Development of Supply Chain Performance Management System Based on Multicriteria Decision Aid for Mo-99 Integrated Supply Chain

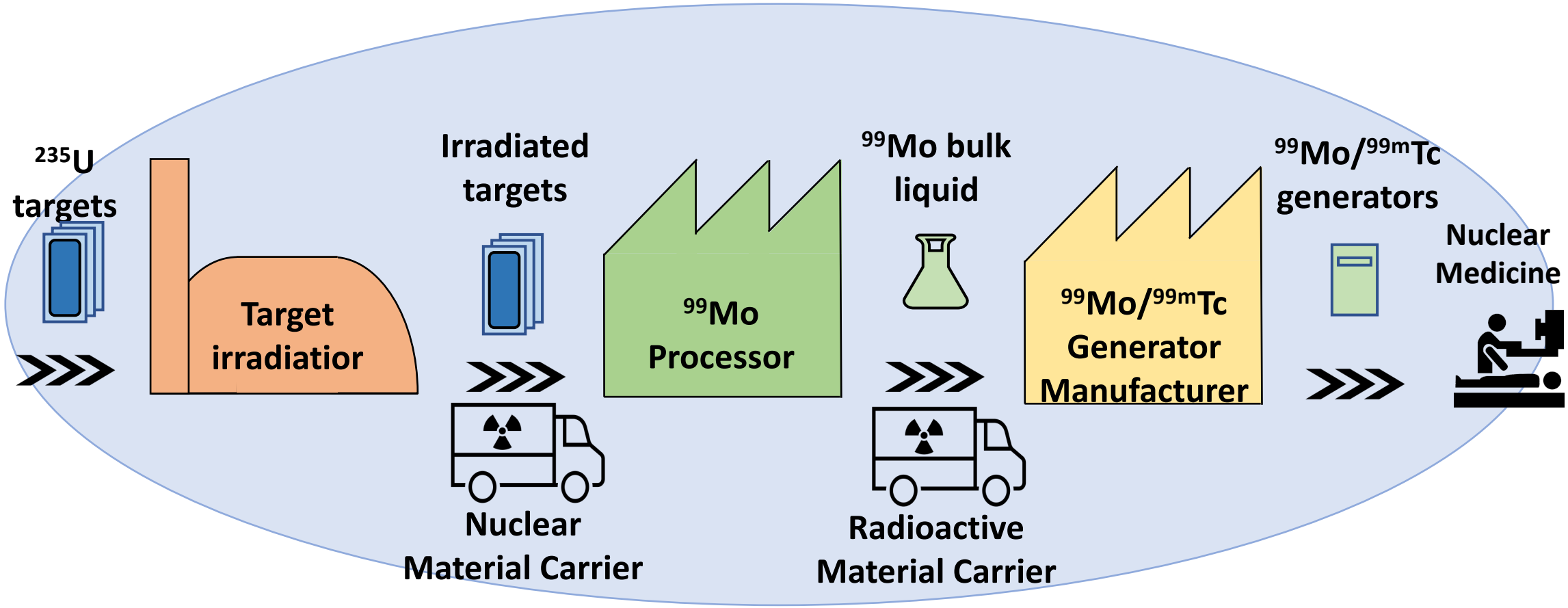
Haingo Rabarijaona – Alassane Ballé Ndiaye

2022 Mo-99 INTERNATIONAL SYMPOSIUM

ULB UNIVERSITÉ LIBRE DE BRUXELLES

qalinca labs

$^{99}Mo/^{99m}Tc$ Supply Chain



Research Question & Objectives

How to design an integrated $^{99}Mo/^{99m}Tc$ Supply Chain to enhance its overall performance?

- Diagnosis of the existing $^{99}Mo/^{99m}Tc$ Supply Chain
- Design of an Integrated Performance Measurement System
- Engineering of an enhanced Integrated Supply Chain

Diagnosis of the $^{99}Mo/^{99m}Tc$ Supply Chain

1- Data collection

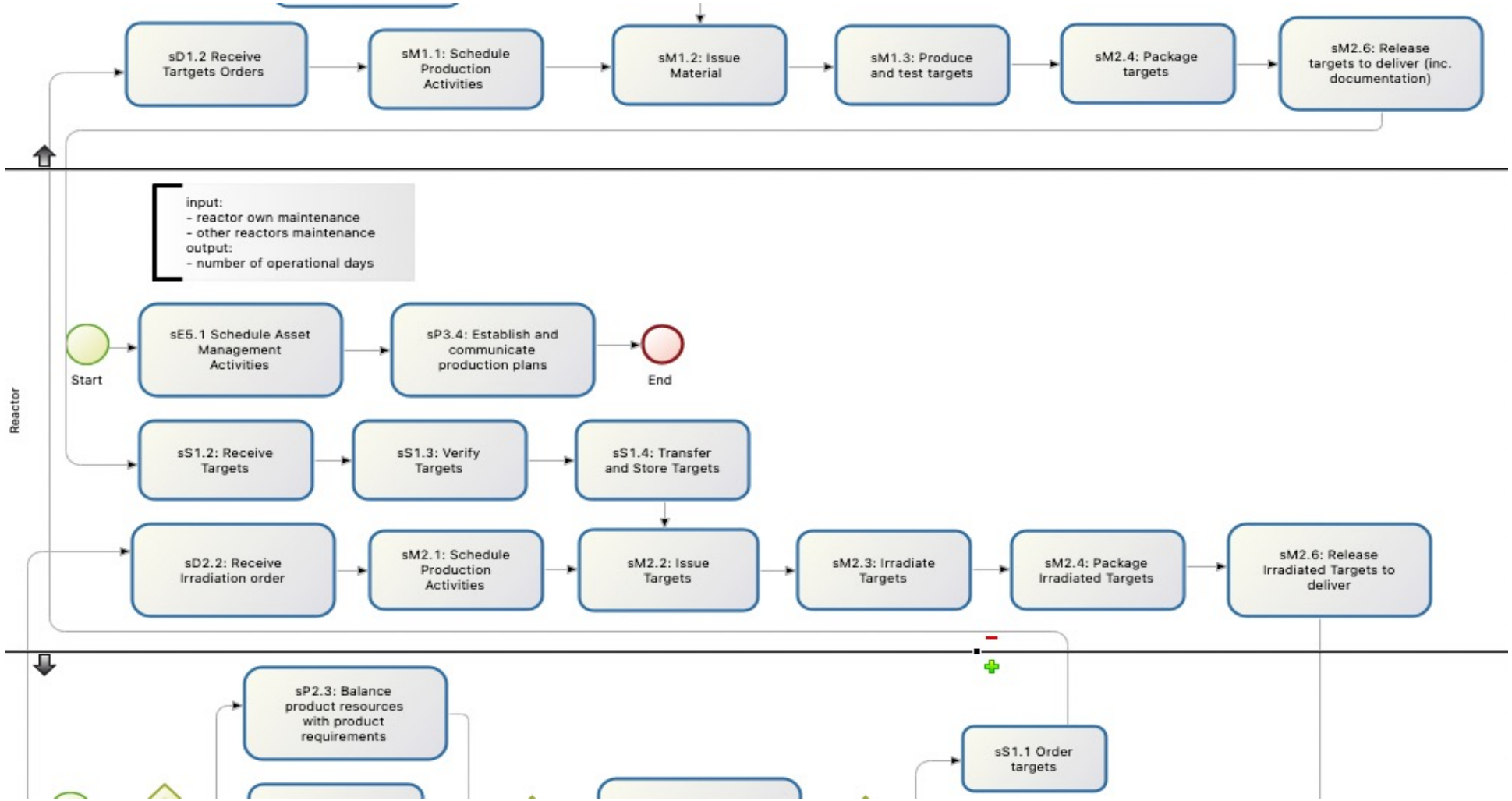
2- Challenges identification

3- Dynamics of stakeholders

4- Supply Chain Modelling

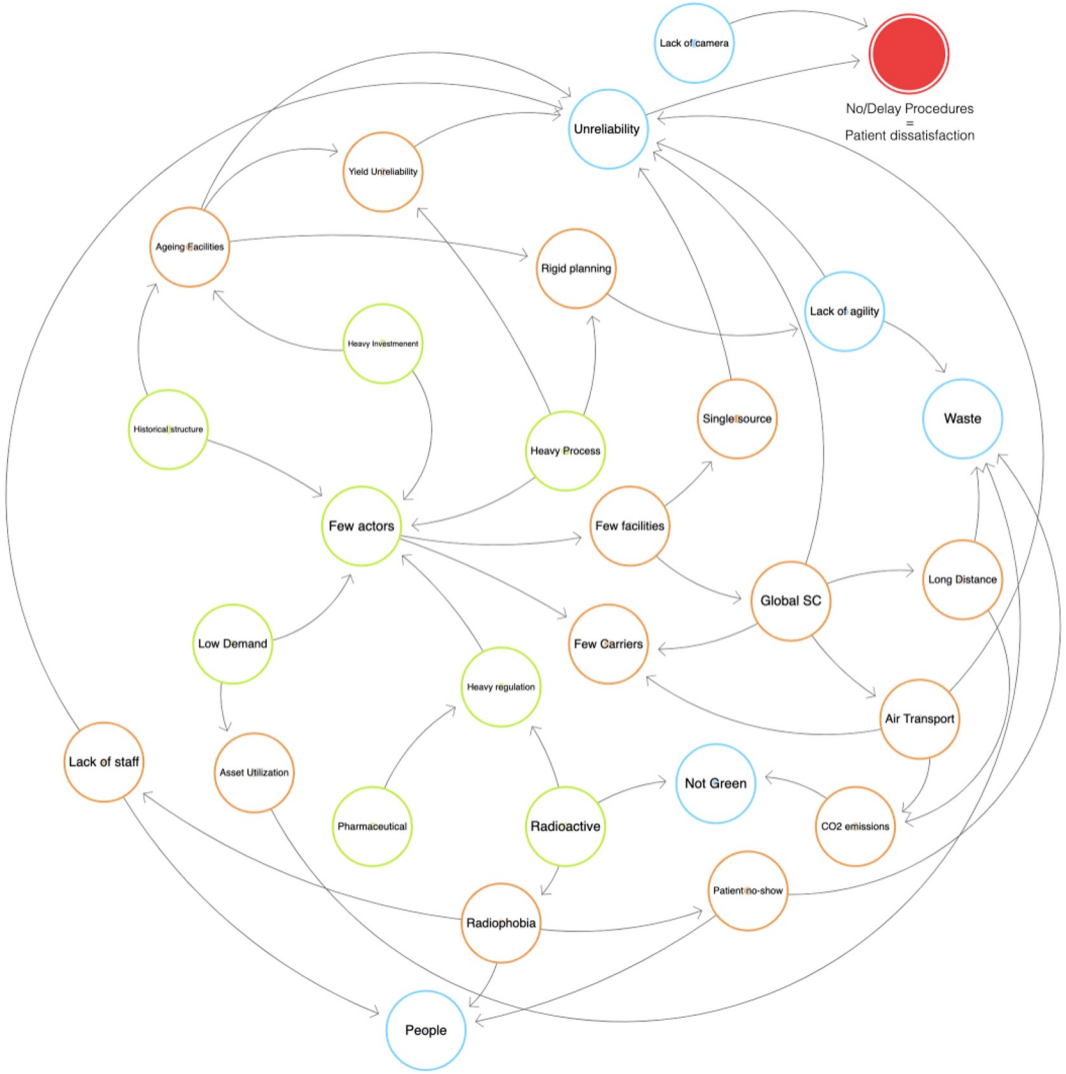
Diagnosis of the $^{99}Mo/^{99m}Tc$ Supply Chain

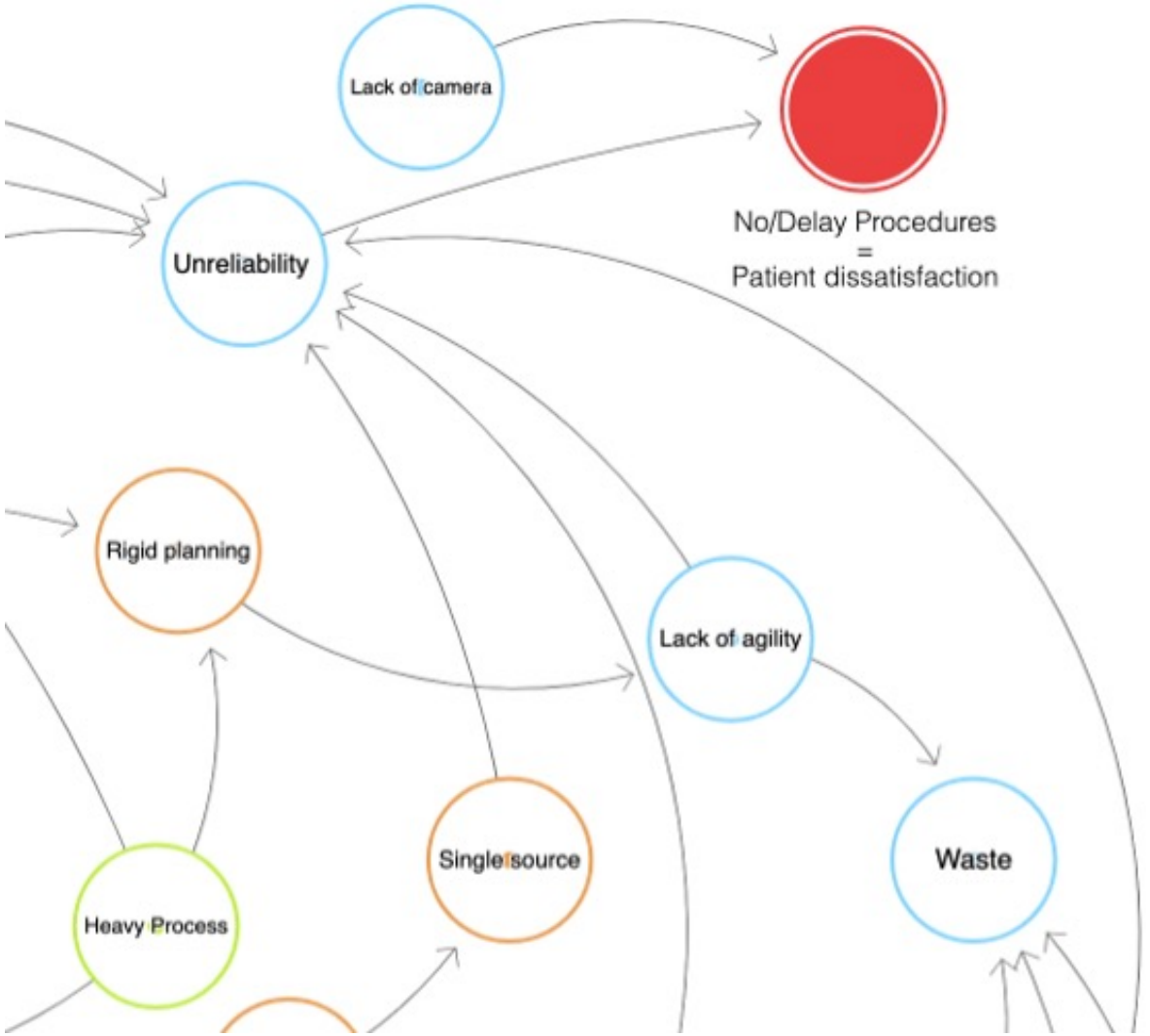
SCOR-BPMN Process-Mapping



Diagnosis of the $^{99}Mo/^{99m}Tc$ Supply Chain

SC Constraints





Development of an Integrated Performance Measurement System Methodology

Supply Chain Management

Integration

Enhance Global Performance

Performance Measurement and Management Tool

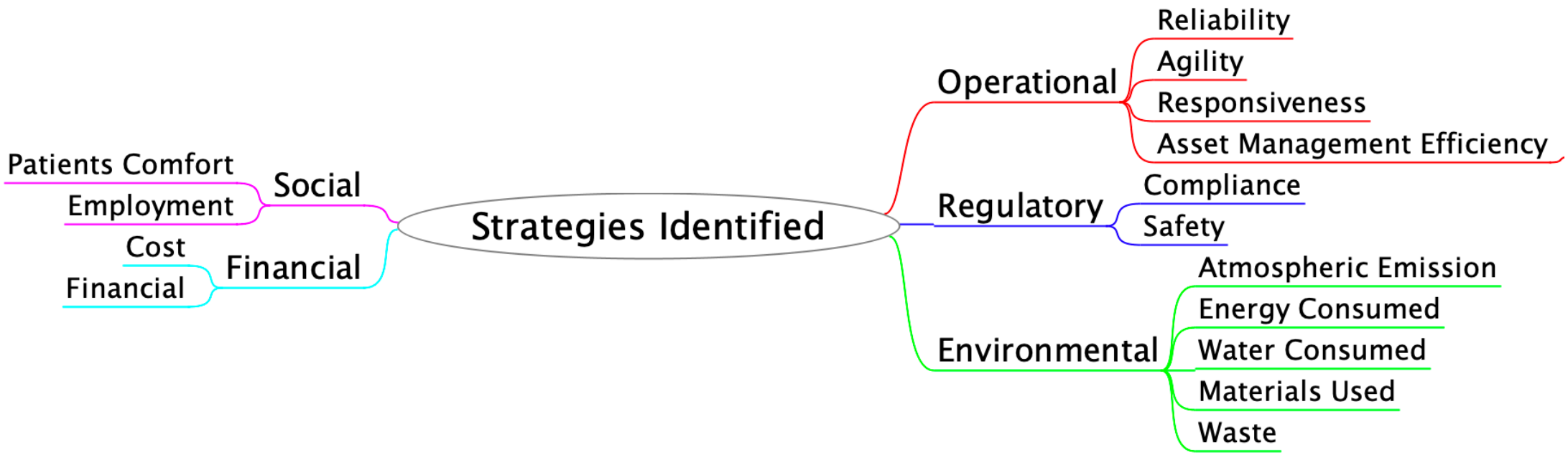
Development of an Integrated Performance Measurement System Methodology

	Scope	Functionality	Technical requirements	IRSCP tool
Performance Measurement	All actors All aspects of the SC	Overall Performance Generation	Multi-actor Multi-criteria →	**- Indicators Selection**

*IRSCP : Integrated Radiopharmaceutical Supply Chain Performance

Development of an Integrated Performance Measurement System Methodology

Strategies and KPIs Selection



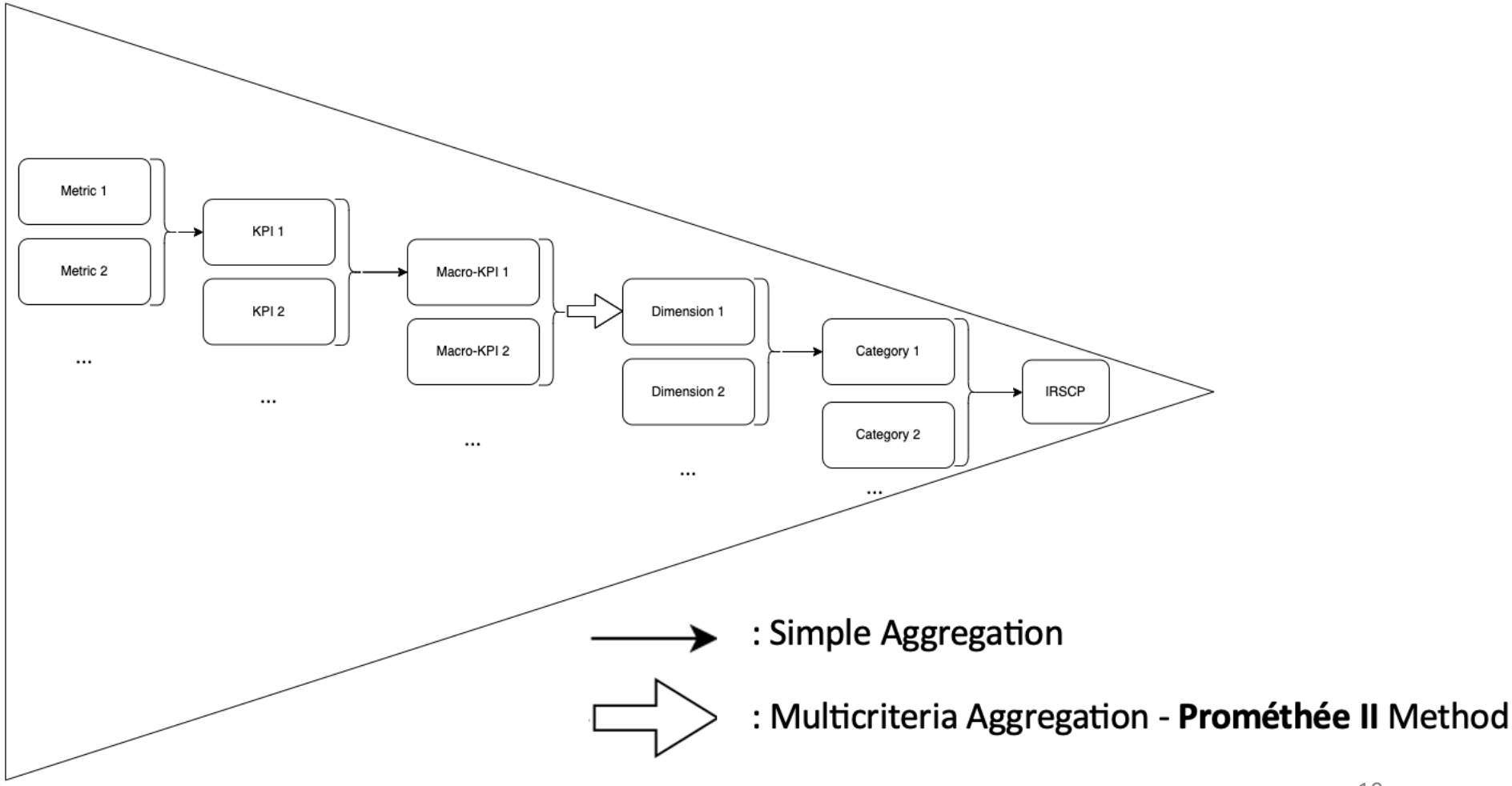
Development of an Integrated Performance Measurement System Methodology

	Scope	Functionality	Technical requirements	IRSCP tool
Performance Measurement	All actors All aspects of the SC	Overall Performance Generation	Multi-actor Multi-criteria	**- Indicators Selection** **- Pyramidal structure methodology** **•Simple aggregation** **•Multicriteria aggregation**

*IRSCP : Integrated Radiopharmaceutical Supply Chain Performance

Development of an Integrated Performance Measurement System Methodology

IRSCP Pyramidal Methodology

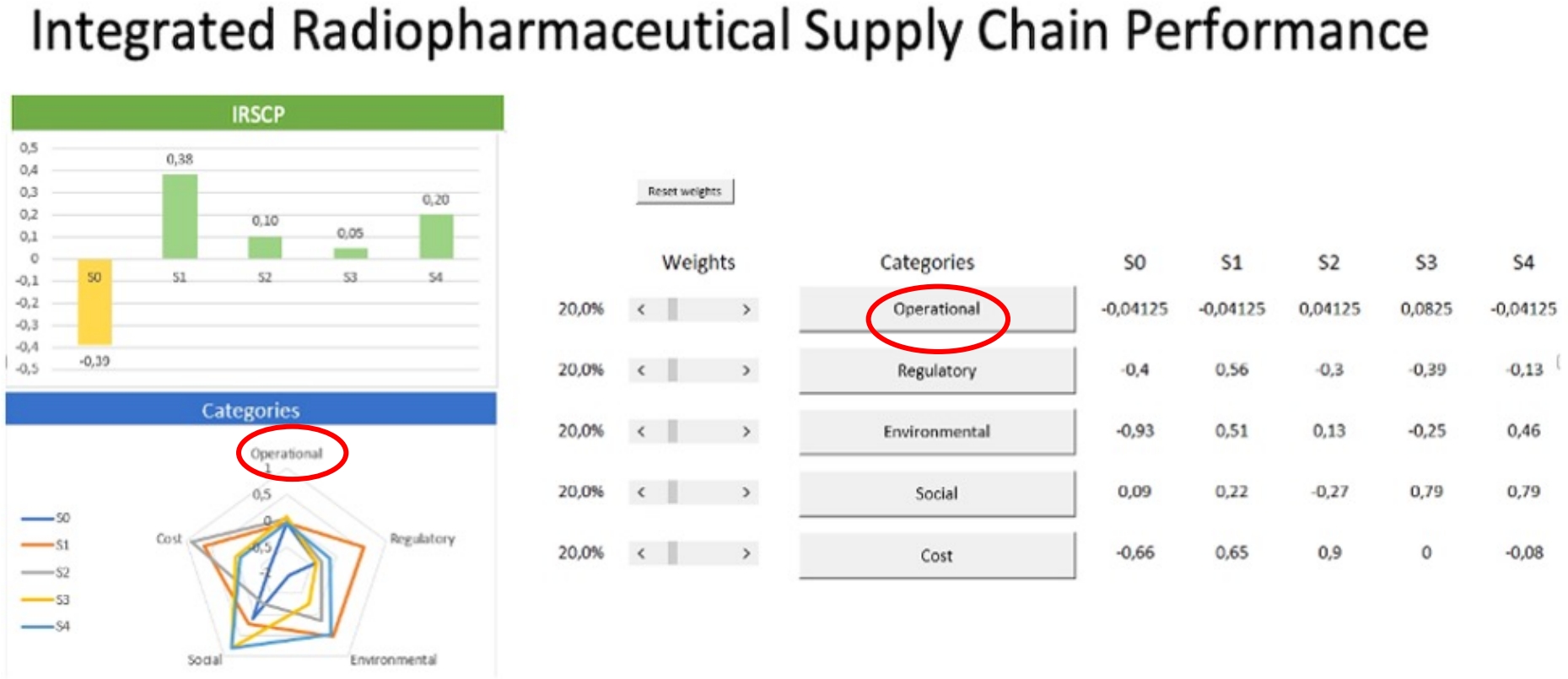


Engineering of an optimised Integrated SC

	Scope	Functionality	Technical requirements	IRSCP tool
Performance Measurement	All actors All aspects of the SC	Overall Performance Generation	Multi-actor Multi-criteria →	**- Indicators Selection** **- Pyramidal structure methodology** **•Simple aggregation** **•Prométhée II aggregation**
Performance Management	Decision Theatre - Real problems identification - Realistic solutions proposition	Detection of non-performance →	Visualization support	**Bars charts, Radars charts, Tables**

Engineering of an optimised Integrated SC

IRSCP Interface



Stakeholder - Metric

Engineering of an optimised Integrated SC

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Performance Management	Decision Theatre - Real problems identification - Realistic solutions proposition	Detection of non-performance → Application of solutions →	Visualization → Solution Parametrization →	**Bars/Radars charts, Tables** **Solution evaluation tool**

Engineering of an optimised Integrated SC

Min/Max	Best Practise N°1	Reactor	Nuc. Carrier	Processor	Rad. Carrrier	Gen Man	Nuc. Med
max	RL.1.1 Make Forecast Accuracy	(--)	(++)	(++)	(++)	(++)	(++)
	RL.1.2 Deliver Forecast Accuracy	(--)	(--)	(--)	(++)	(++)	(++)
	RL.2 Yield Variability	(++)	(.)	(.)	(.)	(++)	(++)
	RL.3.1 On-time Delivery	(++)	(.)	(.)	(.)	(++)	(++)
	RL.3.2 Orders in-full	(++)	(.)	(.)	(.)	(++)	(++)
	RL.3.3 Perfect Conditions	(++)	(++)	(++)	(++)	(.)	(++)
	RL.3.4 Documentation Accuracy	(++)	(++)	(++)	(++)	(--)	(++)
	AG.1 Source Value-at-risk	(++)	(++)	(++)	(++)	(++)	(--)
	AG.2 Time to Recovery	(++)	(++)	(++)	(++)	(++)	(++)
	A.G.3.1 Make Downside Agility	(--)	(++)	(--)	(++)	(++)	(++)
	A.G.3.2 Deliver Downide Agility	(--)	(++)	(--)	(++)	(++)	(++)
	AG 4.1 Make Upside Agility	(--)	(--)	(--)	(++)	(++)	(++)
	AG.4.2 Deliver Upside Agility	(--)	(--)	(--)	(++)	(++)	(++)
	RS 1.1 Plan Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)
	RS.1.2 Source Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)
	RS.1.3 Make Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)
	RS.1.4 Deliver Process Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)
	RS.1.5 Deliver Product Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)
	AM.1 Cash-to-cash Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)
	AM.2 Capacity Utilization	(--)	(--)	(--)	(++)	(++)	(++)
	AM.3 Production yield	(--)	(--)	(--)	(++)	(++)	(++)
	AM.4 Packaging Return Cycle Time	(--)	(--)	(--)	(++)	(++)	(++)

BP-Impact	BP-Alpha
72	1,139534884

Number or Actors	Number of KPI
6	43

	Qualitative	Quantitative
Very Good	(++)	2,00
Good	(+)	1,00
Neutral	(.)	0,00
Bad	(-)	-1,00
Very Bad	(--)	-2,00

Inf Limits	Sup Limits
-516	516
-100%	100%

Engineering of an optimised Integrated SC

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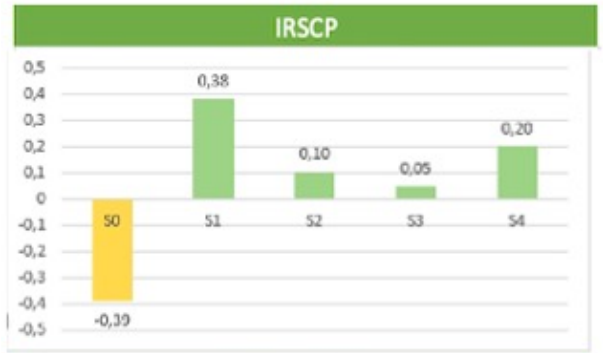
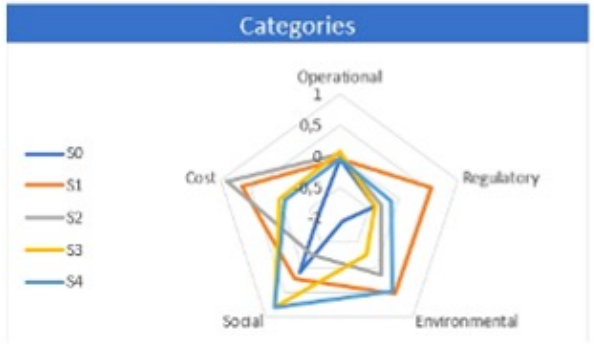
Engineering of an optimised Integrated SC

Engineering of an optimised Integrated SC

Integrated Radiopharmaceutical Supply Chain Performance





Reset weights

Weights	Categories	S0	S1	S2	S3	S4
20,0%	Operational	-0,04125	-0,04125	0,04125	0,0825	-0,04125
20,0%	Regulatory	-0,4	0,56	-0,3	-0,39	-0,13
20,0%	Environmental	-0,93	0,51	0,13	-0,25	0,46
20,0%	Social	0,09	0,22	-0,27	0,79	0,79
20,0%	Cost	-0,86	0,65	0,9	0	-0,08

Engineering of an optimised Integrated SC

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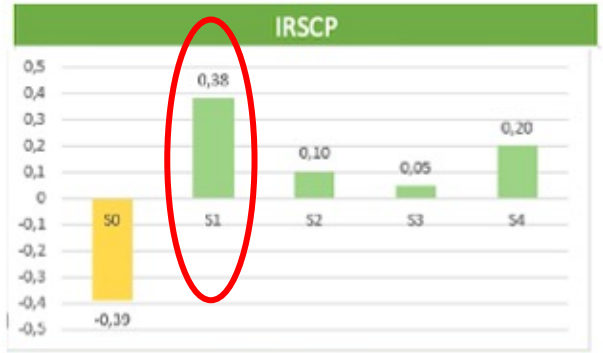
		Application of solutions →	Solution Parametrization →	**Solution evaluation tool** **Scenario Generation**
		Design of more performant SC →	Scenario Comparison →	**Enhanced overall SC Performance Identification (Prométhée II)**

Engineering of an optimised Integrated SC

Integrated Radiopharmaceutical Supply Chain Performance



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		Application of solutions →	Solution Parametrization →	**Solution evaluation tool** **Scenario Generation**
		Design of more performant SC →	Scenario Comparison →	**Enhanced Overall SC Identification**
			User-friendly Flexible Offline →	**Excel (VBA)**

Engineering of an optimised Integrated SC

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Model Validation: Case Study

I- Performance Measurement
- Data Provision
- Proxies Validation and Proposal
- Weights Determination

II- Performance Management
- Solutions Suggestion

=> Design of a better performing Mo-99 Integrated SC

Your Thoughts

+32 492 78 85 62

haingo.rabarijaona@ulb.be

linkedin.com/in/haingo-rabarijaona