32nd Annual INCOSE international symposium
hybrid event
Detroit, MI, USA
June 25 - 30, 2022

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The ISO-15288 technical processes, system maturity & conceptual gaps

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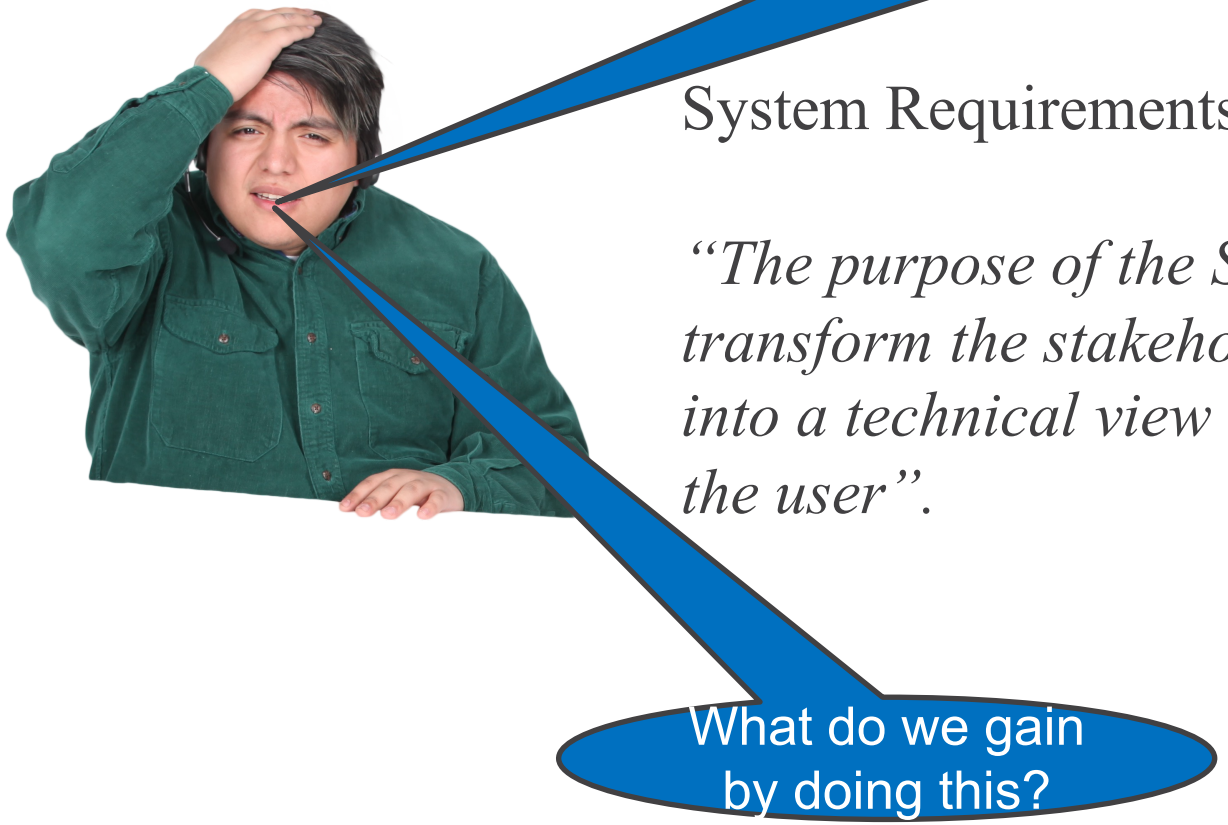
How it came about?

An Example



System Requirements Definition Process:

"The purpose of the System Requirements Definition process is to transform the stakeholder, user-oriented view of desired capabilities into a technical view of a solution that meets the operational needs of the user".

What does this mean?

I thought Design was technical or was that architecture?

System Requirements Definition Process:

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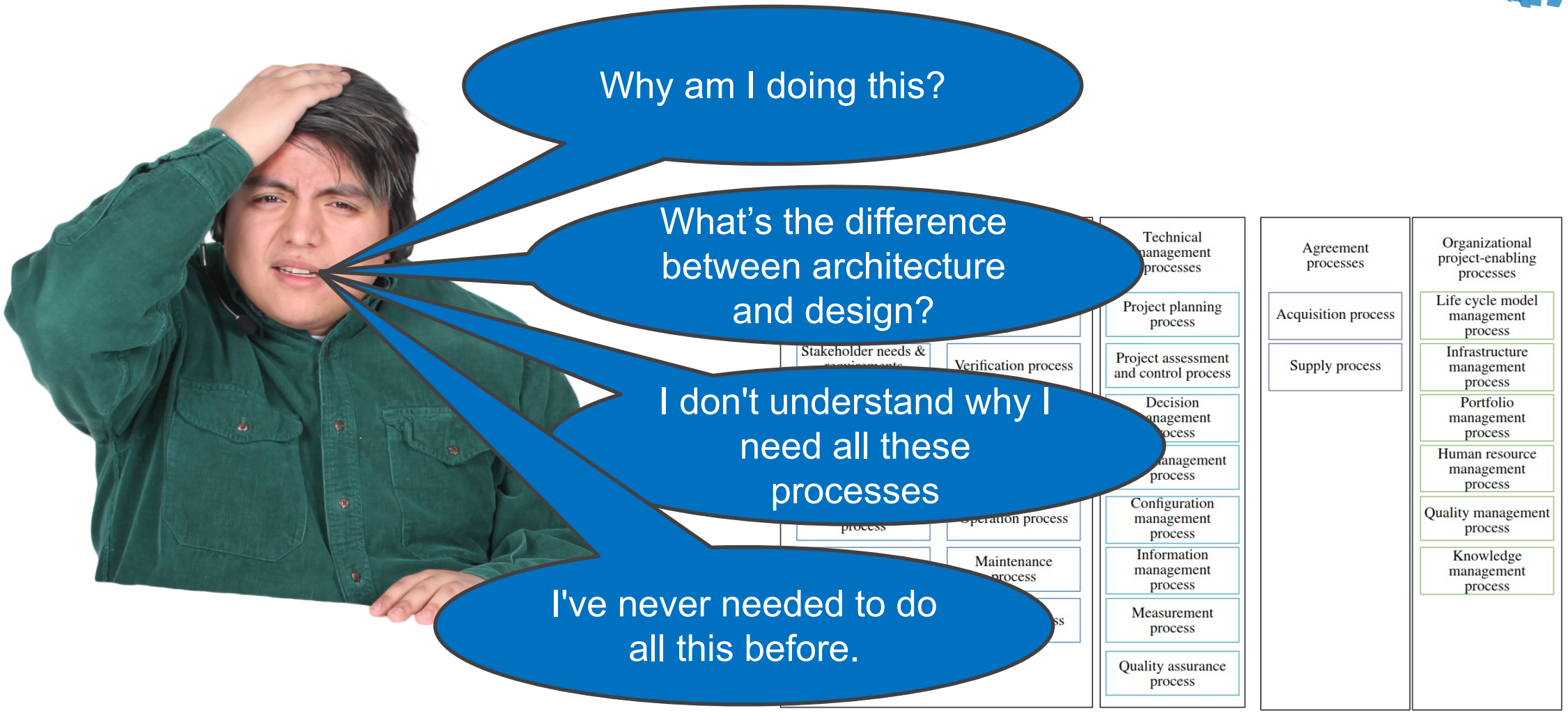
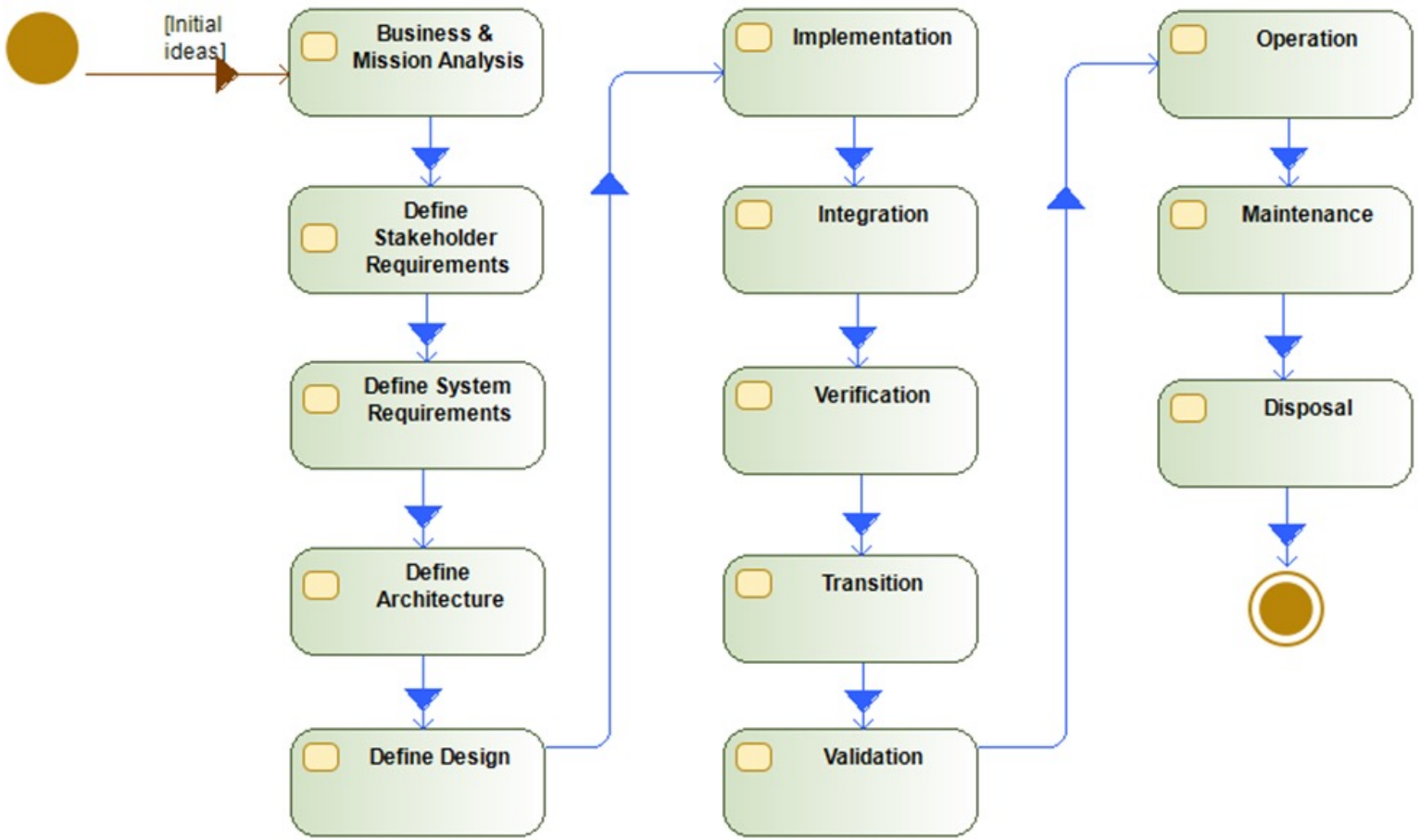
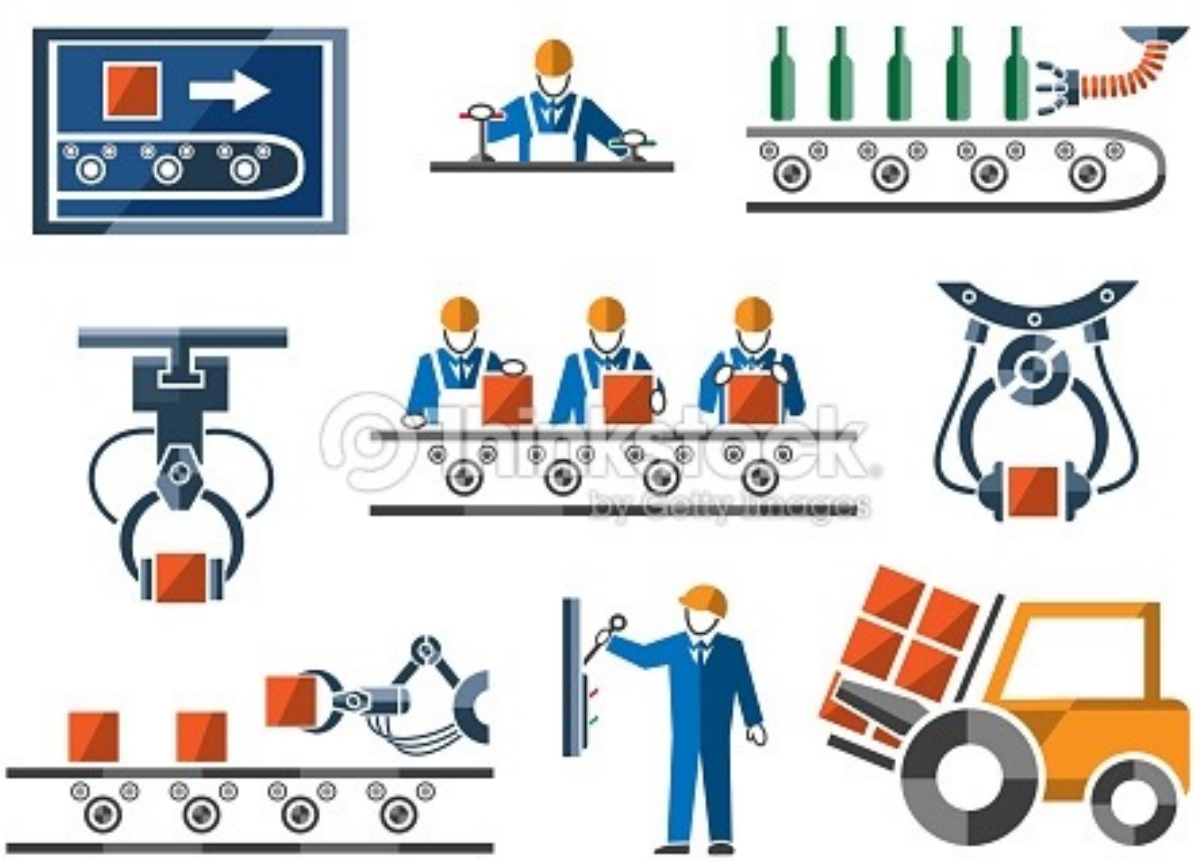

Why am I doing this?
What's the difference between architecture and design?
I don't understand why I need all these processes
I've never needed to do all this before.
Technical management processes
Project planning process
Project assessment and control process
Decision management process
Configuration management process
Information management process
Measurement process
Quality assurance process
Agreement processes
Acquisition process
Supply process
Organizational project-enabling processes
Life cycle model management process
Infrastructure management process
Portfolio management process
Human resource management process
Quality management process
Knowledge management process
Verification process
Maintenance process

Activity Diagram – Technical Processes as a Flow



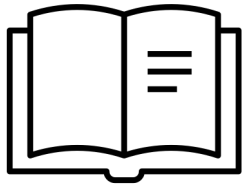
Thought Exercise – What can we learn?

Processes are unique

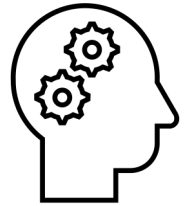


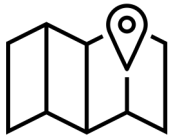
Each one enacts a state change and increases in maturity

What are conceptual gaps?



A conceptual gap arises when the concepts or elements in one statement about the system cannot be clearly mapped to concepts or elements in another statement.





Restaurant example

Process	Example
Business and Mission Analysis	Restaurant provides hot meals to customers
Stakeholder Requirements Definition	Chef shall be able to cook a meal
System Requirements Definition	System shall provide suitable heating
Architecture Definition	Heat source below pans
Design Definition	Induction heating and suitable pans
Implementation	Physical induction stove top and pans
Integration	Integrated stove top and pans
Verification	Verified stove top and pans
Transition	Operable stove top and pans
Validation	Validated stove top and pans
Operation	Stove top and pans in use
Maintenance	Maintained stove top and pans
Disposal	Disposed stove top and pans

To skip, or not to skip, that is the question

Process	Example
Business and Mission Analysis	Restaurant provides hot meals to
Operation	Stove top and pans in use
Maintenance	Maintained stove top and pans
Disposal	Disposed stove top and pans

Just the one?

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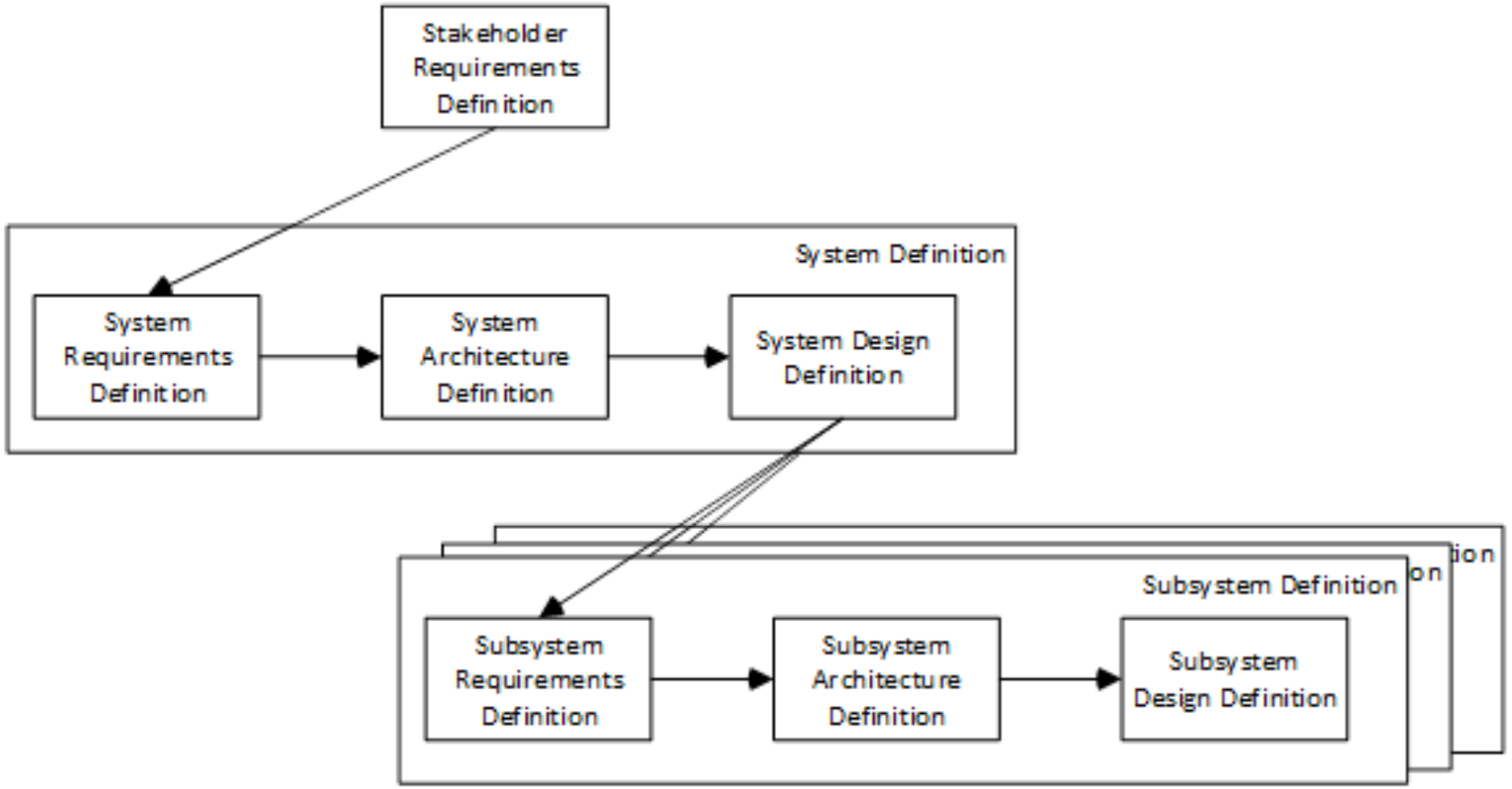
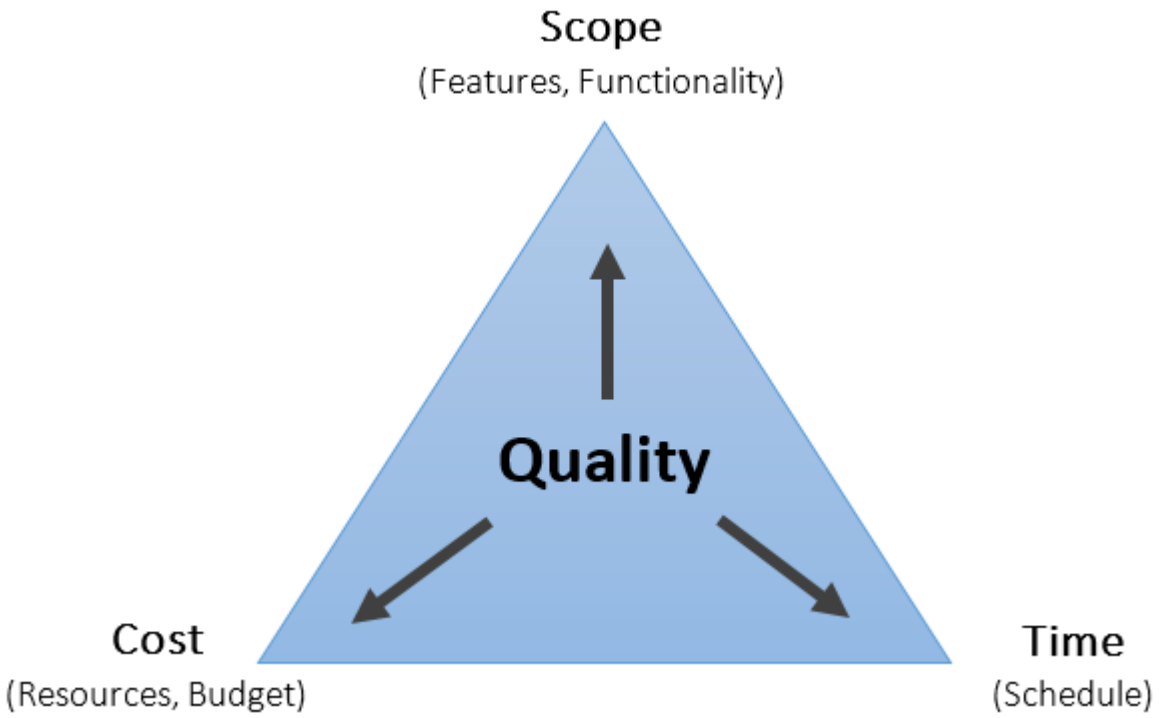
A useful tool?

Process	State Change	Example
Stakeholder Requirements Definition	**Overall Scope** → Verbs describing what the Actors want to achieve (**Actor Verbs**)	Chef shall be able to cook a meal
System Requirements Definition	**Actor Verbs** → Verbs describing what the System will do (**System Verbs**)	System shall provide suitable heating
Architecture Definition	**System Verbs** → Nouns describing what the System is in Abstract terms (**Abstract System Nouns**)	Heat source below pans
Design Definition	**Abstract System Nouns** → Nouns describing the System in Concrete terms (**Concrete System Nouns**)	Induction heating and suitable pans

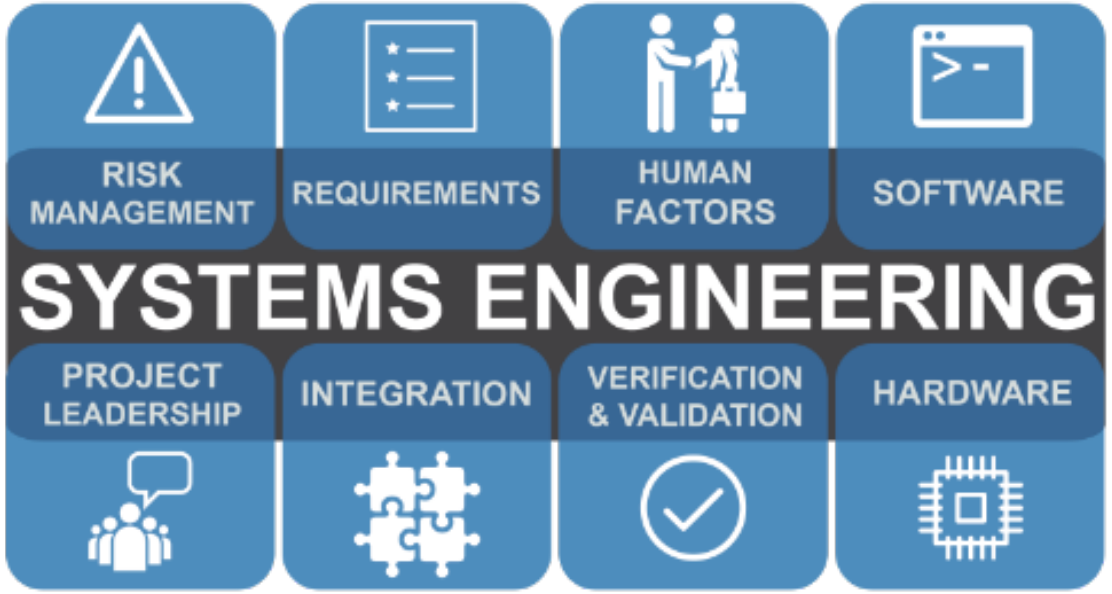
Value to the Systems Engineer



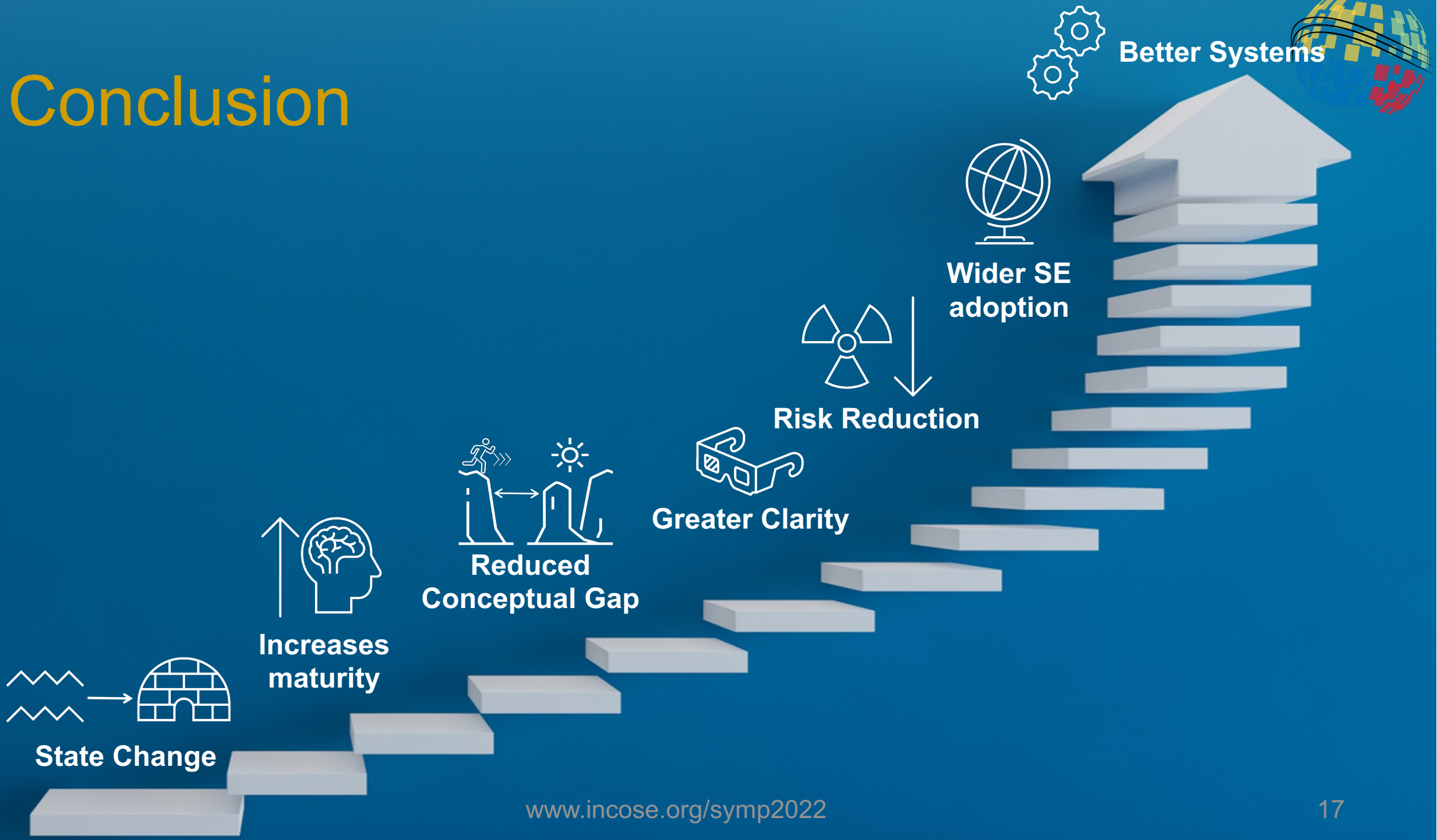
Value to the Project/Programme



Value of Systems Engineering



Conclusion


Better Systems
Wider SE adoption
Risk Reduction
Greater Clarity
Reduced Conceptual Gap
Increases maturity
State Change

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