

SESE TOUR 2022

Systems Engineering for a Sustainable World

*Cubic Verification and
Validation*

Leardi Carlo

10 May 2022

Biography



- Leardi Carlo
- **Dott. Ing. Carlo Leardi** graduated in electronic engineering in Genova, Italy. His professional background starts with quality assurance responsibility evolving in the last years to full verification, validation and testing commitment within complex systems development deployment projects in the following areas: automotive, freight railways and packaging industry.
- As a passion before and today as a full job, he is dealing with Quantitative Systems Engineering on a day-to-day application and coaching of a full range of statistical and simulation methodologies supporting the decisional process. He published several articles in Engineering and Systems Engineering journals. He is one of the founders and past President of the INCOSE Italian Chapter and founder of AISE. He taught at the Systems Engineering Masters in Tor Vergata and ForteMare in La Spezia.

Structure of the presentation

1. Cubic Verification and Validation: dimensions
2. E² Effective and Efficient, Verification and Validation
3. Environnment
4. Socio-technical attributes
5. Wrap-up

Environment

**Sustainable
Verification
and
Validation**

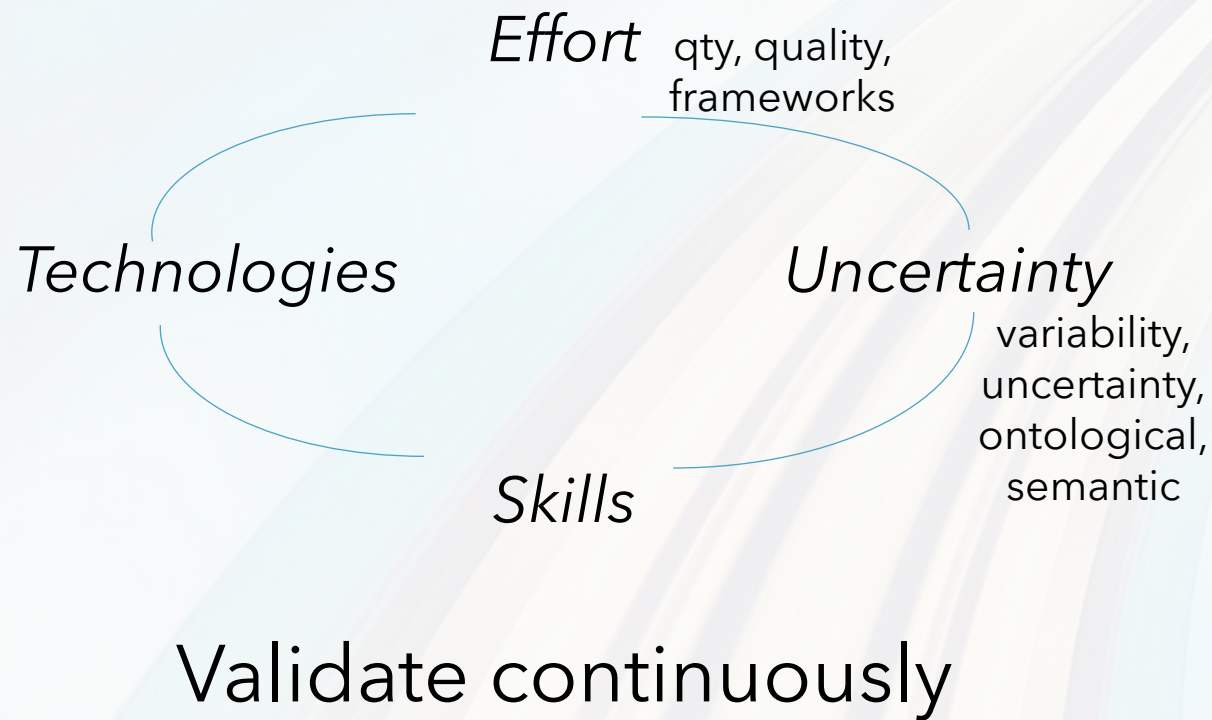
Socio-technical attributes

**E2:
Effectiveness
and
Efficiency**

E² Effective and Efficient, Verification and Validation

Effective:

Verify ASAP



Efficient:

Deliver value

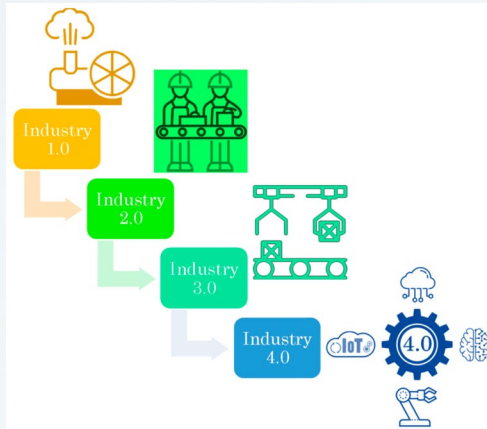


continuous flow of value

Practical and statistical
confidence

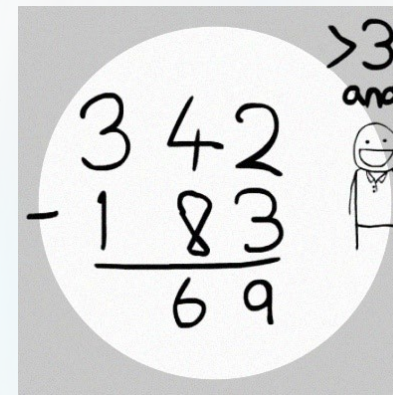
E² Effective and Efficient, Verification and Validation

7 out-of 8 socio-technical, economical attributes



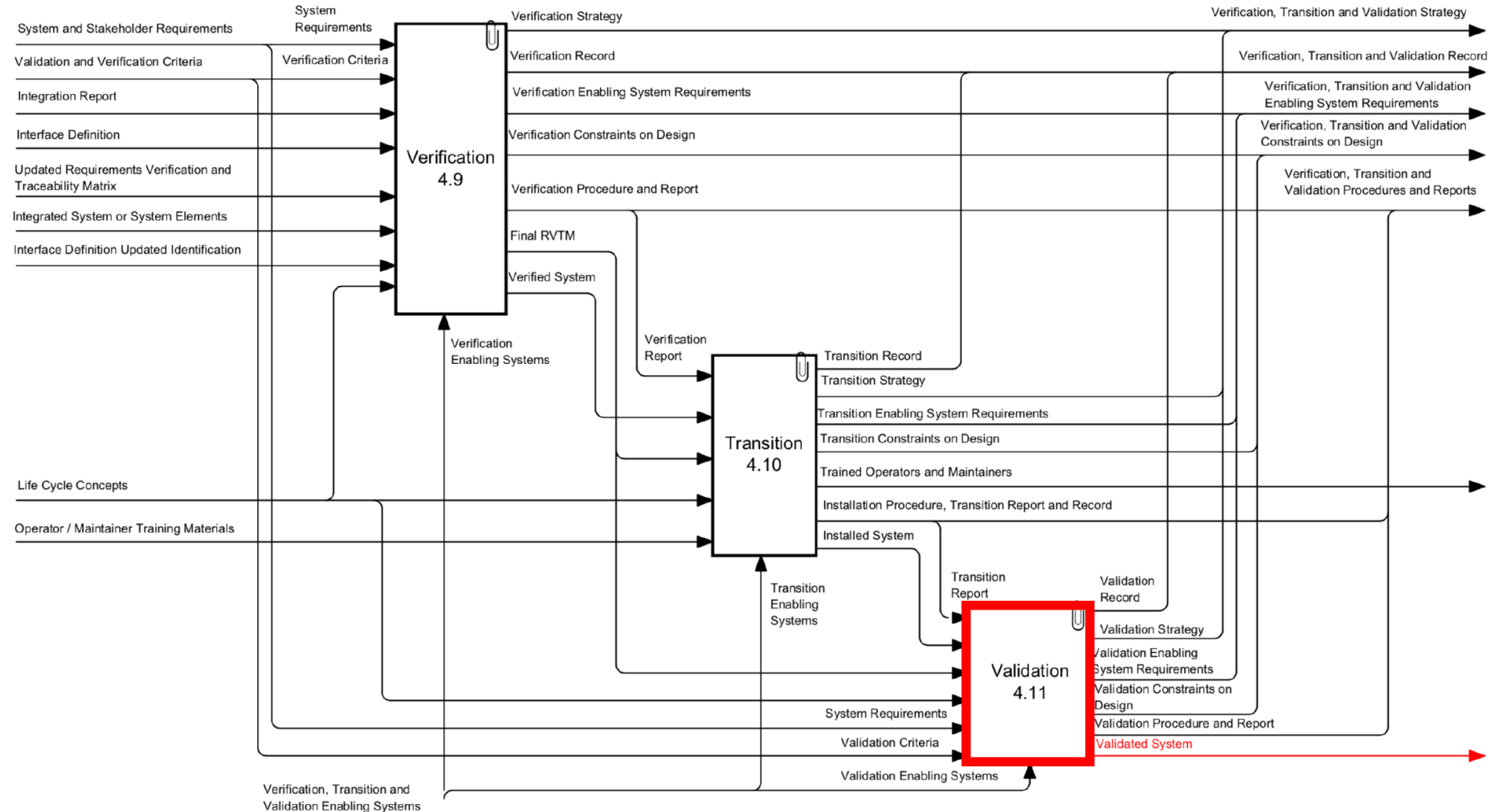
8 socio-technical, economical attributes:

Sustainable, scalable, smart, safe, stable, simple, secure, socially acceptable



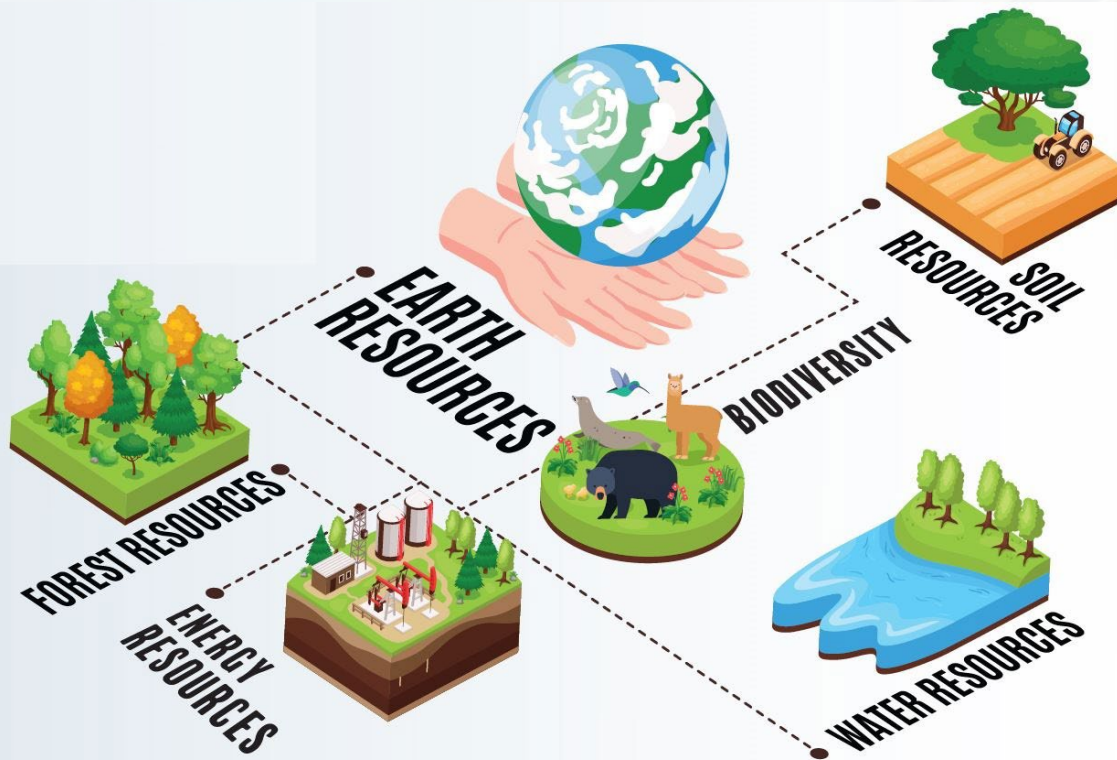
E² Effective and Efficient, Verification and Validation

Keep the best and improve the rest



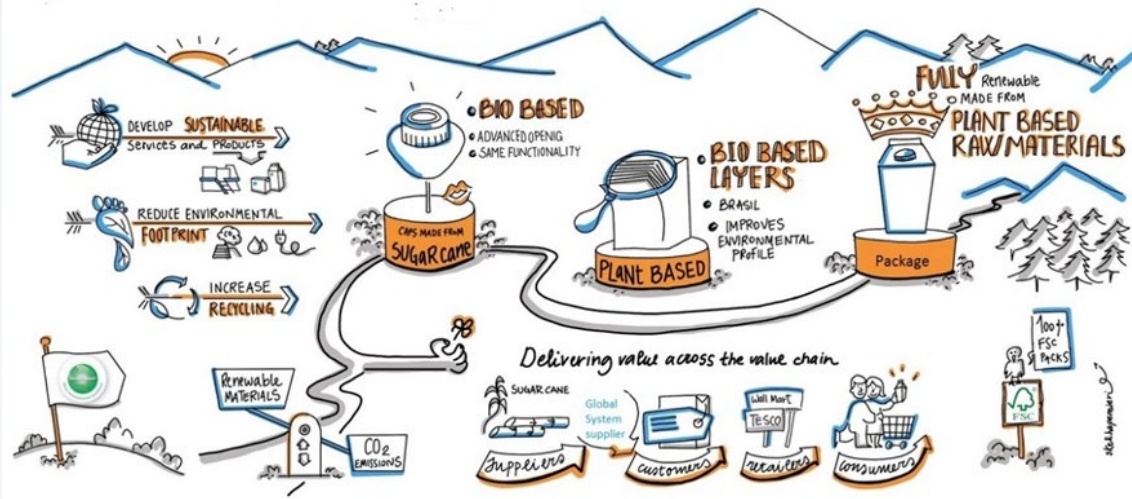
Environnement

capturing the topic in INCOSE 2035 VISION



Environnent

the food packaging industry viewpoint migration



6 - INCREASING RECYCLING

Working ahead of the curve and partnered with organisations working across the waste value chain to boost recycling of used cartons into useful things like classroom desks.

5 - BUILDING AWARENESS

Promoting several initiatives to improve consumer awareness on food safety and environment to encourage good eating habits and proper waste management.

1 - RESPONSIBLE SOURCING

Cartons primarily made from paper and a commitment to sourcing paperboard only from well managed forests.

2 - WORLD CLASS MANUFACTURING

Manufacturing aseptic packaging material while increasing efficiency and reducing waste.

3 - INNOVATIVE SOLUTIONS

Developing processing and filling systems that minimise food waste while ensuring food safety and lowering environmental footprint.

4 - IMPROVING AVAILABILITY

Working with the food industry to make nutritious food accessible and available to everyone, everywhere without needing refrigeration in manufacturing or distribution.



Socio-technical aspects

A few tough questions...

Engineered by humans
For
Humans, society and humanity

Does it enlarge the systems thinking boundaries?
Whom can benefit from system's operations?
Whom can be hurt?



Socio-technical aspects

PESTLE relationships



Socio-technical aspects

A question for Systems engineers?

Insights, September 2021
Volume 24/ Issue 3

Social Dimensions of Systems

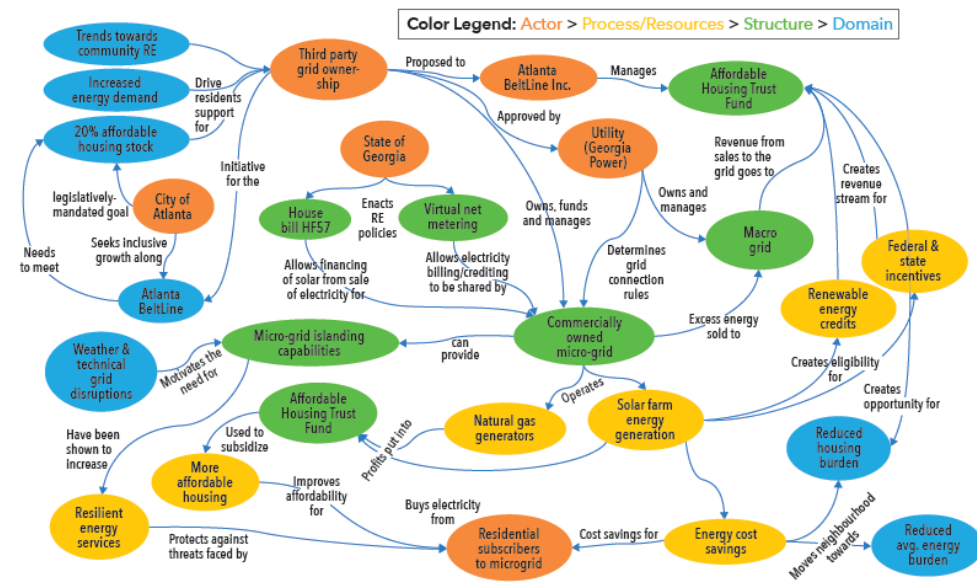


Illustration credit: from the article
To Get Systems Engineers Interested in Social Dimensions,
Give Them a Social Optimization Problem
by Tom McDermott and Molly Nadolski (see page 27)

"To Get Systems Engineers Interested in Social Dimensions, Give Them a Social Optimization Problem" by Tom McDermott and Molly Nadolski present a case study on student-led implementation trades for urban electrical microgrids that optimize community sustainability and resilience. In this case study,

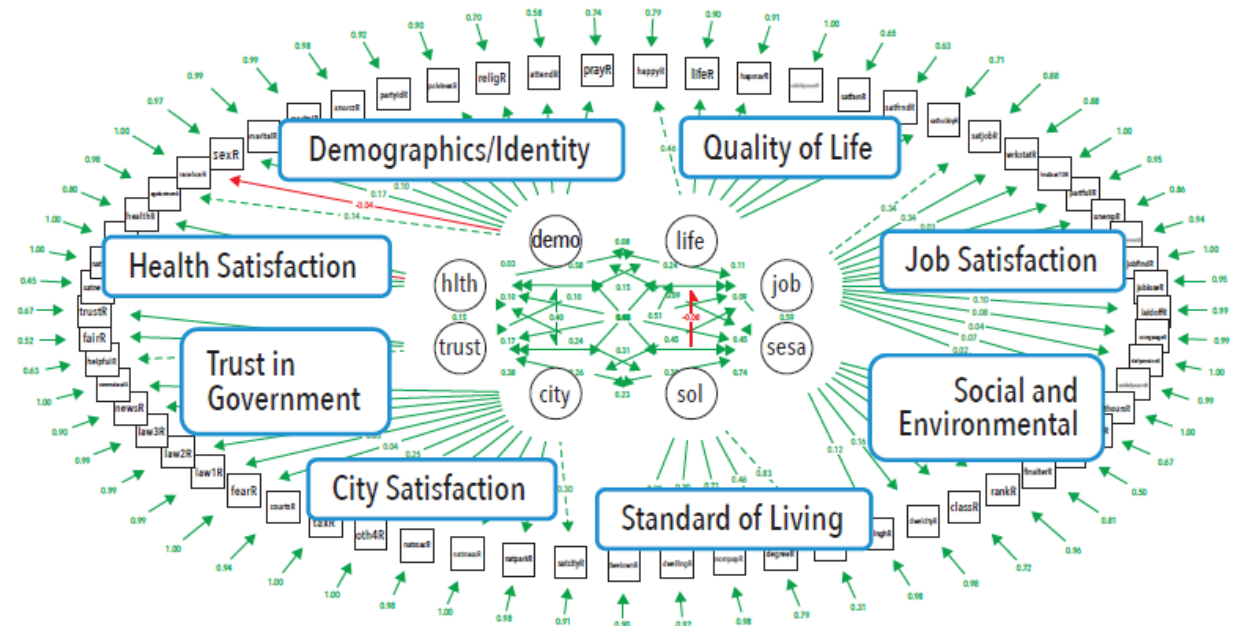


Figure 3. Human Capital Factors Associated with Community Resilience (Hutto, 2017).

Wrap-up

At least three dimensions of Sustainability

Convergence to Human and society needs

Continuity to guarantee sustainable systems for one world



Questions ?