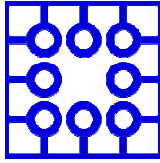


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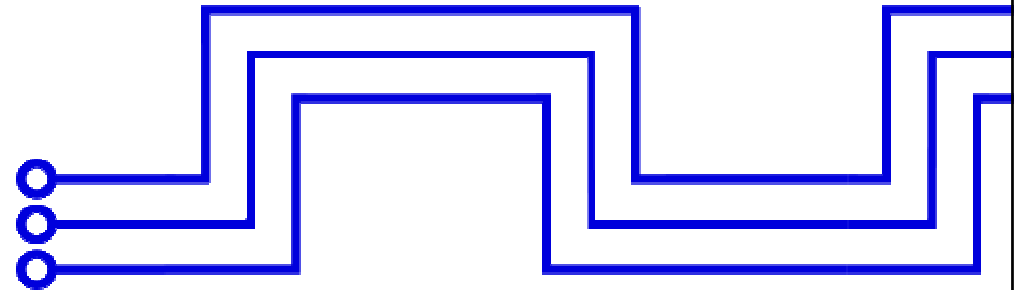


**Laboratory  
of Service  
Systems**

# **PA181 – Service Systems, Modeling and Execution**

Introduction

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# People



Leonard Wallezký

- Lectures



Josef Spurný

- Lectures



Zuzana Schwarzová

- Kyndryl colaboration
- Organization of the projects

# Content of the course

## Theoretical background



- Service complexity
- 4 diamond model
- Quality of services
- Social informatics

## Cloud frameworks



- Framework introduction
- Service model and execution
- Case studies and examples

## Business models



- Canvas
- Lean canvas
- Smart Services

# Final project

Group project of 2 – 3 students

Assignment will be specified in the middle of semester

- After introduction to theory and cloud framework

The presentation of the project during examination period

The best 5 projects will be awarded by Kyndryl

# What is service?

services are processes, performances, or experiences that one person or organization does for the benefit of another

In all cases, service involves deployment of knowledge, skills, and competences that one person or organization has for the benefit of another, often done as a single, customized job

- Lusch & Vargo

## What is the complexity?

<https://www.intercom.com/blog/the-hidden-cost-of-design-complexity/>



- Complexity characterizes the behavior of a system or model whose components interact in multiple ways and follow local rules, meaning there is no reasonable higher instruction to define the various possible interactions

## What are complex services?

Services acting in  
complex  
environment

There is not clear  
way how to define  
the process of  
service provision

The final value depends on

- Response of customer
- The resources currently used
- Interaction with other entities in the environment

All services  
became more  
complex

# Example: Hairdresser and knowledge



1960



How to use scissors and other cutting staff  
The basic trends in haircutting  
Know the basic of marketing (how to impress the new customers and keep the present ones)  
Know the basic of taxation and bookkeeping

2025



actual data of  
sophisticated AI-  
analysis of the hair  
banking to  
payment for



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# Teaching in the environment of Complex services

## New curriculum

- How to turn proposal into application
- Less theory, more practice

## Focus to other skills

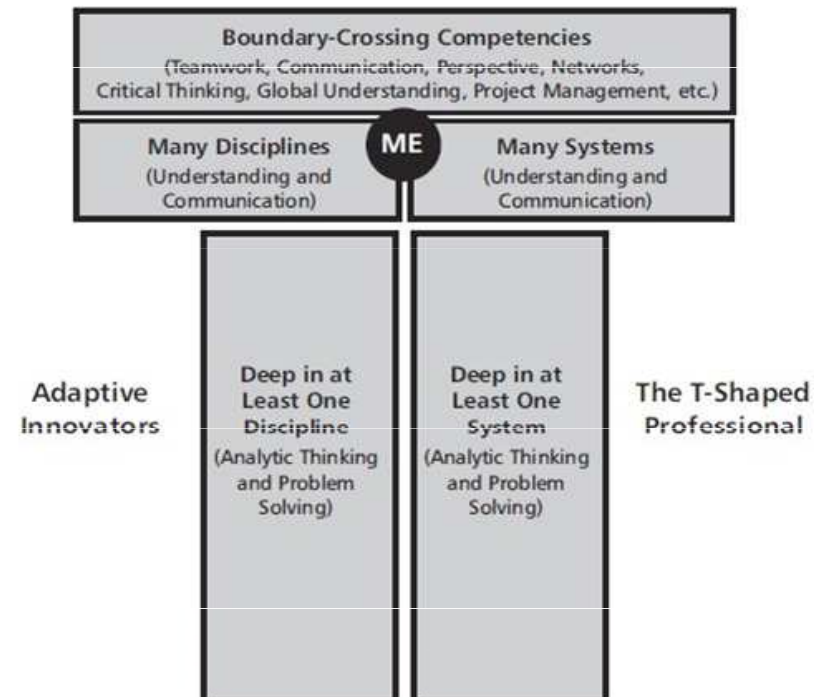
- Multidisciplinarity
- To understand marketing, management etc.

## Social skills

- To present and communicate
- To understand people from other domains



# T-shaped model of competencies



A T-shaped professional model (Gardner 2017; Spohrer & Maglio 2010).

# Introduction to T-Shaped Skills

As universities transform curriculum in the AI era, the importance of preparing T-shaped professionals for career success is an important topic to explore

T-shaped professionals have deep disciplinary problem-solving skills and broad communications skills for improved teamwork and rapid learning of new areas

A T-shaped professional has deep expertise in one area (vertical stem of the “T”) and broad skills across multiple areas (horizontal top of the “T”)

T-shaped professionals have depth and breadth across six areas: Emerging technologies, work practices, developmental mindsets, academic disciplines, societal systems, regional cultures





# WHAT IS THE T-SHAPED ADVANTAGE?



T-SHAPED PROFESSIONALS HAVE THE ABILITY TO COMMUNICATE ACROSS BOUNDARIES, ADAPT TO MULTIDISCIPLINARY TEAMS, AND LEARN NEW AREAS OF EXPERTISE AS NEEDED TO TACKLE MULTICONTEXTUAL PROBLEMS.

# Social skills as key factor

To understand people from other domains is the main factor of success in multidisciplinary teams

One word or phrase can have more, mostly different meaning

IT	Law	Doctor
<ul style="list-style-type: none"><li>• Set of data</li><li>• File stored in cloud</li><li>• Size, type</li></ul>	<ul style="list-style-type: none"><li>• Legal manuscript</li><li>• Legal consequences</li><li>• Laws, paragraphs</li></ul>	<ul style="list-style-type: none"><li>• Medical content</li><li>• Treatment, medicine, pills</li></ul>



## What if the context understanding fails?

E-Prescription has very clear value

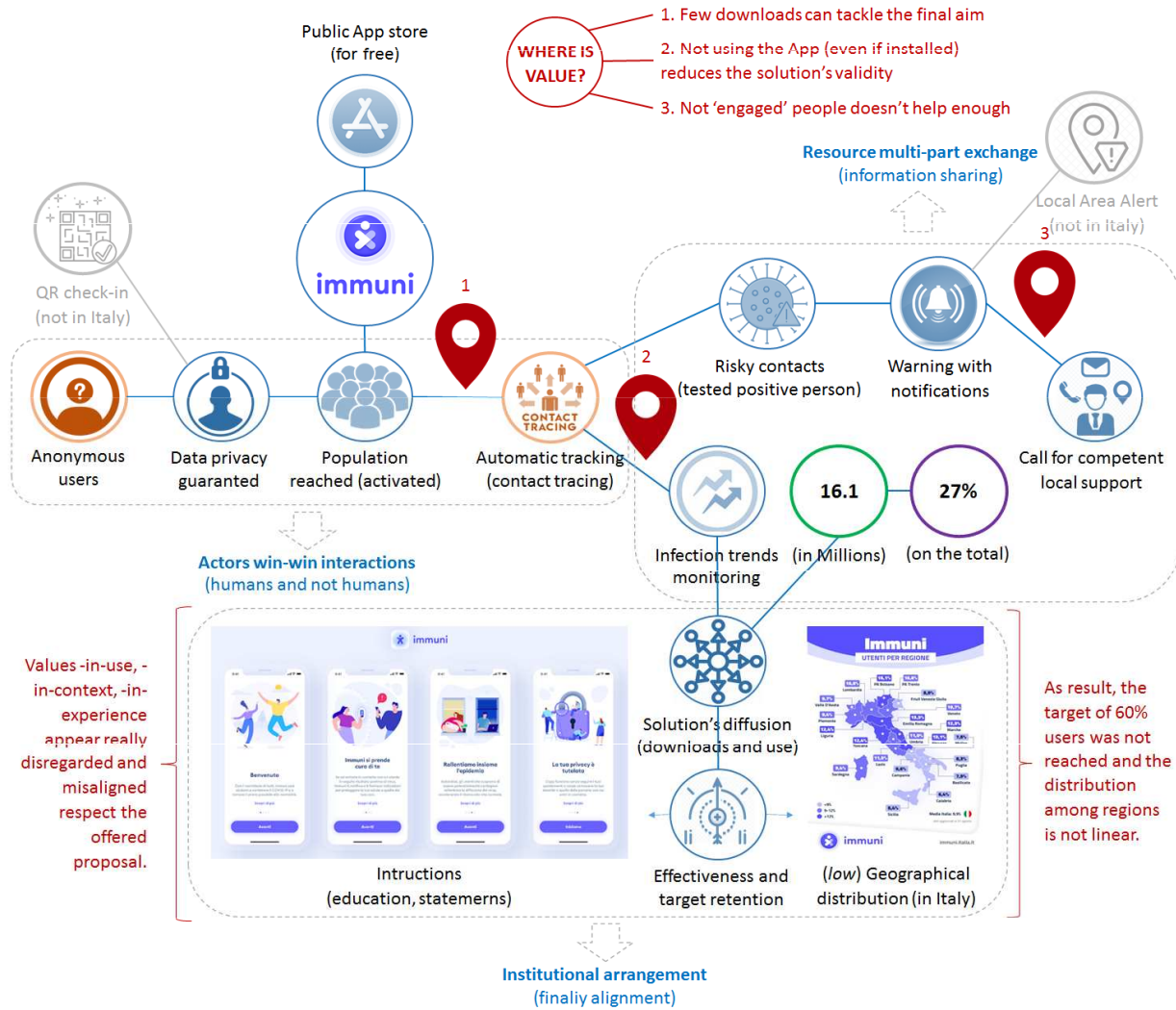
But if it is not described properly to all stakeholders, it is refused

Physicians took e-prescription as example of the state dictate

They have more important duties than learn new technology with no relation to medicine



# Immuni: the contact tracking in Italy

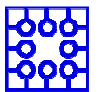


# Smart City – example of service complexity

Correct definition of Smart City

Role of ICT in Smart City Structure

Role and design of Services within the Smart City





# Definition of Smart City

Why do we need „correct“ definition of Smart City?

Many cities claim to be smart

Obviously, the implementation of ICT plays key role in city „smartness“

Smart City Council definition:

- A smart city is one that has digital technology embedded across all city functions

But just usage of ICT does not mean the city is smart

The usage of ICT should have been used in a way to improve city efficiency, usability and sustainability



# Possible definitions

The use of smart computing technologies to make the critical infrastructure components and services of a city – which includes city administration, education, healthcare, public safety, real estate, transportation and utilities – more intelligent, interconnected and efficient

- Where Smart Computing means:  
A new generation of integrated hardware, software, and network technologies that provide IT systems with real-time awareness of the real world and advanced analytics to help people make more intelligent decisions about alternatives and actions that will optimize business processes and business balance sheet results
- WASHBURN, Doug; SINDHU, Usman; BALAOURAS, Stephanie; DINES, Rachel A; HAYES, Nicholas M; NELSON, Lauren E. Helping CIOs Understand "Smart City" Initiatives. 2010.

Smart City is a service, containing different sets of advanced services, using ICT in an innovative way that enables city management and the whole society to meet the challenges of city development with the aim to improve its efficiency, habitation, resilience, and sustainability, to bring its citizens (and all other stakeholders) the highest value possible, formulated in an understandable value proposition.

- Based on Lucie Števková: Analysis of the Smart City from IT management point of view, Master thesis, 2018, Dean's award
- Improved by Chat GPT



# Main research questions

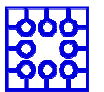
Do the Smart City Services have any structure?

How to design and realize Smart City services in the most efficient and complex way?

What competencies and knowledge are necessary to understand complexity of services?

What are necessary inputs, implementation processes, limits, forms of financing and other constrains to create valuable structure of services within Smart City?

How to formulate the rules to create effective, flexible and complex Smart City, fulfilling the requests of administration, citizens and other related stakeholders?



# Smart City Services

There are many different services, used in Smart City, with different role and customers

- Traffic control
- Route optimization
- Waste services

We can find there many IT services, but in the basic level, we can recognize two main elements

- Software
- Hardware

How they are related or connected? What tasks do they really fulfill?

Is there any methodology we can use?



# How do we model Smart City?



Figure 4. Smart and resilient city model.

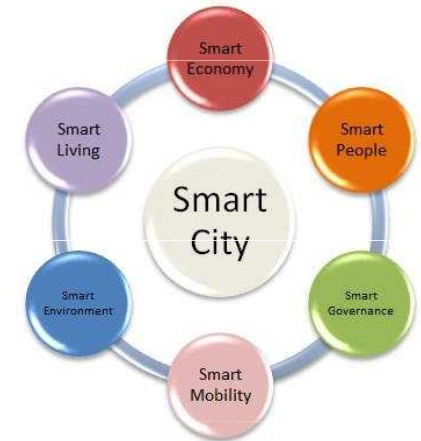
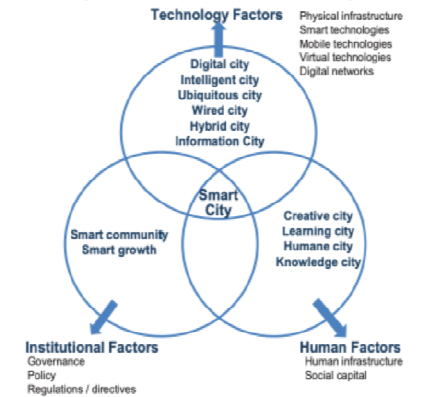
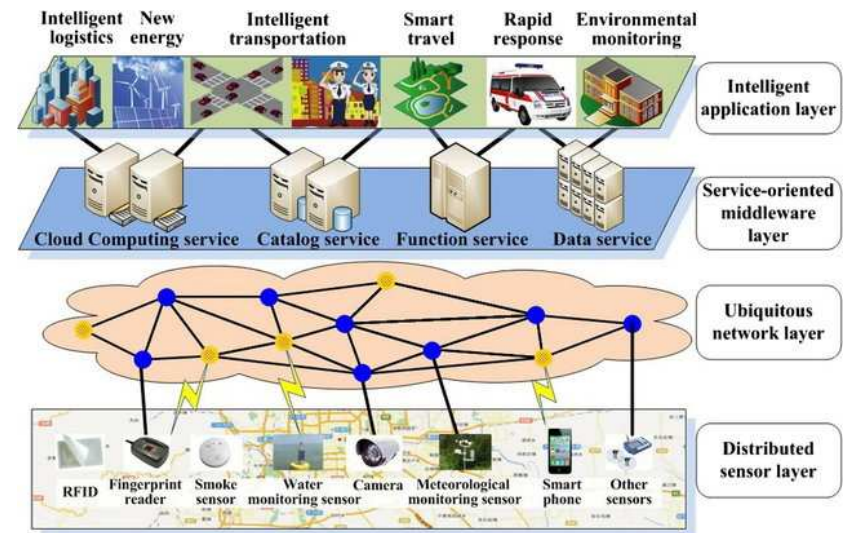
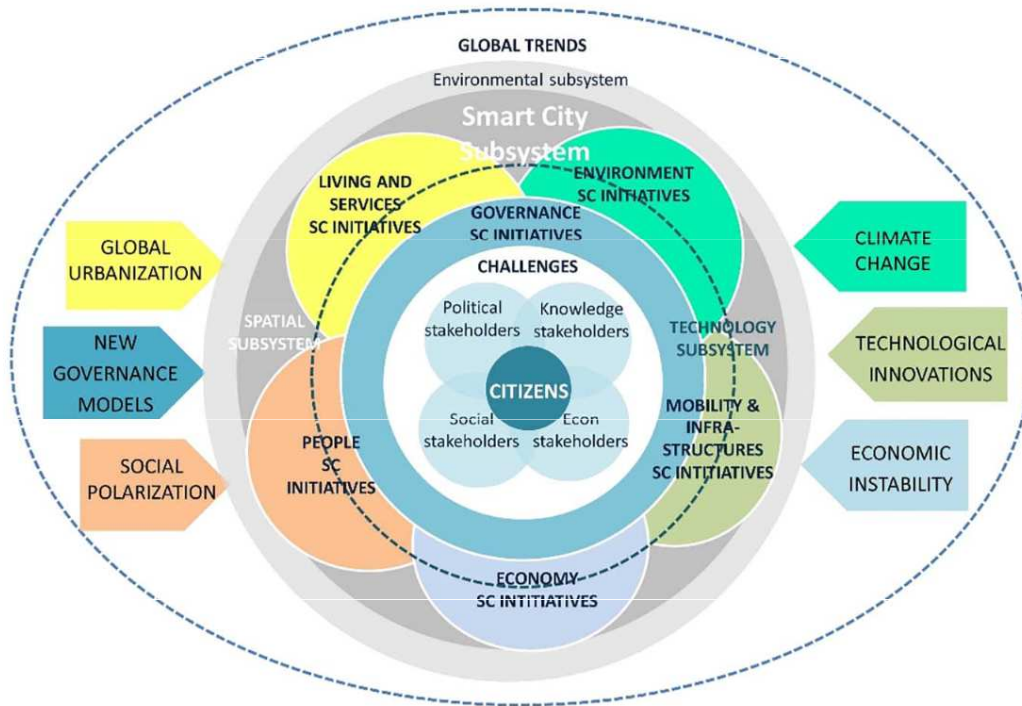


Figure 1. Fundamental Components of Smart City



# How do we model Smart Cities?



# Service Science inspiration

The key element of all services is:

- Value – usefulness or utility for the receiver of the service
- Value proposition – description of the value in the language of receiver

Based on this we divided the Smart City services to the layers depending on their value proposition.

- Do they serve for final user (citizen, administration) or are they just „inputs“ for other services?

IT services

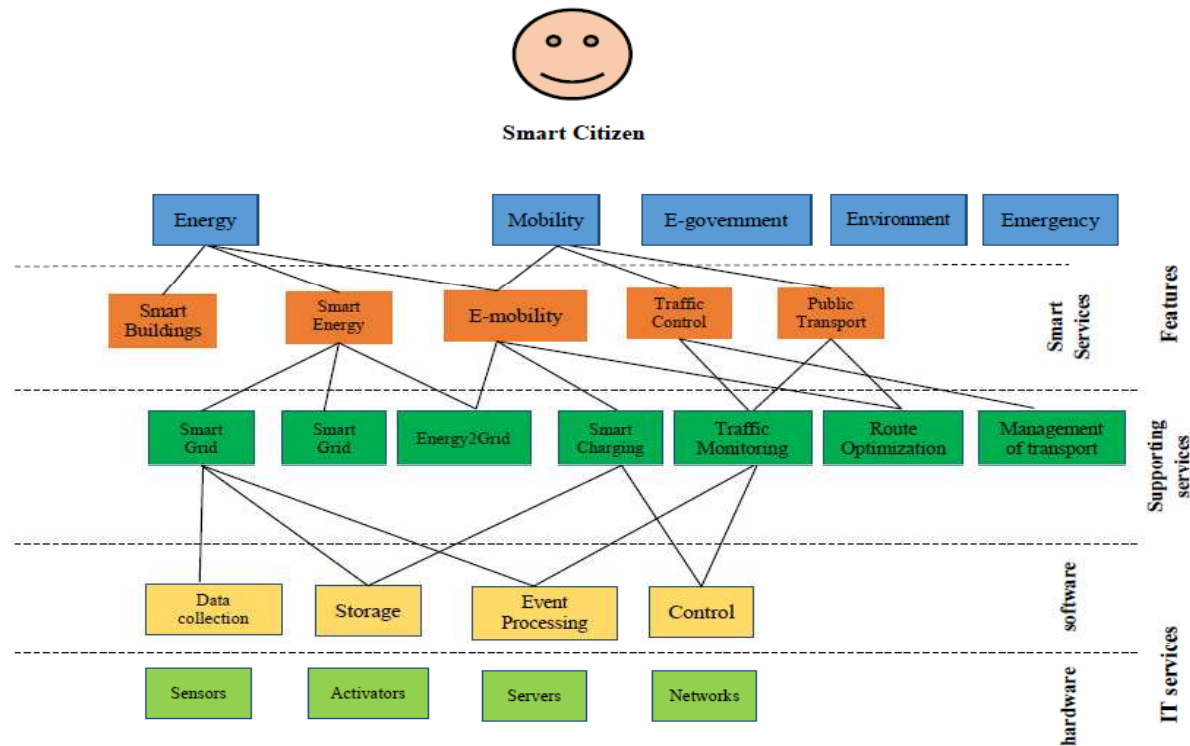
Supporting services

Smart services

Smart features



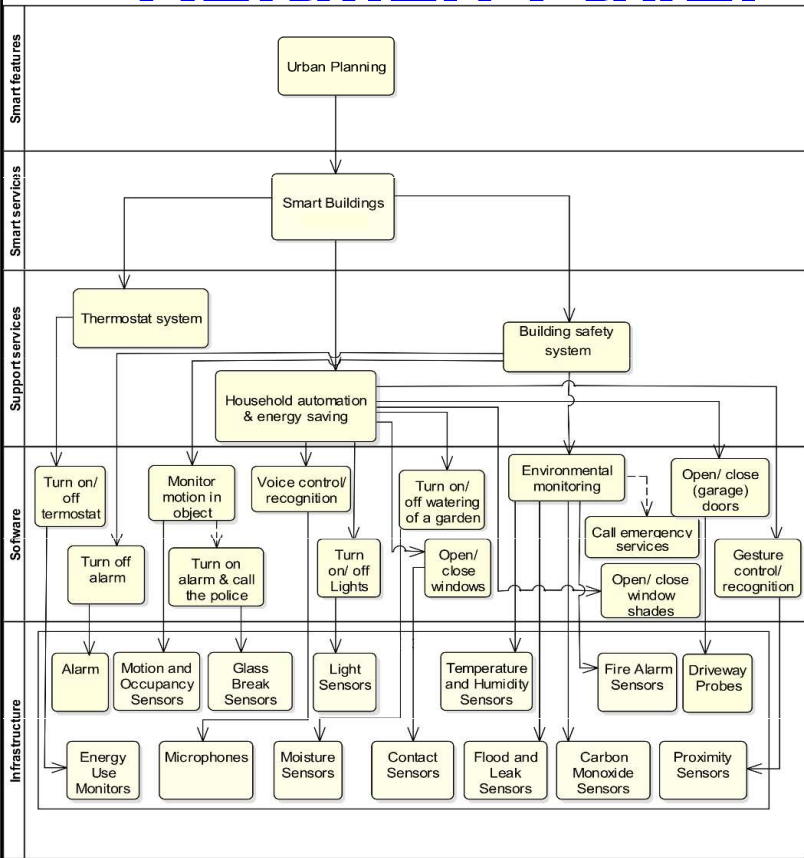
# Layer model of Smart City



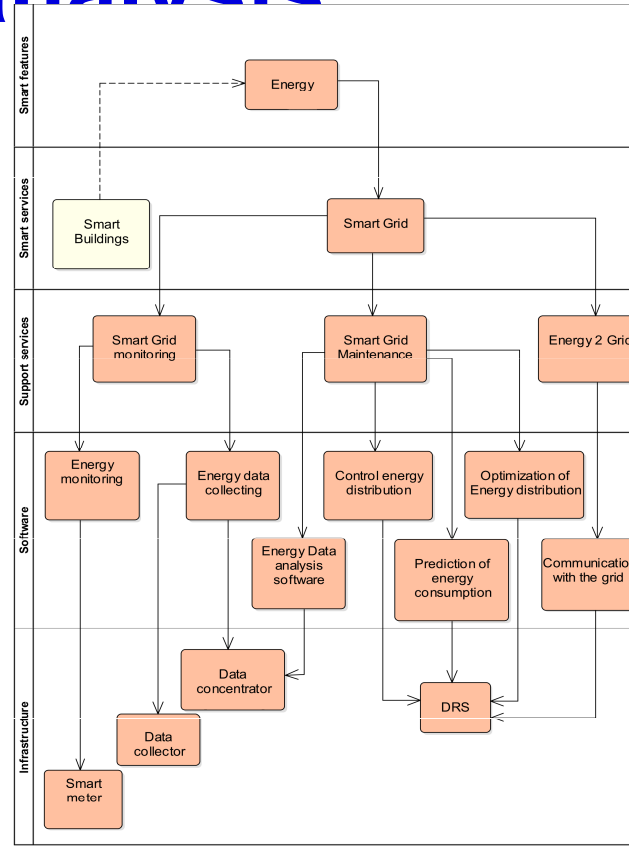
Wallezky L., Buhnova B., Carrubbo L. (2018) Value-Driven Conceptualization of Services in the Smart City: A Layered Approach. In: Barile S., Pellicano M., Polese F. (eds) Social Dynamics in a Systems Perspective. New Economic Windows. Springer, Cham



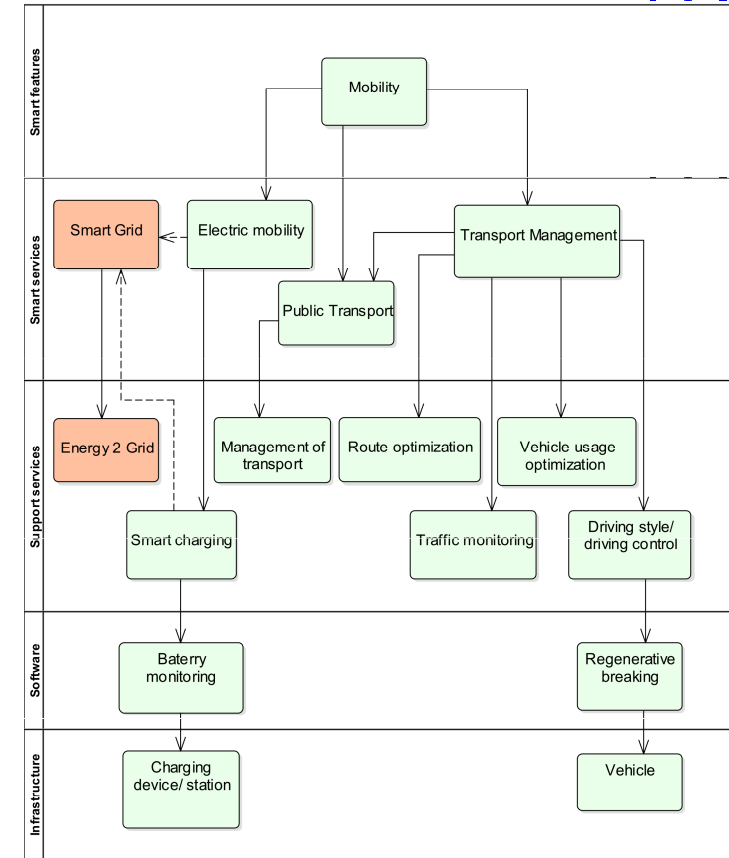
# Detailed Layer analysis



Urban planning



Smart Energy



Mobility

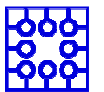
## Breaking idea

All models are trying to model multicontextual environment as one context

- Context is the facets of a situation, fictional or non-fictional, that inspire feelings, thoughts and beliefs of groups and individuals. It is the background information that allows people to make informed decisions. (<https://www.studiobinder.com/blog/what-is-context-definition/>)

Any change, modification or enlargement means redefinition of the model

We need to find a way how context can be part of the model



# New developed r

Smart feature and services depend on specific point of view of customer = context

Smart Features

Customer facing services

Infrastructure and supporting services depend on specific point of view and terminology of experts = context

Smart Services

Supporting Services

Background services

Infrastructure



# Conclusion

Service and its role

Value proposition and its meaning

Service complexity

Smart City as example