

STEP 3 – STS meet Scenario**s**

Taking FATE* on the road

* FATE – Futures Assessed alongside **socio**-Technical Evolutions

NATO SAS-RTC-176

The *FATE* Method

- Step 1 – Socio-Technical System (STS) – 2023
- Step 2 – Future scenario – 2040

- Step 3 – Interactions between future scenario + STS

3.1 How do you see the STS evolving in future scenarios?

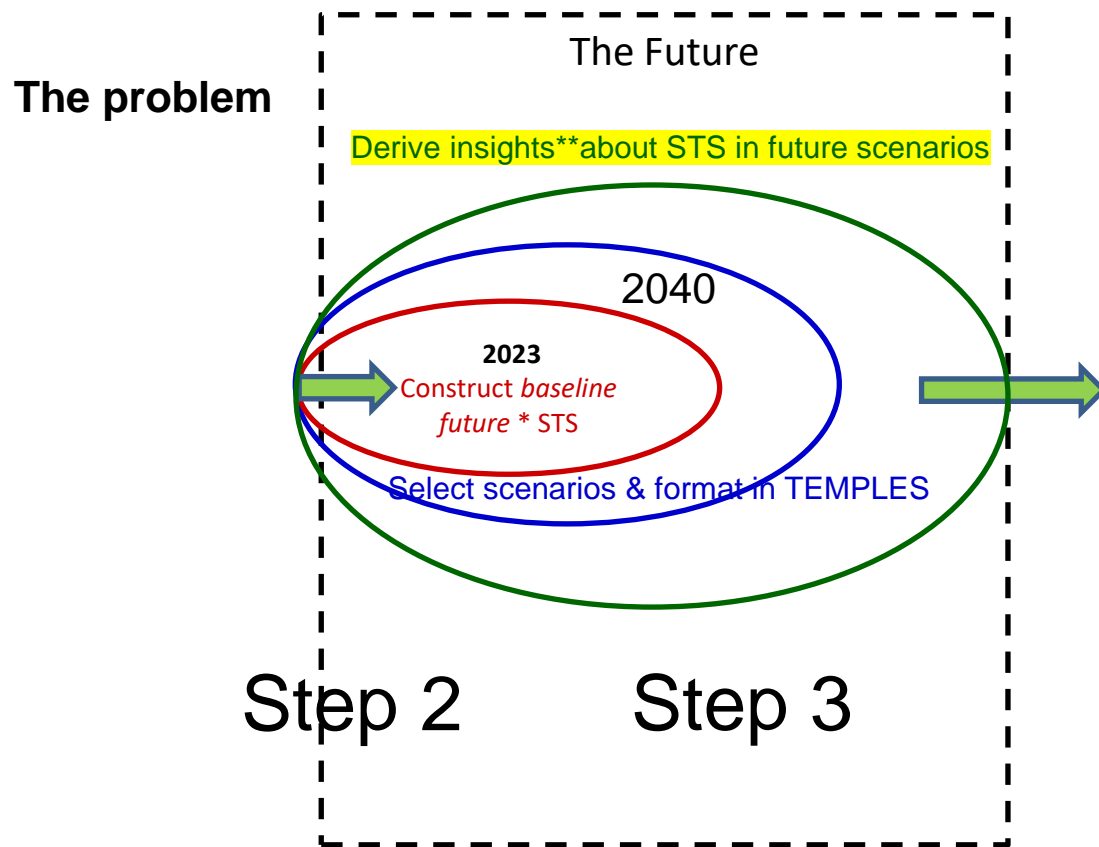
3.2 What are of the STS (OPPPTI) in the described future scenario interactions (TEMPLES)?

Output: insights of components in the STS (OPPPTI) that change through drivers and Resistors (D and R) in different scenarios

TEMPLES – Technological, Economical, Military, Political, Legal, Environmental and Social

* *OPPPTI* – Organization, People, Processes, Policies, Technology, Infrastructure

The *FATE* Method – Step 3 in 2023



* *Baseline future* is an idealised *extrapolation* of what is emerging today, **Insights from analysis, changes in STS, drivers and resistors of change in future scenarios and/or STS

FATE – in action with examples

Step 3 builds on combined results of Step 1 + Step 2

STS+ Scenarios

3.1 How do you see the STS evolving in future scenarios?

- Read scenario (s) with STS in mind
- Document where scenario (s) may drive STS – **extrapolate** the STS into the future

3.2 What are interactions of the STS (OPPPTI) in the described future scenarios (TEMPLES)?

- Note similarities/differences between scenarios & STS
- Think beyond the scenarios and of additional drivers/resistors or insights
- Note if something is missing or unknown
- Cluster and prioritize insights

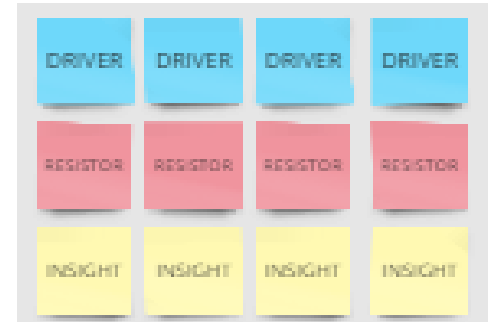
Step 3 – Interactions between STS and future scenario(s)

STS

Socio-Technical System
(changes)+ Scenario(s)

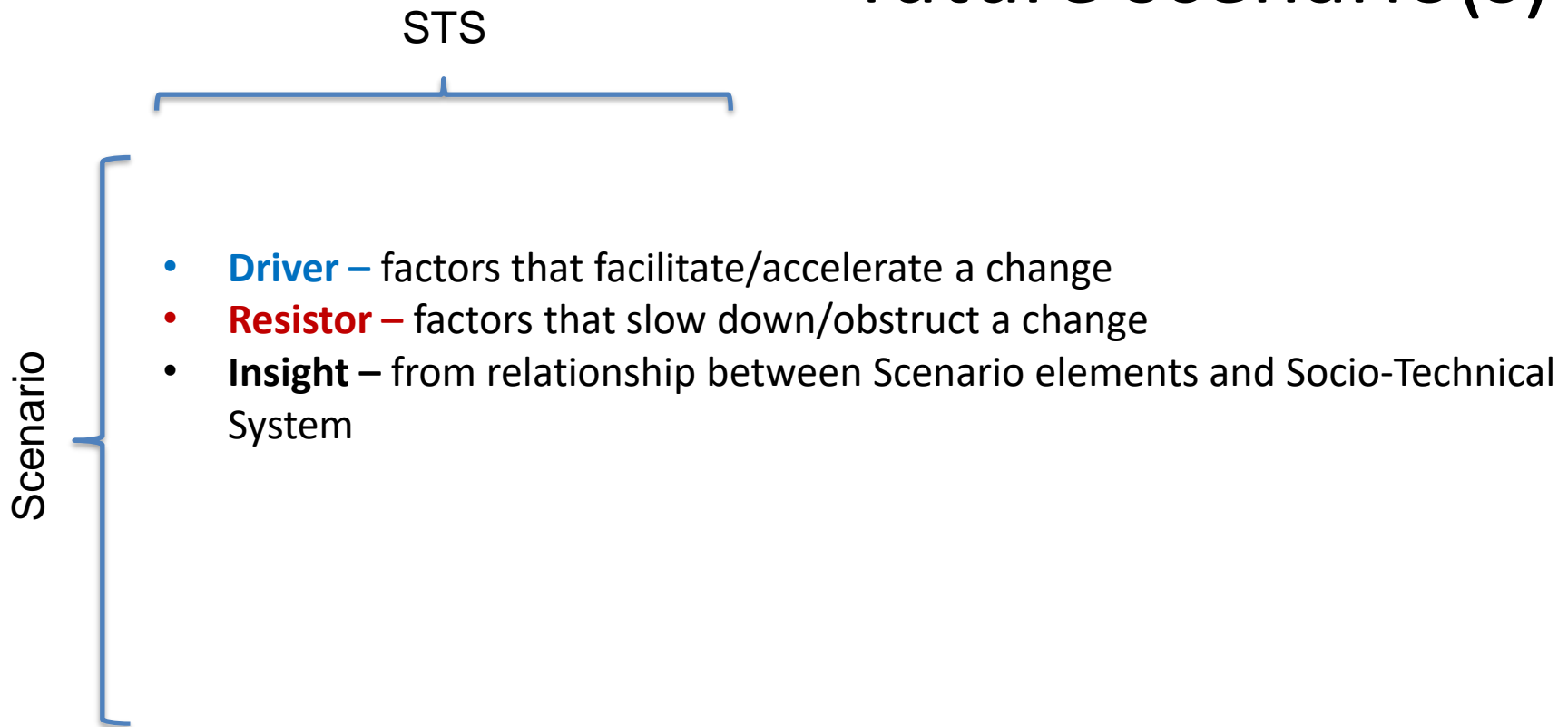
SCENARIO 1: "Seperate Silos"

	O <small>Organization</small>	P <small>People</small>	P <small>Processes</small>	P <small>Products</small>	T <small>Technology</small>	I <small>Infrastructure</small>
T <small>Technological</small>						
E <small>Economic</small>						
M <small>Military</small>						
P <small>Political</small>						
L <small>Legal</small>						
E <small>Environmental</small>						
S <small>Social</small>						



- **Driver-** factor being a driver of change
- **Resistor-** factor being a resistor to change
- **Insight-** Insights into components or relationship between scenario elements and Socio-Technical System

Step 3 – Interactions between STS and future scenario(s)



What is an insight?

- Not a Driver or Resistor of change
- A convergence
- Provides context
- Responds to: If X, then
- If you find a convergence note it down on a new sticky
- Cluster insights

Step 3 – Contrasting Scenarios (Focus on one OPPPTI Element)

Scenario	Technology	Economic	Military	Political	Legal	Environmental	Social	
A World Adrift								
Tragedy And Mobilization	DRIVER							
	RESISTOR							
	INSIGHT							

Practice

Pre-worked Step with Biotech as example

2. WORLD ADRIFT

OPPTILES

SLOWER TECH DEV evolution

- concern for personal health
- Reluctance to share personal data
- Communicate cost → benefit of biotech
- Tech investments from Govt reduced
- ETHICS OF hacking
- Biotech → too expensive for common people
- Pandemic like situation make incentive for personalized medicine
- Biotech Infrastructure: FF RDCs, Univ, Commercial Co's, Labs
- Informed consent, Research protocol
- Mil has advantage on tech, Ethics constraint

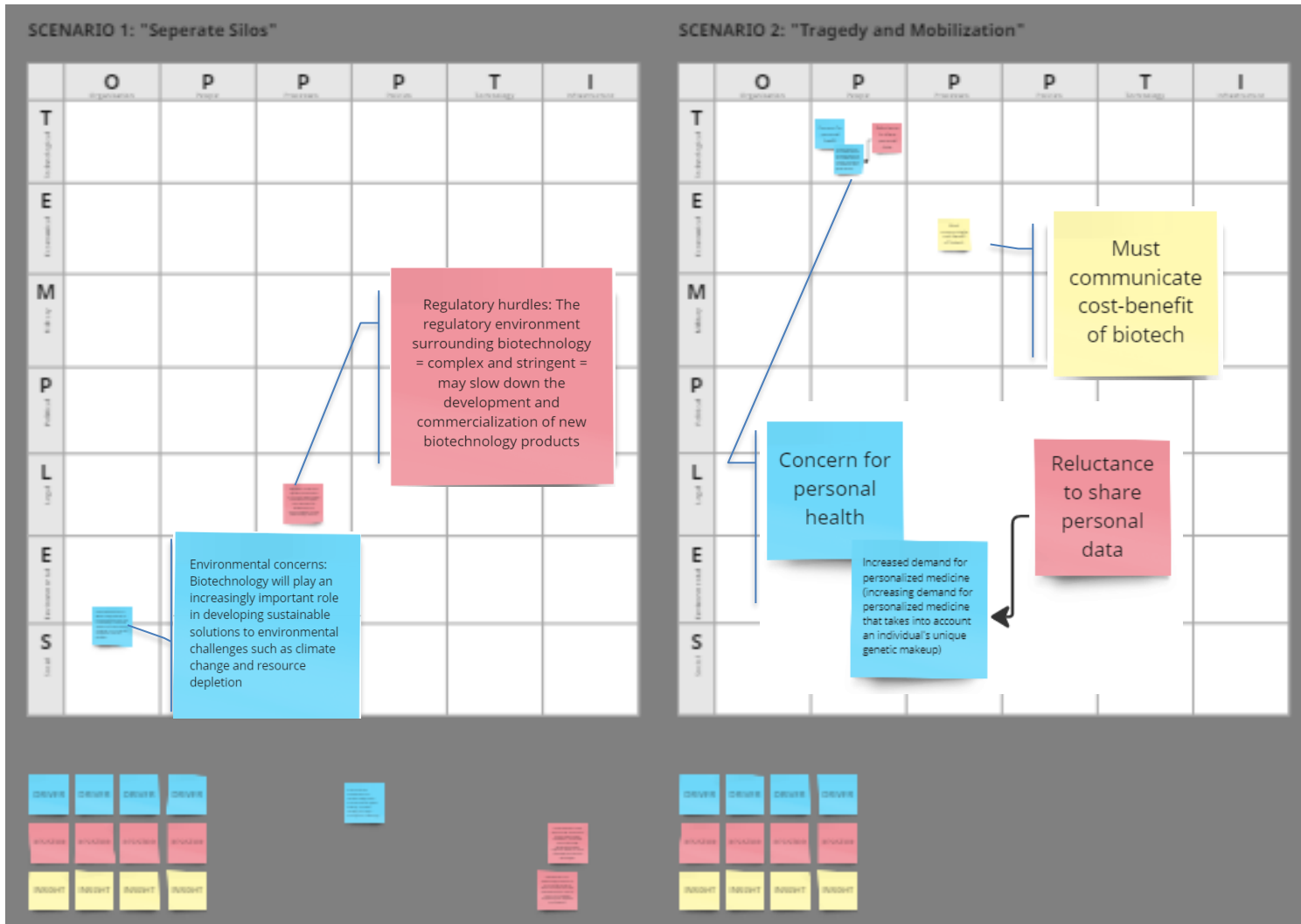
5. TRAGEDY & MOBILIZATION

OPPTILES

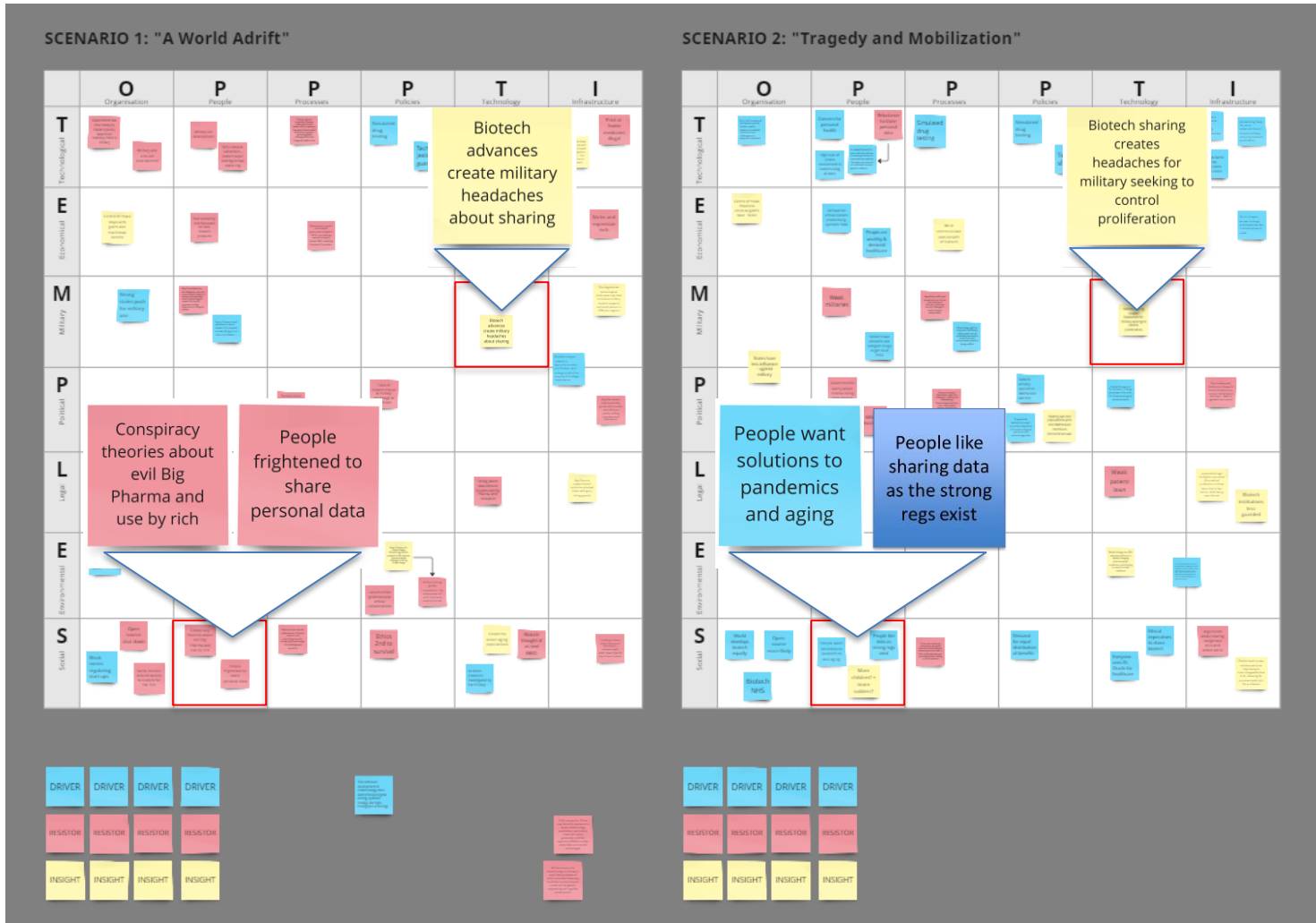
HIGHER TECH DEV evolution

- Equal access to Biotech
- Super health becomes the cause for high fatality
- Mil resourcing research to counter - may be high side research
- Drive development potentially of lethal weapons
- pro tech, pro green, Research investment plan
- Industry leaping ahead on biotech - less in military
- Strategic comm
- Unequality ↑ in the ball field

Step 3 – Interactions between STS and future scenario(s)



Contrasting Scenarios (Focus on OPPPTI - “PEOPLE” + “TECHNOLOGY”)

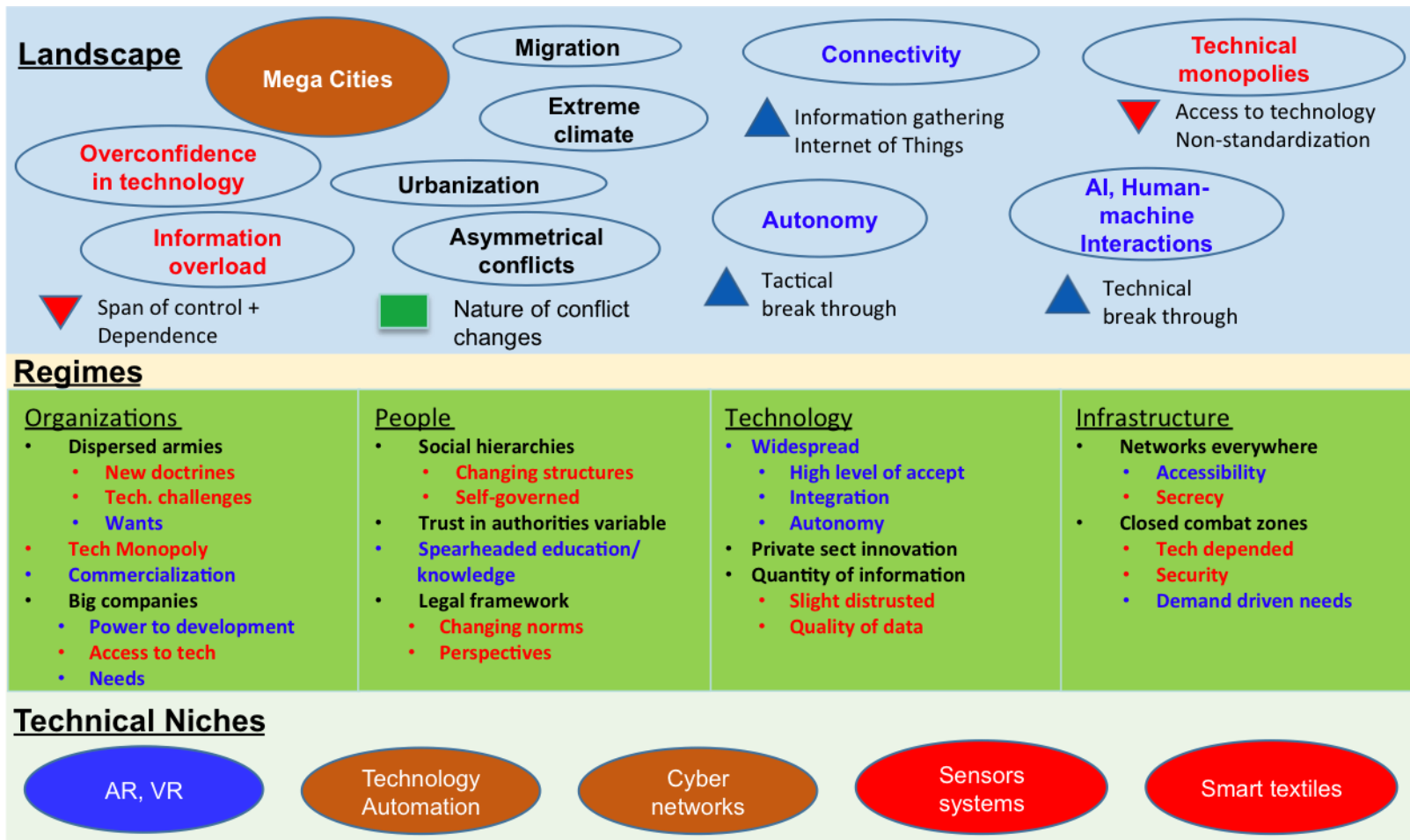


Step 3 – Contrasting Scenarios (Focus on OPPPTI “TECHNOLOGY”)

Scenario	Technology	Economic	Military	Political	Legal	Environmental	Social
A World Adrift	<ul style="list-style-type: none"> Better military focused biotech Advanced tech solutions jealously guarded Neuralink exo-skeletons for the rich & military 	<ul style="list-style-type: none"> Limited biotech spin-offs restricted to rich nations and military 		<ul style="list-style-type: none"> Biotech advances create military headaches about sharing 	<ul style="list-style-type: none"> Strong patent laws enforced by govts and Big Pharma, stifle innovation 		<ul style="list-style-type: none"> Dr. Oracle used by health professionals only Biotech thought of as next WMD Concerns about aging populations
Tragedy And Mobilization	<ul style="list-style-type: none"> Better non-military focussed biotech Many illnesses solved Synbio is strong Advanced tech used across world, across socio-economic groups Neuralink exo-skeletons for the disabled 	<ul style="list-style-type: none"> Lots of biotech spin-off tech Healthier, wealthier populations 		<ul style="list-style-type: none"> Biotech sharing creates headaches for military seeking to control proliferation 	<ul style="list-style-type: none"> Weak patent laws 		<ul style="list-style-type: none"> Everyone uses Dr. Oracle for healthcare

Example of Increasing STS Complexity in the multiple levels of Niches/ Regimes/ Landscapes

How could **wearables** effect urban operations?



References

1. Adlakha-Hutcheon, G. et al (2021) Futures Assessed alongside socio-Technical Evolutions (FATE), DOI: 10.14339/STO-TR-SAS-123, ISBN 978-92-837-2322-6.
2. Adlakha-Hutcheon, G., Bown, K., Lindberg, A. Nielsen, T. G. Roemer, S. Maltby, J.F.J. (2020) The Use of FATE for Illuminating Disruptions, Proceedings of The 14th Annual NATO Operations Research and Analysis Conference, 2020.
3. Maltby, J.F., Di-Placito, J., Strong, P. and Kirlew, M. (2014). FutureWorlds™ Narratives: Global scenarios for evidence-based long-term analysis. Dstl Policy and Capability Studies, Portsmouth West.
4. Global Trends 2040 as scenarios (2021) [Office of the Director of National Intelligence - Global Trends \(dni.gov\)](#)

Backup

Step 1
'OPPPTI'
Social-technical
system



Step 2
'TEMPLES'
Context of building



Step 3
Insights?



Table E-4: Template for Tabulating the Total Number of Drivers and Resistors that Effect Various Capabilities Relative to Each Scenario.

	Capability X	Capability Y	Capability Z
Scenario A			
Scenario B	<p>Relevant components of the STS and drivers/resistors from Table E-3 to be listed in these cells, with the total number of driver/resistor in each cell tabulated. Additional columns should be added to the table as required.</p>		
Scenario C			
Insights to be added as appropriate in this row across scenarios			

Example from facilitators guide

Step 3 – Interactions between STS and future

Table E-3: Template for Documenting the Interaction Between a Scenario and the Baseline STS.

Futuristic STS, One for Each Scenario					Elaboration of Scenario Relevant Drivers/Resistors
LANDSCAPE (Global and/or greater regional level elements)					Participants are to review the list of drivers/resistors from Step 1 and include only those that change as a consequence of the consideration of TEMPLES provided by each scenario.
Taken from Step 1 and new components in STS from analysis of TEMPLES added (distinguish from Baseline with a different color).					
REGIME (Regional and local systems analysis)					
Organization	People	Process/ Policy	Technology	Infrastructure	Add new factors of change (drivers/resistors), for each of these elaborate: <ul style="list-style-type: none"> • Description of the driver/resistor; • which STS component they effect; and • the capability(ies) it can affect and how.
Taken from Step 1 with newly identified components added.					
NICHE (Specific technologies and detailed prerequisites to make the technology work)					
Taken from Step 1 with newly identified components added					

Example Cognitive Map Development (Increasing Complexity)

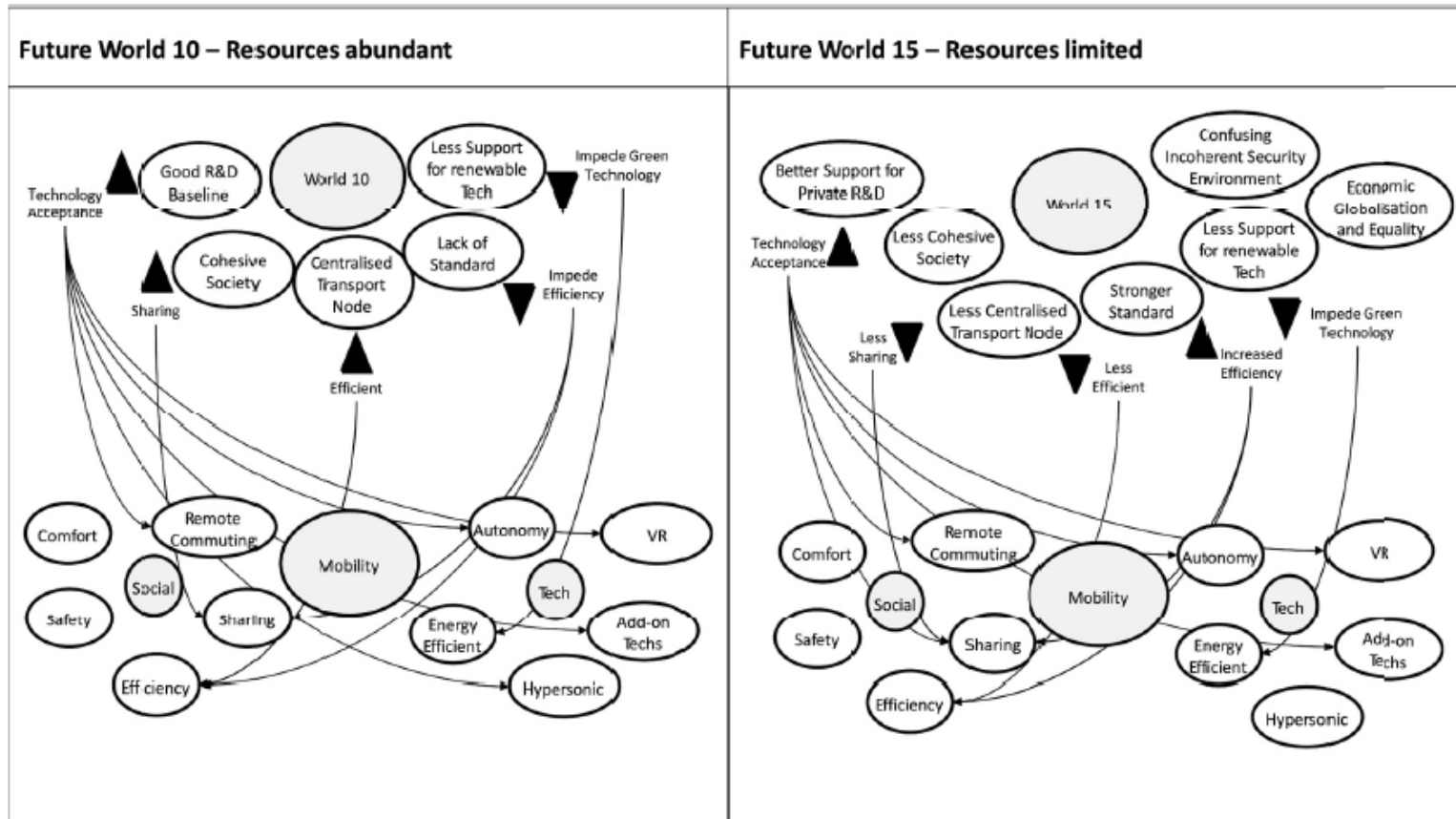


Figure 5: The Mobility STS compared in two Future Worlds [47, slide 29].

Example: Identifying Drivers, Resistors & Impacts for clients

Scenario	World Adrift	Tragedy and Mobilization
Drivers	<ul style="list-style-type: none"> • Concern for personal health 	<ul style="list-style-type: none"> • Research investment plans
Resistors	<ul style="list-style-type: none"> • Lower technology development likely due to reduced investment from governments for it 	<ul style="list-style-type: none"> • Higher technology development
Impacts		