2013 17th International Conference on Intelligence in Next Generation Networks
icin 2013
Unlocking Value from the Networks
Smarter Networks for Smarter Things 15-16 October 2013, Venice, Italy

S5: Business Models

Constructing a Multi-Sided Business Model for a Smart Horizontal IoT Service Platform

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iCore - EU FP7 project No 287708

TNO innovation for life

iCore Empowering IoT through Cognitive Technologies

Alcatel·Lucent

Challenge

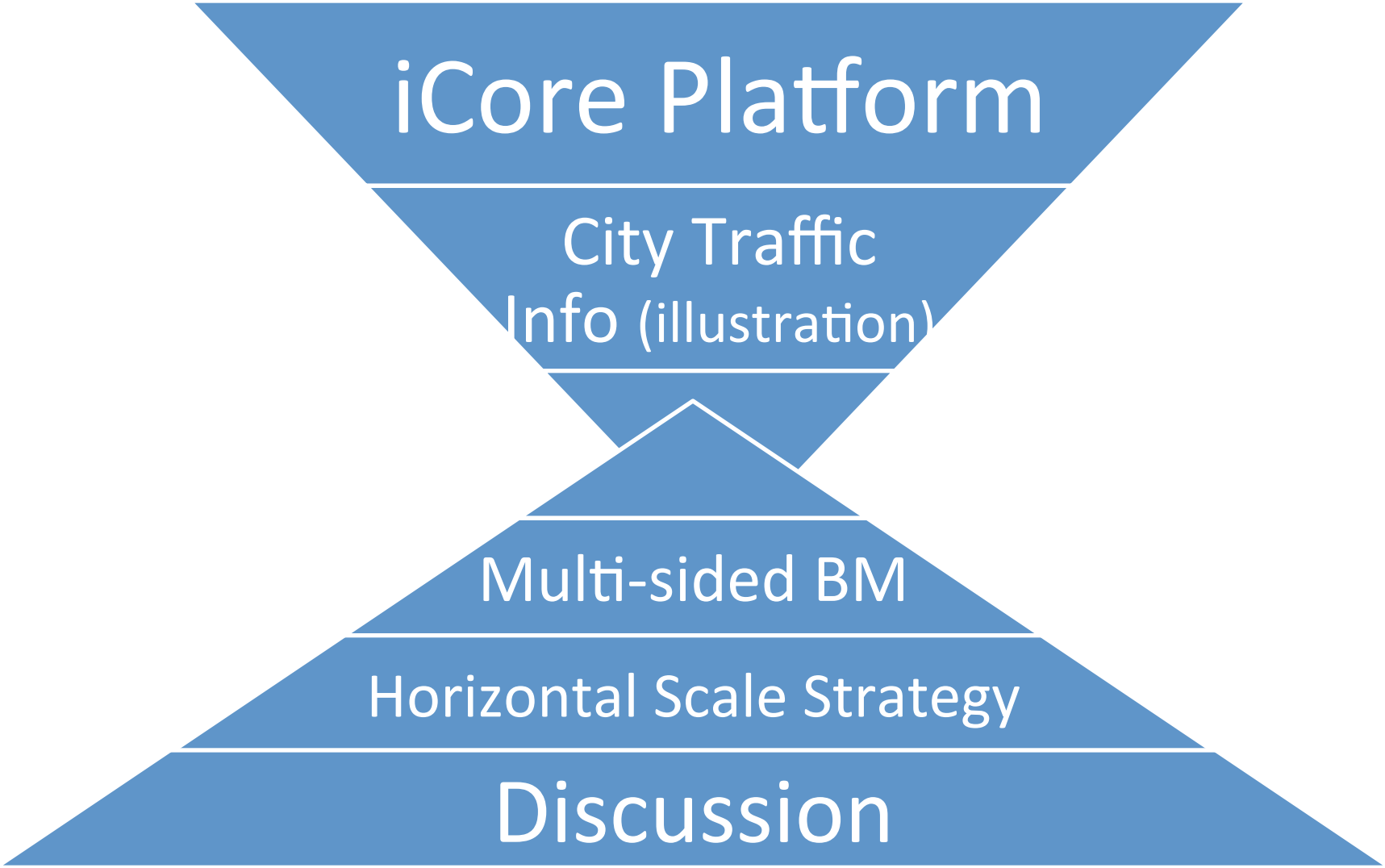
Establishing a Smart Horizontal IoT Service Platform is quite difficult to achieve

- **Service Platform**: must be able to support a phletora of services, most not defined yet
- **IoT**: a field that is wildly developing
- **Horizontal**: must be applicable across domains
- **Smart**: using intelligence in advanced ways (cognitive technologies)

➔Multi-Sided: requires <u>sufficient acceptance</u> on both 'demand' (service) and 'supply' (data) sides

➔A seed and a strategy to achieve horizontal scale

Outline


iCore Platform
City Traffic
Info (illustration)
Multi-sided BM
Horizontal Scale Strategy
Discussion

iCore Platform characteristics

a priori domain knowledge:
(service-agnostic) domain knowledge extensions

- Expressivity
- Execution fulfillment with resource economies

service request interface:
high-level semantic expressions

processing of selected VO data source streams (CVO)

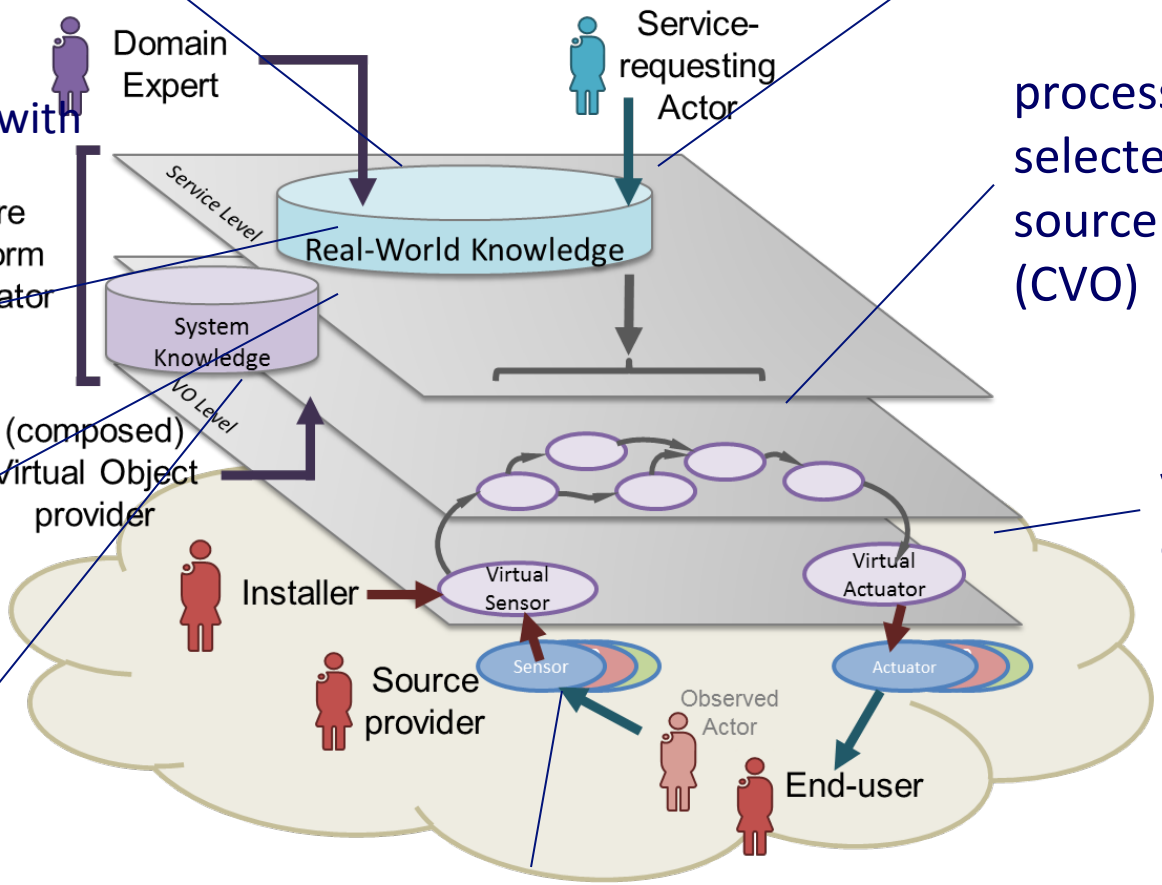
growing real-world cognitive intelligence

autonomous optimizations

virtualized objects

System Knowledge (autonomously growing)

live data sources and sinks



Traffic Info Service

GYT is current market leader in after-market in-car navigation devices

PT is a large bus company that is active in several districts of the country

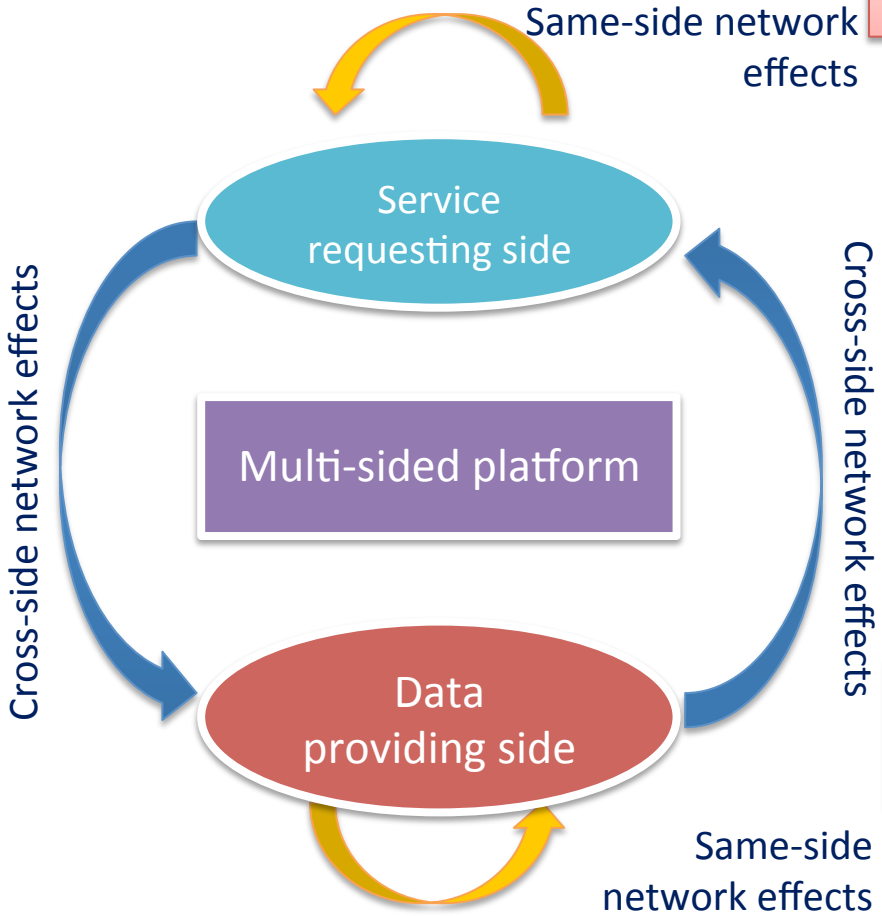
CC is a small company that collects information on traffic relevant events, such as speed measurements, traffic jams, incidents, road works, manifestations or concerts etc.

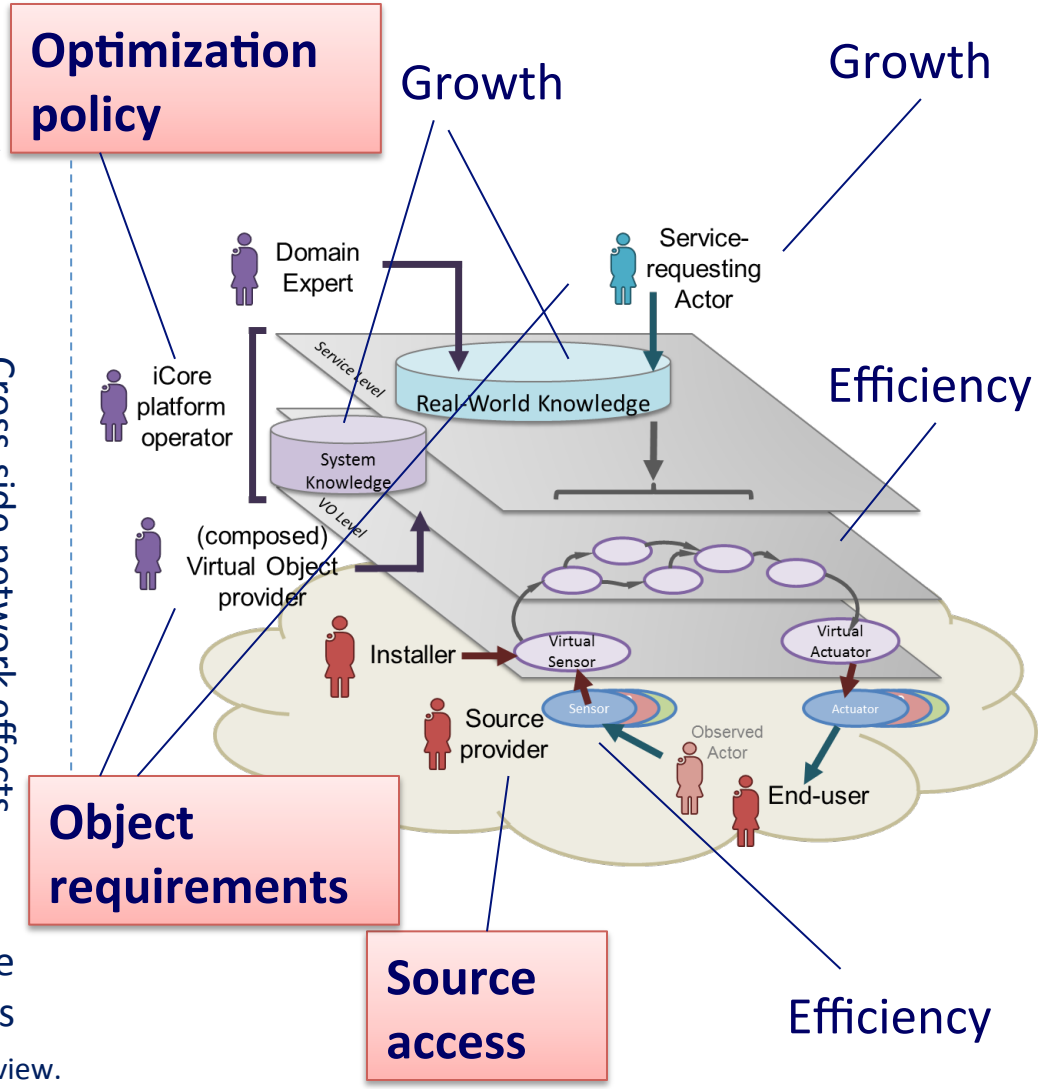
Courier quick and timely deliveries

PS is responsible for the city's safety

High-level value and control points

Multi-sided Business Model





Eisenmann (2006), Managing Networked Businesses: Course Overview.

Traffic Info Service Delivery

GYT **requests** to be informed for each eligible user on relevant disturbances

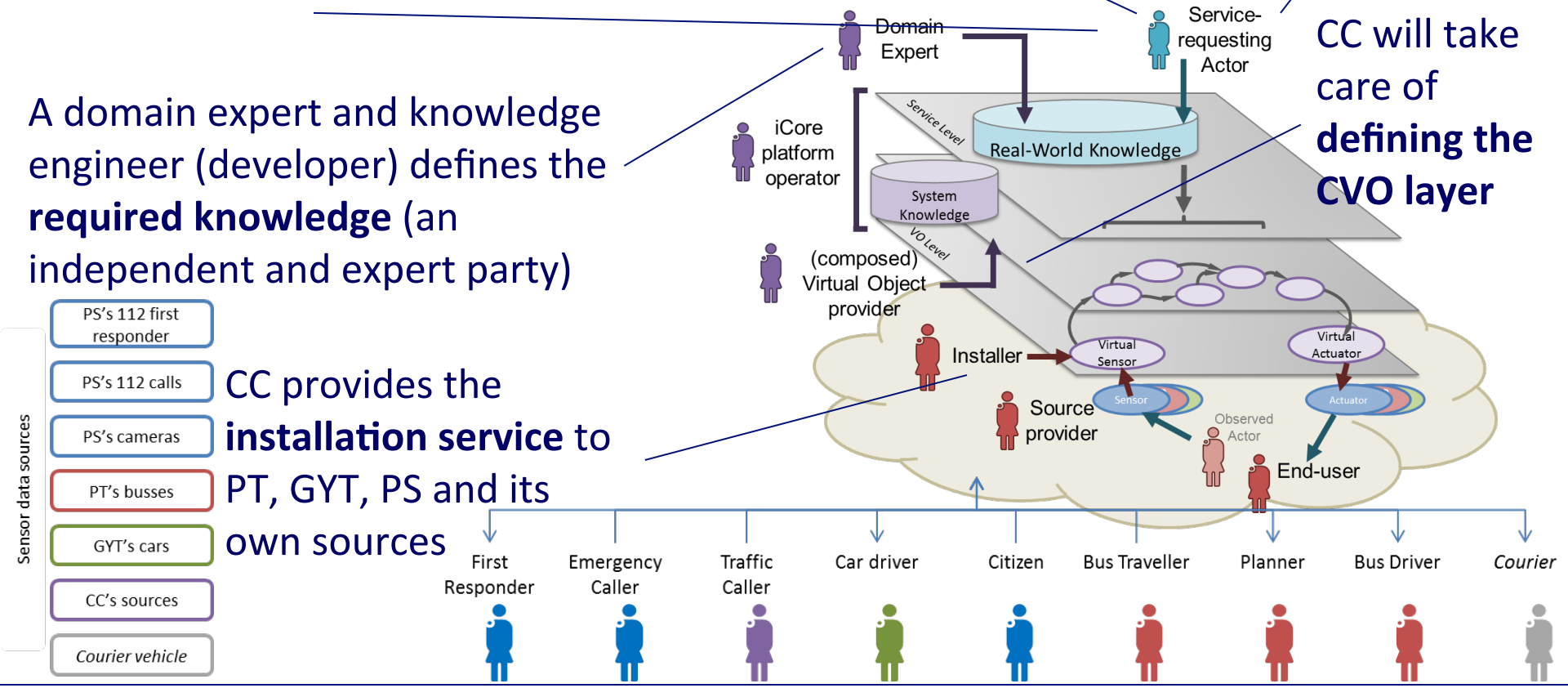
PT specifies the **service request** "inform me if my schedule is at risk"

PS **requests** to be informed only on exceptional disturbances

A domain expert and knowledge engineer (developer) defines the **required knowledge** (an independent and expert party)

CC provides the **installation service** to PT, GYT, PS and its own sources

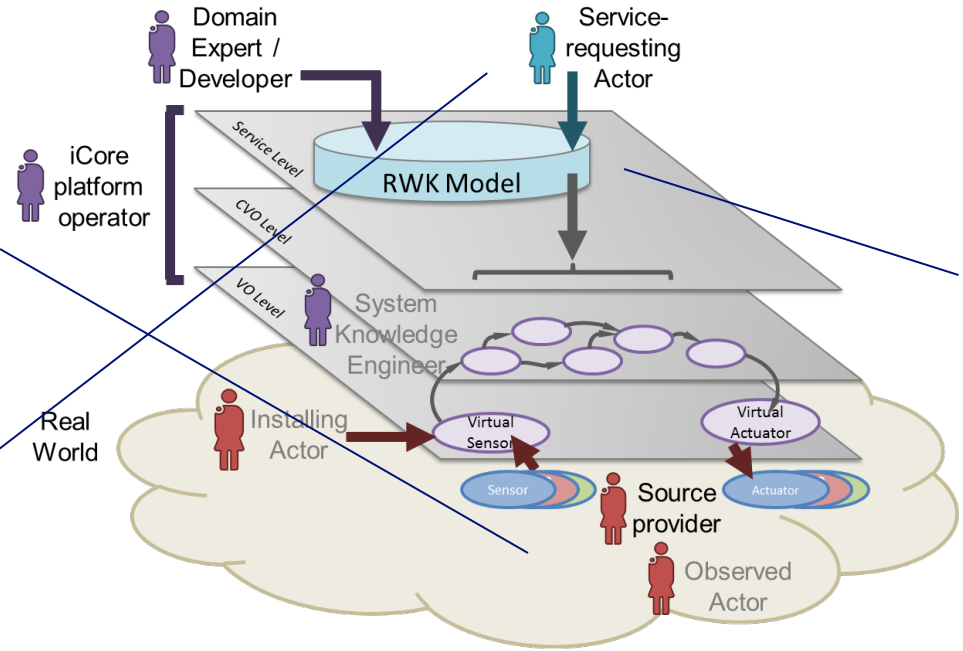
CC will take care of **defining the CVO layer**



Illustrated platform values

Additional applications can be added at a marginal cost of expanding the real world knowledge

Additional data sources provide additional values to existing users, **without altering the interface**



The **cognitive capability** provides additional information such as the structural delays of a bus line

Drivers and more platform values

Utility, supply and demand

Adoption

Shorter time-to-market

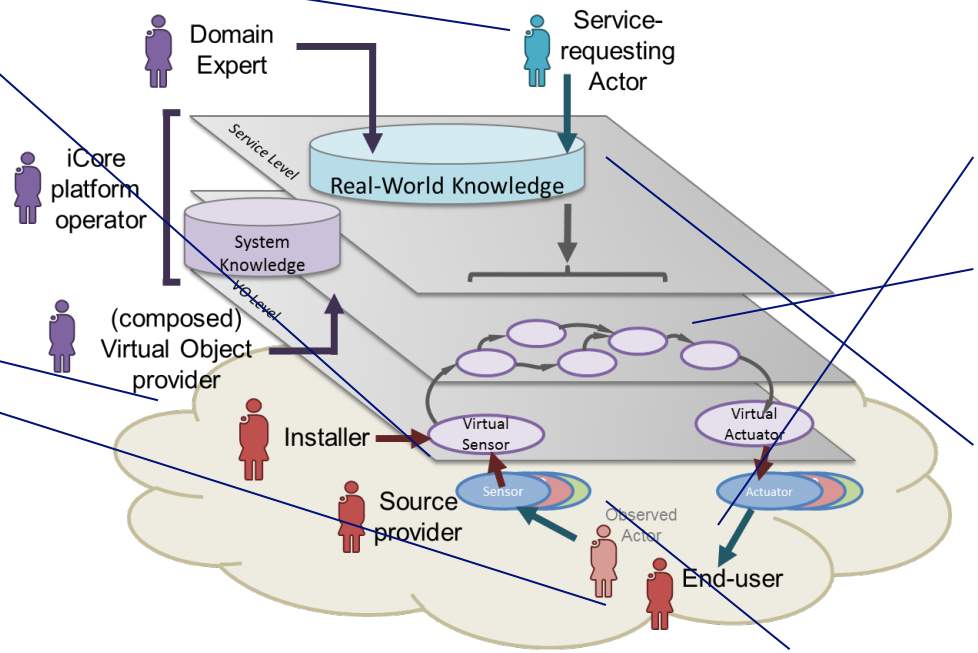
Complex service behavior abstraction

High number of applications and data sources

Economies of scale and scope

- Shared use of sensors and data
- Processing resource efficiency
- Shared use of ever-extending RWK

Dynamics in deployment and service execution



Quality and trust

Heterogeneity of data sources

Timeliness and continuity

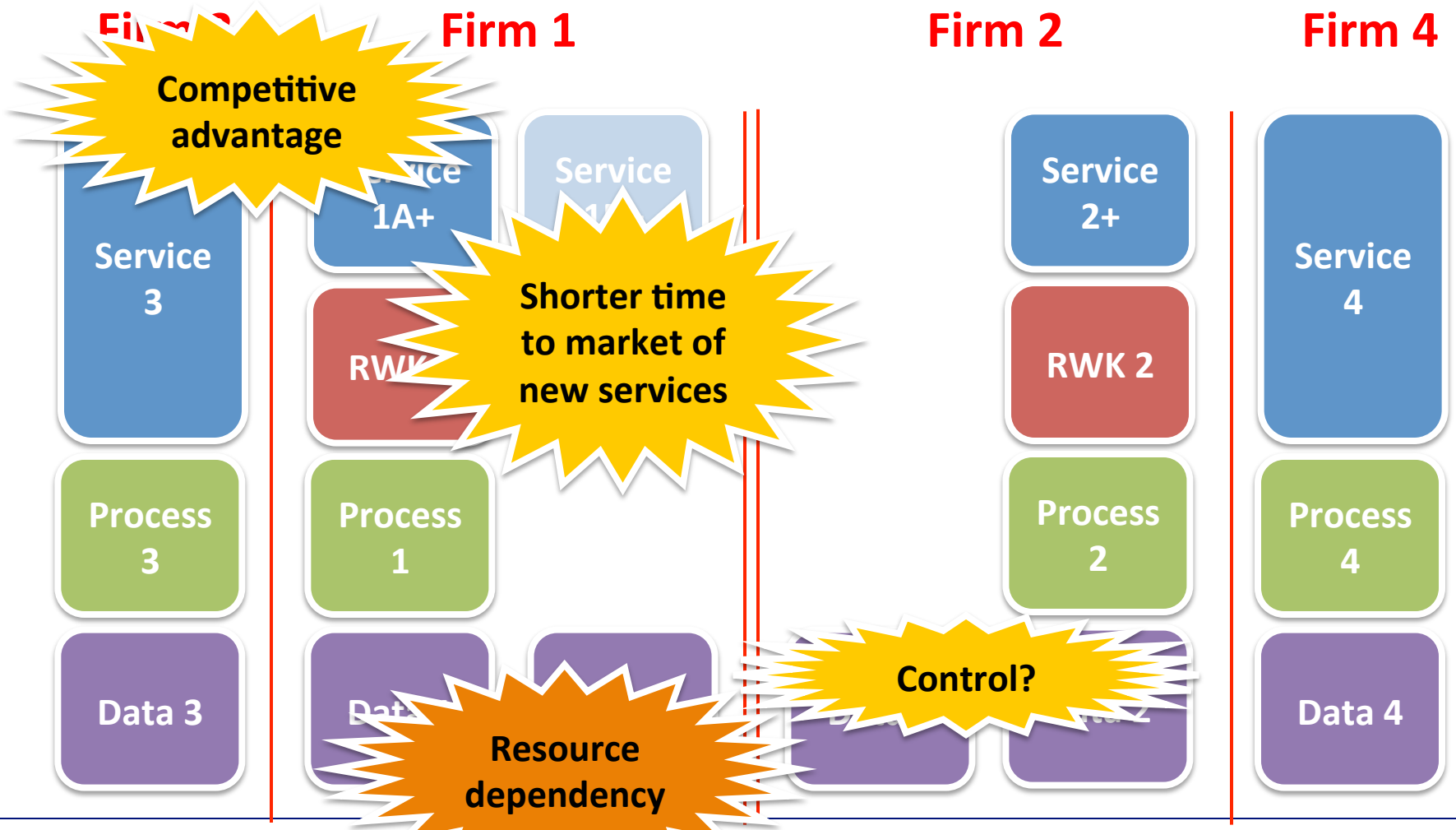
Value of sensor data

Seeding for Horizontal Scaling

- The BM may show to apply well to this application context
  - Values are delivered
  - Concurrent control points are neutral
  - Other domains may fit as well
    - Currently considering and comparing Smart Home, Transport, Office, Car and City.
- But does it work as a seed?
  - Do the players have incentive to scale horizontally?
  - We would need to "back-cast" from the end-state

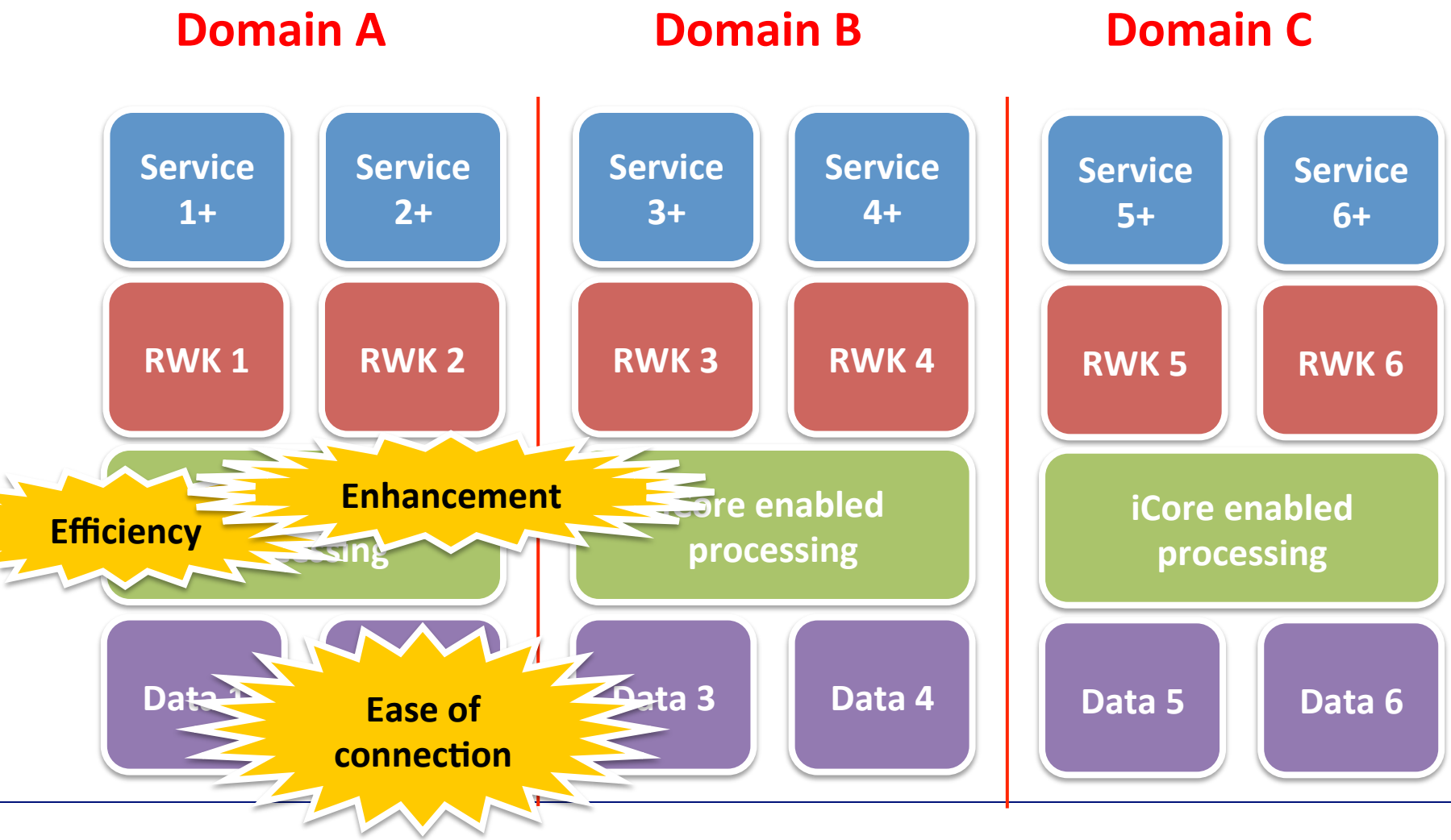
Single firm advantage

Current situation: Linking of data sources



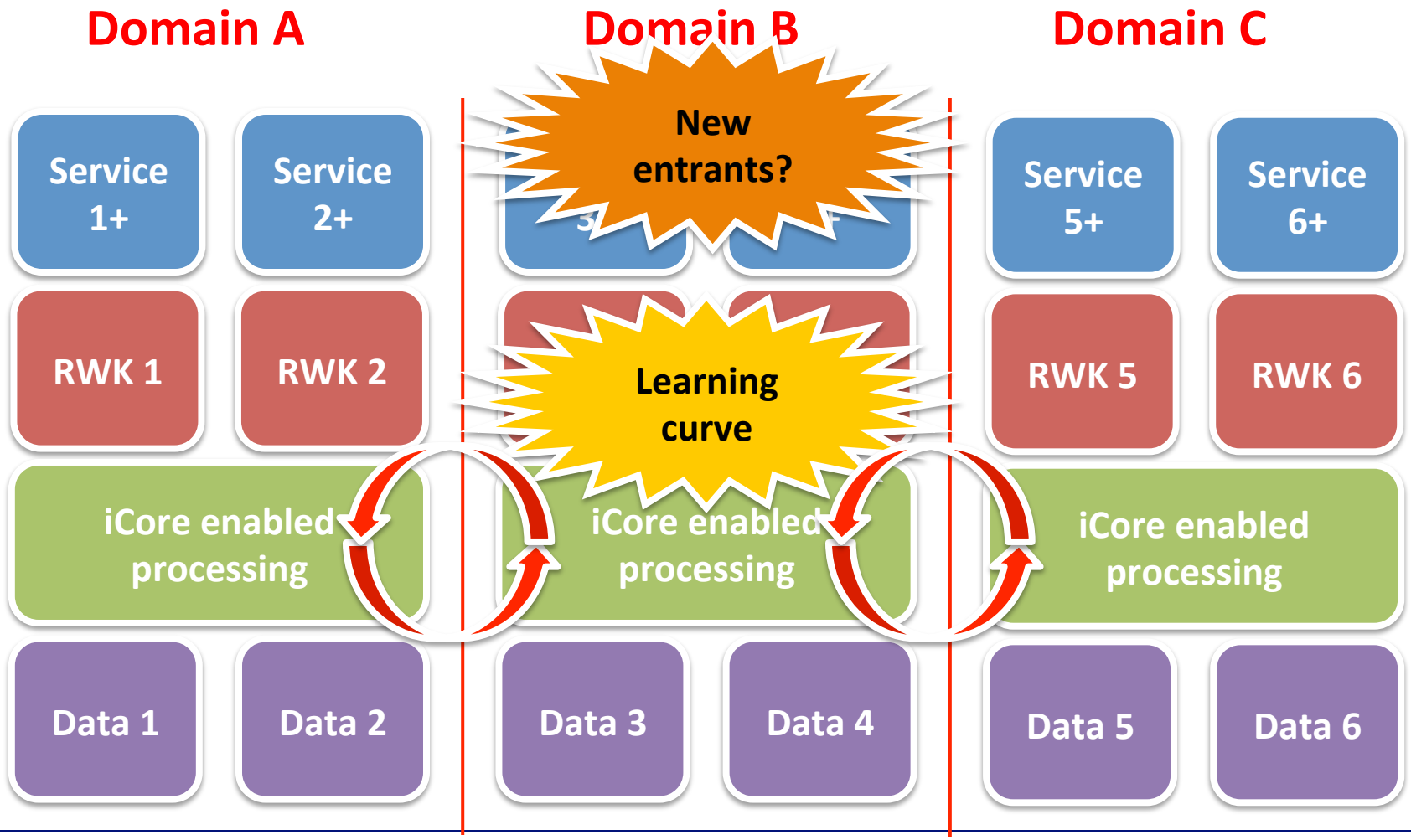
Within domain

Step I: Implement iCore components per domain



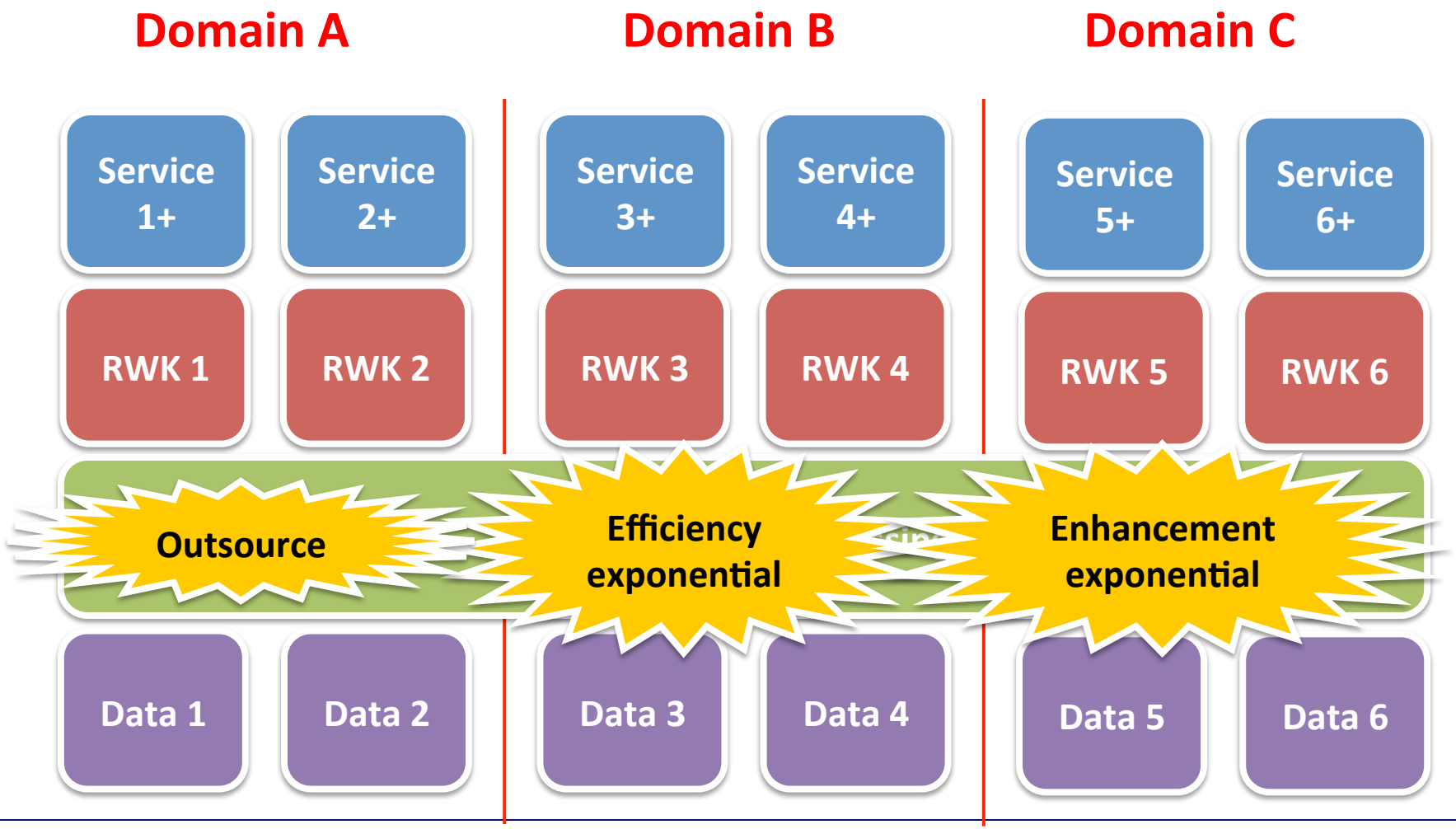
Re-apply in new domain

Step II: Connect domain technologies



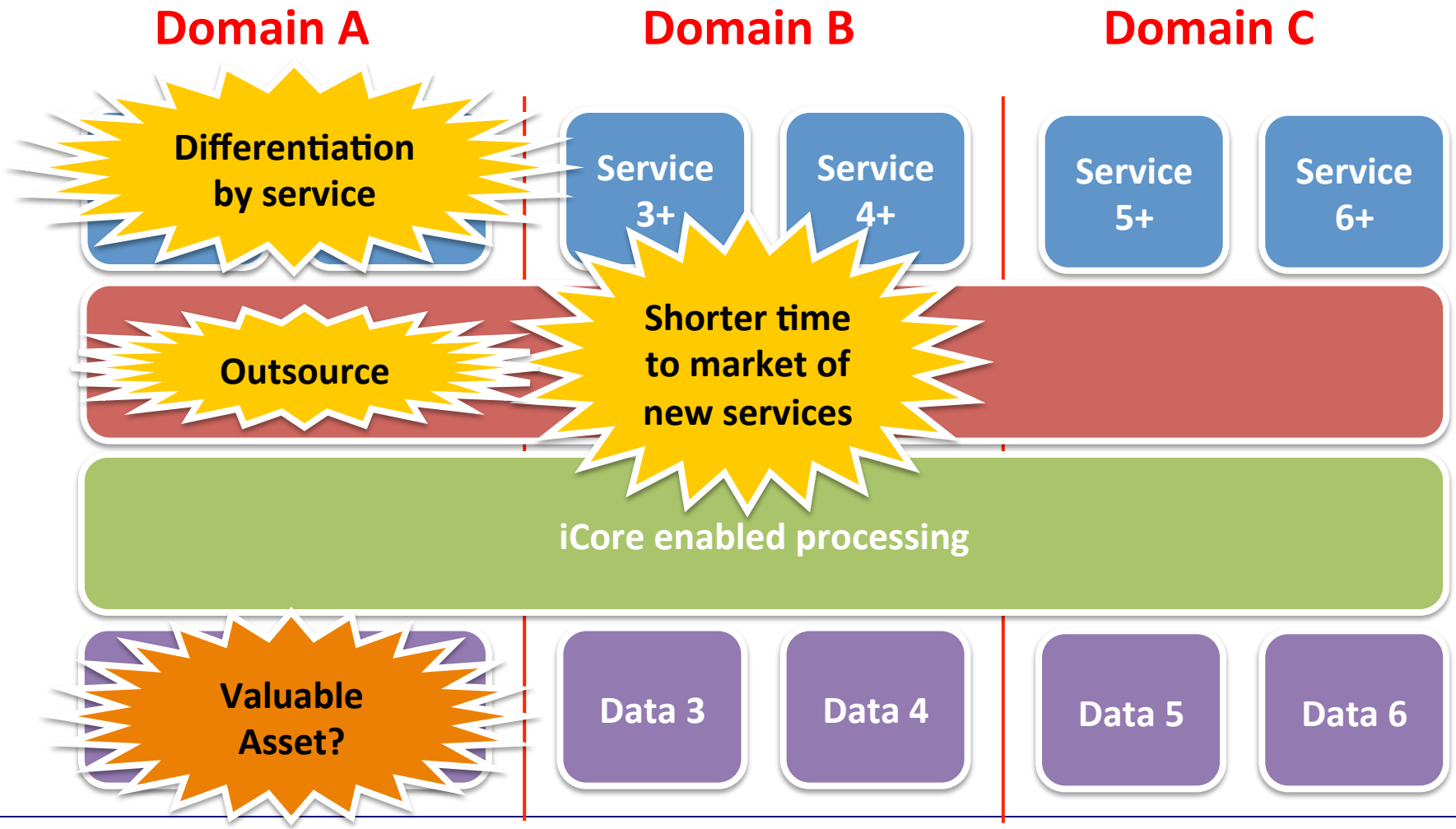
Trans-sectoral (technology)

Step III: Merge domain technologies



Trans-sectoral (knowledge)

Step IV: Merge RWK/domain language



Conclusions

Illustration of a *potential* seed of the platform

- A BM that leverages platform values
- Configured within the business ecosystem to neutralize concurrent control points
- But not compared domains
- And not established horizontal incentives for phased expansion

Establishing a Smart Horizontal IoT Service Platform is quite **difficult** to achieve

The End

Frank Berkers, TNO

Acknowledgement - This presentation and article describes work undertaken in the context of the iCore project, 'Internet Connected Objects for Reconfigurable Ecosystems' (http://www.iot-icore.eu/). iCore is an EU Integrated Project funded within the European 7th Framework Programme, contract number: 287708. The contents of this publication are the sole responsibility of iCore project and can in no way be taken to reflect the views of the European Union.