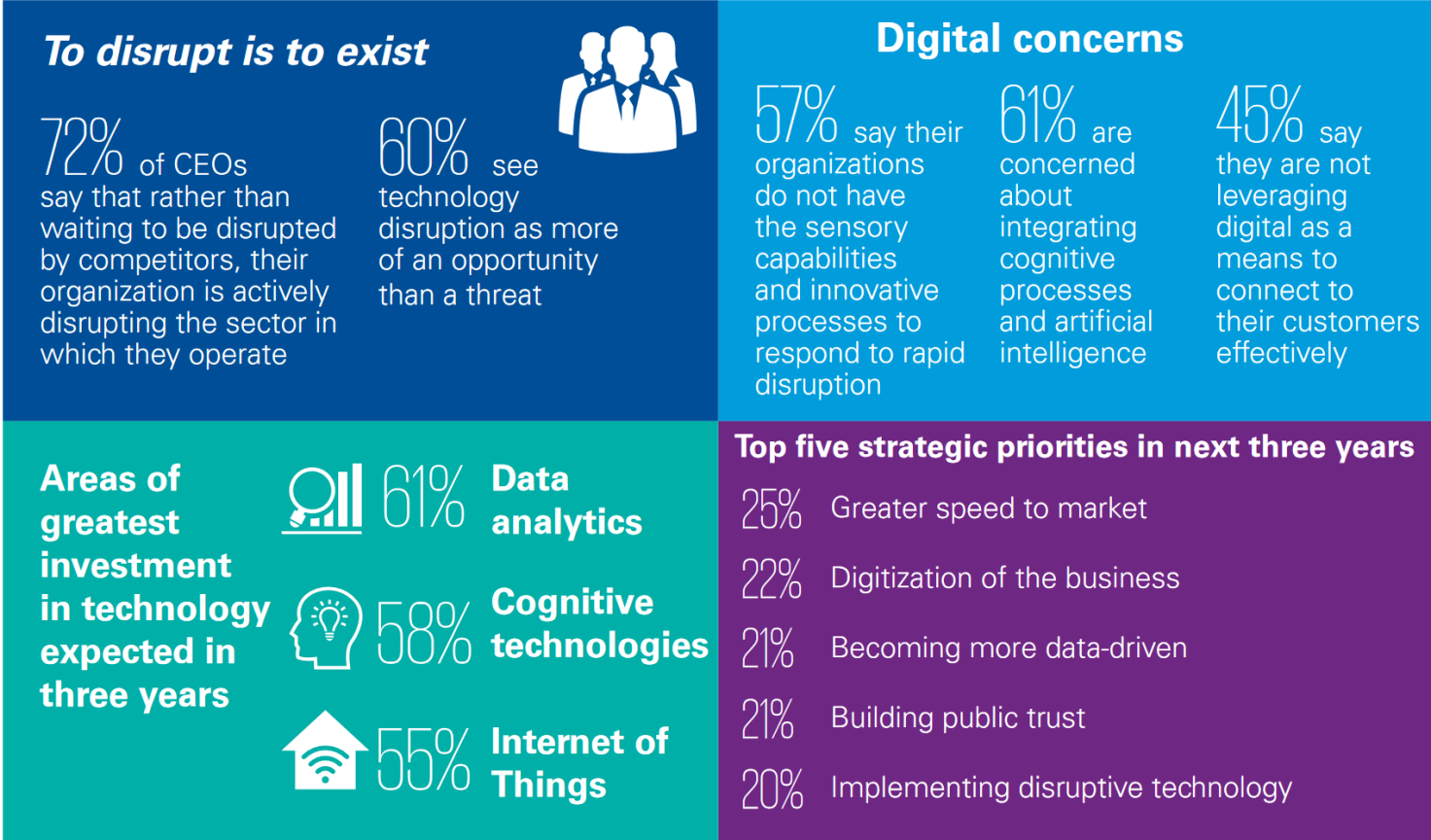


Client Relationship

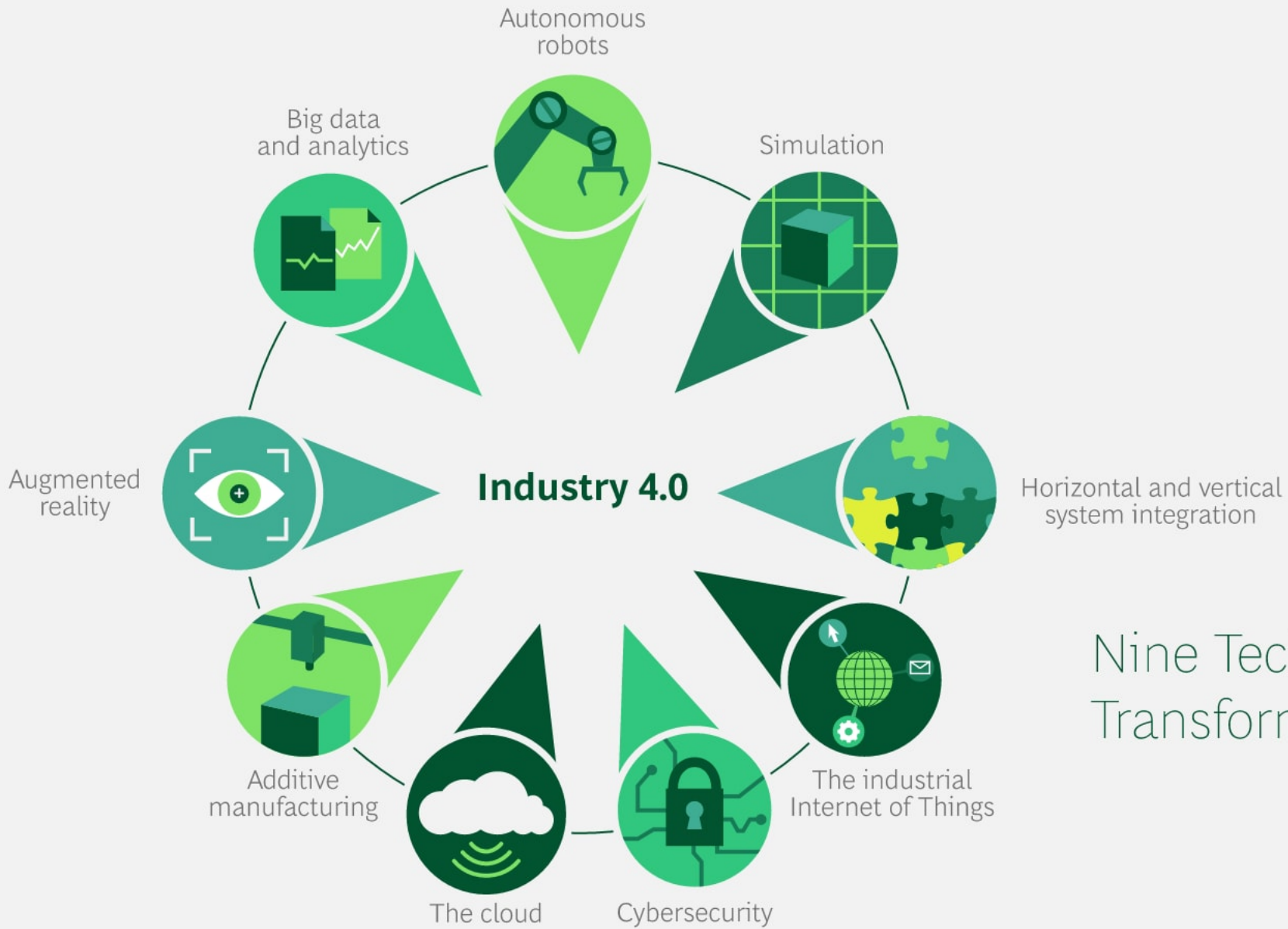
Low and Indirect
High and Direct

IR 4.0 what is Changing for the Companies

CEOs' View on Digital Transformation

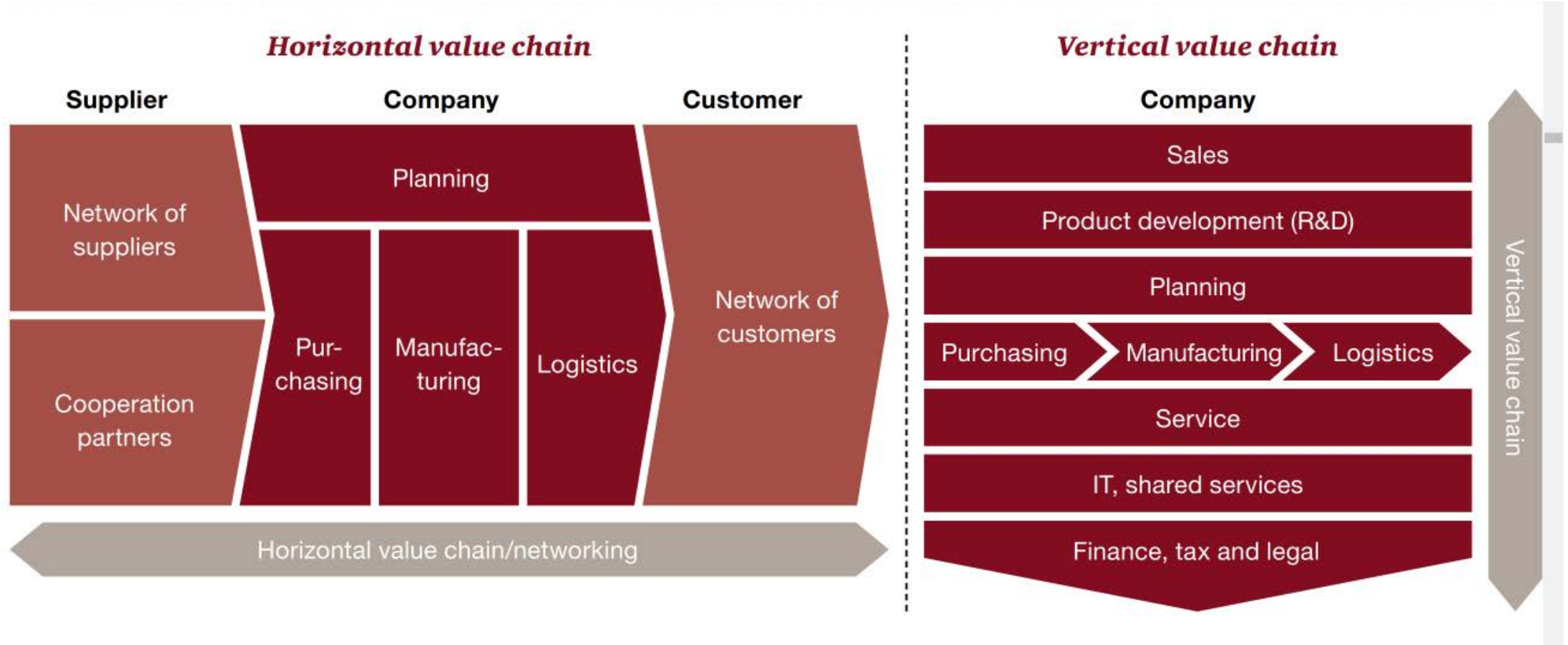


Source: KPMG LLP, U.S. CEO Outlook 2017



Nine Technologies Are Transforming Industrial Production

IR 4.0 Comprehensive of Digitalization



Source :PWC

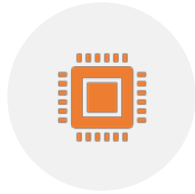
Challenges and Opportunities of IR.40

Challenges of Industry 4.0

- Infrastructure gaps
- Outdated international rules and regulations that do not take into consideration Industry 4.0
- Standards and interoperability
- Data ownership and security
- Incentives and obstacles that may shape the development and diffusion of these new technologies (intellectual property protection and others)
- Reliability and stability of CPSs
- Transparency, privacy, ethics and security
- Inequality and exclusion
- Changes in the very nature of innovation processes and the implication for competition and barriers to entry

Opportunities of Industry 4.0

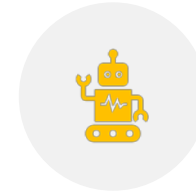
- Economic gains, such as increased revenues because of lower transaction and transportation costs
- More reliable and consistent productivity and output and better quality products
- Shift to mass customization with an increased role for SMEs
- Enabling innovation across many applications, with much larger economic impact on growth
- Energy-efficient and environmentally sustainable production and systems
- Effective use of human and material resources
- Increased food security and safety
- Improvements in the health and safety of workers
- Changes in education and training systems
- More open innovation systems
- Changes in the organization of work, with more remote, flexible and on-demand work becoming a standard



Developing countries must keep up with technological changes to ensure that they are not left behind by Industry 4.0.



Applying Industry 4.0 technologies can be a gradual process and some solutions do not have to be expensive.



Good ICT infrastructure is needed to help SMEs move into the digital economy.



Countries and companies will need a digital strategy, and a strategic vision for a fully integrated multi-stakeholder policy approach.



Education and technical qualifications should play an integral role in digital strategy and business friendly environment.



Continuous learning and on-the-job training are necessary to develop the new skills required for Industry 4.0.

Paper: 17th UNIDO conference

Action Need to be taken



National standards to be consolidated on an international level;



Efficient collaboration between international standardization organizations;



Worldwide accepted reference model enriched by open source reference implementation;



Network of test centers accessible to SMEs; and



Standardization to be taken into account from the very beginning.

Standard Australia Perspective for Standardization for Industry 4.0 to be successful

Benefits of Standards

- Strengthening Industrial Competitiveness by
 - Improving Quality
 - Improving Compatibility
 - Simplifying Unification
 - And, Transmission Information

Benefit of International Standard



Getting Involved

- Shape Industry
- Give Company a voice
- Market Access
- Help Write the Future



Benefit for Business

- Cut Cost
- Increase Customer Satisfaction
- Access New Market
- Reduce impact on Environment



SMEs

- Quality
- Credibility, Trust
- Global Best Practice and Expertise
- New Market
- Regulation



Benefit for Consumers

- Safety , Quality and Reliability
- Benefit of Sustainable development



Benefit of Government

- Standards as a basis for Regulation
- Cost-Effective
- High Degree of Acceptance

International Standard Provides Access to International Market and Make National Standard Better

Current Status of Standardization



Standardization is still in Initial Stage. Standardization Law promulgated in 2015 and established Standardization Council, Working Committee and department.



Slow ICT Related standardization functions. Closed-linkage between relevant authorities for Policy is a necessity.

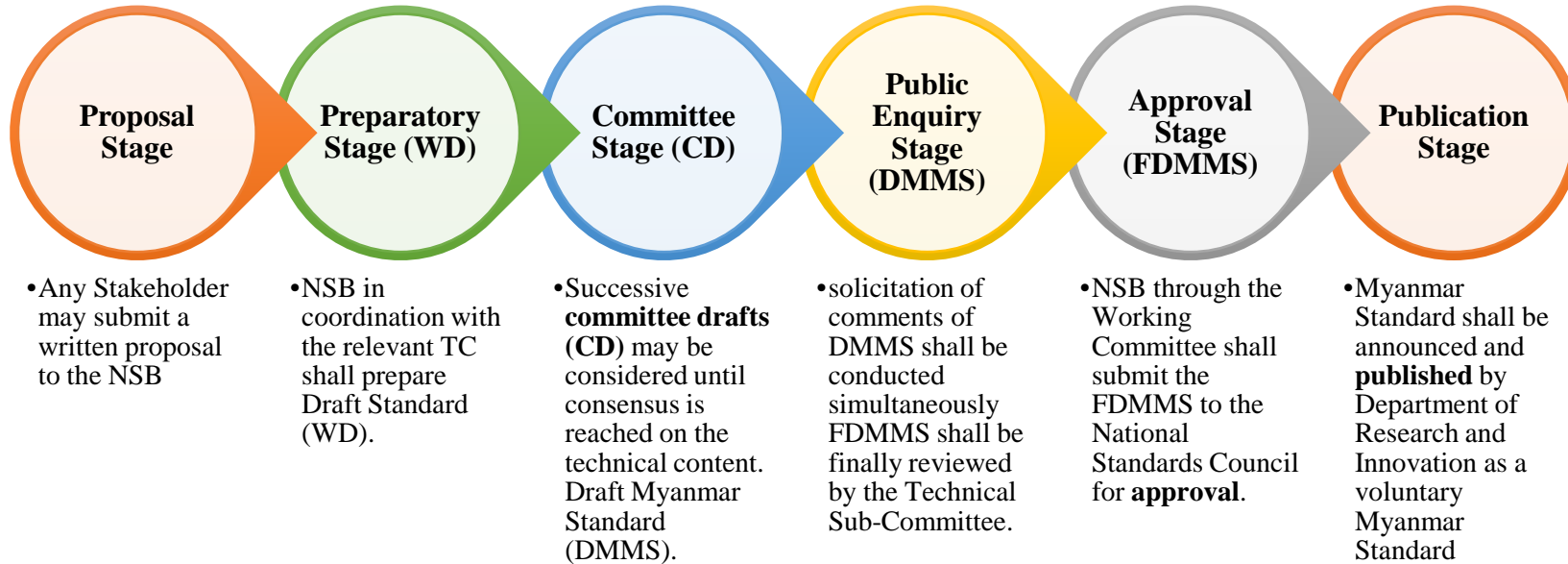


Interoperability problems may encounters for integration of Systems



Weak Collaboration Between Strategic Apex, Industry, Educational Institutes, practitioners and Standardization Body

Standardization Process



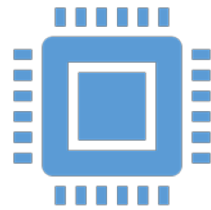
138
Committee Stage

38
Public Comment

ပြန်ပေးရန်		ပြန်ပေးရန်များ သတ်မှတ်ခြင်း	
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(၂)	MS ISO 16	(၂)	MS ISO 8904:1990 မြေကြီးသင်္ကေတ
(၃)	MS ISO 14	(၃)	MS ISO 4471:1982 သစ်သီးသင်္ကေတ
(၄)	MS ISO 197	(၄)	MS ISO 1129:1973 သစ်သီးသင်္ကေတ
(၅)	MS ISO 197	(၅)	MS ISO 8377:2009 သစ်သီးသင်္ကေတ
(၆)	MS ISO 197	(၆)	MS ISO 50061:2011 မြေကြီးသင်္ကေတ
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(၈)	MS ISO 8904:1990 မြေကြီးသင်္ကေတ	(၈)	MS ISO 8904:1990 မြေကြီးသင်္ကေတ
(၉)	MS ISO 4471:1982 သစ်သီးသင်္ကေတ	(၉)	MS ISO 4471:1982 သစ်သီးသင်္ကေတ
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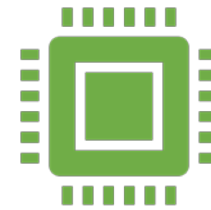
175
Endorse

Standards for Readiness of Emerging Technologies



Readiness for Emerging Technology

Natural Language Encoding
e-ID [Bio-Matrix Standard]
Address and Zip Code



Guideline and Standardization for Emerging Technology

Block Chain
AI
Smart Cities

Areas of Standardization (for IR4.0 Eco-System)



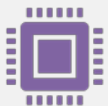
Product Development

To Setting Guidelines and Standards for Process, Methodologies and Techniques of the development of Information Systems, and Information Technology infrastructure components



Service Delivery

To provide the Guideline and Standard for Process, Procedures, facilities level for providing of Information System implementation, Education, Maintenance Services.



Information Processing

To provide the guideline and Standard for Information Processing such as natural language processing [*includes for embedded system*], Interfaces, Standard for Information interchange, information security.



Development of Profession

To provide Guideline for ICT Related Education requirements, Skill acquiring, Certification and Accreditation, Professional Development, development of professionalism Code of Ethics

Suggested Standards Adoption for Governance



Information Security

Information Security Assurance ((ISO/IEC 27001:2013)

Information Access and Transfer(W3C Specifications: RFC 793 (TCP), 9/1981, RFC 794 (IPv4) 9/1981, and RFC 2460 (IPv6) 12/1998

Public Key Infra Structure(X.509)



Technology Architecture

Interoperability and Integration

IT Service Management(ISO/IEC 20000-1:2011)

Enterprise Architecture Framework TOGAF

ICT Skill Development

Risk Assessment Framework NIST, OCTAVE, COBIT

Encoding Standard

Internet Protocol IPV6

Open Source Software

Open Data



Workflow and DMS

Workflow

Project Documentation

Public Record Management



Software Development Standard

IT Governance and Management COBIT

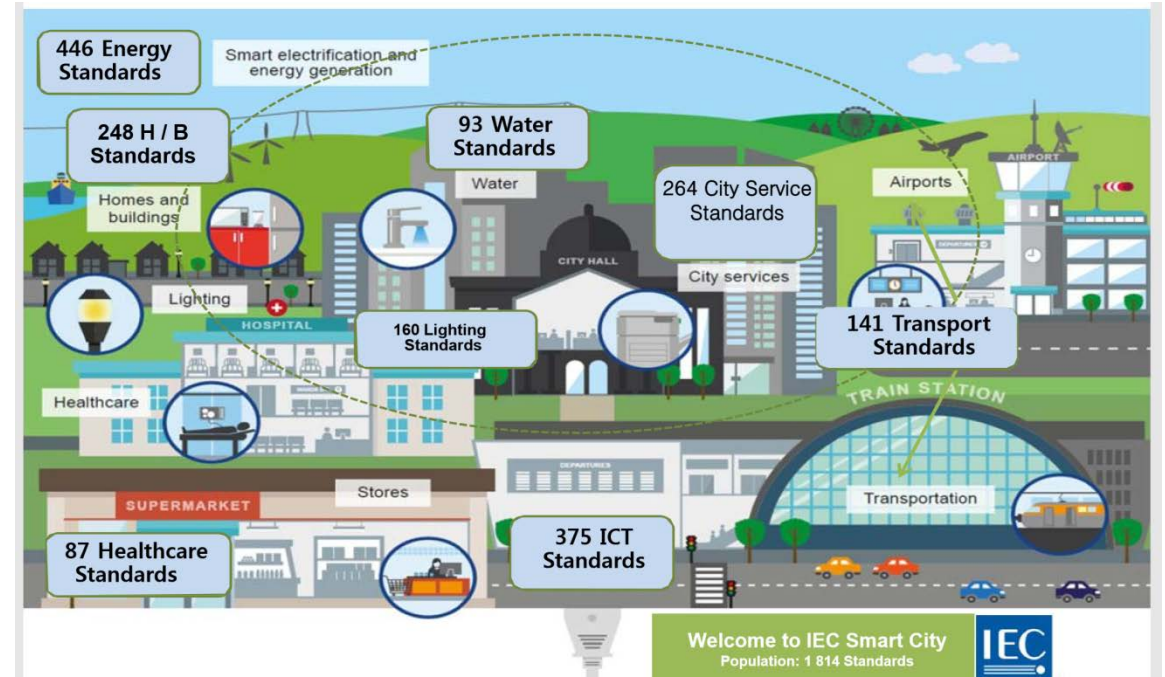
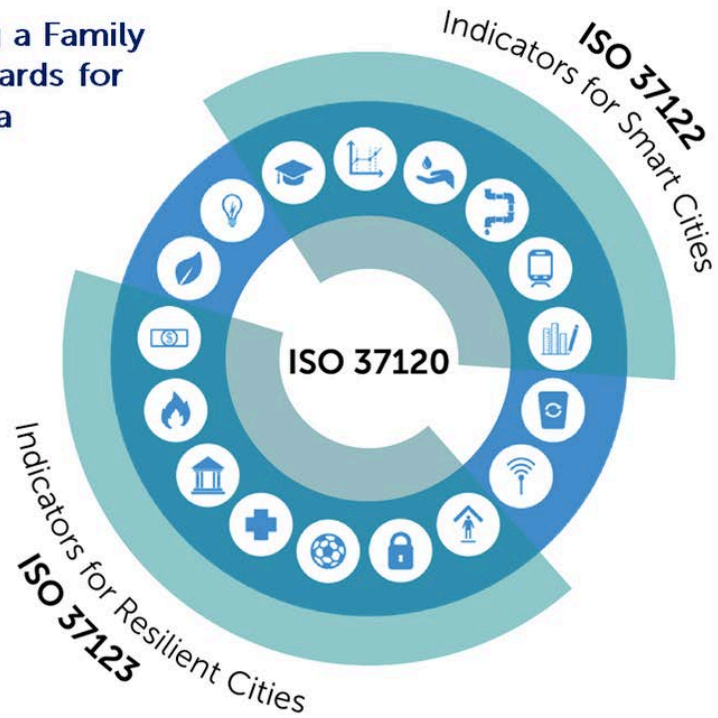
Project Management Skills PMBOK

System Testing

Software Life Cycle Management CMMI

Standards for Smart Cities

Creating a Family of Standards for City Data



IR 4.0 Relevant Standards

- Find out the need for standardization
- Prioritize the requirement of Standards in line with strategy of each sector



Relevant ISO and IEC Committees:

ISO/IEC JTC 1	Information technology
ISO/IEC JTC 1/SC 7	Software and systems engineering
ISO/IEC JTC 1/SC 17	Cards and personal identification
ISO/IEC JTC 1/SC 27	IT Security techniques
ISO/IEC JTC 1/SC 32	Data management and interchange
ISO/IEC JTC 1/SC 37	Biometrics
ISO/IEC JTC 1/SC 38	Cloud Computing and Distributed Platforms
ISO/IEC JTC 1/SC 40	IT Service Management and IT Governance
ISO/IEC JTC 1/SC 41	Internet of Things and related technologies
ISO/TC 10	Technical product documentation
ISO/TC 10/SC 10	Process plant documentation
ISO/TC 39	Machine tools
ISO/TC 39/SC 10	Safety
ISO/TC 184	Automation systems and integration
ISO/TC 184/SC 1	Physical device control
ISO/TC 184/SC 4	Industrial data
ISO/TC 184/SC 5	Interoperability, integration, and architectures for enterprise systems and automation applications
ISO/TC 211	Geographic information/Geomatics
ISO/TC 261	Additive manufacturing
ISO/TC 292	Security and resilience
ISO/TC 299	Robotics
IEC TC 65	Industrial-process measurement, control and automation



Emerging Technologies for Digital Transformation

- Awareness Application of Emerging Technologies to Respective business Sectors
- Taking part in Standardization and adoption of Standards for Emerging Technologies

Challenges of Standardization



Structure

Present Legal and Policy Framework
National Standard Institute



HR

Know-how, experiences
Standardization tasks are doing as Secondary duties and/or Voluntary Duties



Awareness

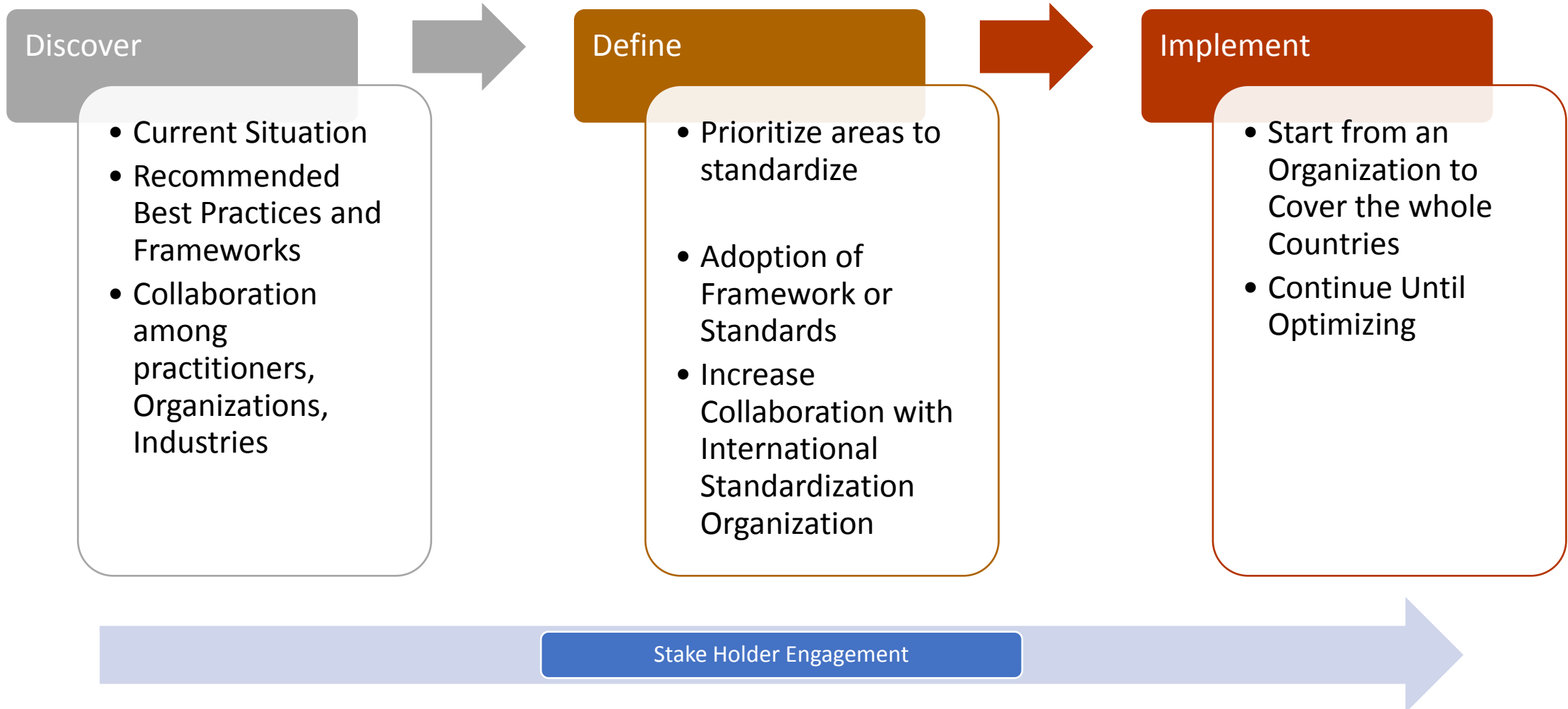
Information Systems
Users and Developers weak in awareness of Standardization
Industry does not actively take part in Standardization process



Collaboration

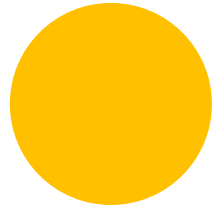
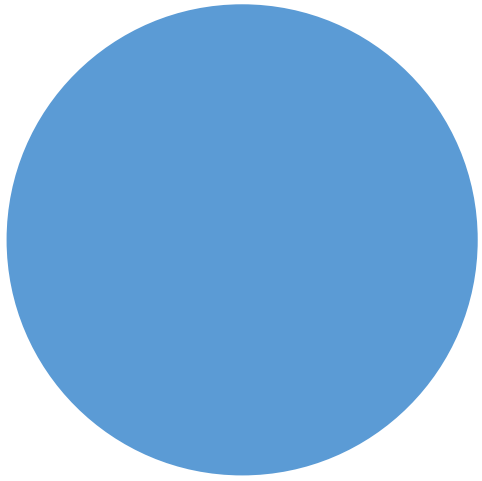
Stronger Collaboration is Required between Industry and Standardization Bodies, policy Makers
Coordination with International Standardization should be extend

Standards to Implementation (Stakeholder participation Strategy)



Conclusion

- IR 4.0 creates many opportunities and challenges. Keep up with technological changes to ensure to grasp opportunities for development.
- Standards plays vital roles in success of IR 4.0
- Awareness and education are necessary for adoption emerging technologies to every sectors
- Seriously taken into account for new skill sets requirements.
- Effective Stakeholder Engagement is important



Thank you

