



# WTSA 2024

## A fresh Structure imperatives & Approach

The Systems Approach to review & Update ITU-T Study Groups Structure & Scope

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First National Preparatory Workshop for WTSA-24

# Technology Trends...

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Disruption is everywhere and the future is uncertain – no one knows what the world will look like even a decade from now. As we head into future, we are surrounded by disruptive innovation

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As we look to the years & decades ahead, tech-disruption will be driven as much by the methods and systems as it is by the devices, we associate with tech disruption.

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The pace of innovation is incredibly fast, with new things getting discovered daily. The future trends in technology are very diverse, very intertwined, and very promising...

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There are several developments that have and will continue to shape business strategies. From **Automation** to **Sustainability**, organizations are adapting to a whole new wave of consumer preferences.





This pandemic has catapulted two diametrically opposite paradigms to the focus of the mankind

# Digitalization

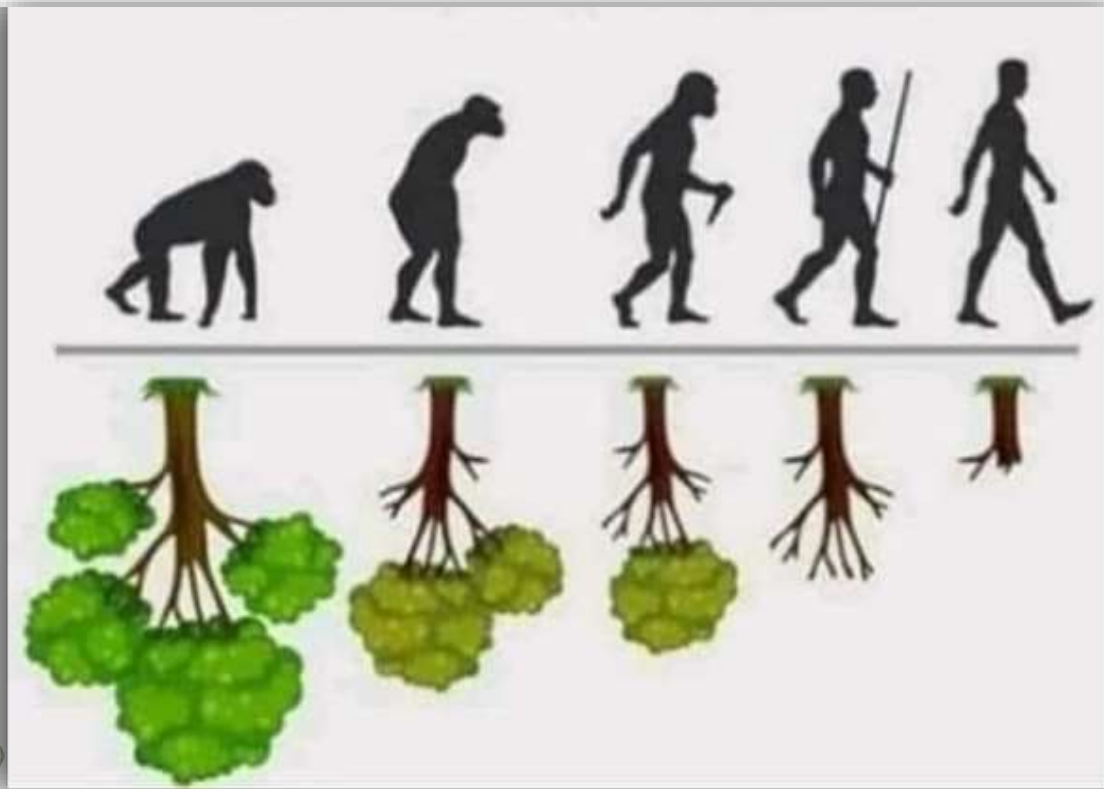


# Sustainability

designing a sustainable n resilient future



# The EVOLUTION we NEVER EXPECTED



It's a small world. It's also an increasingly hot, crowded, and contentious one.

The combined effect of climate change and society's impact on the earth is intensifying struggles over natural resources while also threatening our infrastructure, food systems and quality of life.

**“Nature no longer runs the Earth, we do”**

**Climate is not politically strong enough to fight Carbon by themselves.**

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# The Context...

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- The emergence of disruptive digital technologies has already begun profoundly reshaping our lives, our interactions, and our lived environments.
- As adoption of these technologies becomes widespread, they are likely to play a substantial independent role in society's energy consumption and environmental impact.
- Following the deliberations in the COP26 & COP 27 climate conferences, private organizations and governments alike are stepping up their promises to combat climate change, bringing to bear a mix of public policy and innovative technologies to address one of our era's defining challenges.



# Future of Life... on EARTH...

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It has been observed that the technologies developed by human beings in the last 2-3 centuries have had a major impact on the earth's climate and our nature's equilibrium

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Some believe that we have reached a point of no return. This can have a huge impact on *life on earth*, especially on the *human species*.

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However, while technology has been responsible for most of it, technology also seems to have a solution for it.

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It's increasingly clear that today's environmental conditions are not sustainable. Over the past few decades, we have made huge progress fighting disease, poverty, and illiteracy.

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Now we must apply that same ingenuity to the problem of global warming and other consequences of human activity.

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Artificial intelligence



Robot Assistants



Chatbot



Block chain



Machine Learning



Deep learning



Cloud computing



Cyber security



Cryptocurrency



Big Data

# Future of Life - on EARTH...

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# The Digital Transformation

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The society, the business, the infrastructure, the services and all other aspects of the civilization on the planet Earth are going through a paradigm shift in the wake of technological advancements, especially in the field of ICT

All the ecosystems, be it Smart Cities, Smart Grid, Smart Buildings or Smart Factories now find themselves making three classes of transformations:

- **Improvement of Infrastructure** – to make it resilient & sustainable...
- **Addition of the Digital Layer-** which is the essence of the *smart paradigm*; and
- **Business Process Transformation** - necessary to capitalize on the investments in smart technology.





# The genesis of Digital Transformation

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In digital transformation in any paradigm, domain or ecosystem

- ‘Sustainability is the *True* Destination’
- ‘Resilience is the *Core* Characteristic’
- ‘Smart is *merely* the Accelerator’

Standards are the Chromosomes of Digital Infrastructure

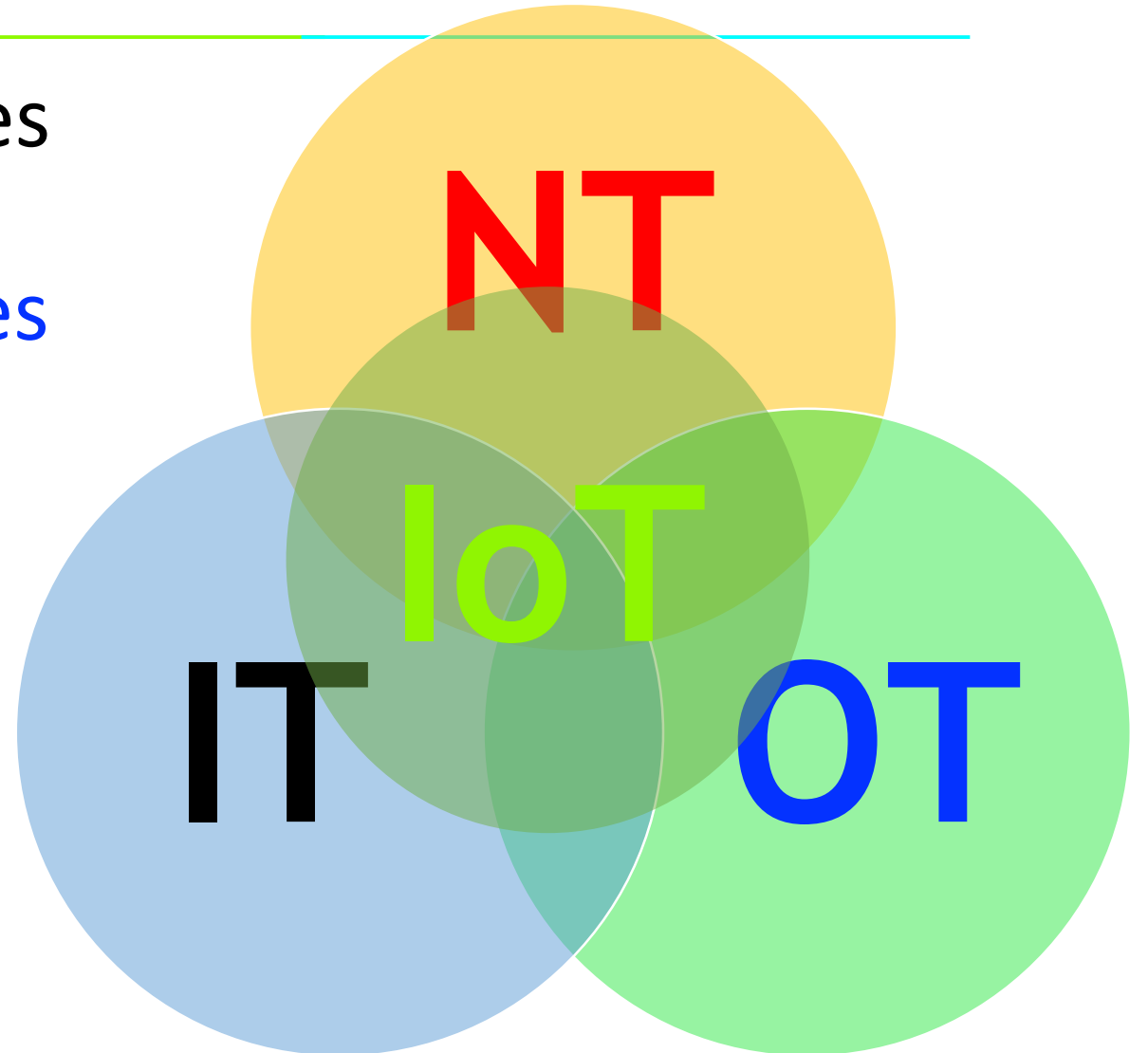
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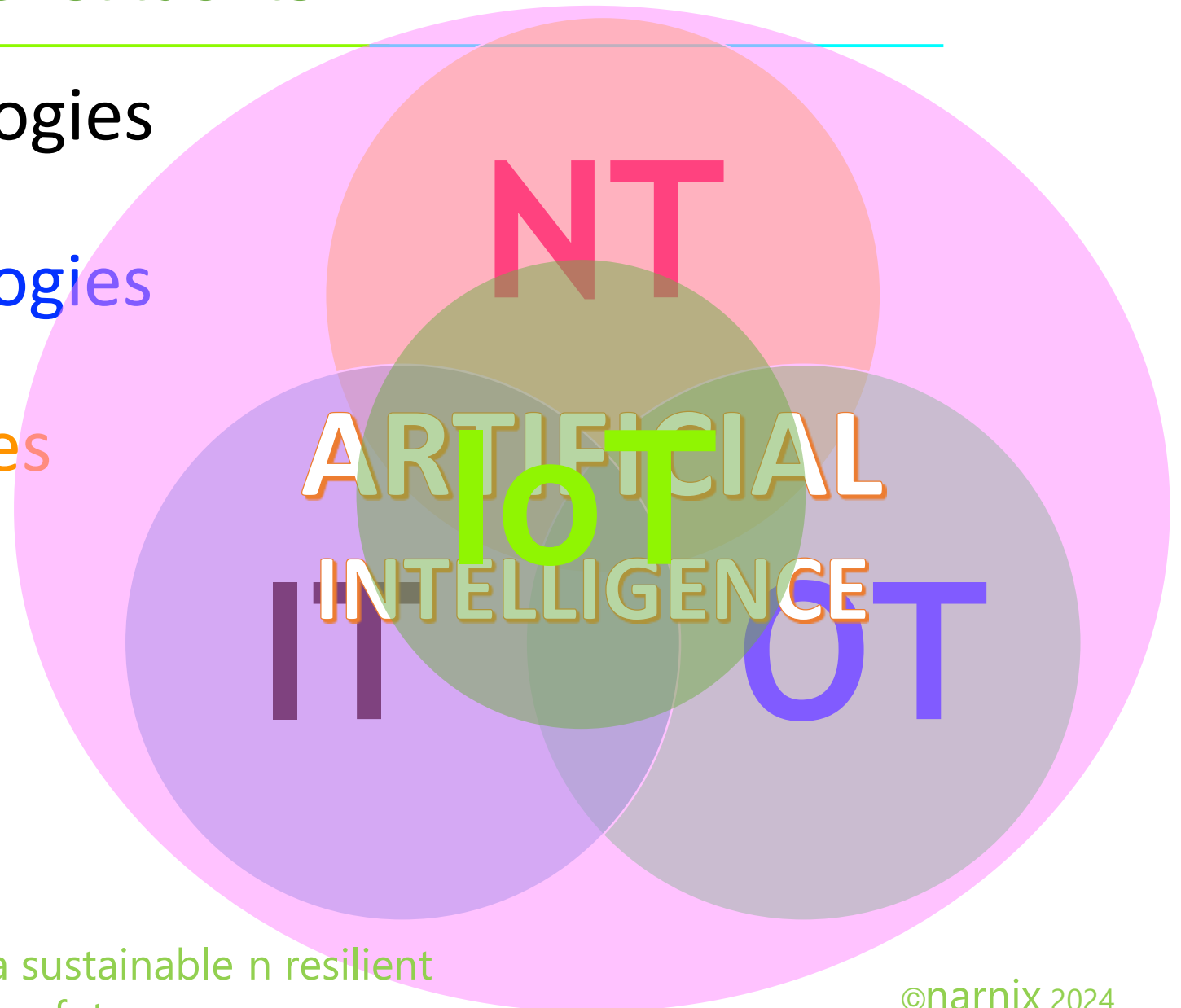
# Digital Transformation Constituents

- Information Technologies
- Operational Technologies
- Network Technologies
- IoT Technologies



# Digital Transformation Constituents

- Information Technologies
- Operational Technologies
- Network Technologies
- IoT Technologies
- Artificial Intelligence





# Digital Transformation



is not a technology,

it's a complex paradigm

with domain-specific implications

**We are living in an ephemeral world**

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# Disruptive Technologies on the Radar

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- Artificial Intelligence/Machine Learning**
- Blockchain**
- Internet of Things/Everything**
- Big Data**
- 5G/6G**
- AR/VR/XR**
- Web 3.0**
- Robotics & Drones**
- Data Centers**
- Digital Twin**
- Metaverse....**



# The current landscape & imperatives...

- **Climate Change** - Net Zero Goals and Going Carbon Neutral imperatives and initiatives
- **Energy Security** – Example - Current challenges that Europe is facing due to geo-political issues...
- **Clean/Green Energy** - Coal, gas and oil still meet three-quarters of global heat demand, making it heavily fossil-fuel dependent.
- **Energy Efficiency** - It is rightly considered as the 5<sup>th</sup> Fuel and a Source of Clean Energy rather than a strategy...
- **Electricity Access** - 90.5% in 2020. An estimated 660 million people would still lack access in 2030, most of them in Sub-Saharan Africa.
- **Global Digital Population** - Internet Users 5.0 Billion; Social Media Users 4.65 Billion
- **Digital Transformation** - Intertwining of IT, OT, NT, IoT & AI... DT is NOT about Technology, it is domain & context specific evolution leveraging Disruptive Technologies
- **Growing Carbon Footprint of Digital Infrastructure** – Impact of growing digitalization
- **A meaningful Safe Digital Life** - a fair, more livable digital future for our fast-evolving and technology-driven world
- **Industry 4.0 to Industry 5.0** – Shifting perspectives: Man-Machine Collaboration & Sustainability on the forefront.
- **Sustainability & Resilience** – Whether Electrified and/or Connected , Society has to be Sustainable and Resilient to say the least...
- **Green Washing** - Need to control it comprehensively...





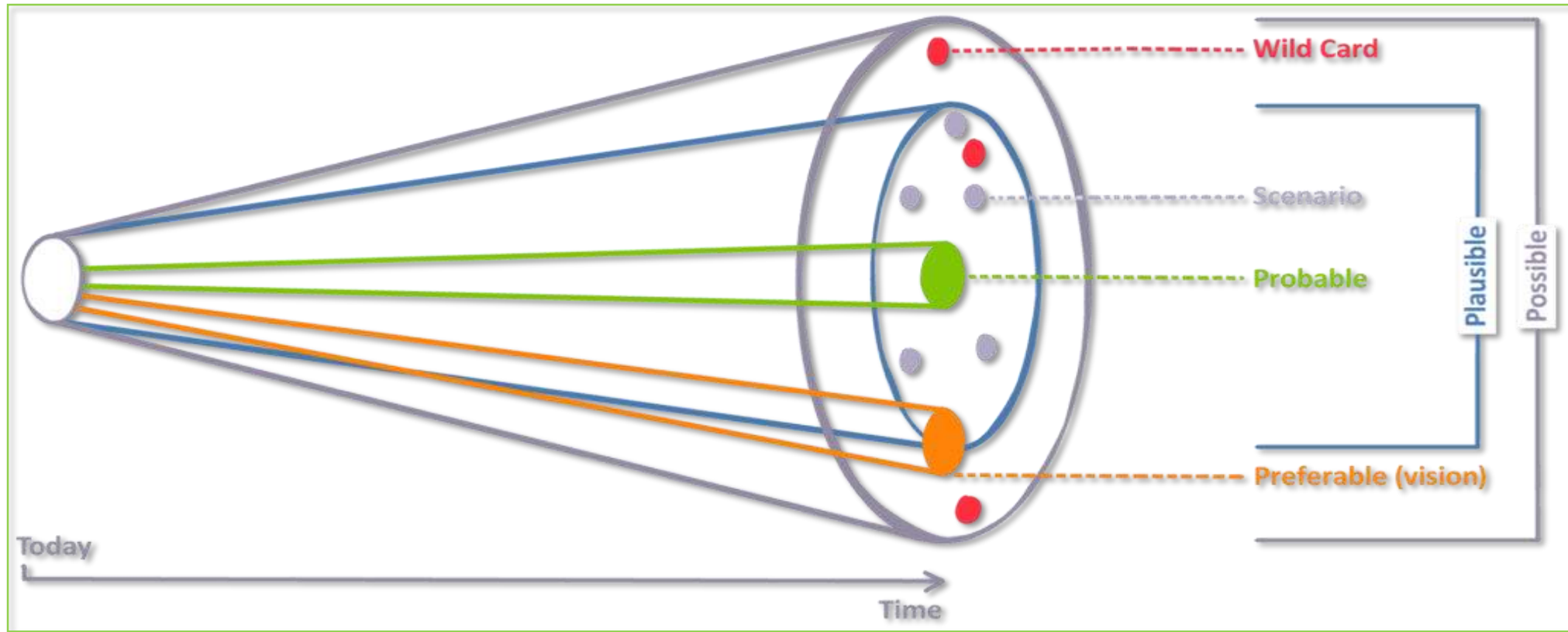
## ... Designing the Future

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- It is strongly advised to leverage the “3 P’s & a W” model of Futurology (Possible, Probable, Preferable & Wild Card Futures) and strive to capture the shifting socio-technological megatrends and forces to design a ‘Resilient & Sustainable Future’ for the “All Electric & Connected Society”.
- This model enables systemic investigation of the future, starting with the default (Business as Usual) scenario - if we don’t do anything. It helps us review several scenarios under the threads of Possible, Probable, Preferable & Wild Card Futures and identifies the likely consequences. The most plausible scenarios are identified and tracked to enable future strategy updates to take cognizance of such trajectories into the future.
- Covid 19 is a living example of Wild Card Future – Low-Probability, High Impact.



# The “3 P’s & a W” model of Futurology



"Futurology"—or "futures studies", futures research, and foresight—can be summarized as being concerned with "three P's and a W", i.e. "possible, probable, and preferable" futures, plus "wildcards", which are low-probability, high-impact events, should they occur. Even with high-profile, probable events, such as the fall of telecommunications costs, the growth of the internet, or the aging demographics of particular countries, there is often significant uncertainty in the rate or continuation of a trend. Thus, a key part of futures analysis is the managing of uncertainty and risk.



# The Approach...

- First let us **envision** the kind of Society we would like to develop and thrive in...
- Then, let's identify & list the Core Characteristics, Principles and foundational corner stones of such a Society and its ecosystem.
- Identify a few macro threads to match the vision
- Identify and map the diverse Technologies under each macro-thread by looking into the shifting socio-technological megatrends and forces...
- Bucketize the different technologies identified
- Contextualize these Technologies and the macro threads to the Society...
- Now attempt to develop the Strategy needed to fulfill the vision...
- Split the strategy into actionable items & sequence
- After that - need to understand what Role Standards can play in realizing the Vision.
- Develop a high-level framework to capture the categories/classes of Standards to help realize the vision...
- Map the Standards (or categories thereof) to the Global Standardization Ecosystem i.e., the different SDOs and other agencies already involved in the activities.
- Identify the gaps, overlap & interplay amongst different SDOs & their work programs etc.
- Extract the ITU specific Standards mapping and Gap analysis
- Develop a Strategy and structured approach to fill in the Gap Areas in Standards by assigning, them to relevant IEC committees to develop.





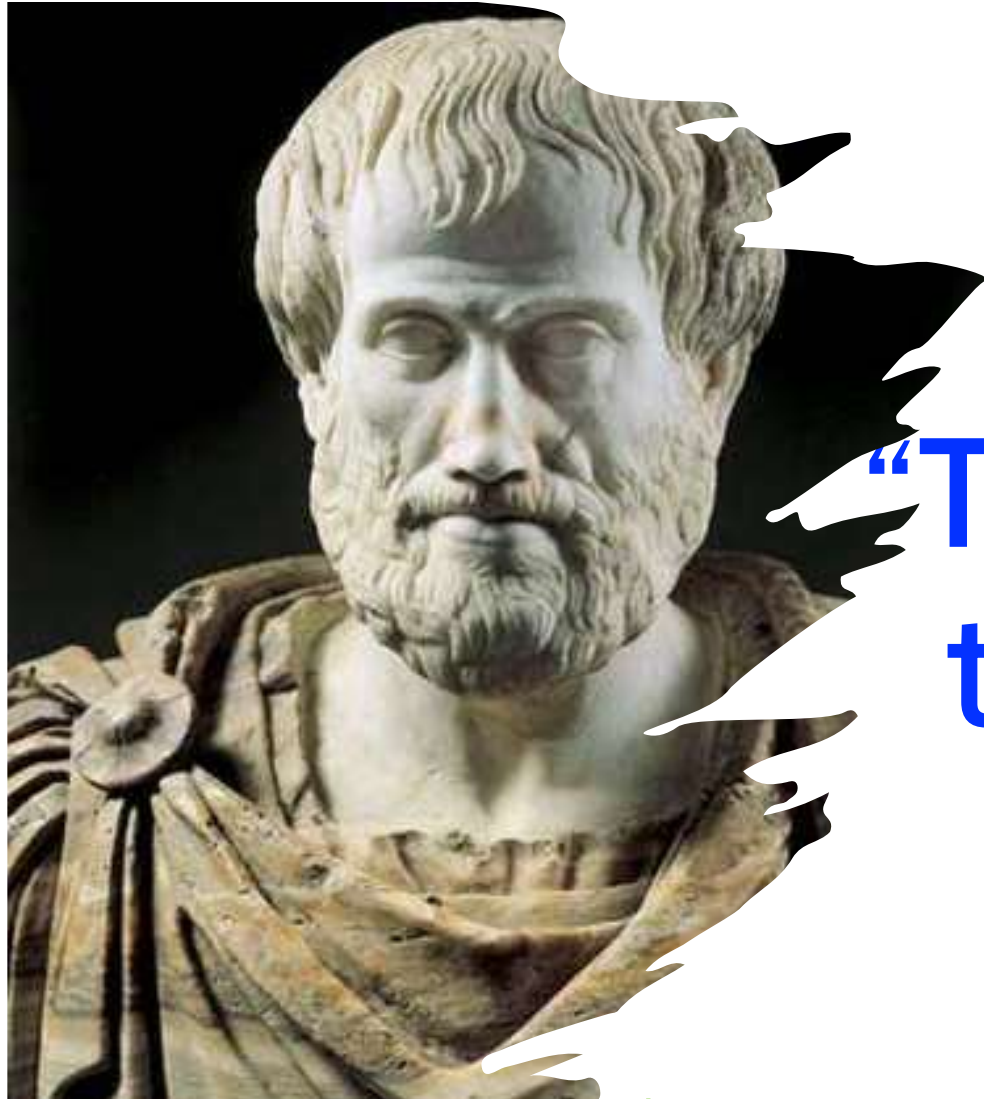
# In Summary...

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- Envisioning the Future scenario
- Understanding the ecosystem and stakeholders
- Capture the Technology & Market Trends
- Collect the High-level Use Cases
- Bucketize the use cases in macro-threads of Technologies
- Map them to the current Structure to understand the overlap and gap areas...
- Develop the new structure based on the new learnings..
- ...



# Systems Approach: Holism



Aristotle (300 B.C.)

**“The Whole is Greater  
than the Sum of its  
Parts”**



# Systems Approach imperatives

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- The multiplicity of technologies and their convergence in many new and emerging markets, however, particularly those involving large-scale infrastructure demand a top-down approach to standardization starting at the system or system-architecture rather than at the product level.
- Therefore, the systemic approach in standardization work can define and strengthen the systems approach throughout the technical community to ensure that highly complex market sectors can be properly addressed and supported.
- It promotes an increased co-operation with many other standards-developing organizations and relevant non-standards bodies needed on an international level.
- Further, standardization needs to be inclusive, top down and bottom up; a new hybrid model with a comprehensive approach is needed.



# System and Systems Approach

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- **System:** *A group of interacting, interrelated, or interdependent elements forming a purposeful 'WHOLE' of a complexity that requires specific structures and work methods in order to support applications and services relevant to the stakeholders.*
- **Systems Approach:** *A holistic, iterative, discovery process that helps first defining the right problem in complex situations and then in finding elegant, well-designed and working solutions. It incorporates not only engineering, but also logical human and social aspects.*





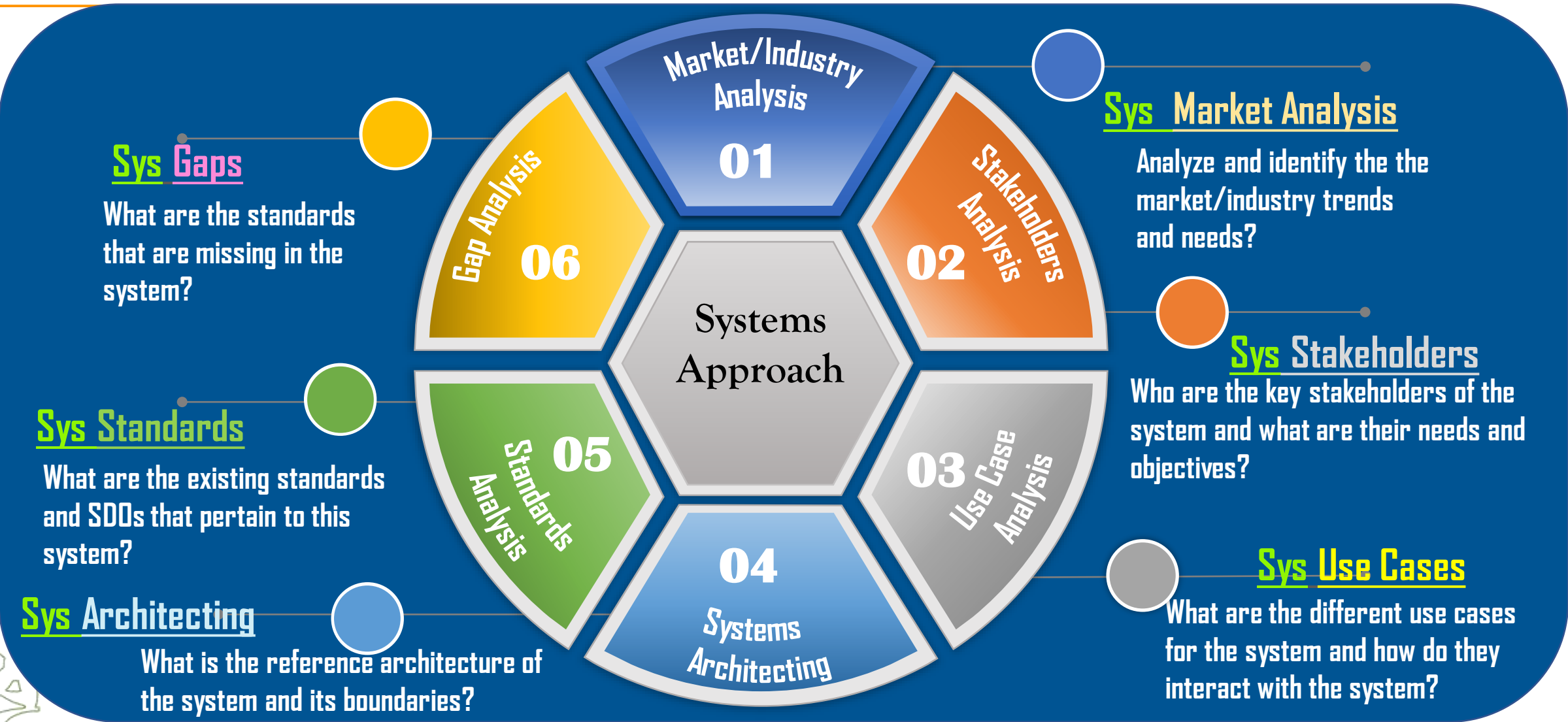
# Systems Approach demystified...

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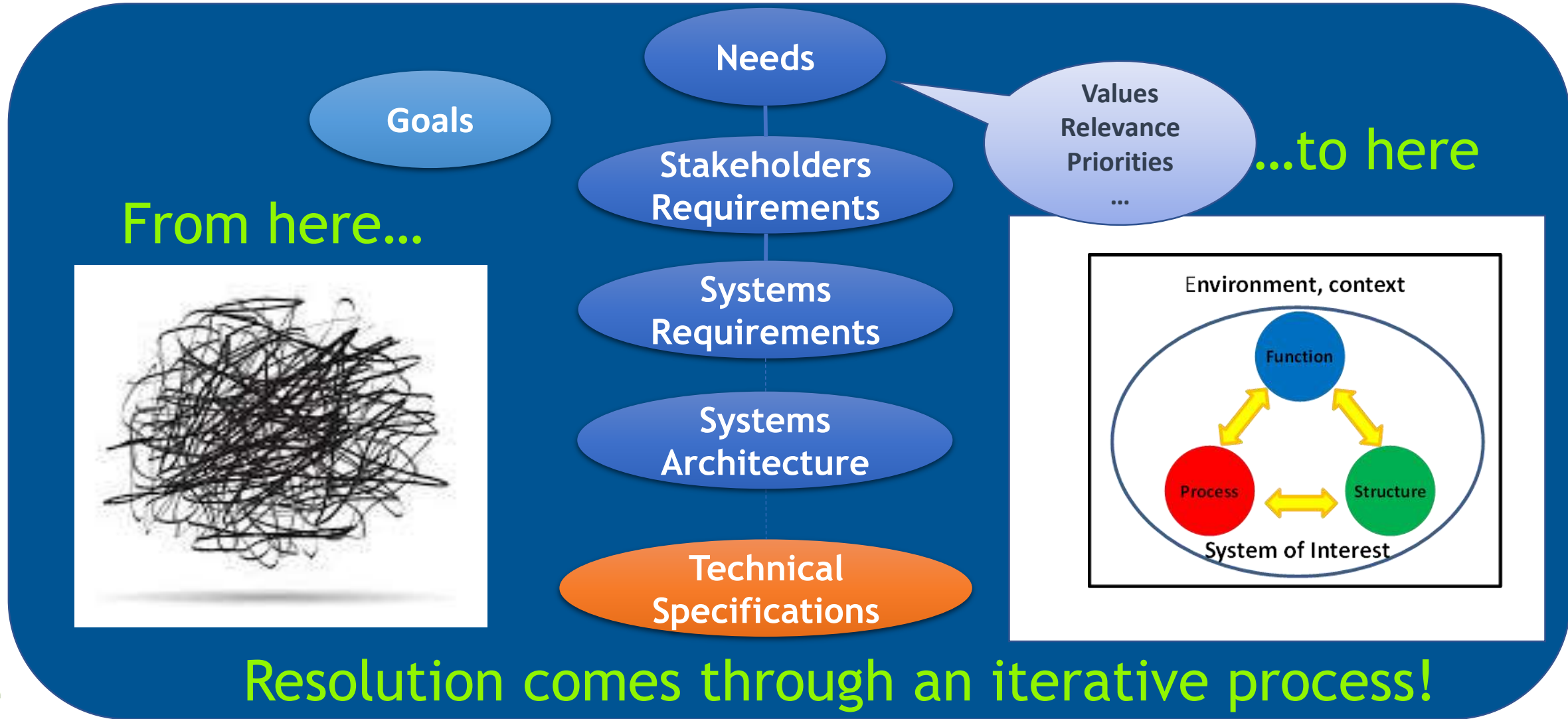
- **Identify** and understand the **relationships** between the potential problems and opportunities in a real-world situation.
- Gain a thorough **understanding of the problem** and describe a selected problem or opportunity in the context of its wider system and its environment.
- **Synthesize** viable **system solutions** to a selected problem or opportunity situation.
- **Analyze** and **trade off** between **alternative solutions** for a given time/cost/quality version of the problem.
- **Measure** and provide evidence of correct **implementation** and **integration**.
- Deploy, sustain, and apply a solution to help solve the problem (or **exploit the opportunity**).
- All of the above, are considered within a **life cycle** framework which may need **concurrent**, **recursive** and **iterative** applications of some or all of the systems approach.



# SYSTEMS APPROACH PROCESS FLOW



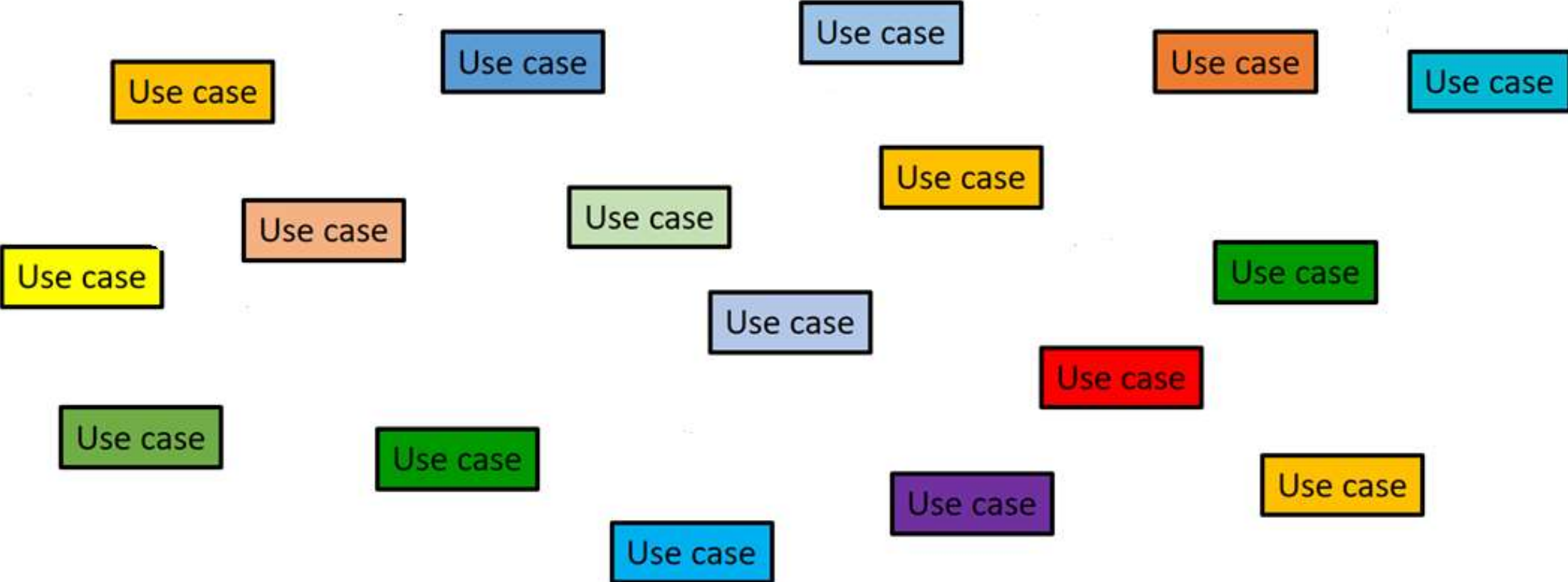
# Shaping the Mess...



**Resolution comes through an iterative process!**

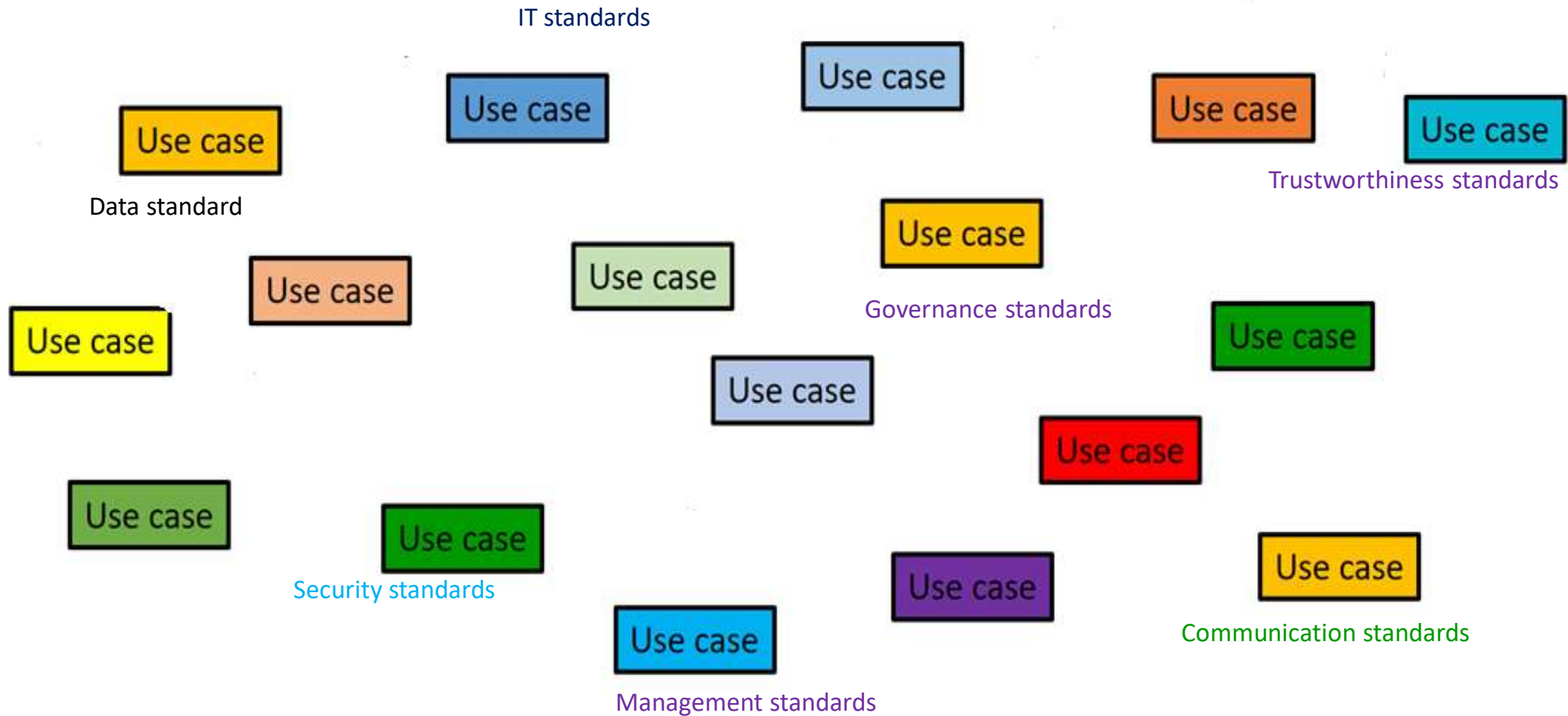


# Collect the High-Level Use Cases

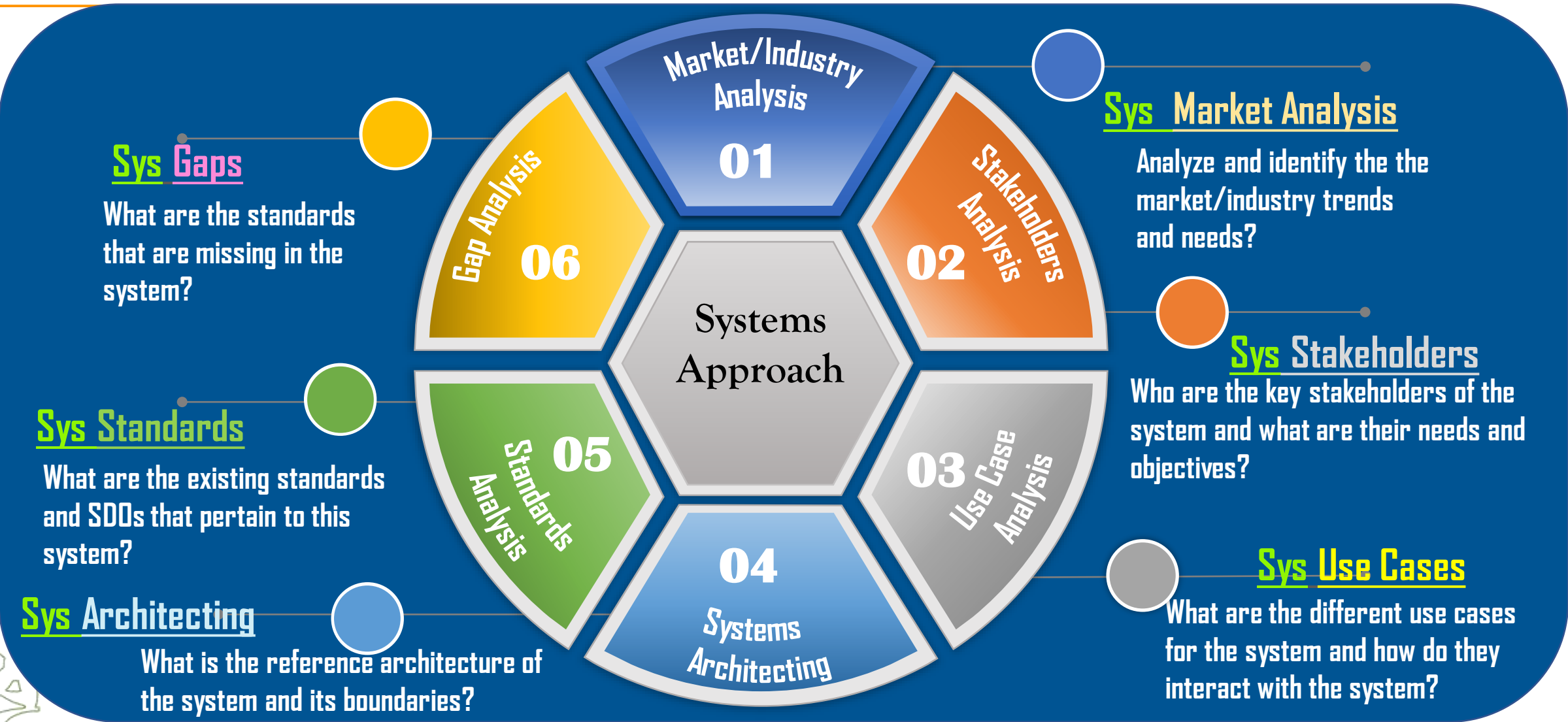


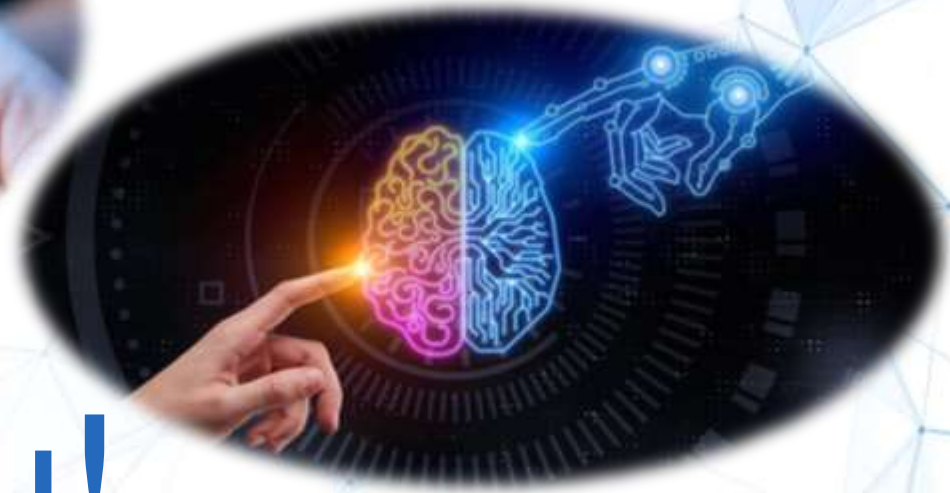


# Scope out Family of Standards needed



# SYSTEMS APPROACH PROCESS FLOW





**Thank you!**  
For a Sustainable & Resilient Future



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