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**Future Research Challenges in ICT  
Trust, Security, Privacy and Dependability**

a view from *eMobility*

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# eMobility vision



**“Improving the **individual’s** quality of life, achieved through the availability of an environment for the instant provision of and access to **meaningful, multi-sensory information and content”****



## Future Internet & Mobile/Wireless

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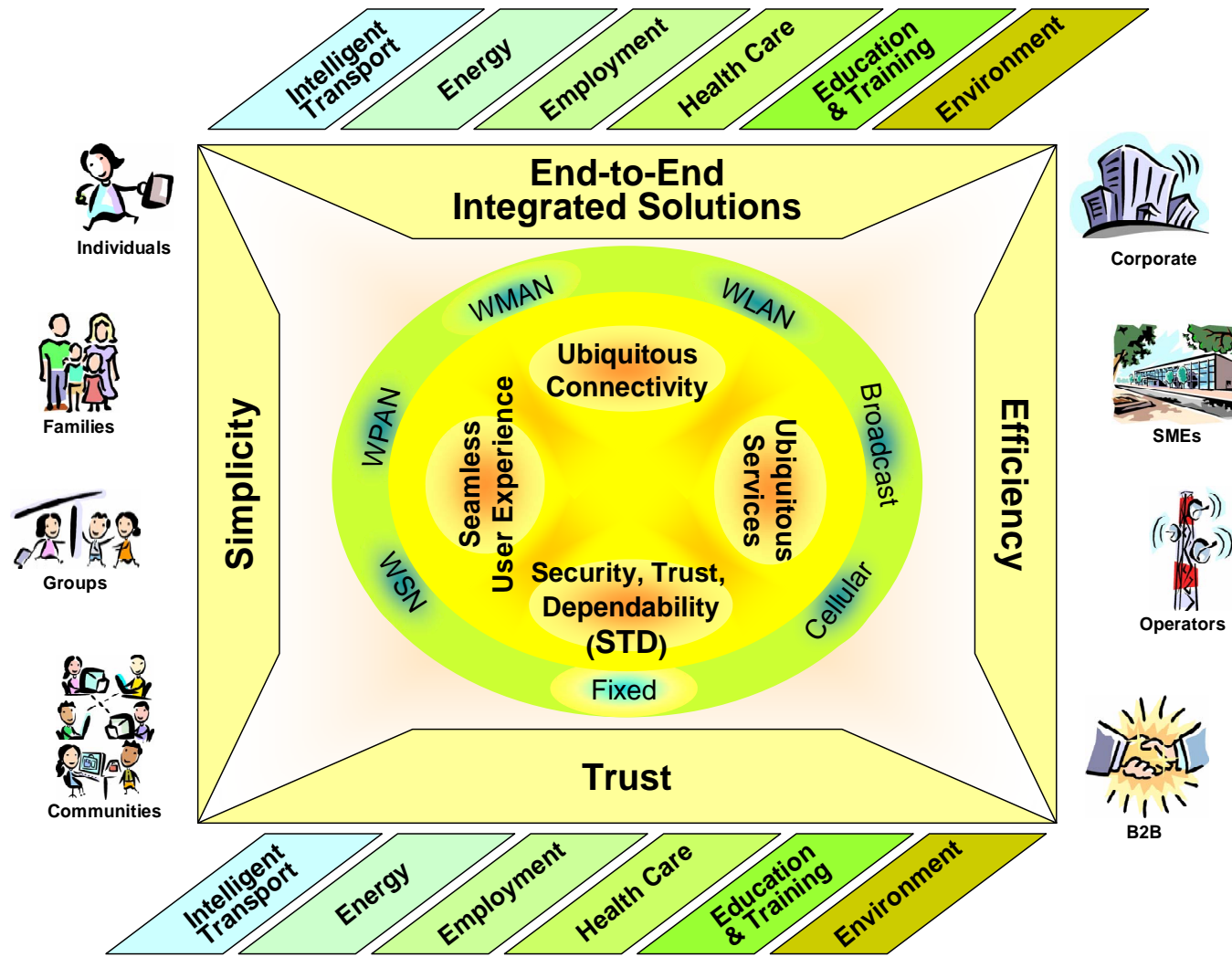
- developments of Future Internet and Future Mobile intimately bound together
- $f$  IN depends on  $f$  Mob for user connectivity
- $f$  Mob depends on  $f$  IN for service richness
- each is constrained without the other
- *both* are totally dependent on **trust, security, privacy and dependability** (TSPD) to reach envisaged goals

# SET

## Simplicity, Efficiency, Trust



### eMobility



# Common Issues (1)

## **TECHNOLOGY CONVERGENCE = KEY DRIVER**

- TSPD fundamental to integration of converging technologies
- TSPD solutions should evolve through open standards

## **GLOBAL INTERCONNECTION OF NETWORKS**

- Hazardous multiple level dimensions to security threats
- Environment mixed of computation and communication

## **INTERDEPENDENCIES**

- A vast number of interdependencies is progressively being built between systems and diverse areas of social and economic activity

## **COMPLEXITY IS INCREASING**

- Products, value nets, services and telecommunication solutions are getting more complex

Society

Business

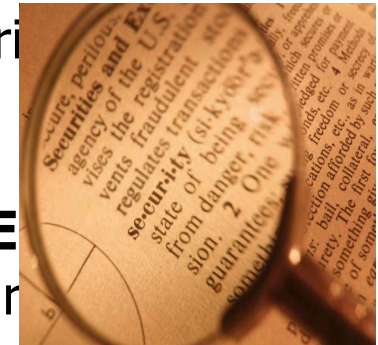
Citizens

Technology

## Common Issues (2)

### STRICT PRODUCT DEVELOPMENT SCHEDULES

- Markets set more and more strict time schedules to products, creating challenges to quality and security
- ➔ Security awareness needed



### DIFFUSION OF ICT SOLUTIONS TO EVERYWHERE

- E.g. IP based solutions and wireless technology are used in industrial automation and critical infrastructures
- ➔ Security by obscurity paradigm does not work anymore



### REACTIVE CYCLES not FAST

- The timeliness of reactive security solutions (such as antivirus, firewall and IDS/IPS products) is challenging
- Need for proactive solutions!

# Technical Research Priorities 1(2)



## SECURITY MECHANISMS

- Evolved protection mechanisms needed
- Confidentiality, integrity, authentication & authorisation, non-repudiation, privacy, anonymity and content protection
- Mobility and identity management are big challenges in ubiquitous environment

## TRUSTED DEVICES

- End-user devices have an essential role
- Management of connections
- Multi-modal and context-aware security mechanisms
- Change of authentication paradigm: from device authentication to user authentication
- Safe and secure SW download

## HOLISTIC TSPD ENGINEERING & MANAGEMENT

- Throughout the product, service and infrastructure lifecycles
- Trust, security, Privacy and dependability metrics for security assurance (testing, monitoring and analysis) and design



# Technical Research eMobility Priorities 2(2)

## USER TRUST

- Commercial success depends heavily on user trust and confidence on security and privacy

## FUTURE BUSINESS MODELS

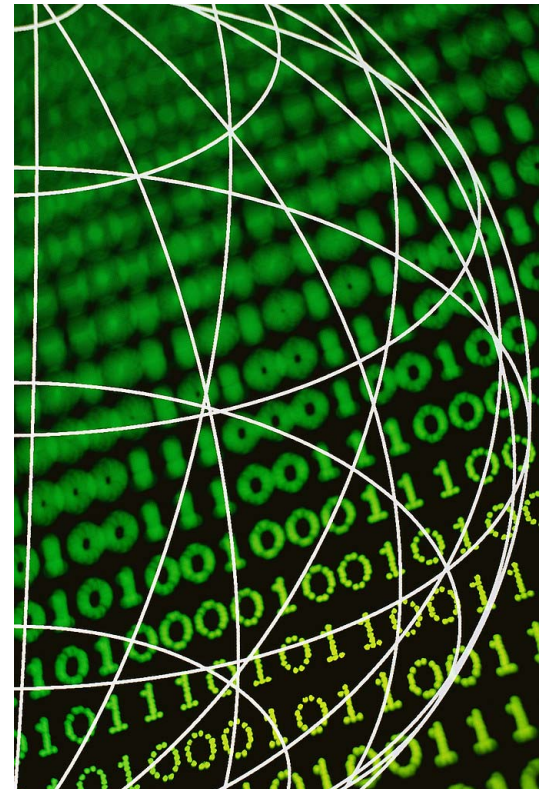
- Security transactions between business infrastructures (multi-business environment)
- Security & privacy providers

## REGULATORY ISSUES AND LEGISLATION

- Early detection of regulatory and legislation issues

## REACTIVE SOLUTIONS

- Defensive and forensic mechanisms
- Complementary protection to proactive solutions



# Working Group established eMobility

## eMobility Expert Group recently established WG on Trust, Security, Privacy and Dependability

- Call for participants
  - Objectives
    - broaden participation of members for inputs to the next version of the eMobility Strategic Research Agenda.
  - Contact person Reijo Savola <[Reijo.Savola@vtt.fi](mailto:Reijo.Savola@vtt.fi)>
- Conduct cross platform cooperation in these areas!

