Is it always clear what 'good quality' is? – Value choices in quality management

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What is quality?

Do we all agree on quality characteristics and priority of these characteristics?

Probably yes, most of the time.
But there are value-laden and controversial elements.

For example in system scoping:

Lean systems: E.g. inventorying well known and popular processes and effects (e.g. only air emissions of CO_2, NO_x, SO_2 from fuel use)

Full systems: Assessing systems in depth, including 'far-background' processes, auxiliary materials and exotic pollutants.

Control vs. Curiosity

Lean system

- System parts and effects are well known and 'popular'.
- Focus on 'known knowns' (WYKIWYG)
- Quite predictable, usually unsurprising results.

Full system

- Effort on extensions to reduce unknowns.
- Gain of new knowledge.
- Surprises are possible.
- Hitherto unknown or unexpected effects could become detected as important.

Is complexity a good thing?

Lean system

- **Reduced system complexity with low to moderate inventory workload**
- **Streamlined system = many *intentional* data gaps**

Full system

- **Complex system with high inventory workload**
- **Data gaps minimised**
- **Often larger uncertainty in results**

Closure vs. Completeness

Lean system

- **Few or no data gaps (except the intended ones)**
- **High risk of burden shifting (stakeholders replace the assessed burdens with the not-assessed ones)**

Full system

- **Some data gaps filled, many remain.**
- **Every result is always 'preliminary' as more data might be added.**
- **Precautionary principle of heeding every burden.**
- **Lowers the risk of burden shifting ***

* ***The*** **major reason to assess life cycles in the first place**

Lean vs. full systems

Every LCA system is inherently complex:

How do we deal with that complexity?

- Do we cut down complexity by focussing on the well-known, 'popular' system parts?
- How can we know that the 'popular' system parts are the relevant ones for the assessed process?

Two 'archetypes' for these questions:

Conservative: favours lean systems and popular processes

Progressive: favours full systems, curious disposition

Conservative review outcomes

A Conservative reviewing a lean system LCA

- **"complete"** all of the few pre-set emissions are recorded
- **"low uncertainty"** because system complexity was reduced

A Conservative reviewing a full system LCA

- **"incomplete"** data gaps for a lot of emissions
- **"high uncertainty"** because system is complex and also unpopular or speculative effects are included

Progressive review outcomes

A Progressive reviewing a lean system LCA

- **"incomplete"** a lot of pollutants are intentionally missing
- "**results questionable**" for environmental decision making because burden shifting is possible → higher "decision uncertainty"

A Progressive reviewing a full system LCA

- **"as complete as possible"** a lot of pollutants are heeded according to available sources
- "**results suitable**" because risk of burden shifting is lowered. Priority of avoiding data gaps/burden shifts over result value uncertainty.

Concluding remarks

- The foremost quality of LCA studies is that they try to create a **synoptic view** of the burden potential of the assessed processes
- The prime motivation for this synoptic effort is the **avoidance of burden shifting** from LCA-based decisions
- Intentionally cutting down this synoptic complexity might be a **pragmatic short-cut**, but clashes with the prime motivation
- Completeness produces complexity, which tends to lead to **larger uncertainty** and variability in result values (Min-Max ranges)
- Data gaps raise **"decision uncertainty"**, but without leading to any quantitative signals in the result and nothing to perceive.

Thank you for your attention