



Aalto University
School of Business

Scenario-based portfolio model for building robust and proactive strategies

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Building Expertise for Innovation Conference, Espoo 27.4.2017*

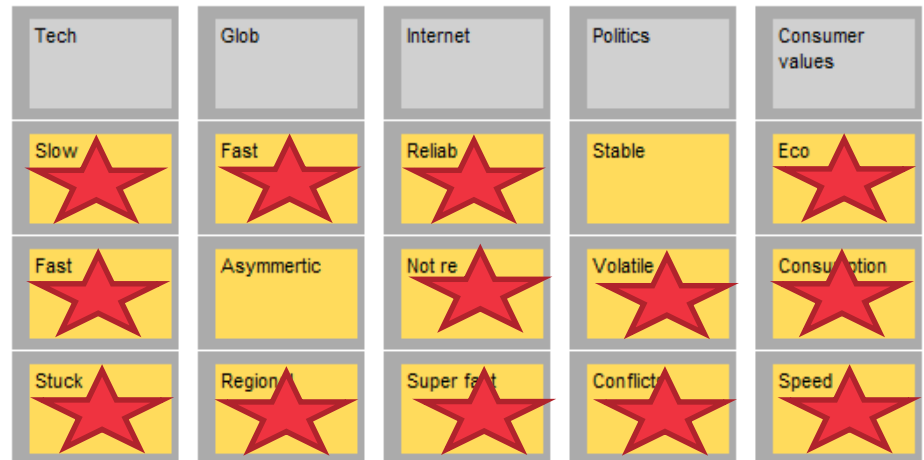
SmartSteel platform ecosystem

- ❑ In the fall of 2015, a group of Nordic steel and engineering companies were developing a multisided, economic ecosystem around a technology platform called SmartSteel
- ❑ The group was looking to build a strategy for the ecosystem that would be robust across alternative scenarios for the future operational environment



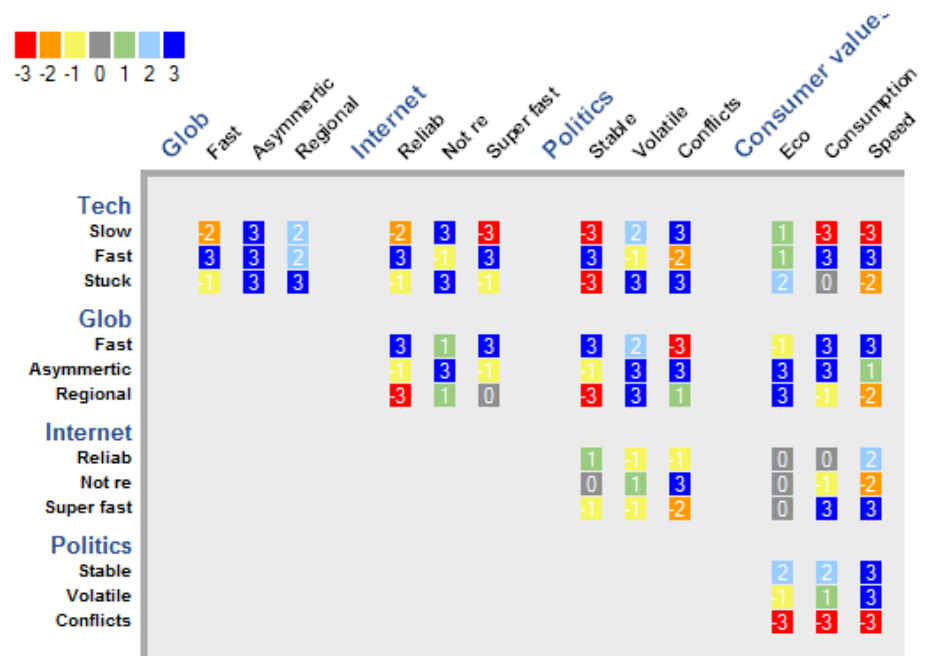
Building scenarios for the future

- ❑ The focus was on five key uncertainties, each with three possible outcomes
 1. Technological development
 2. Globalization
 3. Internet
 4. Political environment
 5. Consumer values
- ❑ Scenarios were modeled as combinations of outcomes



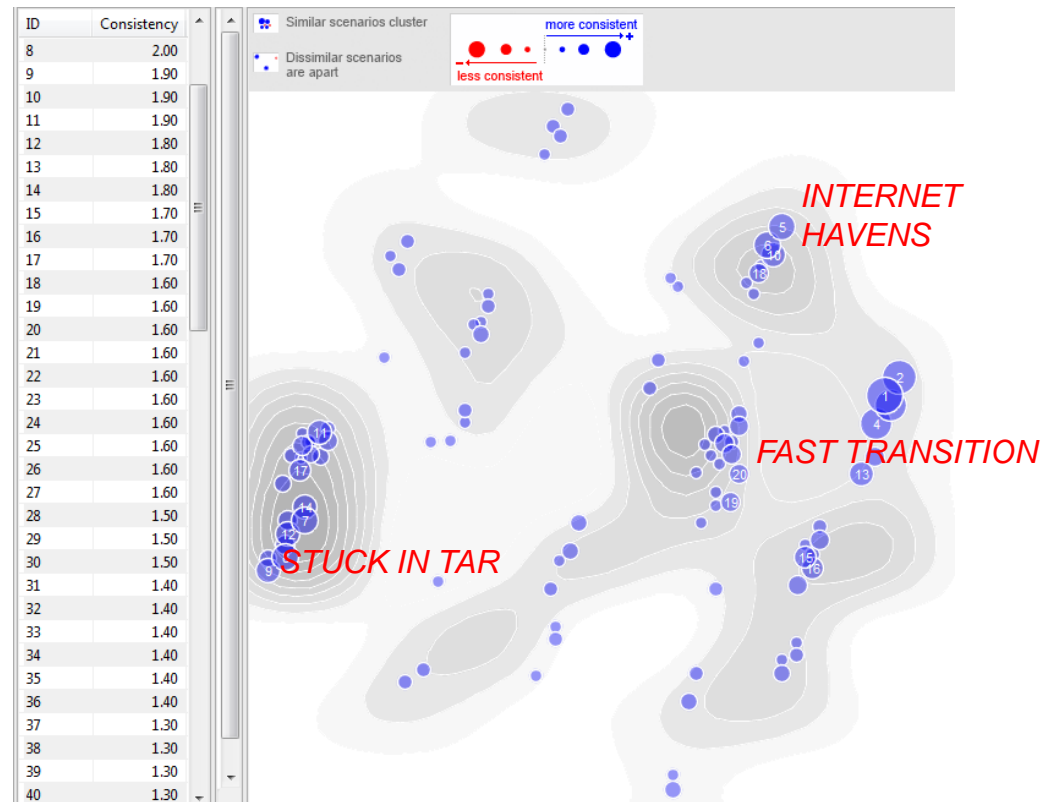
Consistency analysis

- To find internally consistent scenarios, the consistency of each pair of outcomes was assessed on a scale from -3 to 3
 - 3: It is highly unlikely that these outcomes occur simultaneously
 - 3: It is highly likely that these outcomes occur simultaneously



Selecting representative scenarios

- Based on these assessments, EIDOS Option Development* tool was used to find three scenarios that were
 - Internally consistent and
 - Sufficiently dissimilar



*<https://www.parmenides-eidos.com/eidos9/us/>

Scenarios selected for further analysis

Internet havens 2030

World politics are very turbulent when different power structures are fighting for dominance. Open conflicts and information warfare have generated major disruptions on the Internet, whereby platform ecosystems are characterized by closed, sector-specific networks. These ecosystems can generate scaling advantages by transferring sector-specific solutions to other sectors (e.g., from defense to medical, aviation, and food industries) but due to troubled global Internet, global consumer markets do not benefit from this development.

Fast transition by 2030

Documentation solutions based on EU-level regulation become the global standard, leading to a unique competitive advantage of European manufacturers compared to cheap Chinese steel. Competition between platforms is fierce, whereby they are enhancing in efficiency, transparency, and adaptability. These developments lead to a situation in which each member of the ecosystem is specializing in their core area. Even if the transaction costs of transferring from one ecosystem to another are high, increased competition leads to failures of some of the platforms

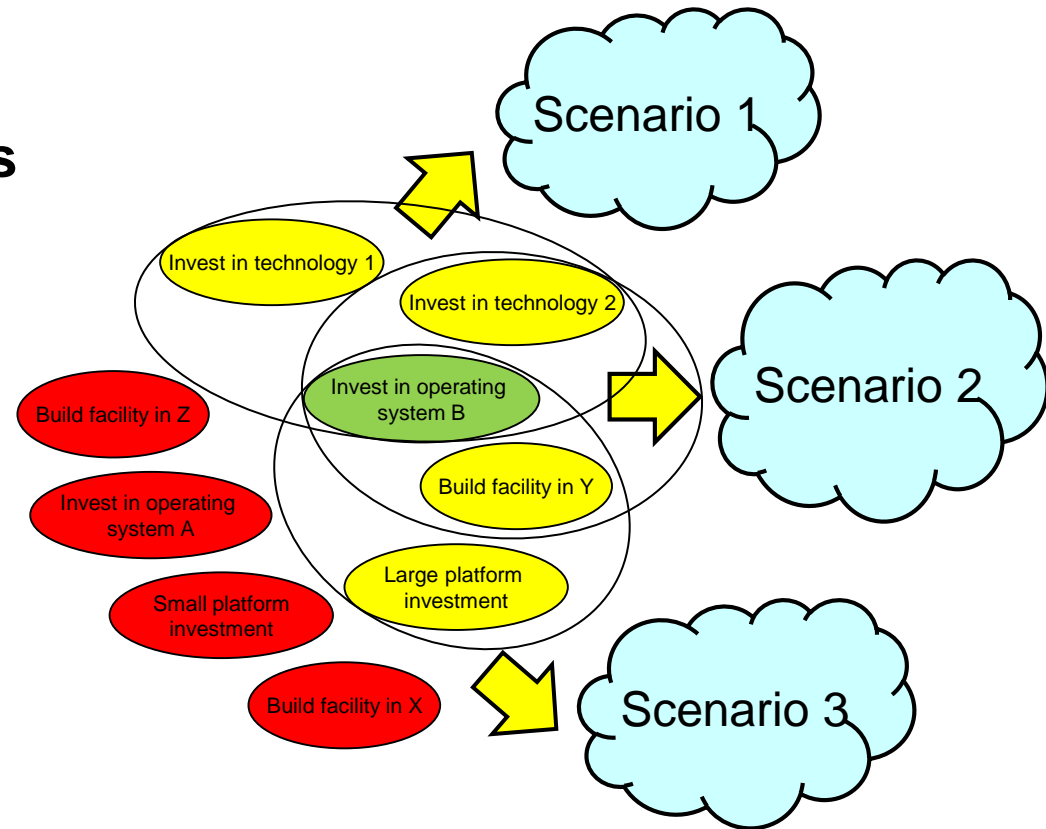
Stuck in tar 2030

Global political conflicts are violent and technology development investments are focusing on military solutions. Technology is used for the disruption of global Internet and building national secured systems. All this is possible because consumers are willing to give up some of their consumption. Robustness and security are emphasized, making it crucial for small players to form coalitions. Yet, open collaboration models in coalitions are hard to maintain due to unreliable Internet and the need to ensure the image of high security.

Building a robust strategy – from scenario thinking to action

□ Strategy as a combination of initiatives

- Recognize critical investments
- Maintain a portfolio of strategic options



Shaping strategies – from reactivity to proactivity

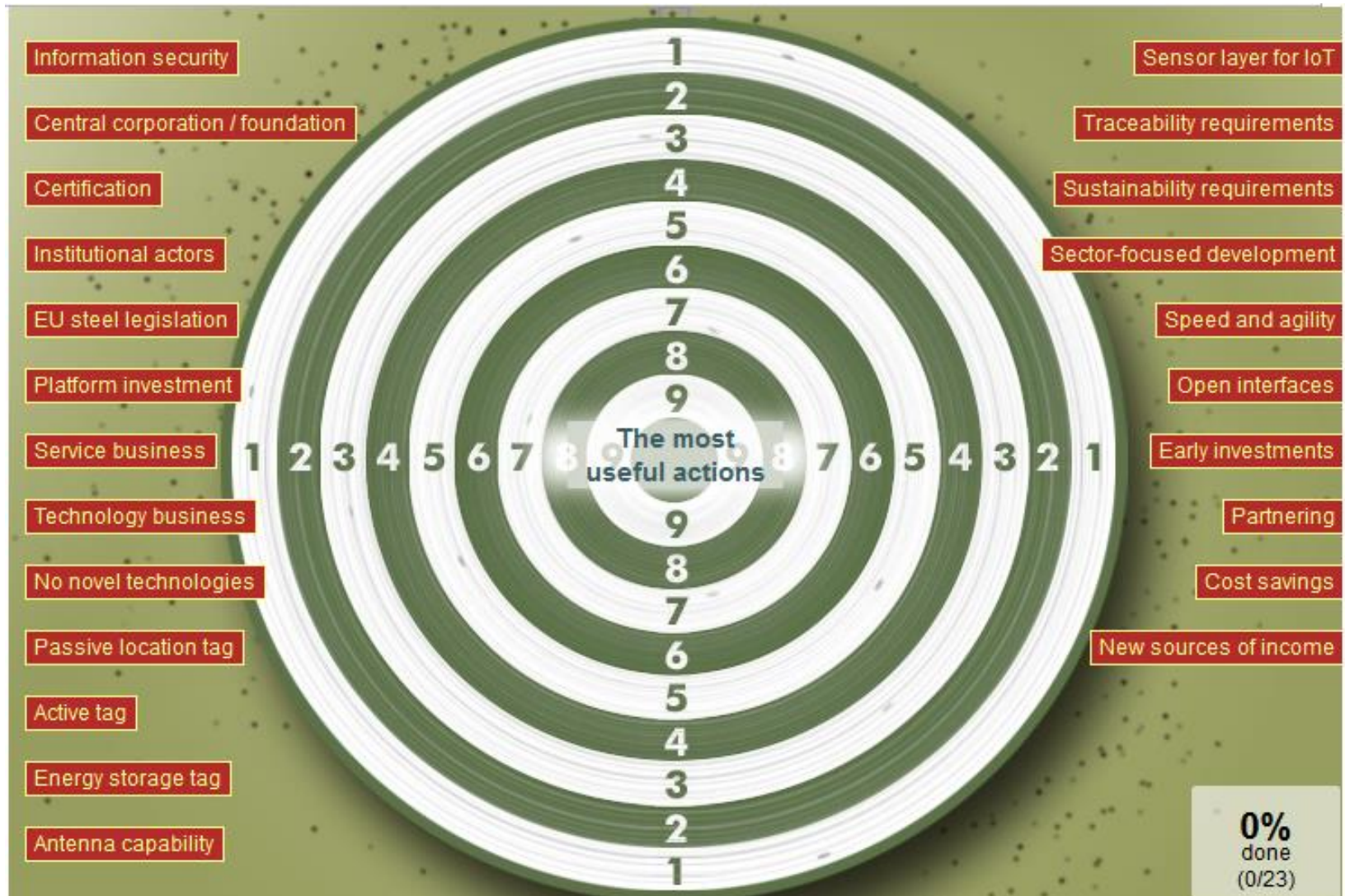
❑ Reactive strategy

- Build a strategy that performs well across different scenarios of future operational environment

❑ Proactive strategy:

- Recognize uncertainty, but...
- Take strategic actions to steer the future towards the desired scenario

Task 1: Evaluate 23 actions in the three scenarios



Task 2: Rank the scenarios in order of occurrence probabilities

Rank order the scenarios according to occurrence probability. Please tick exactly one circle per row and column.



	<i>Most probable</i>	<i>Second most probable</i>	<i>Least probable</i>
Internet havens 2030	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fast transition by 2030	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stuck in tar 2030	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Responses: Evaluation of actions

- Eight actions (~ one third) with highest average scores in each scenario:





Internet havens	Fast transition	Stuck in tar
Open interfaces	Speed and agility ^o	Partnering
Traceability requirements ^o	Certification ^o	Central corporation / foundation ^o
Sector-focused development	Platform investment*	Information security*
Partnering	Information security*	Platform investment*
Sustainability requirements ^o	EU steel legislation*	EU steel legislation*
Information security*	Open interfaces	Sector-focused development
Platform investment*	Service business ^o	Institutional actors ^o
EU steel legislation*	New sources of income	New sources of income

^o Among the top 8 in this scenario only

* Among the top 8 in all scenarios

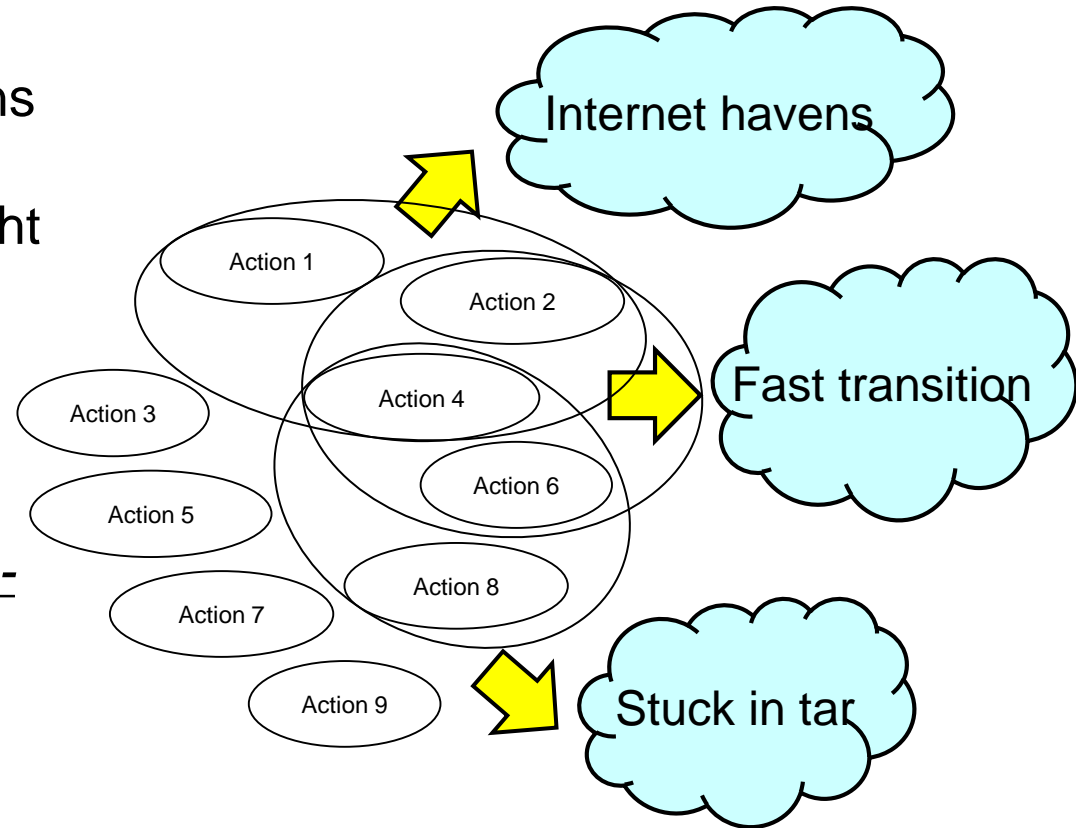
Responses: Scenario probabilities

- Based on the participants' responses,
 - A 10% lower bound on the probability of each scenario was set
 - The below information was used to model the seven actions' impacts on scenario probabilities

Traceability requirements		
Sustainability requirements		Internet havens > Stuck in tar Fast transition > Stuck in tar
Information security		
Sector-focused development		Fast transition > Stuck in tar
EU steel legislation		
Open interfaces		Fast transition > Stuck in tar Fast transition > Internet havens
Partnering		Fast transition >> Stuck in tar Internet havens > Stuck in tar

Identification of non-dominated strategies

- ❑ Which combination of actions (=strategy) has the highest expected performance in light of the scenario probability information?
- ❑ No precise scenario probabilities → multiple non-dominated strategies



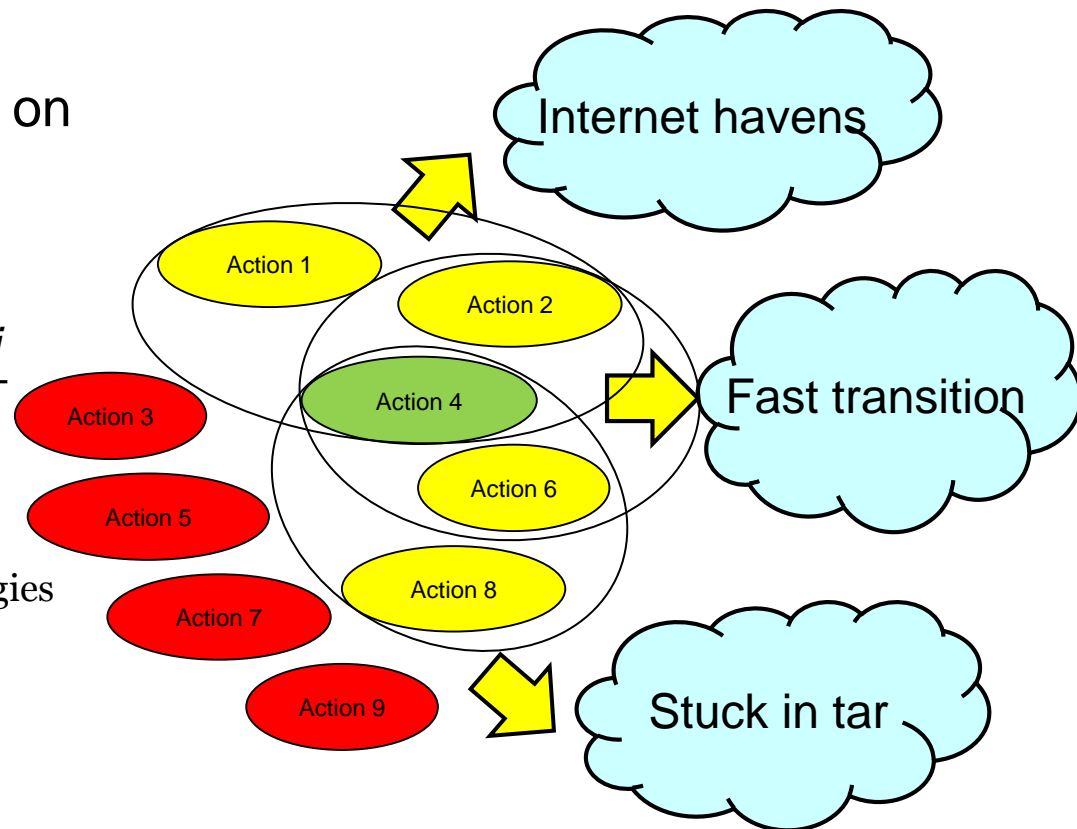
Core index

- Action-specific recommendations are based on core index (CI)

Core index of action j =

$$\frac{\text{\# of ND strategies that include } j}{\text{\# of ND strategies}}$$

- CI = 1: action included in all ND strategies → select
- CI = 0: action not included in any ND strategies → reject
- $0 < CI < 1$: action included in some ND strategies but not all



Results

- Focus on combinations of eight actions (ca. 33%): 13 non-dominated strategies

Actions' impacts on scenario probabilities taken into account	
EU steel legislation	1.00
Platform investment	1.00
Information security	0.92
Certification	0.92
Speed and agility	0.92
Service business	0.77
New sources of income	0.77
Open interfaces	0.62
Traceability requirements	0.38
Partnering	0.38
Central corporation / foundation	0.31
Early investments	0.00
Cost savings	0.00
Sustainability requirements	0.00
Sector-focused development	0.00
Institutional actors	0.00
Technology business	0.00
No novel technologies	0.00
Passive location tag	0.00
Active tag	0.00
Energy storage tag	0.00
Antenna capability	0.00
Sensor layer for IoT	0.00

Actions' impacts on scenario probabilities neglected	
EU steel legislation	1.00
Platform investment	1.00
Information security	1.00
Partnering	1.00
New sources of income	0.68
Traceability requirements	0.56
Open interfaces	0.52
Central corporation / foundation	0.52
Certification	0.48
Service business	0.48
Sector-focused development	0.30
Speed and agility	0.30
Institutional actors	0.14
Sustainability requirements	0.02
Technology business	0.00
No novel technologies	0.00
Passive location tag	0.00
Active tag	0.00
Energy storage tag	0.00
Antenna capability	0.00
Sensor layer for IoT	0.00
Early investments	0.00
Cost savings	0.00

Conclusions

- ❑ We developed a scenario-based method for building strategies that would be
 - Robust across alternative scenarios for the future operational environment
 - Proactive in that they would help steer the future toward the desired direction

- ❑ The method was used to support the strategy building process of a group of steel and engineering companies looking to build a platform ecosystem

- ❑ The method helped the group to identify
 - Strategic actions that should be pursued immediately
 - Strategic actions in which small initial investments should be made to be either expanded or abandoned later



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Thank you!

Questions or comments?