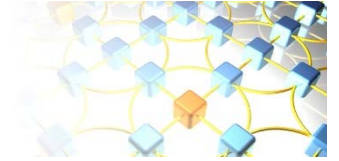




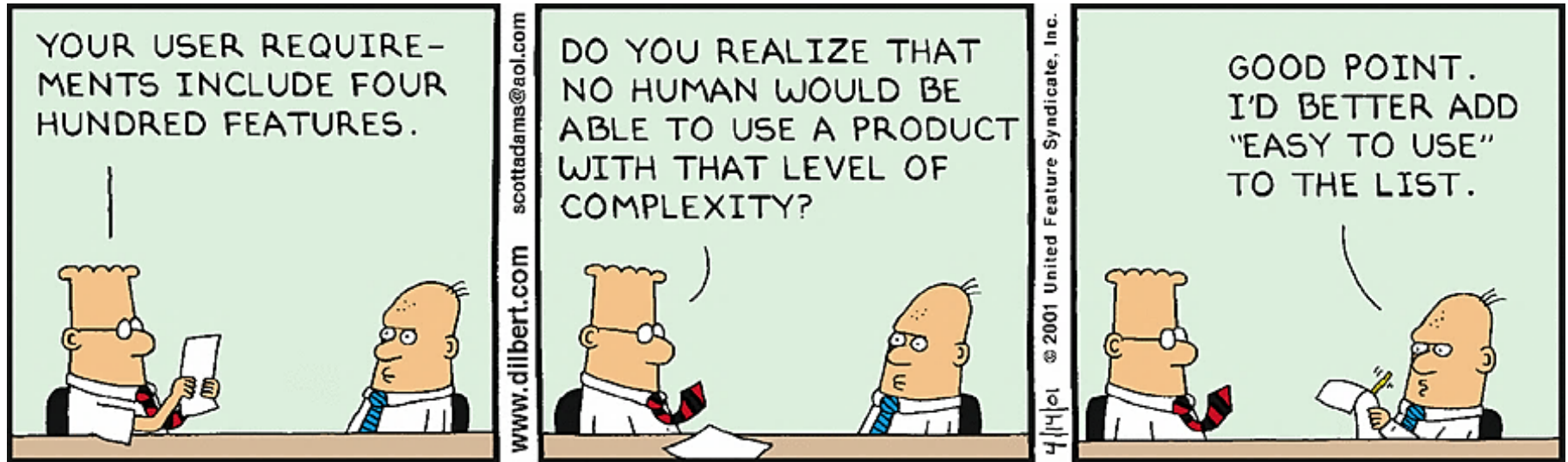
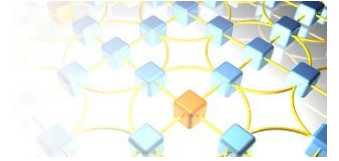
ETSI SUMMIT ON 5G NETWORK INFRASTRUCTURE

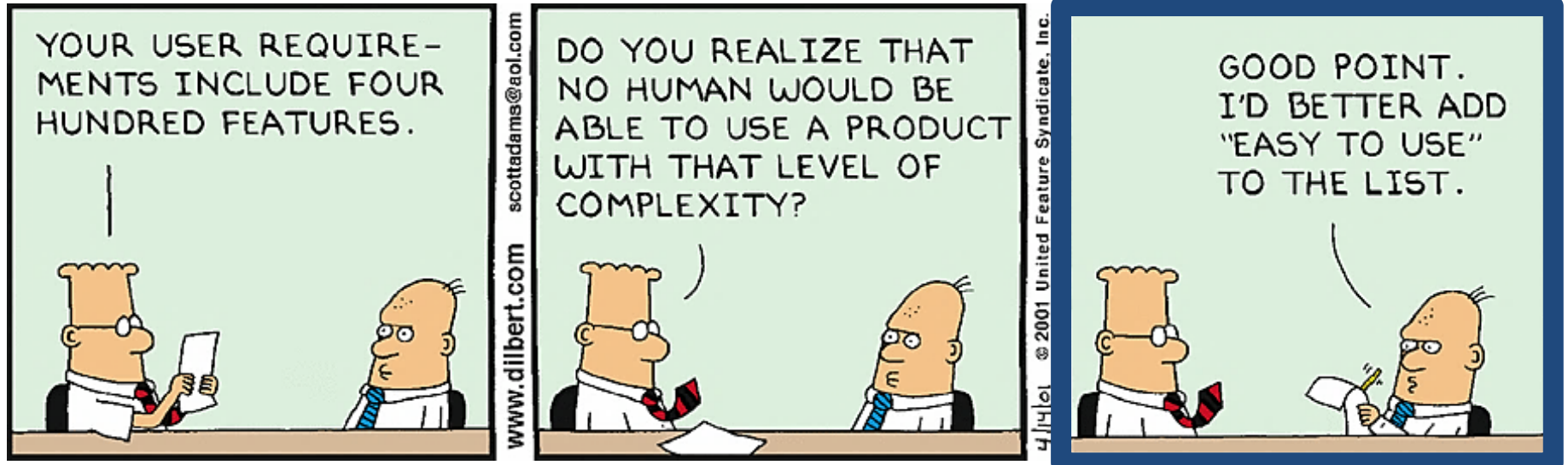
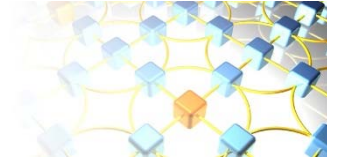
TOWARDS INTENT-DRIVEN AND COGNITIVE NETWORK OPERATIONS

Presented by Laurent Ciavaglia

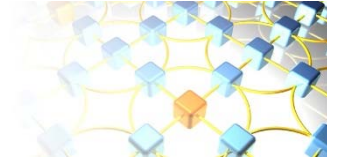


Do you know what is Feature #401 ?

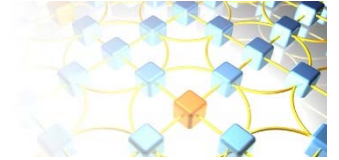




Feature #401 = "Ease of Use"



Why usability matters ?



DESIGNING THE
PRODUCT

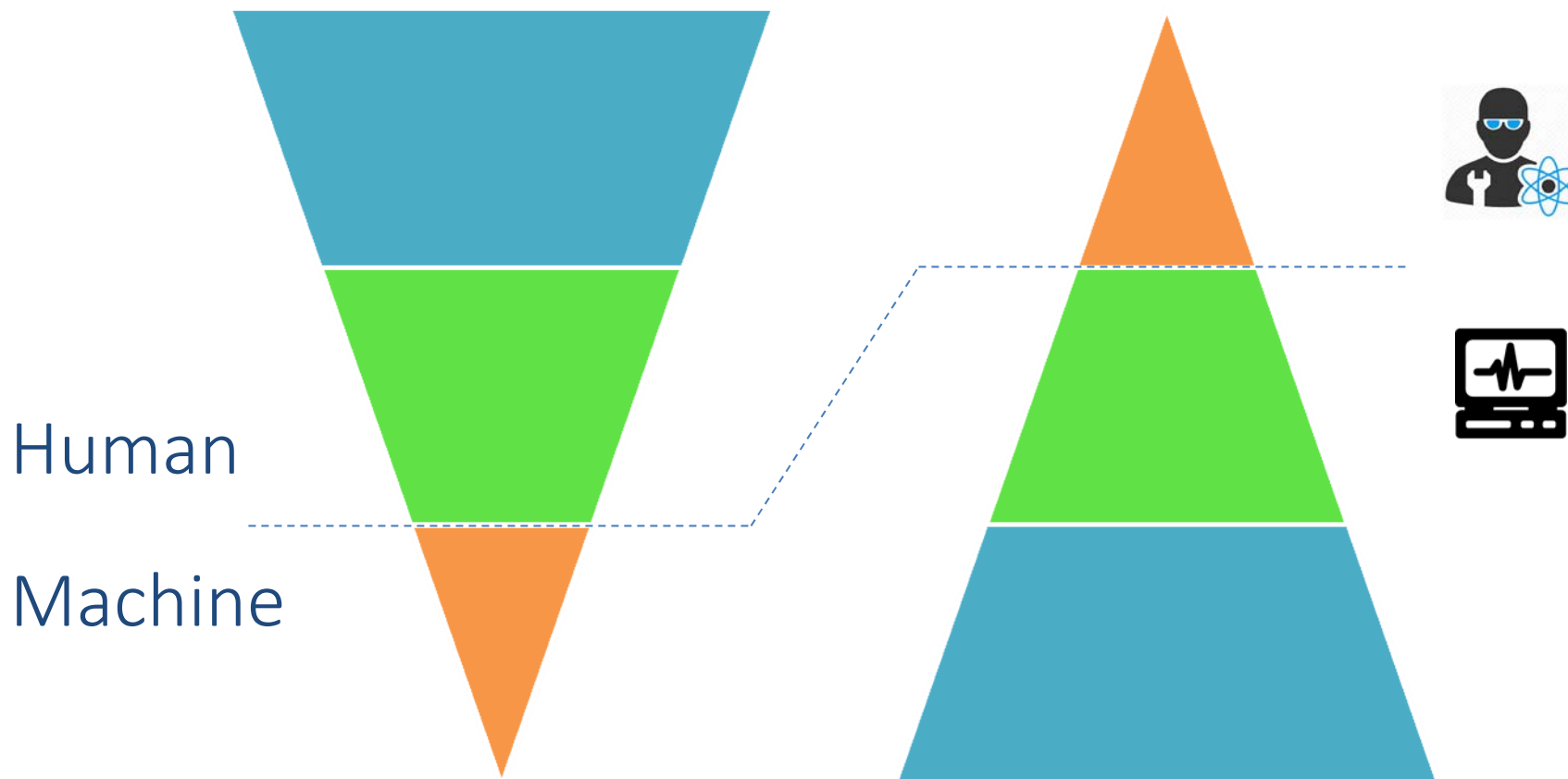


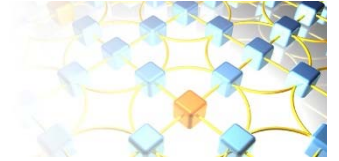
DESIGNING THE
EXPERIENCE



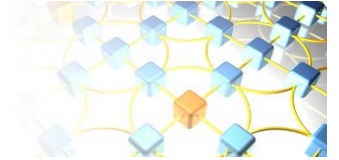
Imperative

Declarative

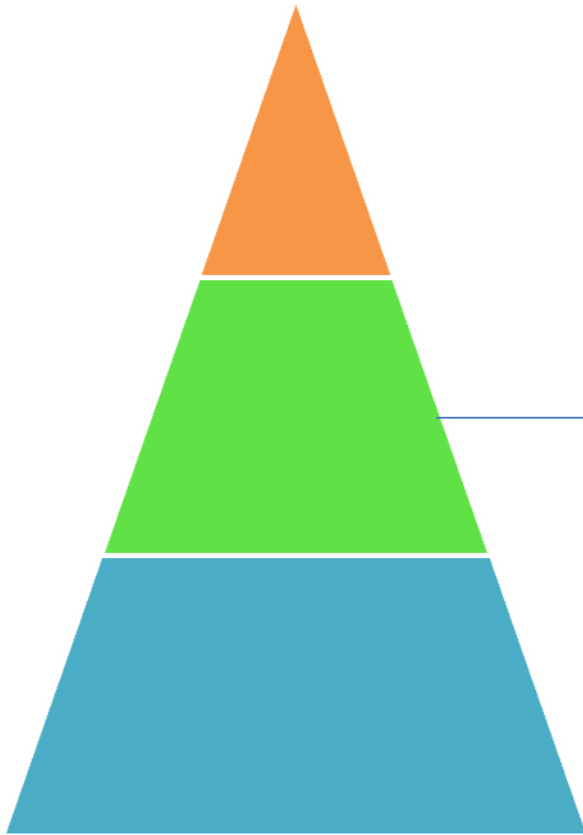




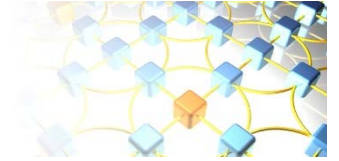
The Promises of Intent Driven Networking



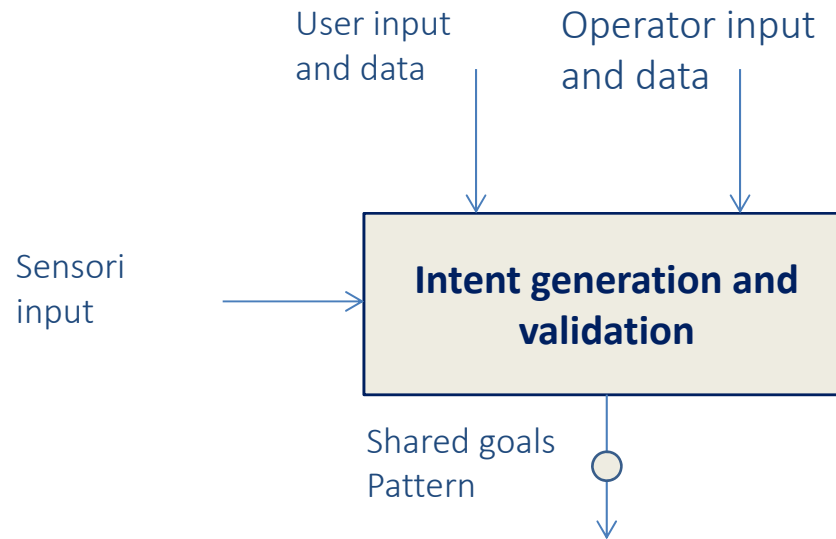
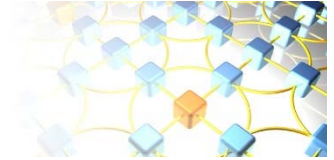
Intent Driven System



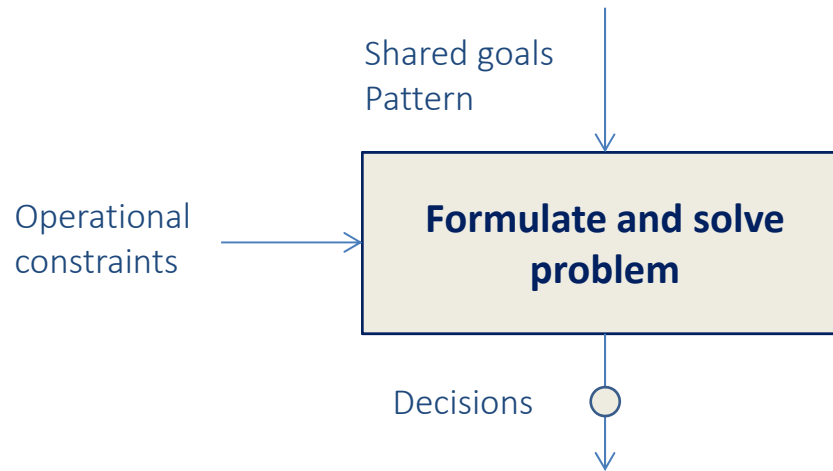
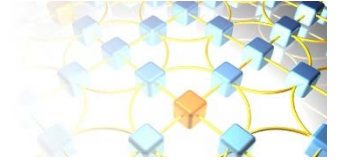
 Usability	 Efficiency
 Adaption	 Automation
 Control	 Safe



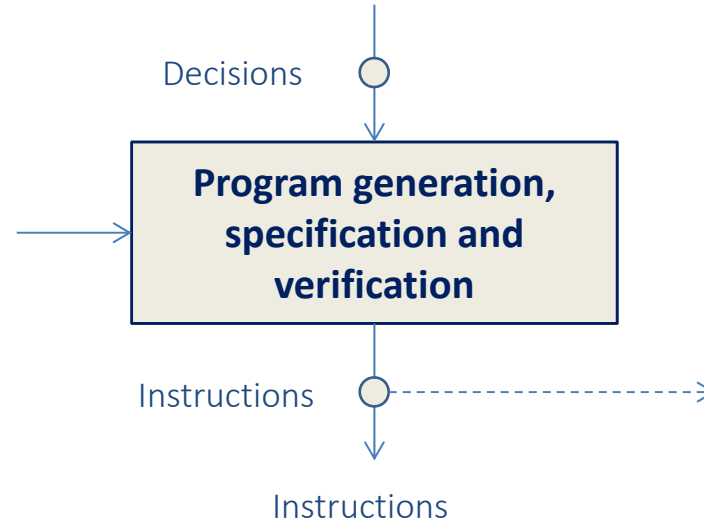
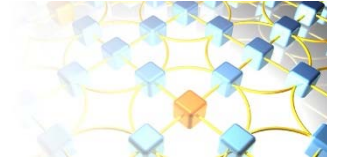
Key Innovations



Innovation 1.
Ability to learn and reason on intent sets

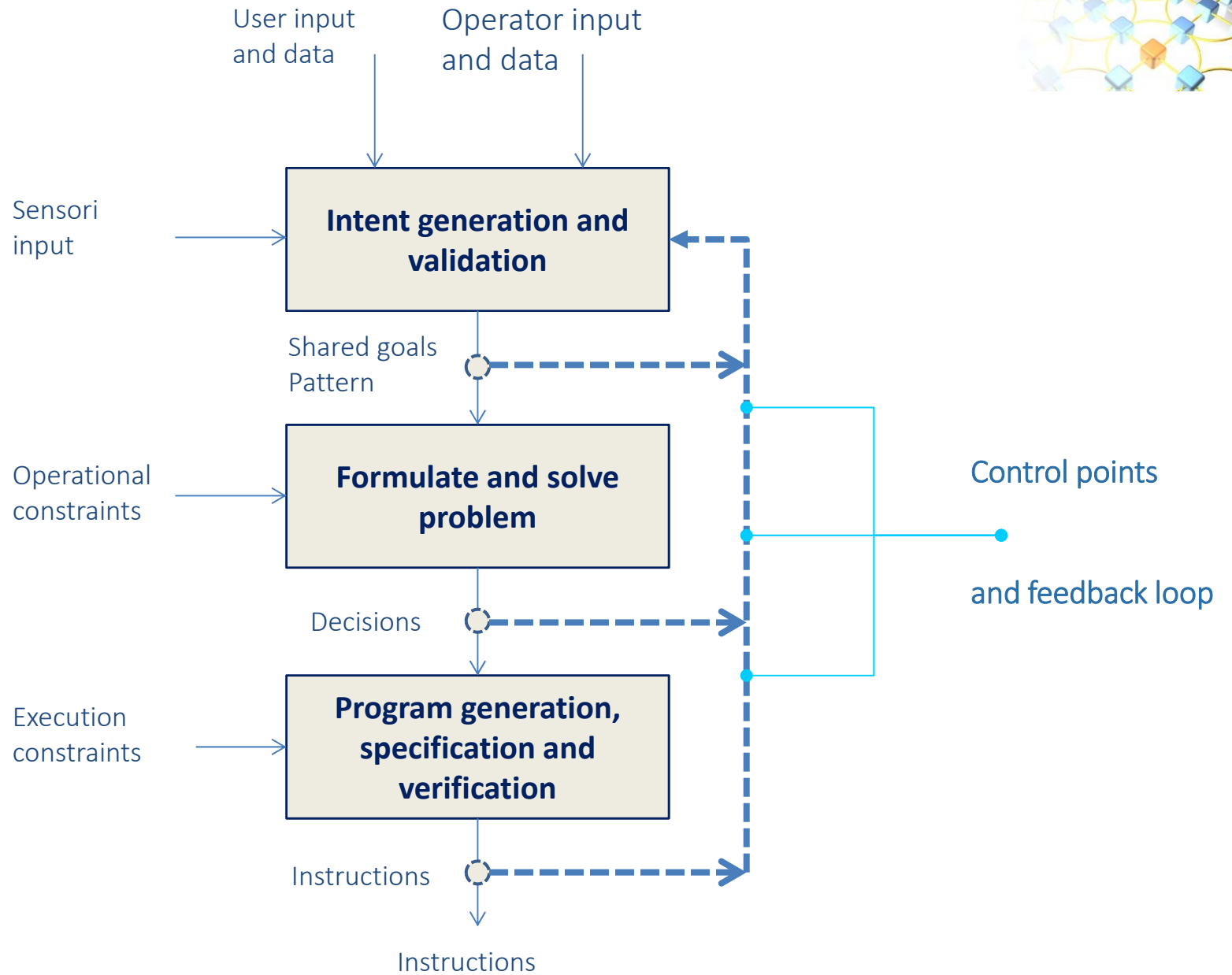
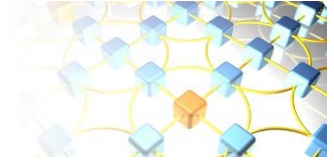


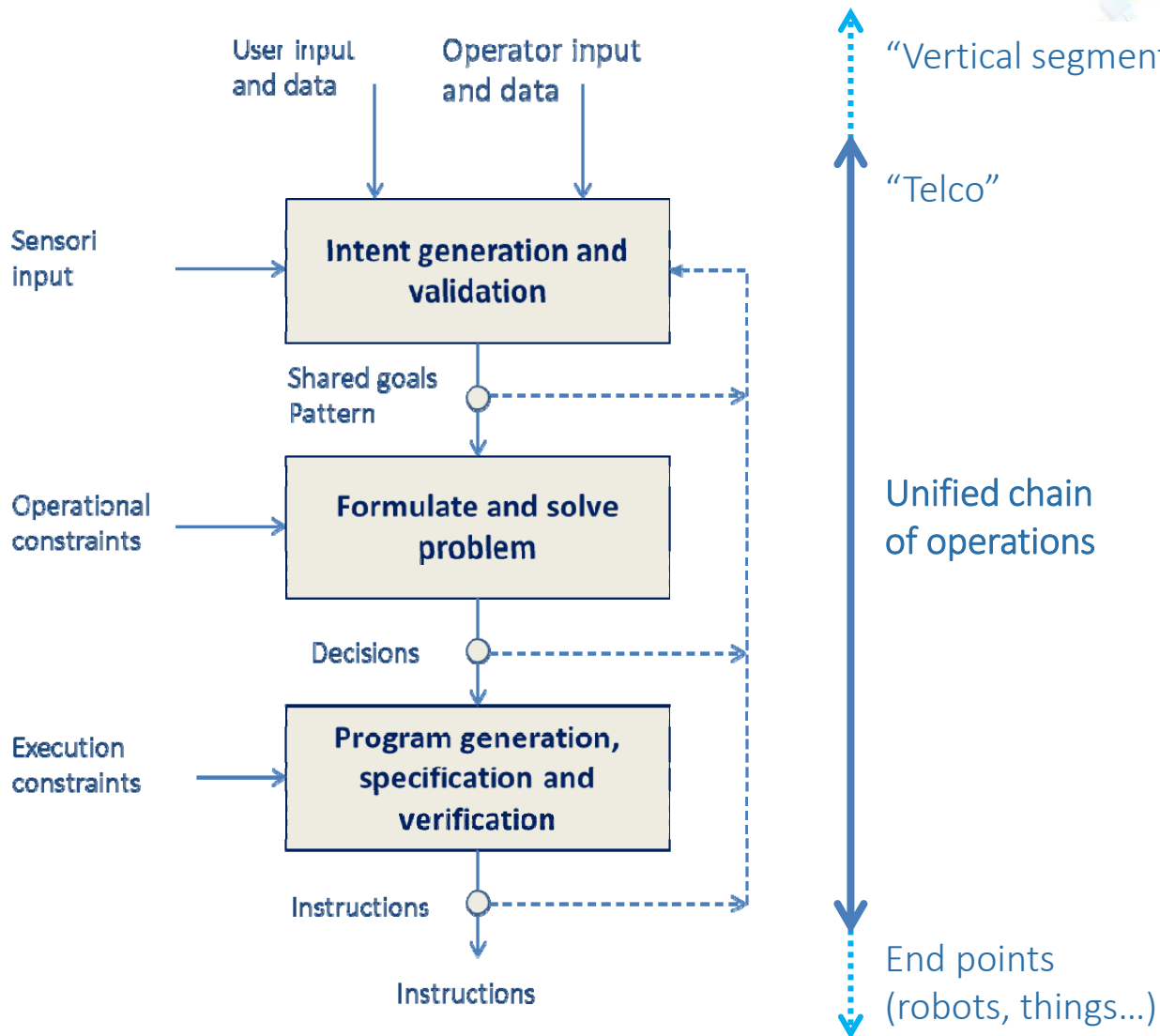
Innovation 2.
Ability to optimize and re-optimize decisions

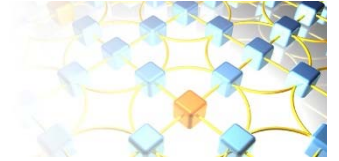


Innovation 3.

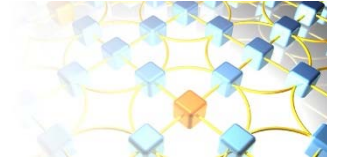
Ability to generate and verify programs







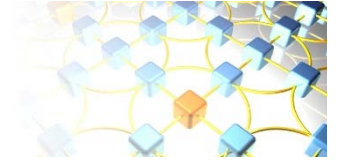
Summary



Industry challenge

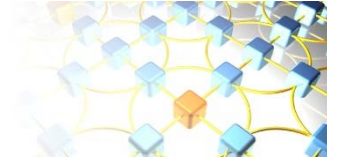
Overcome operational complexity of networks and networks of things by a radical shift in their usability

- **Empower:** 6th-sense interface recognizes intentions from any form of data
- **Accelerate:** continuous self-optimization drives generalized network automation processes
- **Trust:** guide user inputs, verify system decisions, quantify operations effectiveness



Game changing aspect

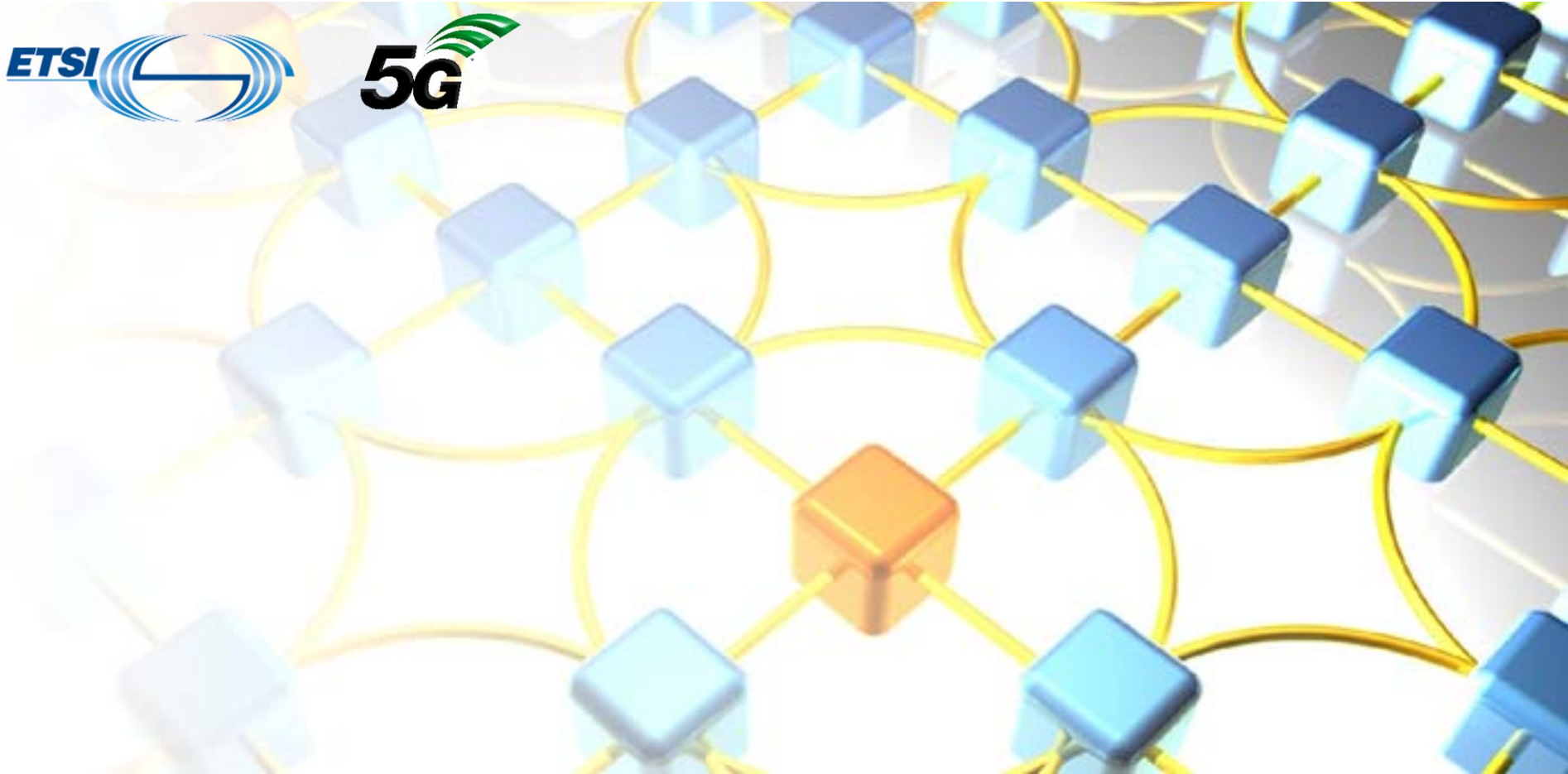
The **promise** of intent-driven and cognitive networking is that of networks configuring and **adapting autonomously to the user's or operator's intentions** (i.e., a desired state or behavior) without the need to specify every technical detail of the process and operations to achieve it (i.e., the "machines" will figure out on their own how to realize the user's goal).



Good news

This is happening...

- Research projects
 - EU H2020 5G PPP, industrial consortia (NEMO...)
- Open source initiatives
 - ONF + ON.Lab, Open Daylight, OpenStack...
- Standardization activities
 - ETSI: NFV, NTECH/AFI, NGP, ENI
 - MEF, TMF, IETF/IRTF, NGMN...
- Market
 - Companies such as Apstra, Auvik, Fortinet... and other big players



ACKNOWLEDGEMENTS

This is the work of a large team inside and outside of Nokia.