Fifth SG13 Regional Workshop for Africa on "ITU-T Standardization Work on Future Networks: Towards a Better Future for Africa"
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# Standardization Activities on Trust in ITU-T SG13


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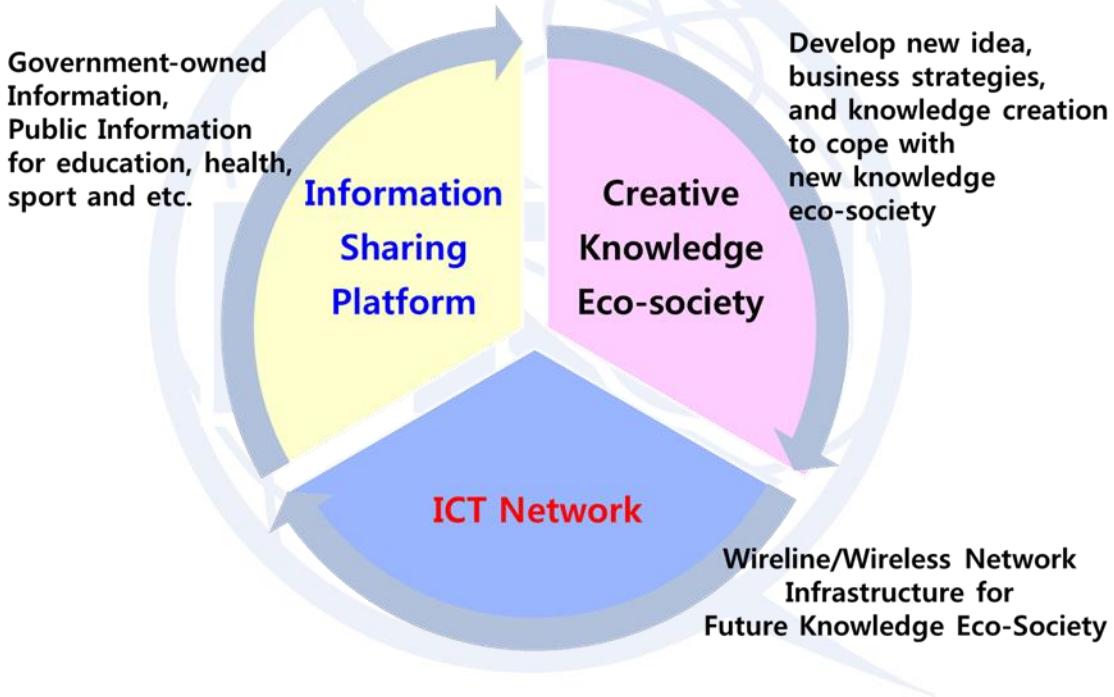
# Trust and Knowledge

- **Future trust and knowledge infrastructure**




**ICT** is a Basis of Knowledge Society

→ Potential Risks

Source: ITU-T SG13

# ITU-T CG-Trust Activities

- Terms of Reference
  - Develop a **technical report** which contains:
    - Definition, use cases, functional classification
    - Challenges, technical issues related to trust
    - Overall strategies of standardization for trust provisioning
  - The lifetime: 1 year
- The CG-Trust reported its activities to the SG13 meeting (April 2016)

# ITU-T CG-Trust Activities

- **CG-Trust Technical Report**
  - The importance and necessity of trust toward knowledge societies;
  - Concepts and key features of trust;
  - Key challenges and technical issues for trusted ICT infrastructures;
  - Architectural overviews of trusted ICT infrastructures;
  - Trust based ICT service models;
  - Summary of use cases for trusted ICT infrastructures;
  - Strategies for future standardization on trust.

# Trust Standardization in SG13 (1)

- **Two Recommendations** on Trust consented in February 2017
  - **Y.3051 (Y.trusted-env):** The basic principles of trusted environment in ICT infrastructure
  - **Y.3052 (Y.trust-provision)**: Overview of trust provisioning in ICT infrastructures and services
- **Draft Recommendations** on Trust in ITU-T Q16/13
  - **Y.trustworthy-media**: Framework of Trustworthy Smart Media Services
  - **Y.trustnet-fw**: Framework of trustworthy networking with insulated domains

# Trust Standardization in SG13 (2)

- **Living list items** on Trust in ITU-T Q16/13
  - Trust index for measuring trust in ICT infrastructures and services
  - Architectural framework for trust provisioning in ICT infrastructures and services;
  - Functional architecture of trustworthy networking with insulated domains
  - Trust framework of trustworthy device selection for data transmission;
  - Trust based ICT service and business models.

# Trust Standardization in other SDOs

- Other SDOs
  - Until now, focusing on **network security and cybersecurity**
    - To be expanded to take into consideration trust issues
  - **Online Trust Alliance**, **Trusted Computing Group**
    - Still limited to social trust between humans
    - Further consideration on trust between humans and objects as well as across domains of SCP and services

# Increasing Intelligence

- Behave intelligently and rationally to
  - **Sense** real-world behaviour
  - **Perceive** the world using information models
  - **Adapt** to different environments and changes
  - **Learn** and **build** knowledge
  - **Act** to control their environments

**Control and Trust**

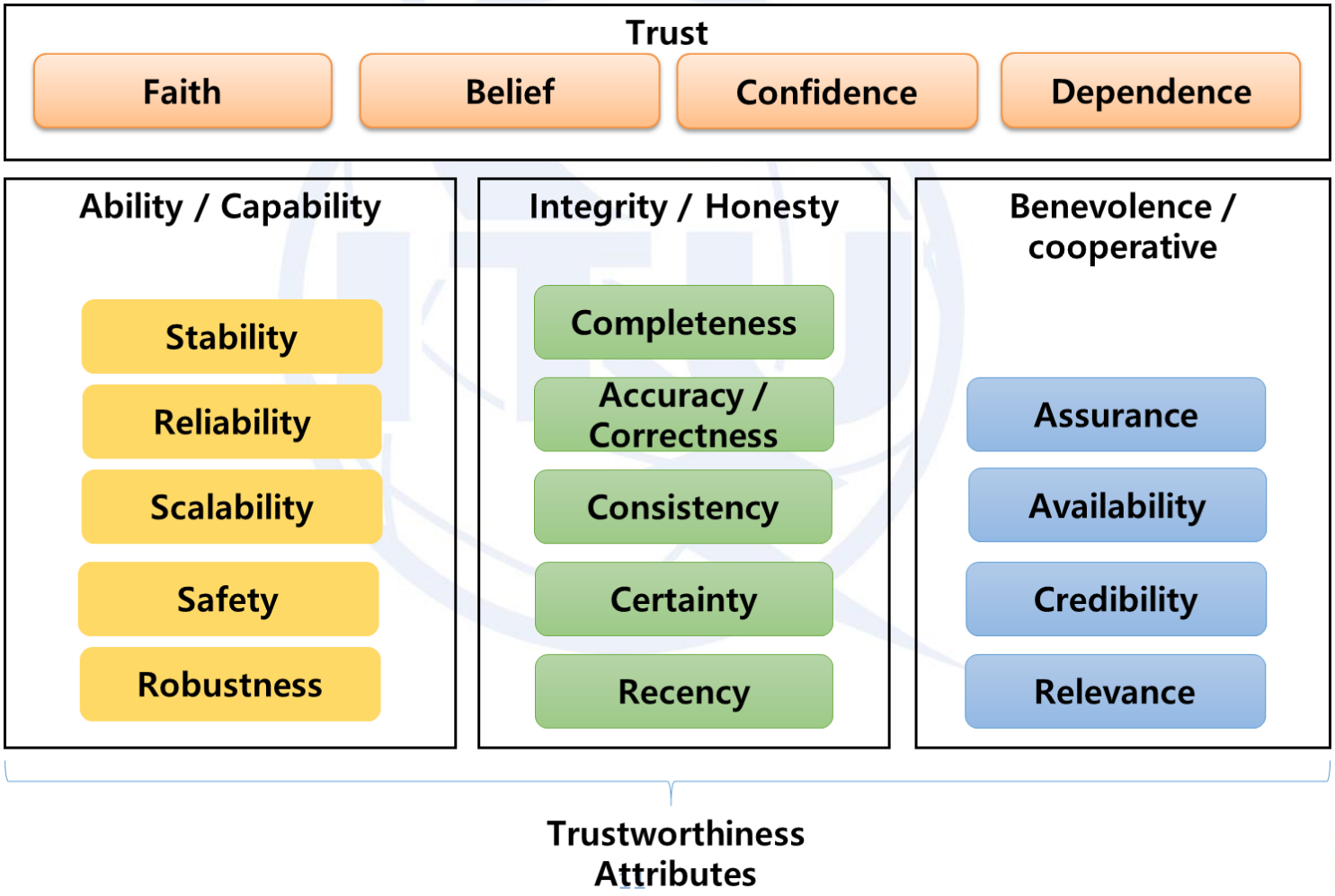
# Challenges

1. Understanding of trust
2. Trust relationships
3. Trust management
4. Measure & calculate
5. Decision making
6. Autonomy
7. Constraint environment
8. T-SCPI architecture
9. New business models
10. Standardization

NOTE - T-SCPI: Trustworthy Social-Cyber-Physical Infrastructure

Gyu Myoung Lee, “Challenges for Trustworthy Social-Cyber-Physical Infrastructure,” ITU Workshop on “Future Trust and Knowledge Infrastructure”, Phase 1, Apr. 2015.

# Understanding of Trust



# A Proposal – Definition of Trust

Trust of a party **A** to a party **B** for a given task **S** is the measurable belief of **A** in that **B** accomplishes S dependably for a specified period **P** within a particular trust context T (in relation to the task **S**)

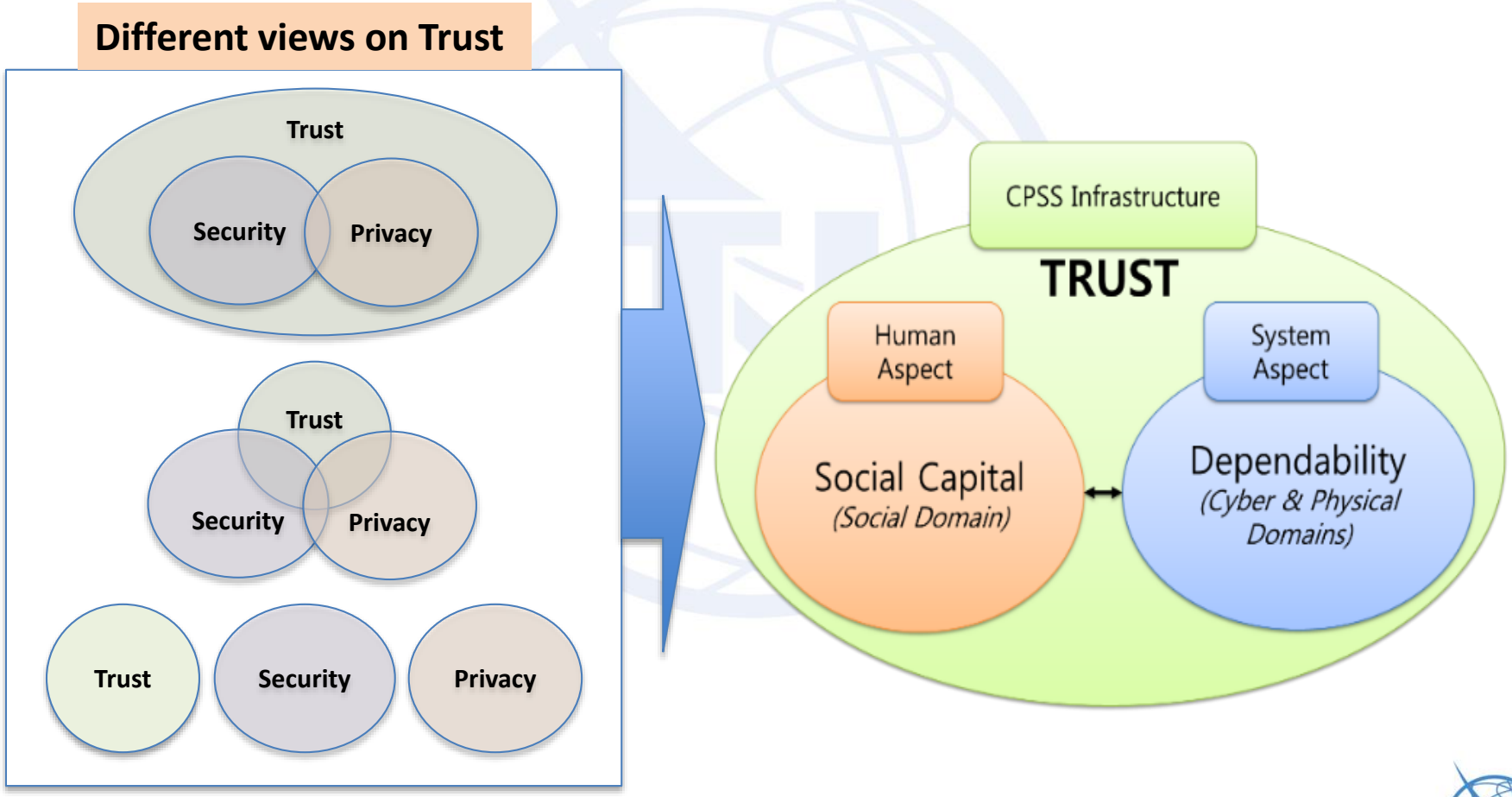
Trust is **relative** to a specific task (a service). Different trust relationships appear in different business contexts

The measurement may be **absolute** (e.g. probability) or **relative** (e.g. Level of Trust)

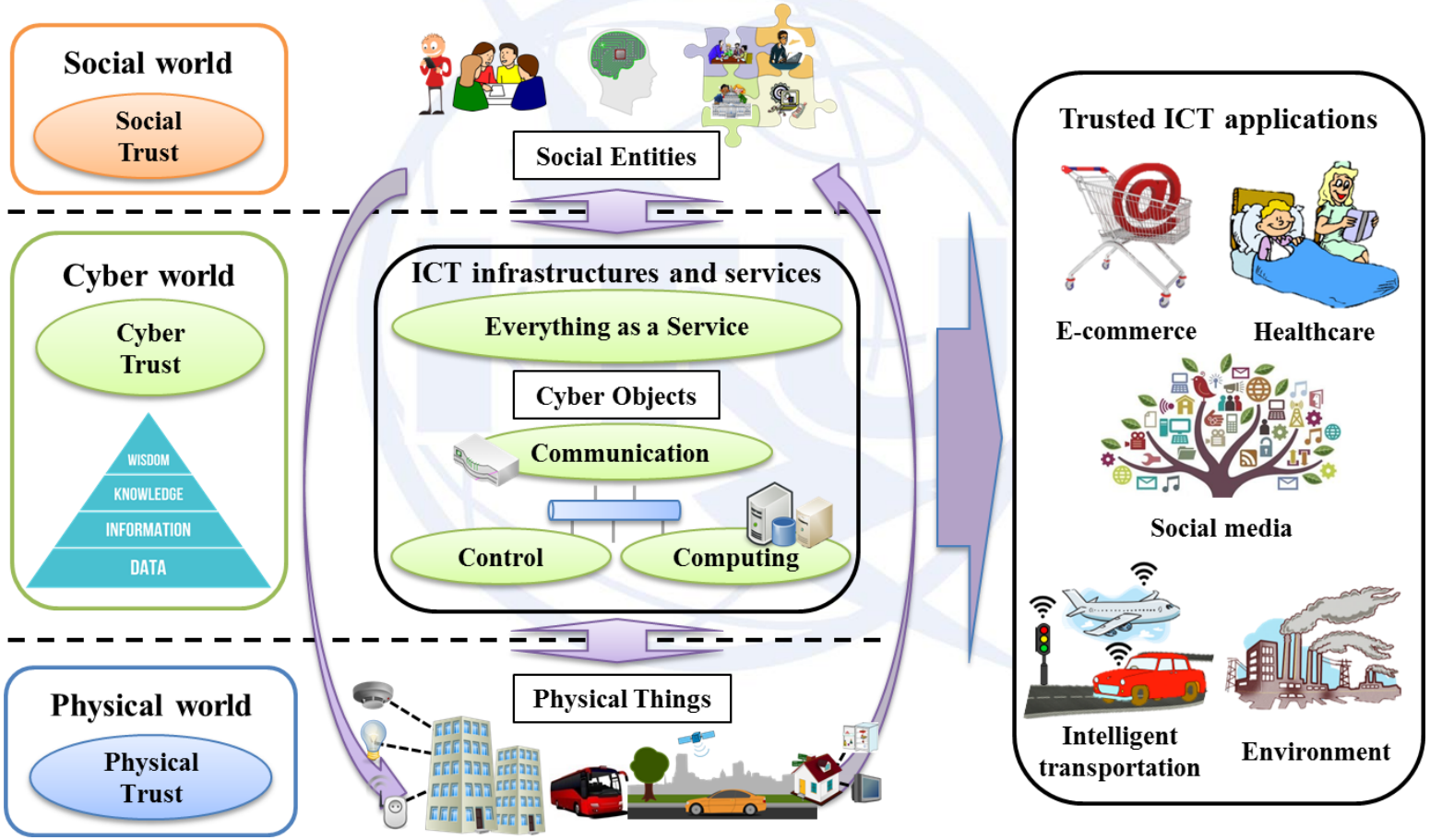
This period may be in the **past** (history), the **duration of the service** (from now and until end of service), **future** (a scheduled or forecasted critical time slot), or always

Dependability is deliberately understood broadly to include
**availability, reliability, safety, confidentiality, integrity and serviceability**

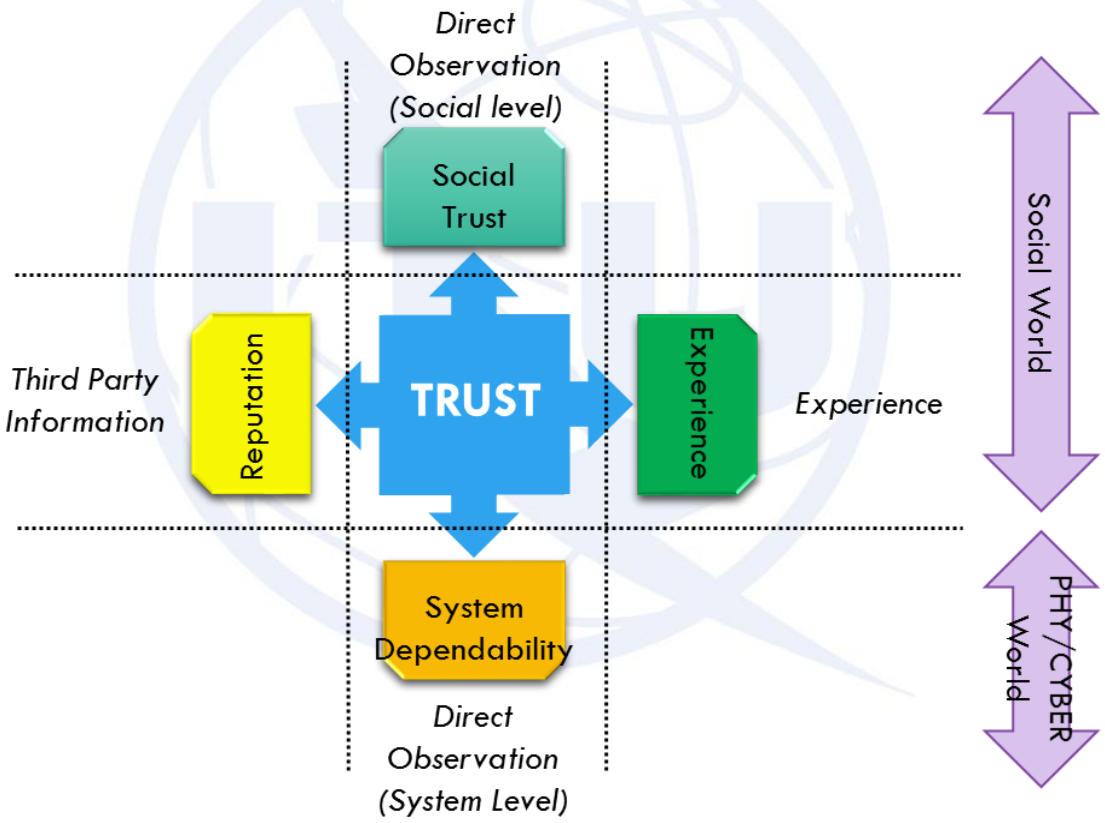
# Relationship among security, privacy and trust with different aspects



# Social Cyber Physical Trust



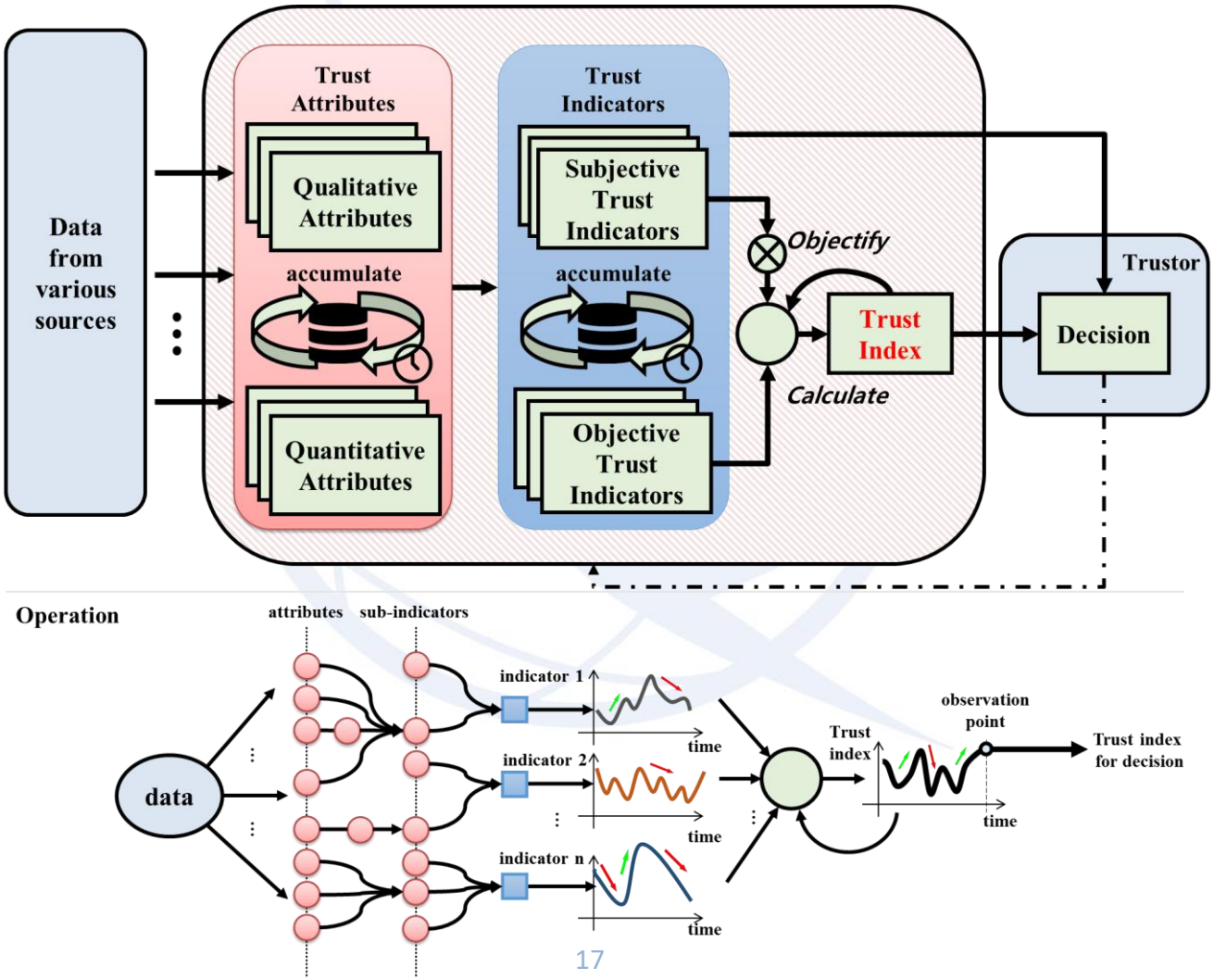
# Four-Dimensional Trust Model



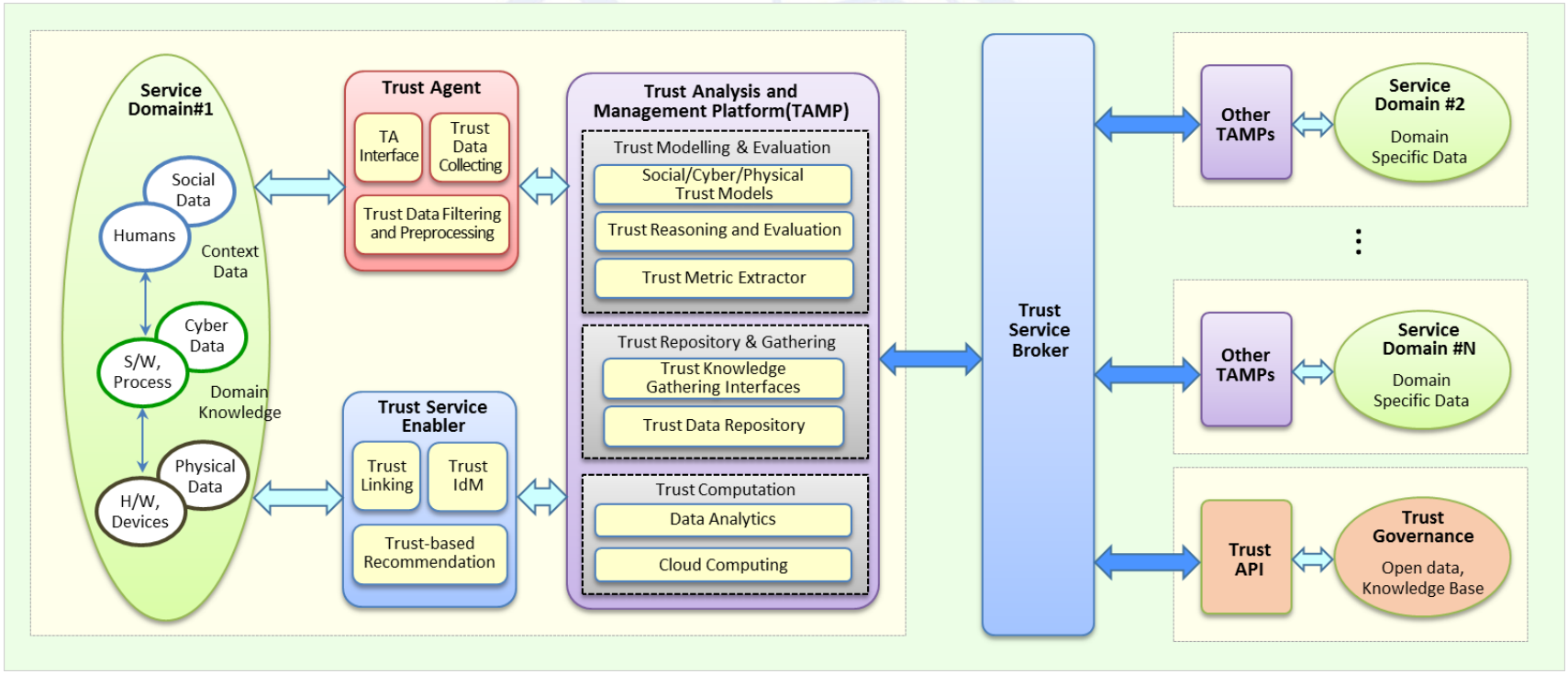
# Technical Issues

- Trustworthy data collection and aggregation
- Trustworthy data process and analysis
- Trust metric and modelling
- Trust index
- Dissemination of trust information
- Trustworthy system lifecycle management

# Trust Evaluation – Trust Index



# Architectural Framework

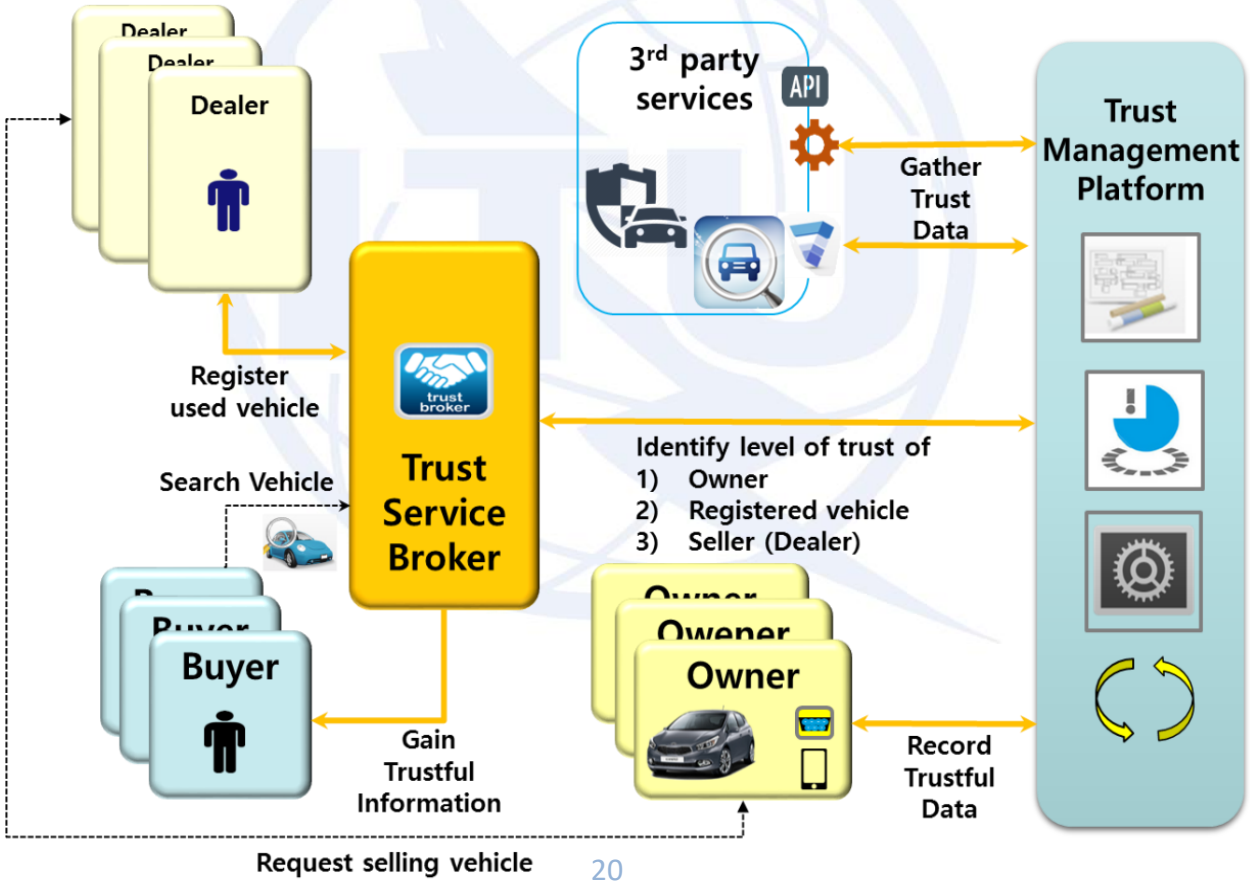


# Use Cases – Summary

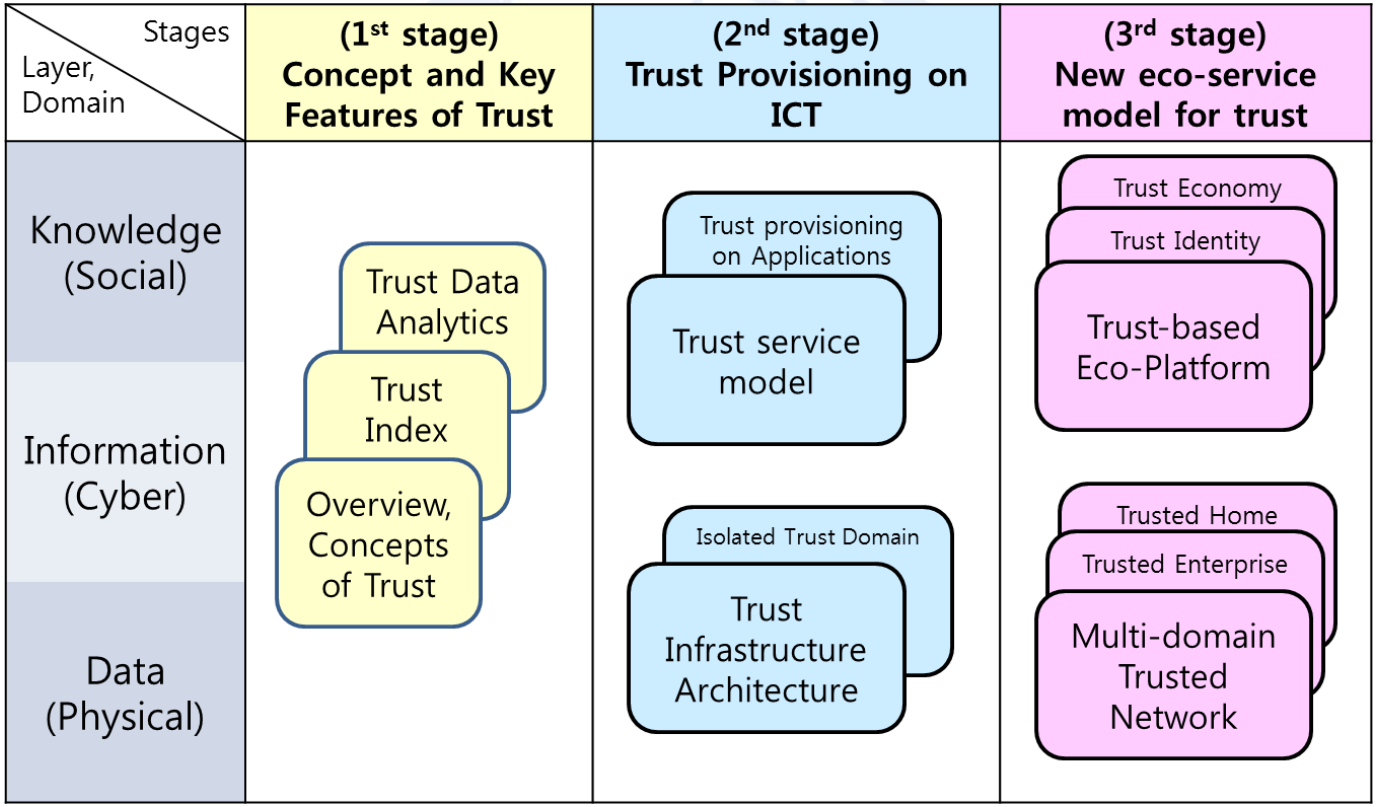
| No | Use case | Purpose | Method |
|---|---|---|---|
| 1 | **Trustworthy smart home service** | Managing home facilities | Trustworthy home-related data → Providing personal information to service platform |
| 2 | **Trustworthy smart office service** | Managing office facilities | Trust level of users → Determining facility usage right |
| 3 | **Trustworthy document sharing service** | Sharing document with appropriate users | Trust level between users → Determining authority of accessing document |
| 4 | **Device selection for data transmission** | Selecting trustful device for D2D communication | Trust level between devices → Selecting appropriate device for transmission |
| 5 | **Trustworthy car sharing service** | Promoting trustworthy car sharing | Trustworthy data about a shared car and users' data → Providing an information of shared car and its user |
| 6 | **Trustworthy used car transaction service** | Mediating transparent used car transaction | Trustworthy data about a used car → Providing transparent car history information |

# Use Case – Used Car Transaction Service

Buying a used car in trustworthy procedure.



# Roadmap for Trust Standardization



# Conclusion

**Trust considerations as an important item for standardization**

- **ITU-T**
  - Lead future knowledge societies in terms of standardization.
  - Initiate new work methods for future knowledge information infrastructures including pre-standardization and conceptual framework.
  - A strong leadership to collaborate with private sectors and academia which are outside of ITU-T.


ITU