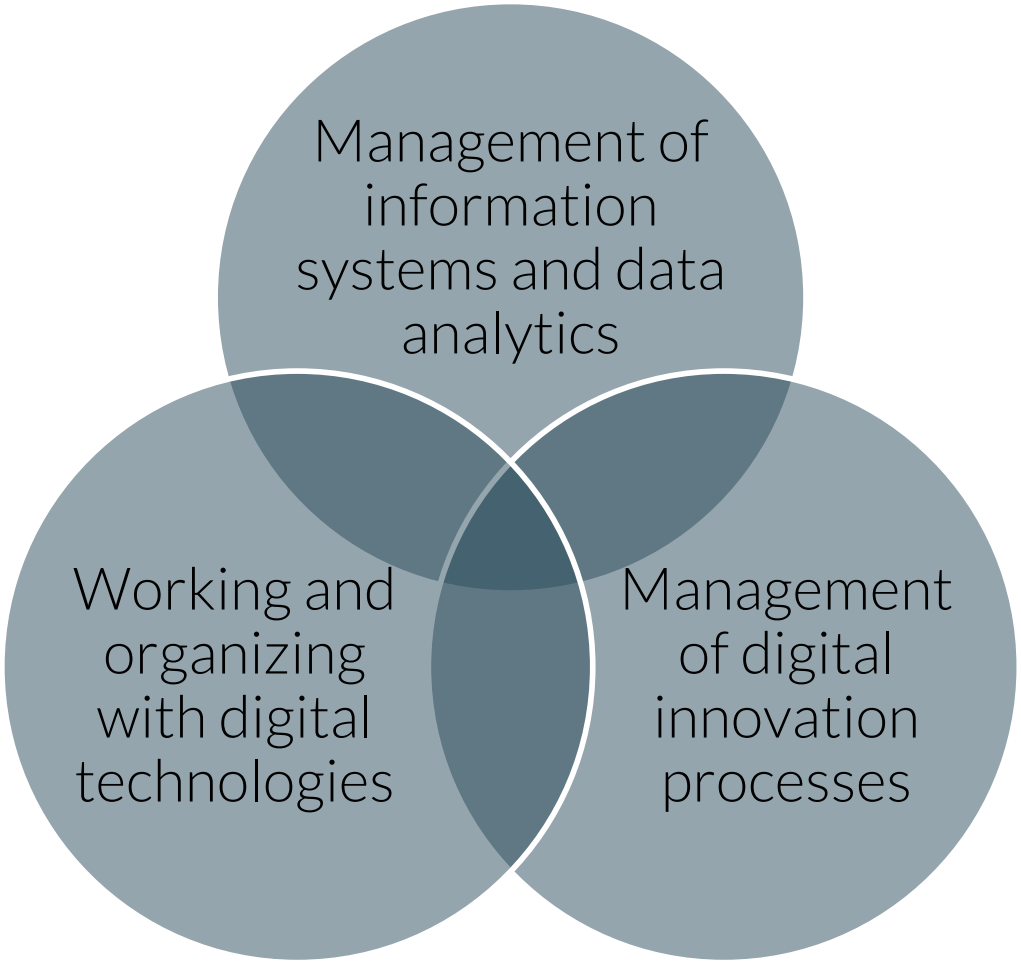
ORGANIZING FOR DIGITAL INNOVATION

Hans Berends (Vrije Universiteit Amsterdam)

17 december 2019, Surf Superday

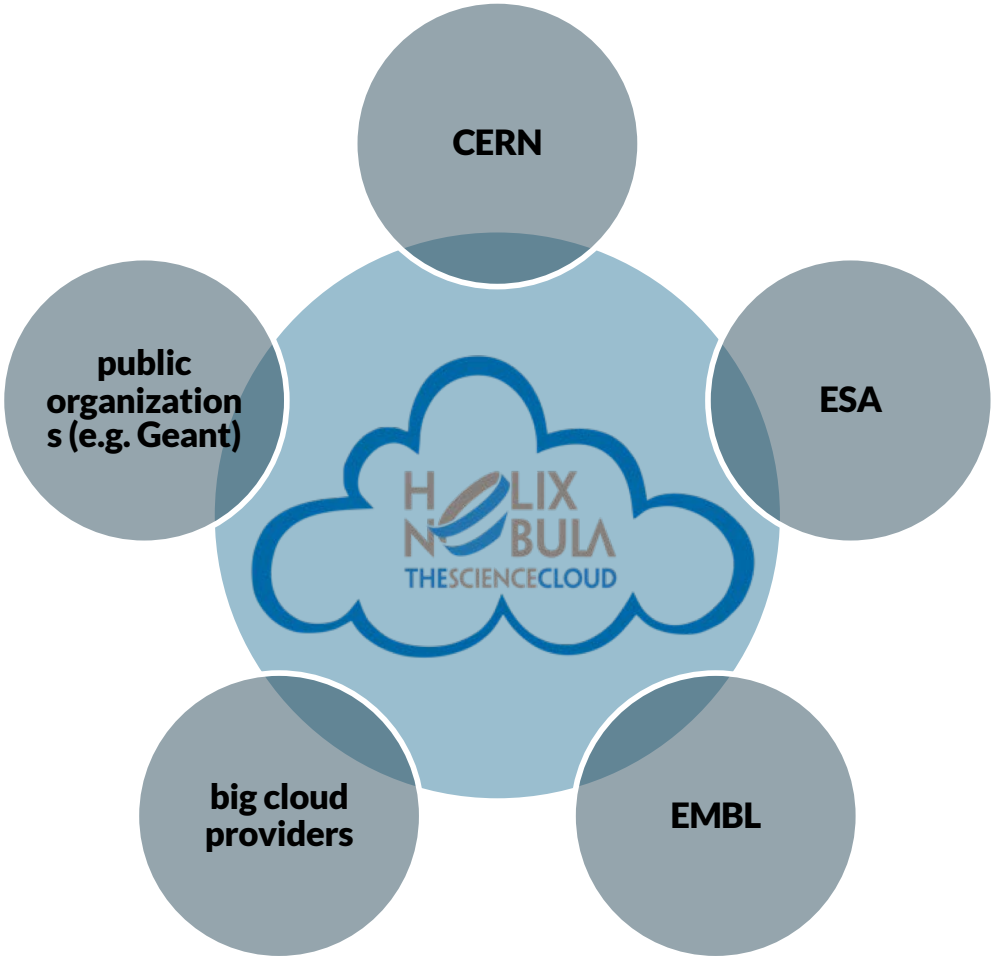
VU VRIJE UNIVERSITEIT AMSTERDAM
School of Business and Economics
Center for Digital Innovation

KIN CENTER FOR DIGITAL INNOVATION @VRIJE UNIVERSITEIT AMSTERDAM



- Collaboration enabled by digital technologies
- Collaborative innovation for digital innovation
- Changing nature of innovation processes

SOLUTIONS TO COMPLEX PROBLEMS REQUIRE COLLABORATION



COLLABORATION

Shared goal

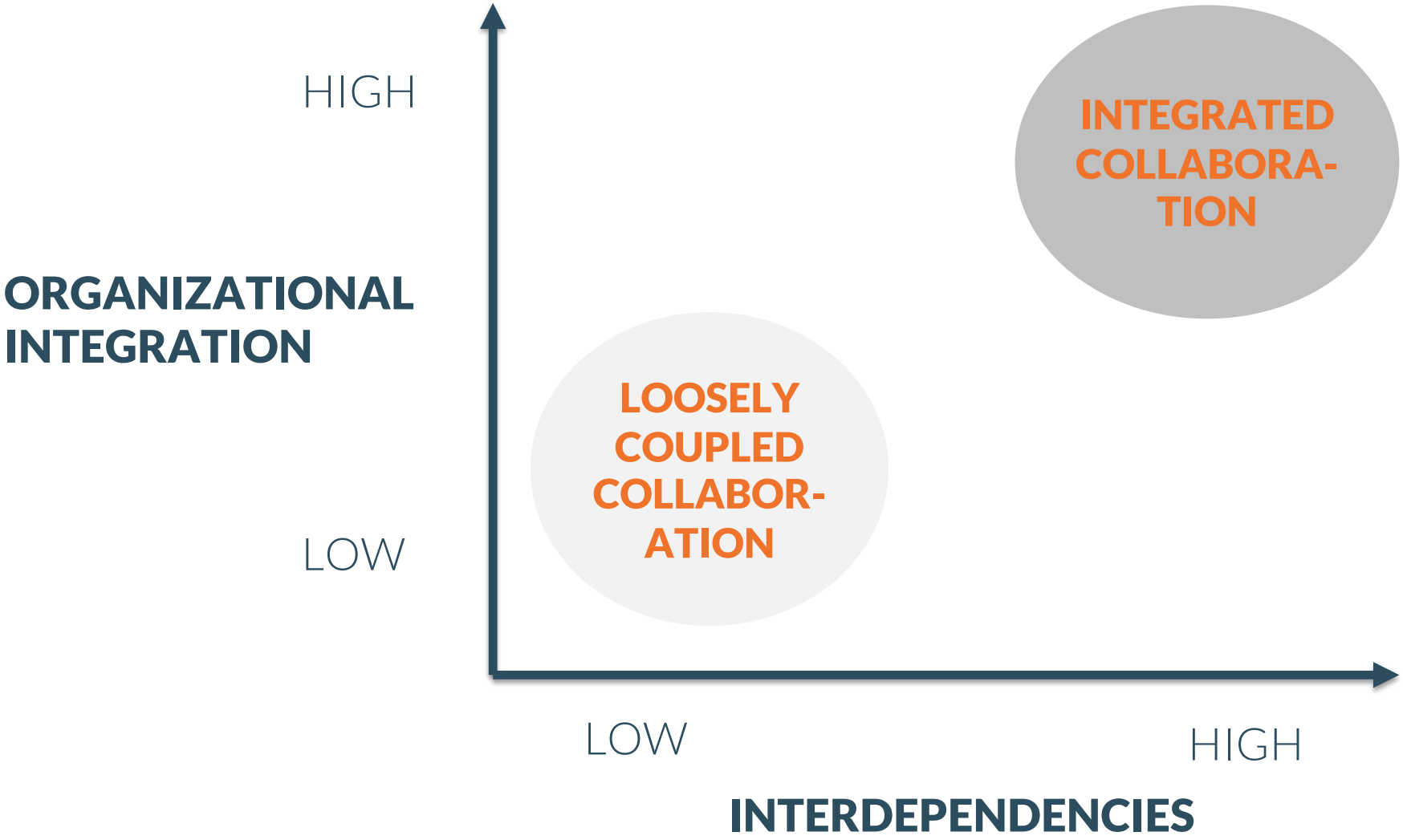
-> what if outcome is novel? competing interests?

Complementarity of resources

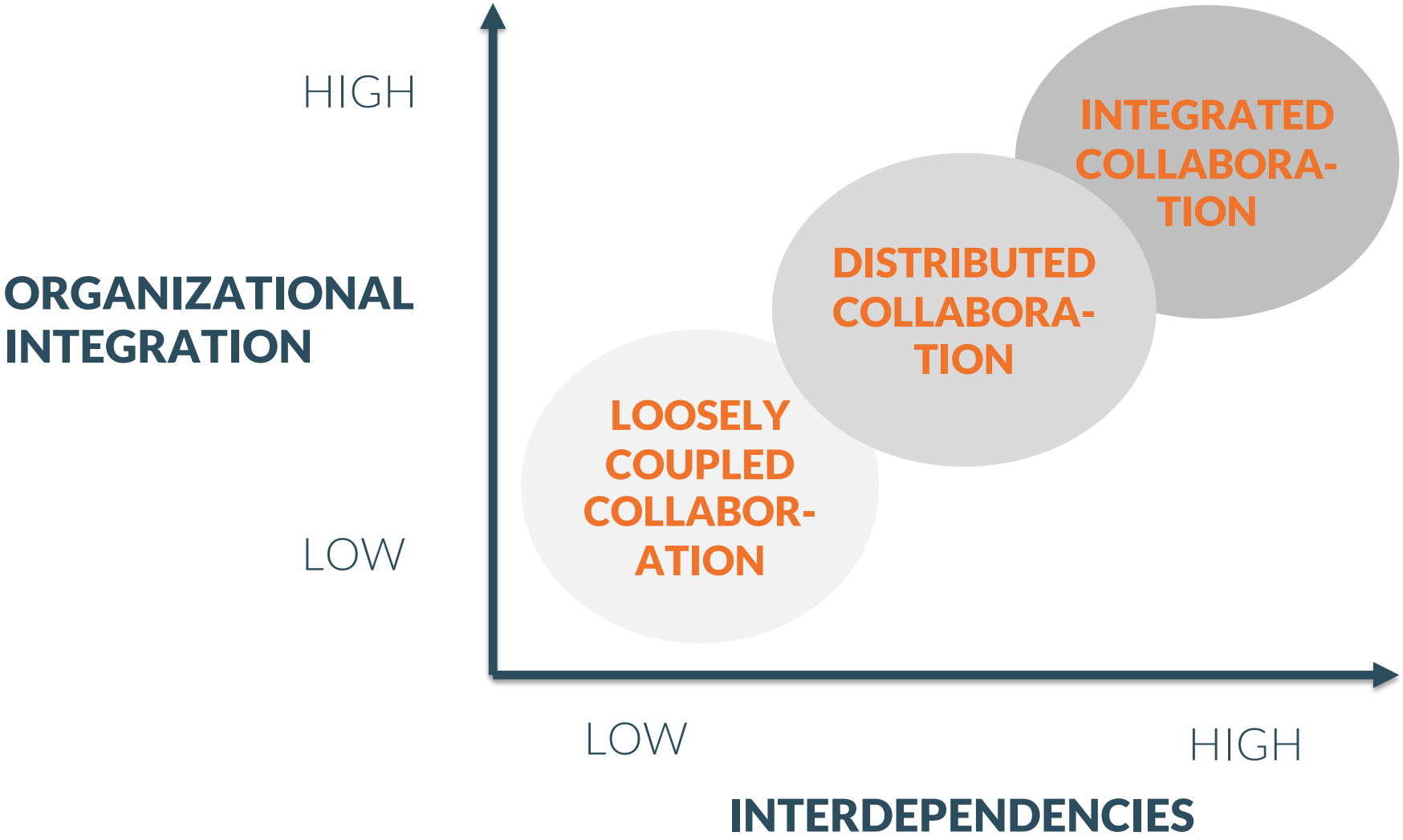
-> what if you do not know what is needed?

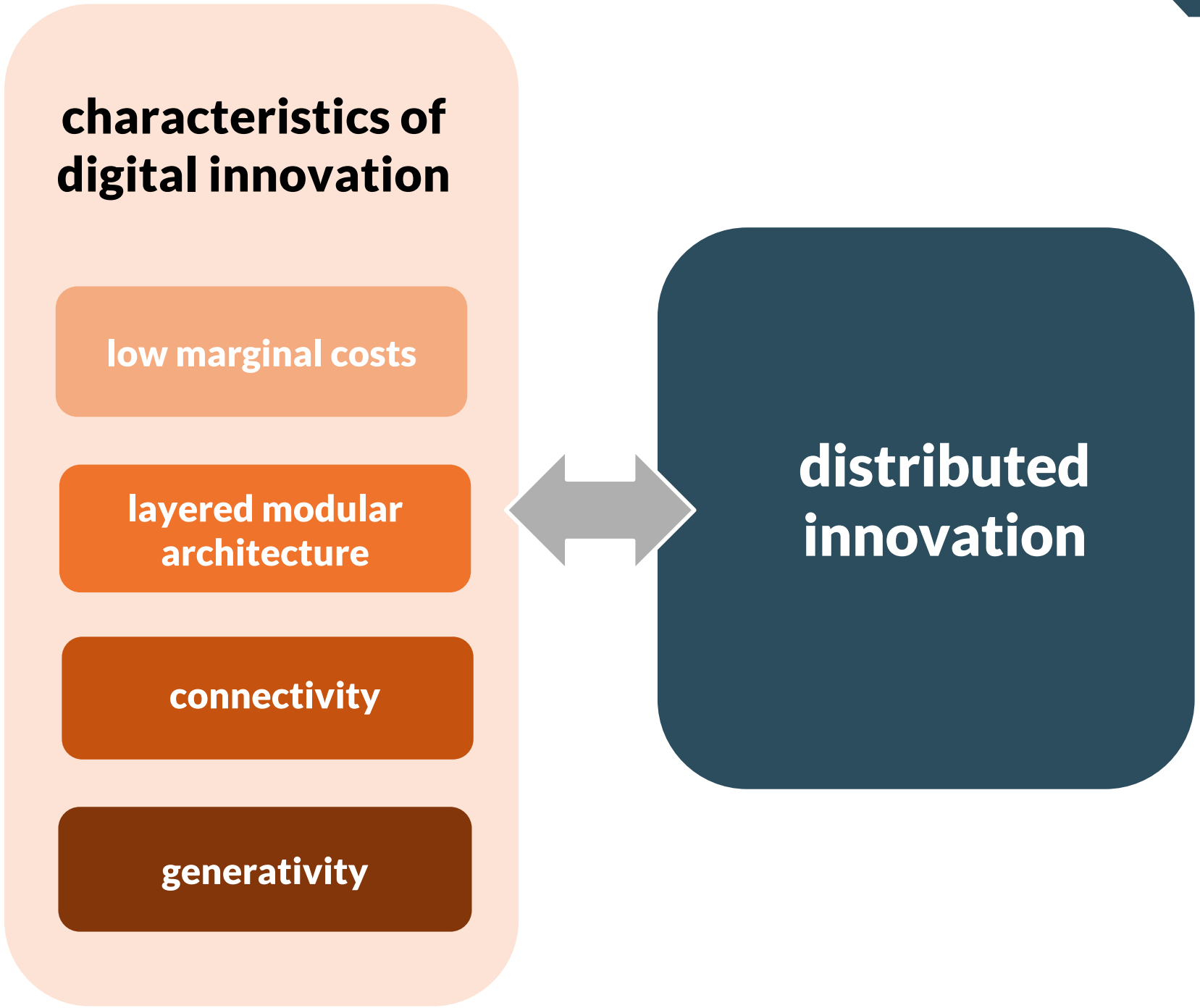
Formal or informal governance mechanisms

-> what if diverse & independent organizations ?



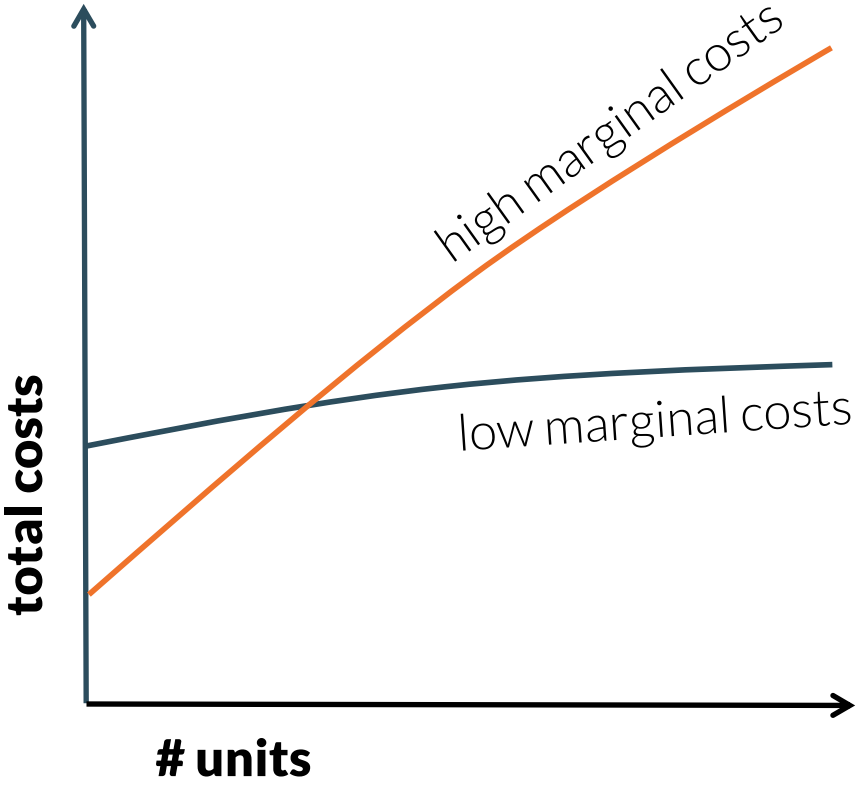
COLLABORATION



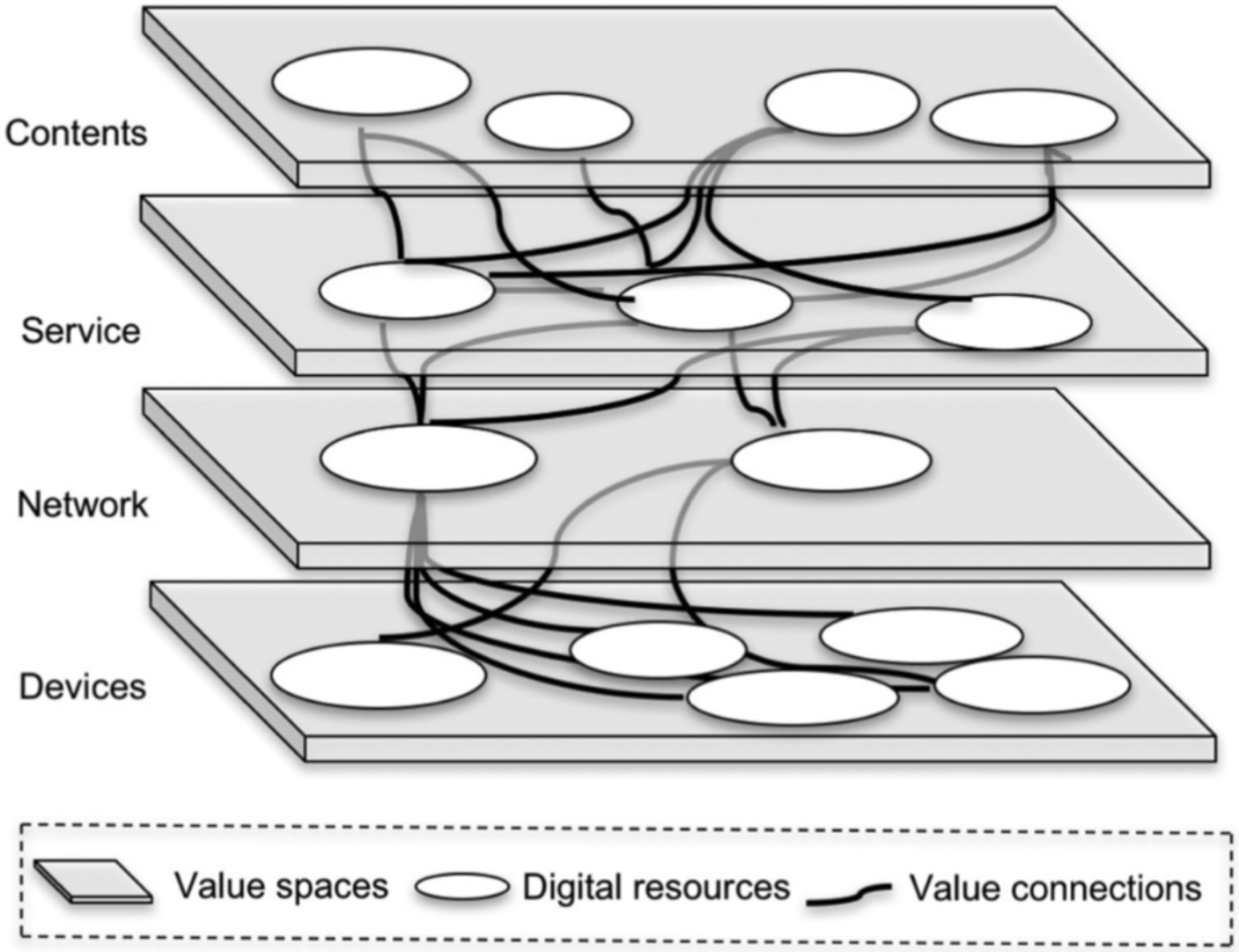

characteristics of digital innovation
low marginal costs
layered modular architecture
connectivity
generativity
distributed innovation

LOW MARGINAL COSTS: SCALABILITY

- decoupling of **content** and **medium**
- consequence: low costs for **search**, **replication**, **transportation**, **tracking**, and **verification**



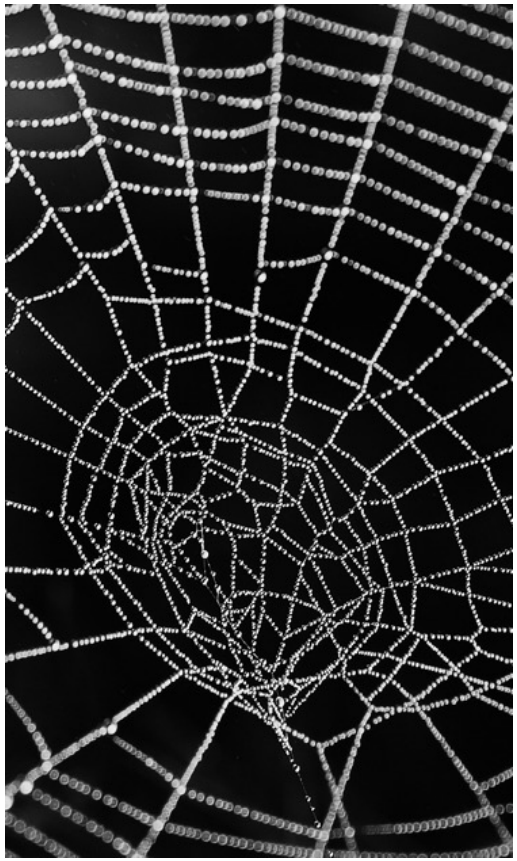
LAYERED MODULAR ARCHITECTURE:
COMBINATORIAL INNOVATION



Henfridsson et al. 2018

MODULARITY: THIN CONNECTIONS

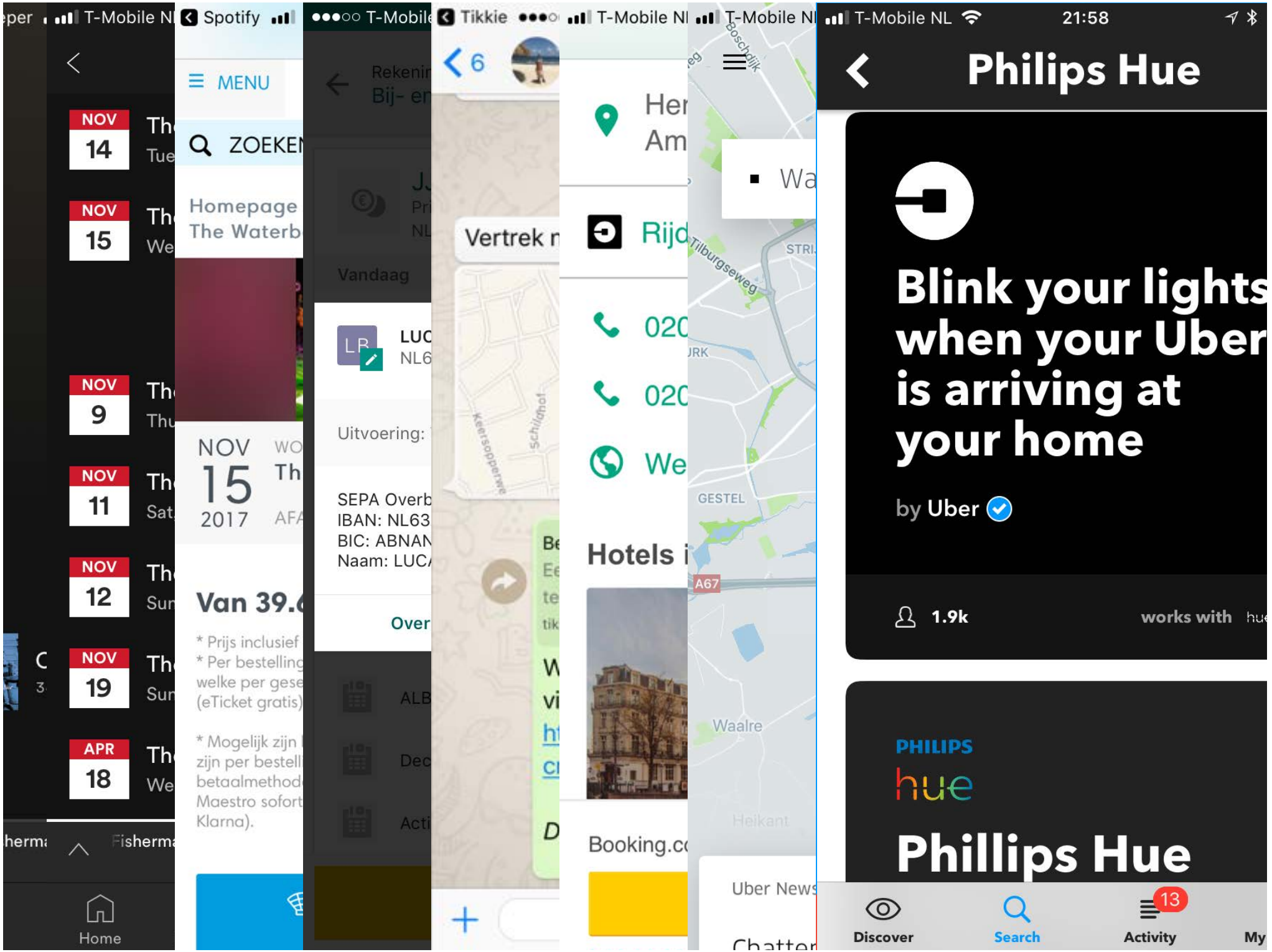
CONNECTIVITY: RECOMBINATION



USERS
direct
network effects

PRODUCTS
indirect
network effects

PROVIDERS
ongoing
service delivery


T-Mobile NL
21:58
Philips Hue
Blink your lights when your Uber is arriving at your home
by Uber
1.9k
works with
PHILIPS
hue
Phillips Hue
Discover
Search
Activity
13
Home
Spotify
MENU
ZOEKEN
Homepage
The Waterb
NOV
15
2017
Van 39.
Tikkie
Vertrek
Hotels
Booking.co
Uber News
Waalre
GESTEL
Tilburgseweg
Boschdijk
Vandaag
Uitvoering:
SEPA Overb
IBAN: NL63
BIC: ABNAN
Naam: LUC
Over
NOV
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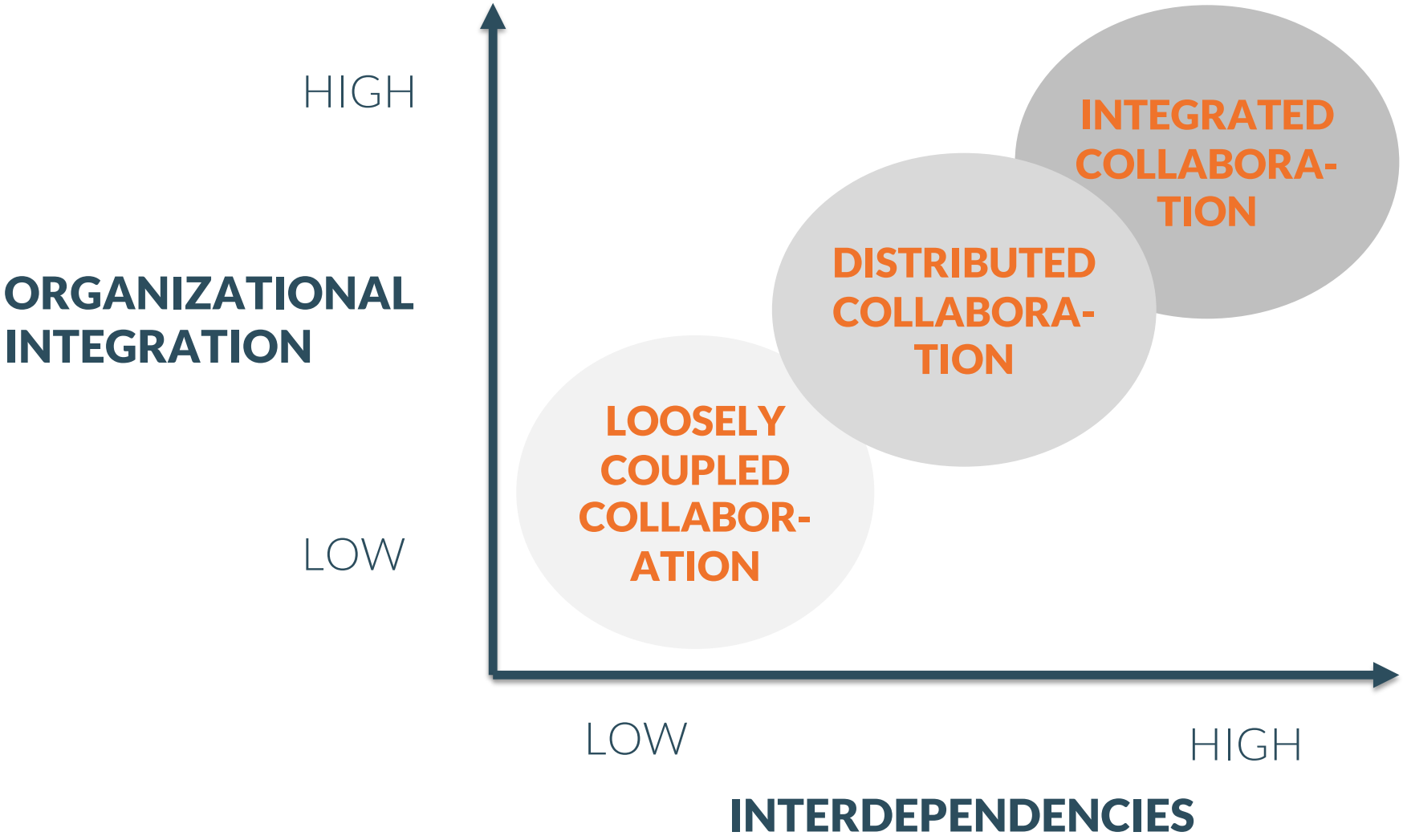
NOV
19
APR
18

GENERATIVITY

- decoupling of **form** and **function**
- **reprogrammability**

"We did the first software update of a light bulb in 136 years since they were first invented. That is exciting!"
(George Yianni, Philips Hue)

COLLABORATION

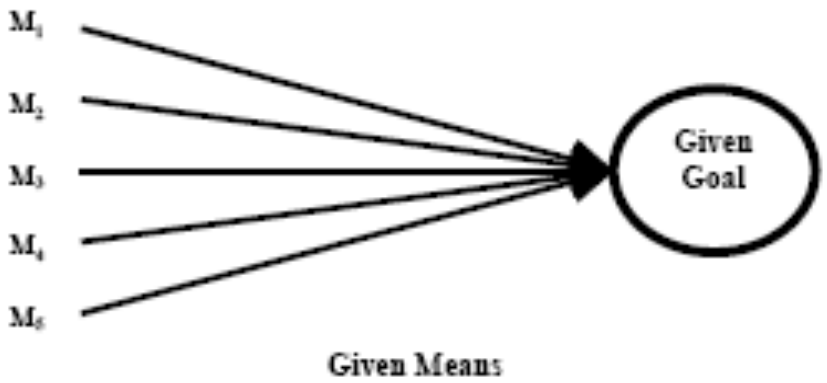


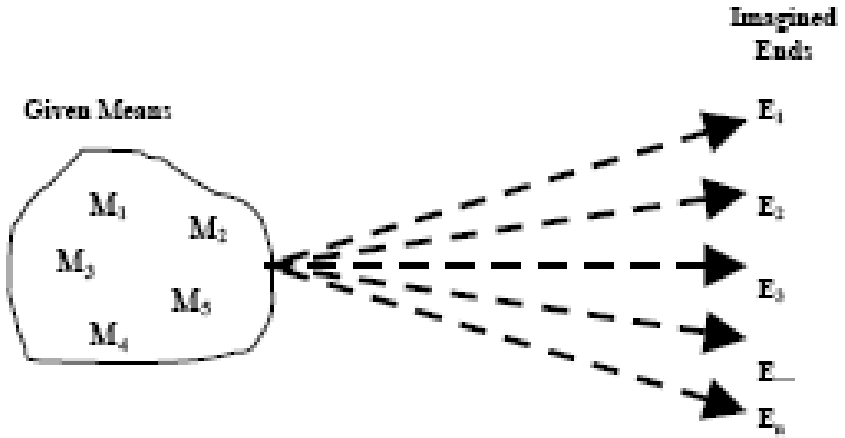
DISTRIBUTED INNOVATION

- Thin connections
- **Parallel** search
- **Independent** third parties
- Partial **recombinable** solutions, not integrated whole
- **Generative/effectual** instead of (only) goal-oriented

HYPERLOOP
TRANSPORTATION TECHNOLOGIES

CAUSATION AND EFFECTUATION
(SARASVATHY 2001)





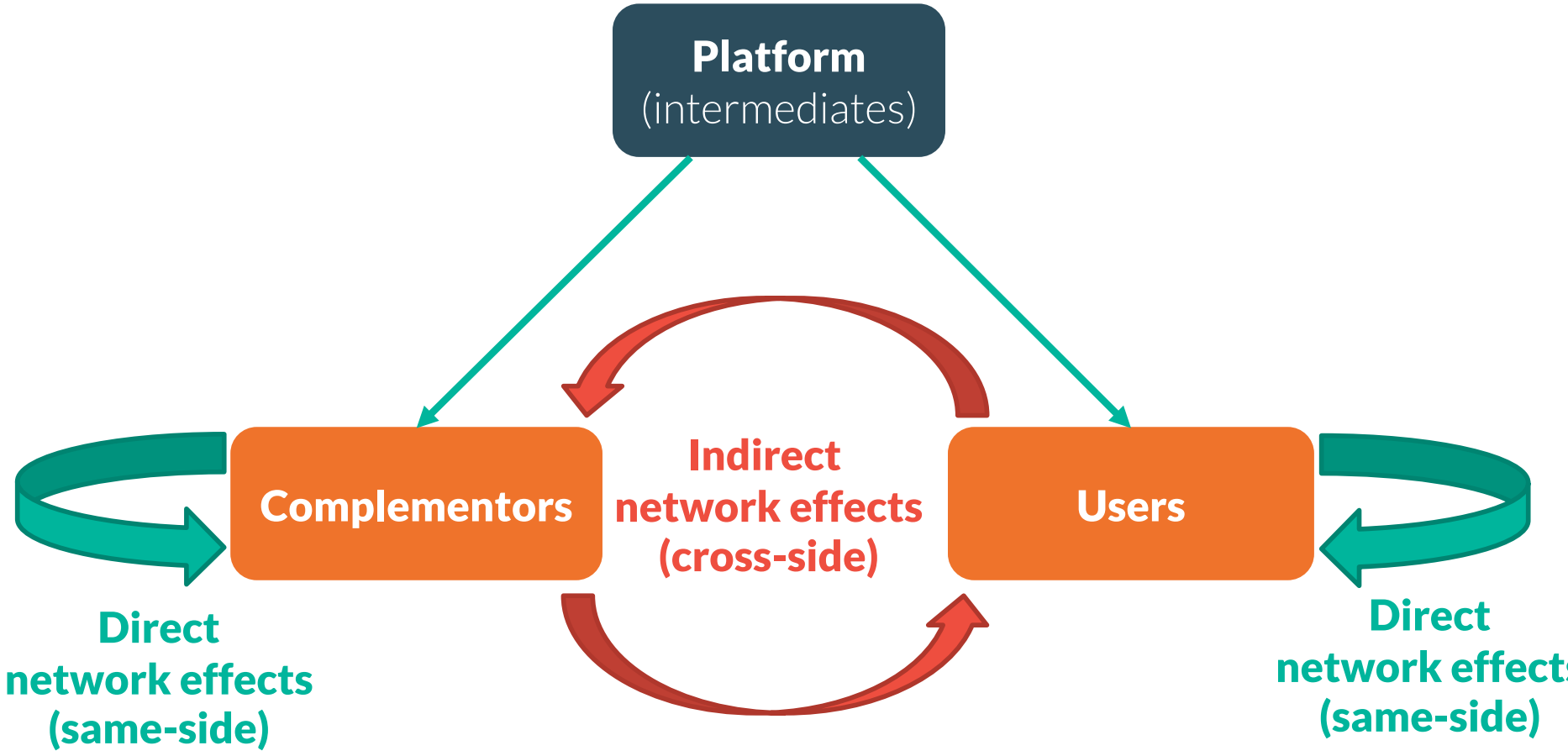
CAUSATION

1. Goal driven
2. Control through prediction
3. Expected returns
4. Competitive analysis
5. Avoid disturbances

EFFECTUATION

1. Means driven
2. Non-predictive control
3. Affordable loss
4. Pre-commitment of partners
5. Exploit emergent contingencies

MULTI-SIDED PLATFORMS



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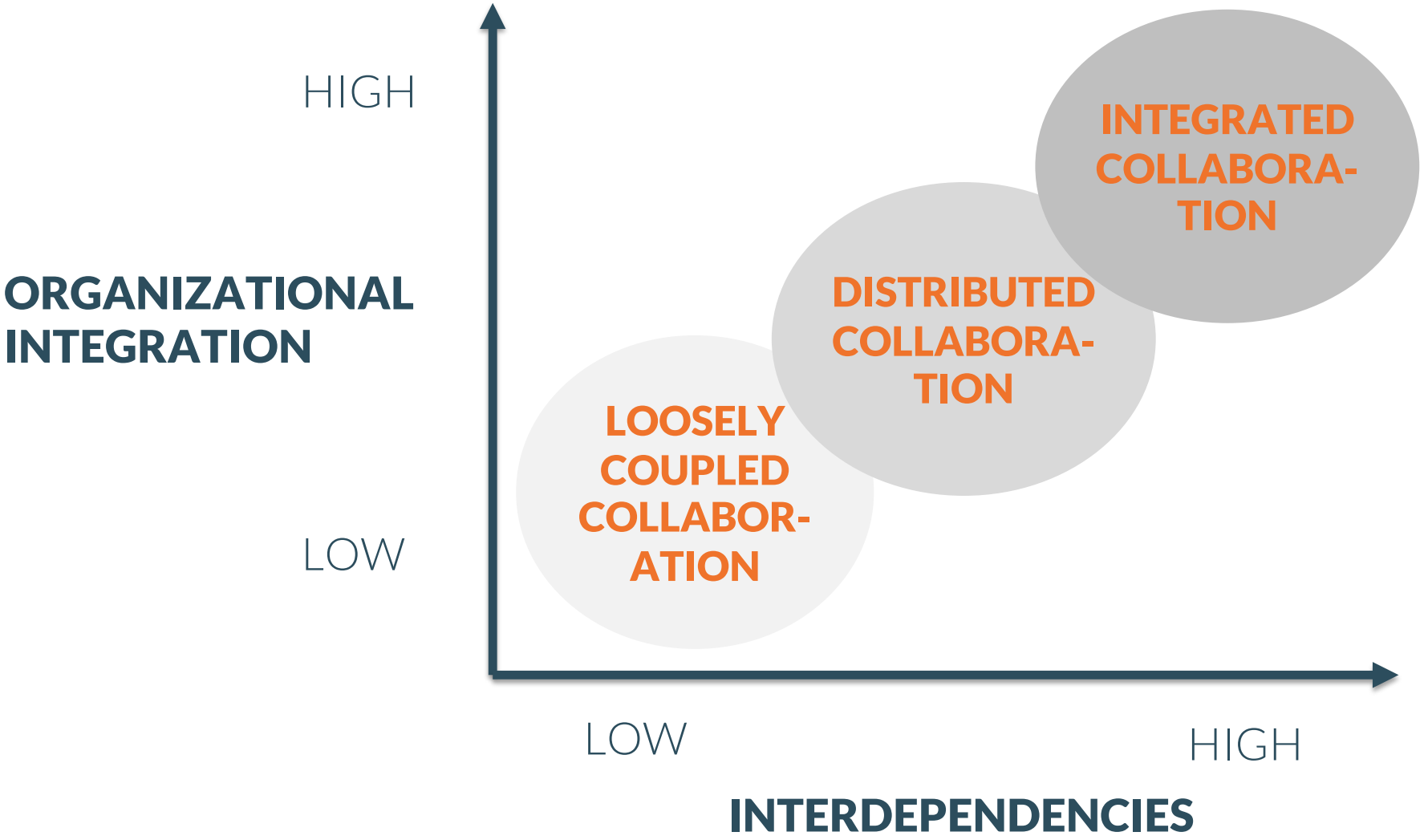
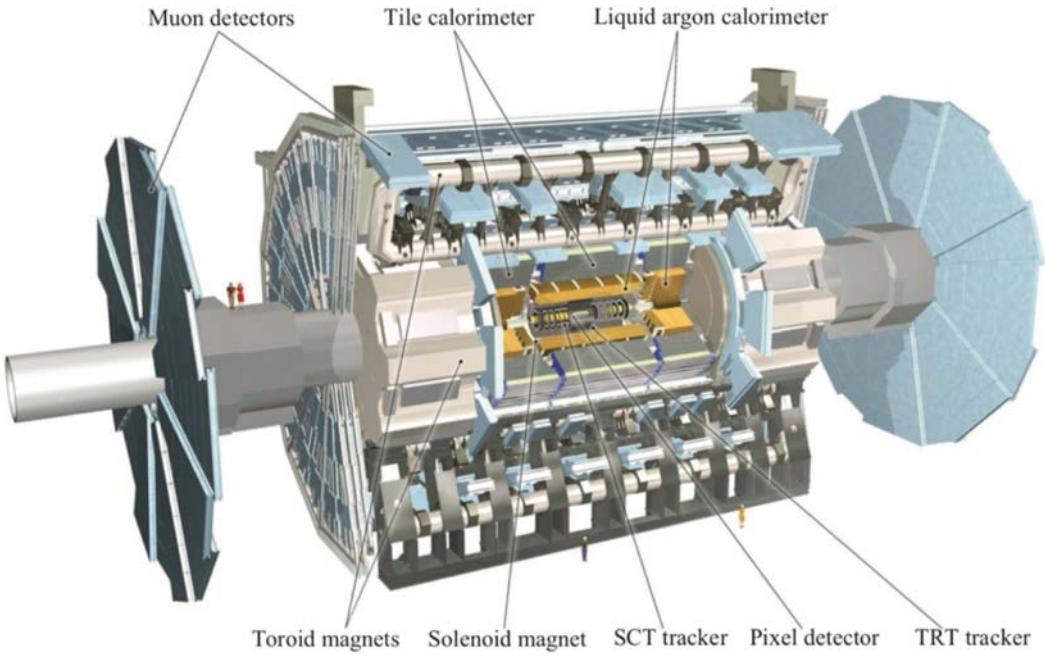
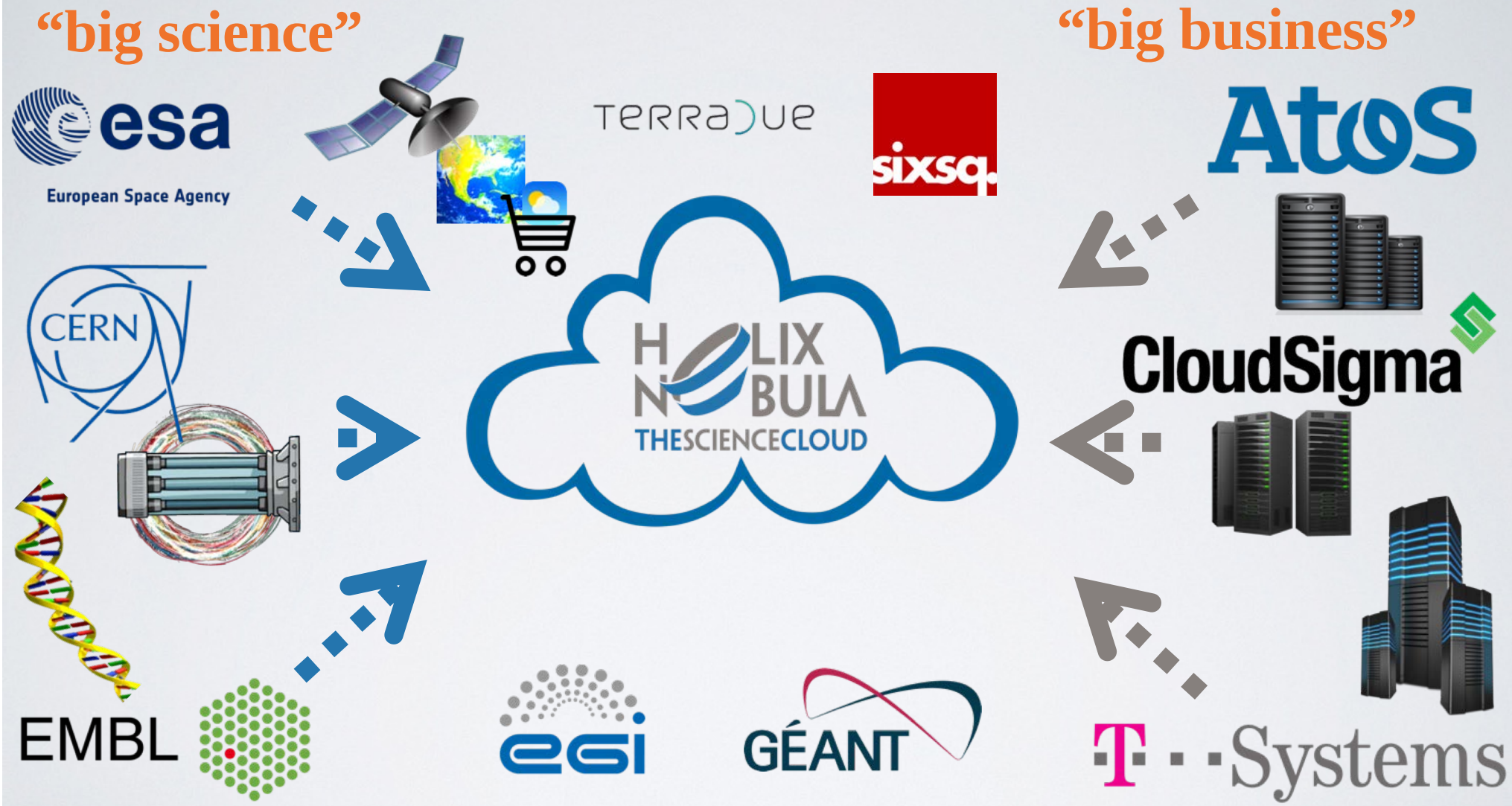


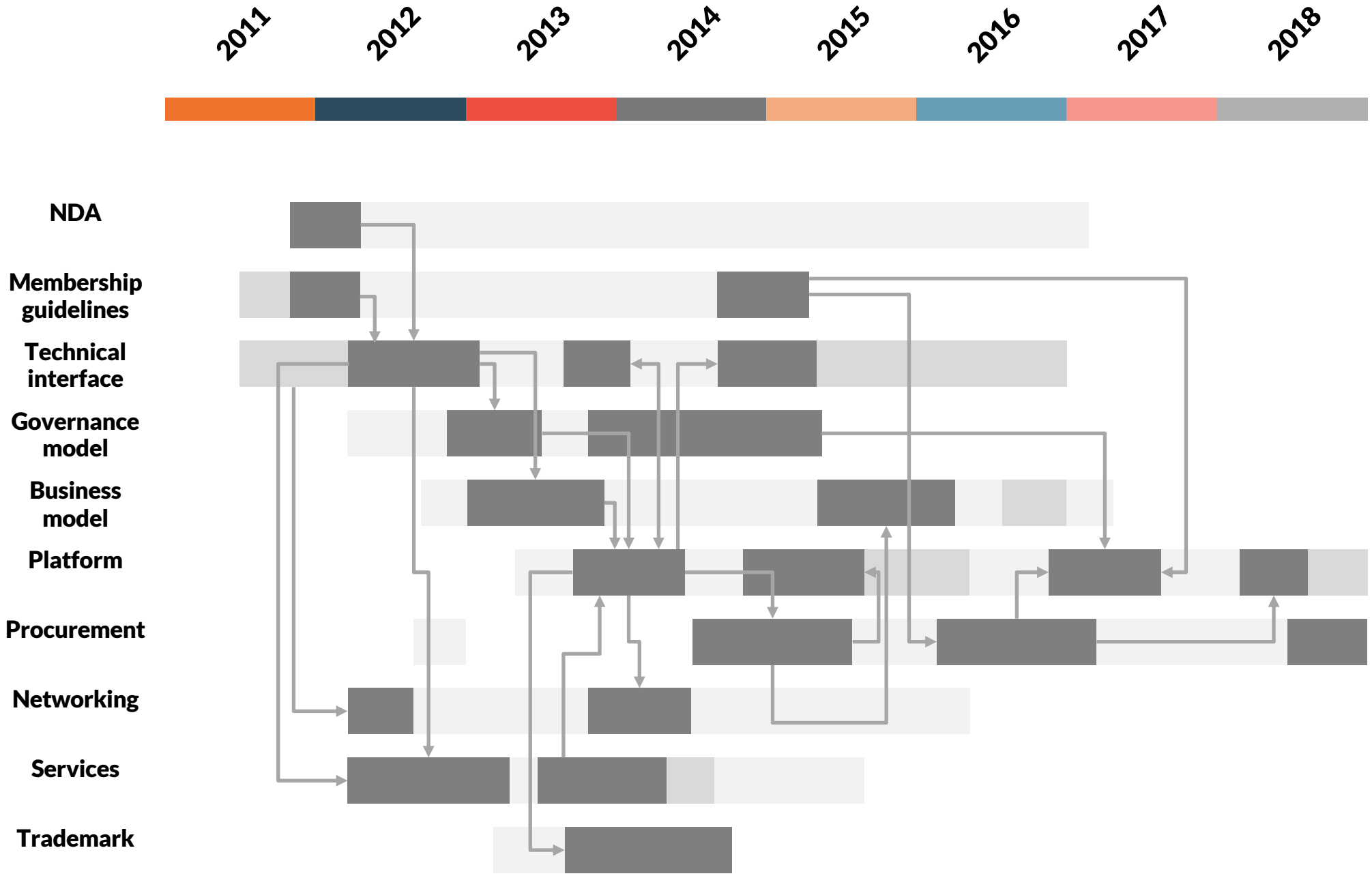
BUT WHAT ABOUT STRONG INTERDEPENDENCIES?

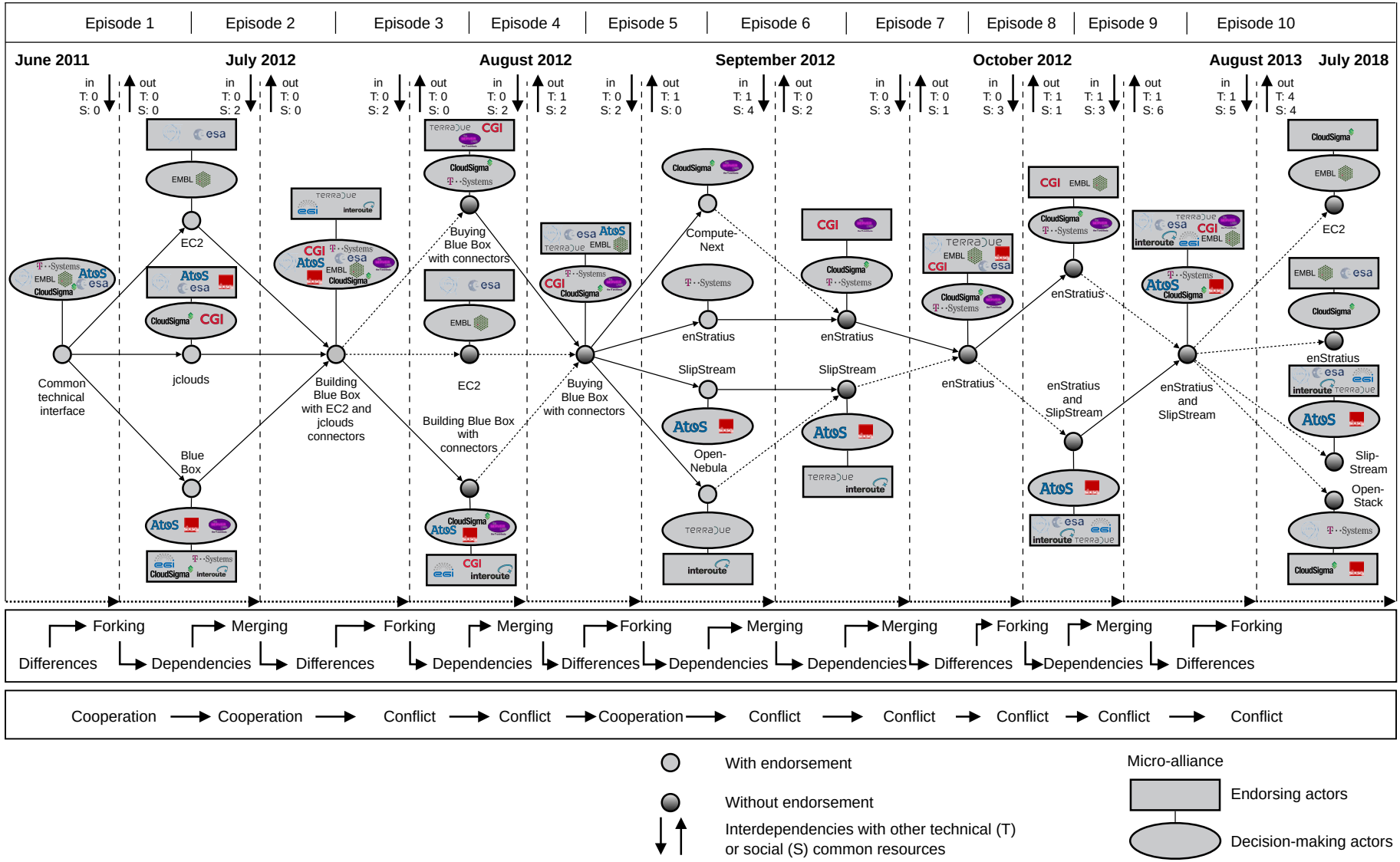
- The development of ATLAS (CERN) by people from 170+ independent organizations (Tuertscher et al. 2014)
- **Provisional decomposition**
- Contestation and **justification** of proposed solutions
- Emergence of **interlaced knowledge**
- Enabled by **shared norms**

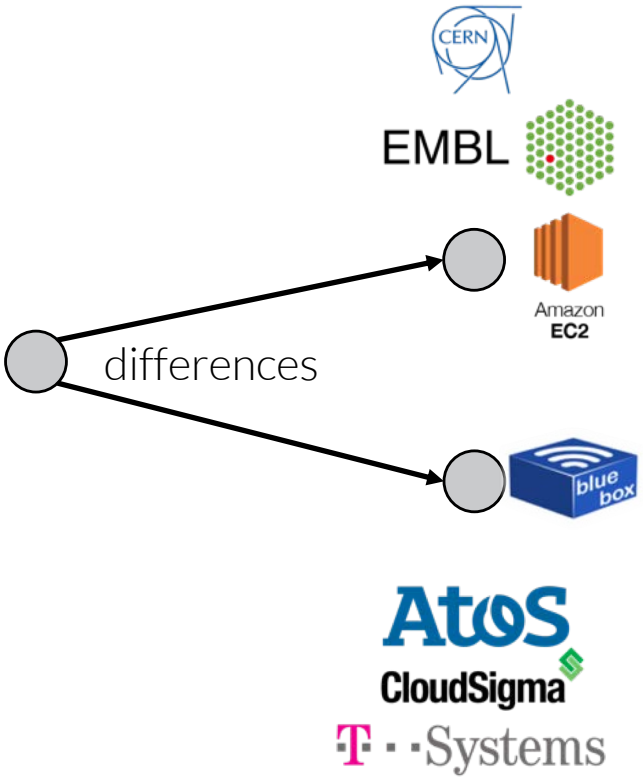




Hummel, Berends, Tuertscher (2019)

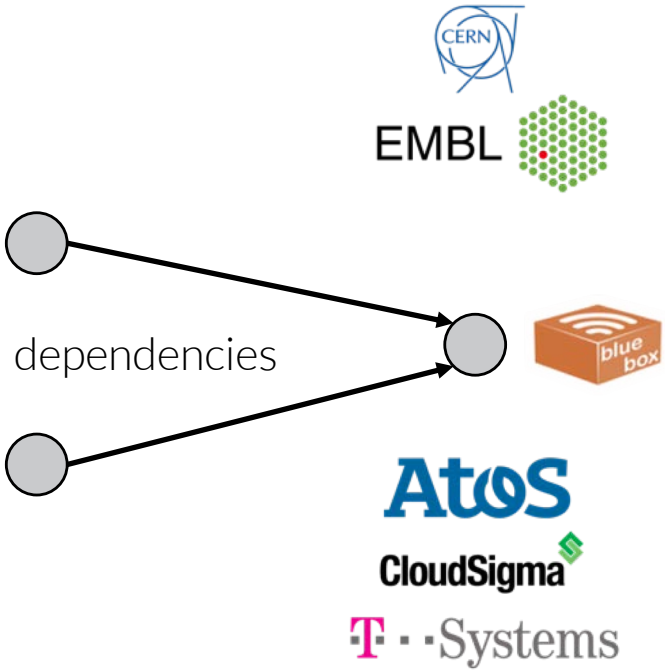

2011
2012
2013
2014
2015
2016
2017
2018
NDA
Membership guidelines
Technical interface
Governance model
Business model
Platform
Procurement
Networking
Services
Trademark


Episode 1
Episode 2
Episode 3
Episode 4
Episode 5
Episode 6
Episode 7
Episode 8
Episode 9
Episode 10
June 2011
July 2012
August 2012
September 2012
October 2012
August 2013
July 2018
Common technical interface
EC2
jclouds
Blue Box
Building Blue Box with EC2 and jclouds connectors
Buying Blue Box with connectors
EC2
Building Blue Box with connectors
Buying Blue Box with connectors
Compute-Next
enStratius
SlipStream
Open-Nebula
enStratius
SlipStream
enStratius
enStratius
enStratius and SlipStream
enStratius and SlipStream
EC2
enStratius
Slip-Stream
Open-Stack
Forking
Merging
Differences
Dependencies
Cooperation
Conflict
With endorsement
Without endorsement
Interdependencies with other technical (T) or social (S) common resources
Micro-alliance
Endorsing actors
Decision-making actors



options

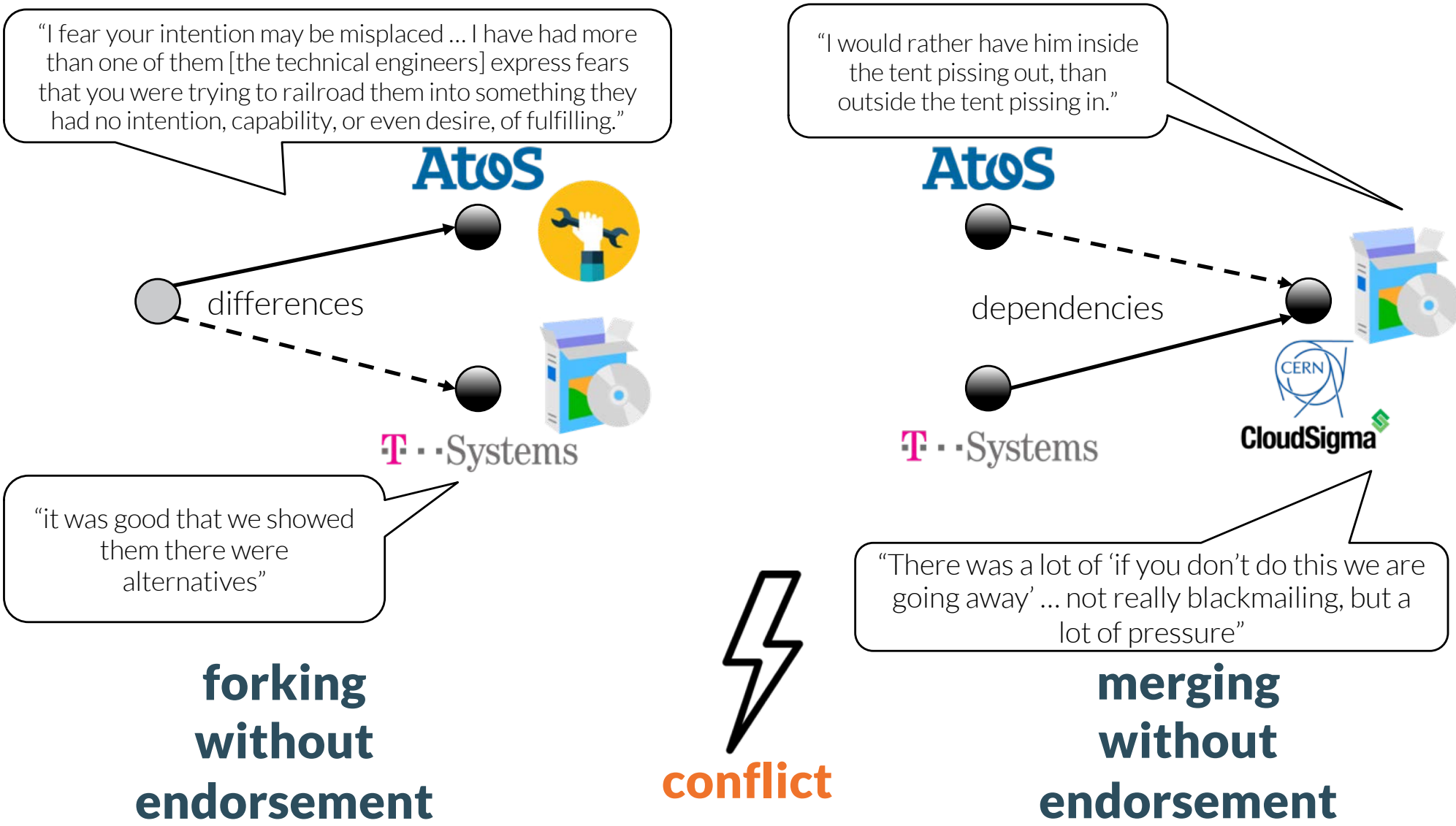
micro-alliances



forking with endorsement

cooperation

merging with endorsement


"I fear your intention may be misplaced … I have had more than one of them [the technical engineers] express fears that you were trying to railroad them into something they had no intention, capability, or even desire, of fulfilling."
Atos
differences
T · · Systems
"it was good that we showed them there were alternatives"
forking without endorsement
conflict
"I would rather have him inside the tent pissing out, than outside the tent pissing in."
Atos
dependencies
T · · Systems
CERN
CloudSigma
"There was a lot of 'if you don't do this we are going away' … not really blackmailing, but a lot of pressure"
merging without endorsement

CONCLUSIONS

- Large-scale collaboration increasingly needed
- Digital technology enables distributed innovation, with recombination logic instead of integrated system development
- Where needed organize for interdependencies:
  - Engage
  - Experiment to find complementarities
  - Provisional decomposition
  - Allow for forking and merging
  - Develop organizational resources to tolerate conflict
- **Still many open questions …**

Digital innovation & transformation (DIT)

Executive education program

VU

KIN Center for Digital Innovation

Looking beyond the hypes!