

SUSTAINABILITY BEYOND GUIDELINES

How our perception of research infrastructures shapes our understanding of sustainability?

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Bertolt Brecht (1935) Fragen eines lesenden Arbeiters / Questions From A Worker Who Reads

Wer baute das siebentorige Theben?
In den Büchern stehen die Namen von Königen.
Haben die Könige die Felsbrocken herbeigeschleppt?
Und das mehrmals zerstörte Babylon,
Wer baute es so viele Male auf? In welchen Häusern
Des goldstrahlenden Lima wohnten die Bauleute?
Wohin gingen an dem Abend, wo die chinesische Mauer fertig war,
Die Maurer? Das große Rom
Ist voll von Triumphbögen. Über wen
Triumphierten die Cäsaren? Hatte das vielbesungene Byzanz
Nur Paläste für seine Bewohner? Selbst in dem sagenhaften Atlantis
Brüllten doch in der Nacht, wo das Meer es verschlang,
Die Ersaufenden nach ihren Sklaven.

Der junge Alexander eroberte Indien.
Er allein?
Cäsar schlug die Gallier.
Hatte er nicht wenigstens einen Koch bei sich?
Philipp von Spanien weinte, als seine Flotte
Untergegangen war. Weinte sonst niemand?
Friedrich der Zweite siegte im Siebenjährigen Krieg. Wer
Siegte außer ihm?

Jede Seite ein Sieg.
Wer kochte den Siegeschmaus?
Alle zehn Jahre ein großer Mann.
Wer bezahlte die Spesen?

So viele Berichte,
So viele Fragen.

Who built Thebes of the seven gates?
In the books you will find the name of kings.
Did the kings haul up the lumps of rock?
And Babylon, many times demolished.
Who raised it up so many times? In what houses
Of gold-glittering Lima did the builders live?
Where, the evening that the Wall of China was finished
Did the masons go? Great Rome
Is full of triumphal arches. Who erected them? Over whom
Did the Caesars triumph? Had Byzantium, much praised in song,
Only palaces for its inhabitants? Even in fabled Atlantis
The night the ocean engulfed it
The drowning still bawled for their slaves.

The young Alexander conquered India.
Was he alone?
Caesar beat the Gauls.
Did he not have even a cook with him?
Philip of Spain wept when his armada
Went down. Was he the only one to weep?
Frederick the Second won the Seven Years' War.
Who Else won it?

Every page a victory.
Who cooked the feast for the victors?
Every ten years a great man.
Who paid the bill?

So many reports.
So many questions.

translated by M. Hamburger from Bertolt Brecht, Poems 1913-1956, Methuen, N.Y.,
London, 1976

This talk: Looking for the role of 'people' in the sustainability of Ris!

'People' in RIS and sustainability – two examples

- Lessons learned from a RI project – CENDARI looking into its own sustainability
- Comprehending RIs – the role of architectural models/reference models to catch aspects of sustainability

CENDARI sustainability – 2016

(together with Jennifer Edmonds, DARIAH-ERIC)

- Experience from the CENDARI Project: in 2016 presented a report on sustainability

→ New Paradigm:

- **Sustainability as a process** rather than a state
- Goal of sustainability is **transformation and reuse**
- There are many aspects of sustainability, but in fact you need to consider all of them. **People** is one of the aspects.

CENDARI conclusions

Sustainability of the **Technical Infrastructure**

- Identify a **partner** responsible for the maintenance after end of the project
- Have a realistic expectation for how long software will remain useful
- Design the infrastructure in a way that the single elements can be reused
- Technical documentation available

Recommendations on **Process**

- Start early to think re. sustainability
- Think of a 3-5 years window
- Reuse whenever possible (knowledge, standards, data, code)

Sustainability of **Research Data**

- Use standards and open formats, reuse previous work, and find a partner to continue development (DARIAH, PARTHENOS), document work
- Build **robust social structures** (e.g. documented use policies, contracts, license, MoU) to build trust
- Be clear about what you have collected your data for, and what its value is (and for whom)

Take Away from CENDARI – human capital is key for sustainability

Sustainability of Knowledge Capital

- Ensure that research work can be accessed reliably (e.g. persistent identifier) in a variety of easy to find, relevant formats and locations
- Build in a 'Tacit Knowledge Audit' process to the project and publish appropriately around this

“staff”

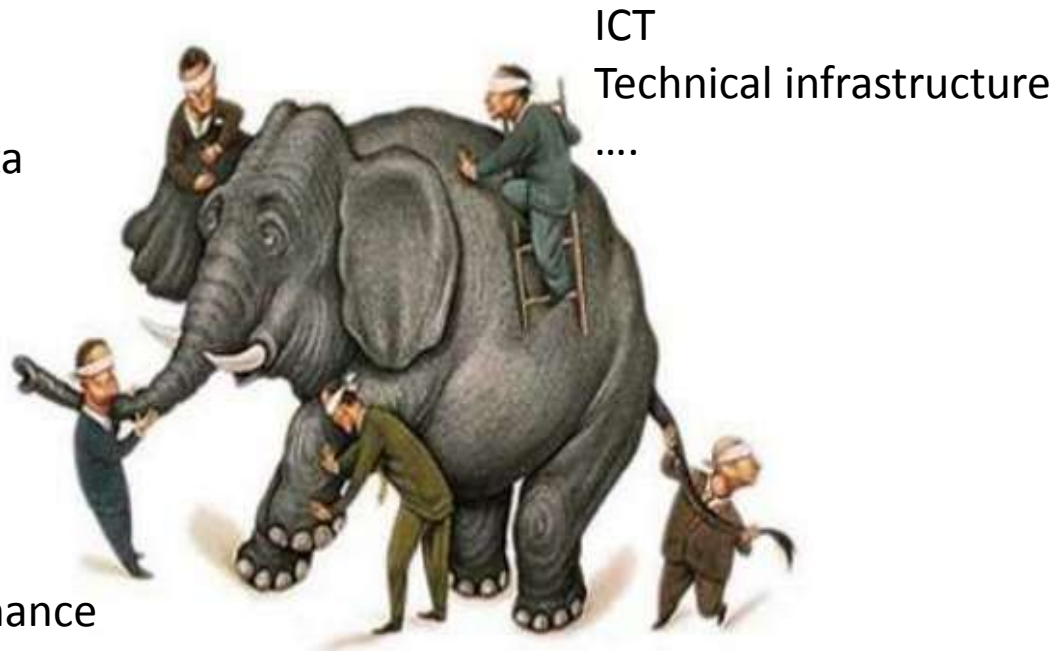
Sustainability of User Community

- Maintain a consistent central communication point
- Find a context or platform that fosters continued engagement and communications (DARIAH Working Group)
- Provide to the end users with simple instruments or forms to contact the project's team, to add content, report bugs and query usage of tools

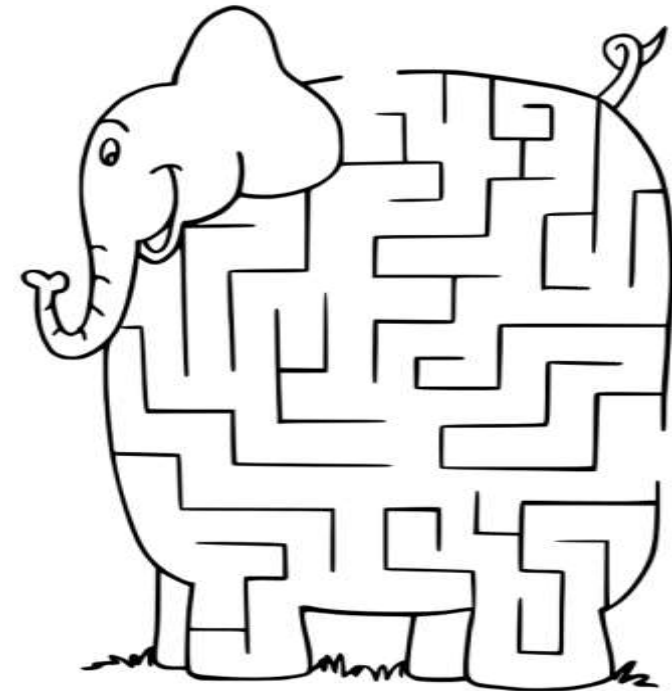
“user”

Factors influencing sustainability

Community
Research data
....



Policy/ governance
Process
....



People talk about sustainability but they talk about different things without knowing or noticing!

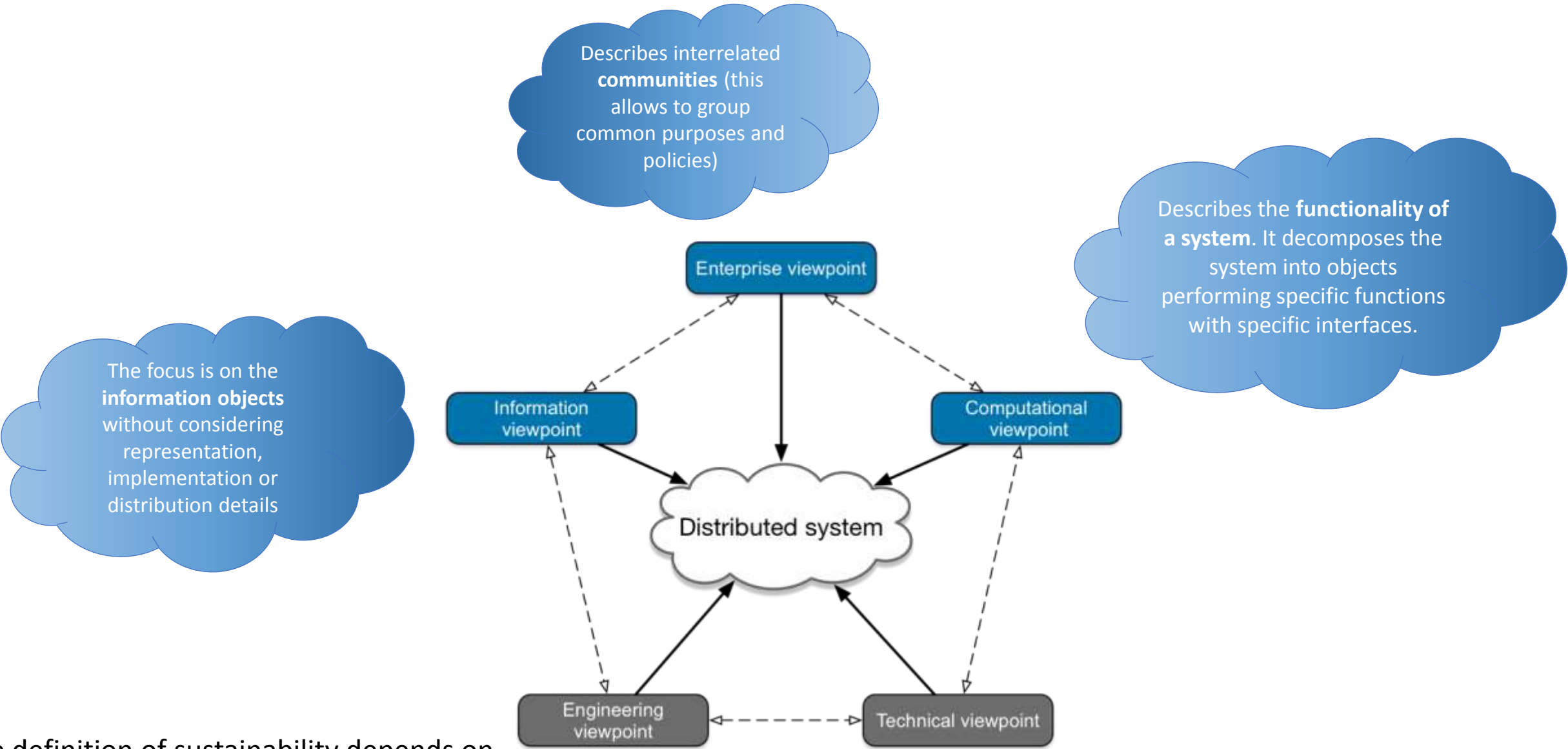
Reference Architecture Models

(together with Mike Priddy, DANS-KNAW)

Why do we need architectures and what are they?

- Provide a **blueprint**, a clear and **unambiguous** description of the components and functioning of a RI, therefore it makes it easier to sustain the aspects of RIs
- Reference architectures help different stakeholders to collaborate and to communicate effectively
- A reference architecture comprises a document or set of documents which provide recommended structures and integrations of products and services

*Developed in the context of the project *Humanities At Scale (HaS)*



The definition of sustainability depends on the viewpoint one chooses. Ideally, they all are represented in a sustainability analysis.

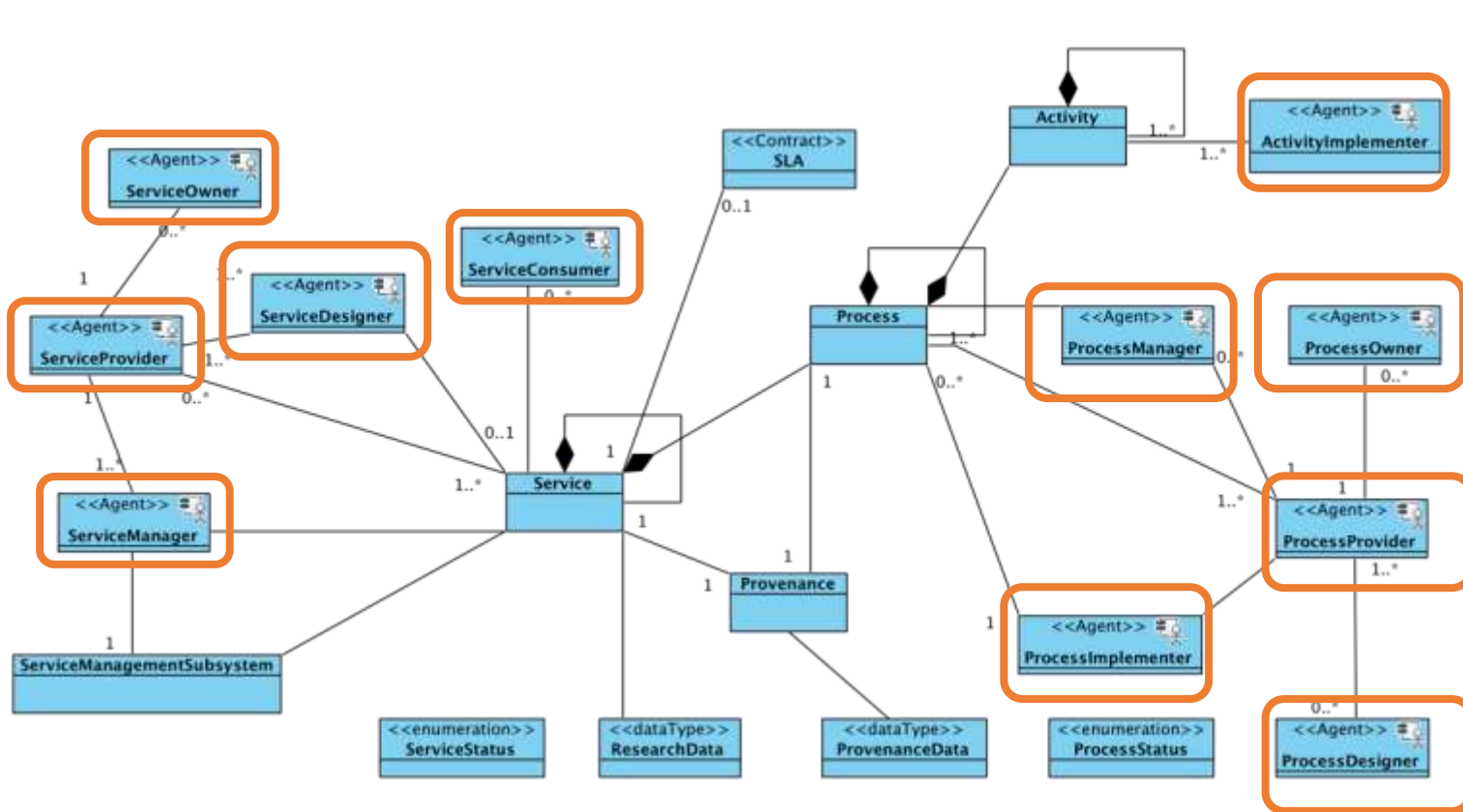
ODP-RM – Open Distributed processing - Reference Model

PEOPLE's actions make a RI and define its sustainability

How/where do they appear in a reference architecture?

The **communities** are described by community contracts which contain the **objectives**, **roles**, **policies**, **behavior** and **enterprise object types** of a community





AGENTS

- ServiceOwner
- ServiceProvider
- ServiceDesigner
- ServiceManager
- ServiceConsumer
- ActivityImplementer
- ProcessManager
- ProcessOwner
- ProcessProvider
- ProcessImplementer
- ProcessDesigner

Service Information - Object Types and Relationships

Example from the Reference architecture for the DARIAH in-kinds

Summary

Sustainability

- Is a process not a tickbox
- Needs early setting of goals
- Penetrates the architecture of a RI



Requires

- Documentation
- Institutions
- Human capital



Risks

- Ephemeral institutional settings
- Diverse roles, responsibilities, skills sets of the human capital involved

Both can inhibit the transfer of knowledge which is inherent to sustainability

Sustainability in RI's means also sustainability in people

“ RI can be seen as the dead end of a scientific career where only publications count and this perception needs to be avoided.” (19)

“The development of a service-oriented mission is essential for sustainability and this goal needs to be reflected in the staff and management skills, as stated by an RI the service provider role goes beyond an academic laboratory – with clients and shareholders; having a good knowledge of operations, contracting, service provision, quality control, etc. without professional provision of services, sustainability is at risk.” (19)

“The attractiveness of an RI career is directly linked to the RI reputation as well as its visibility. Measures to increase visibility of services need to be assessed, such as a system to trace the involvement of RI in publications or even the potential implementation of an RI service voucher system.” (21)

Conclusions

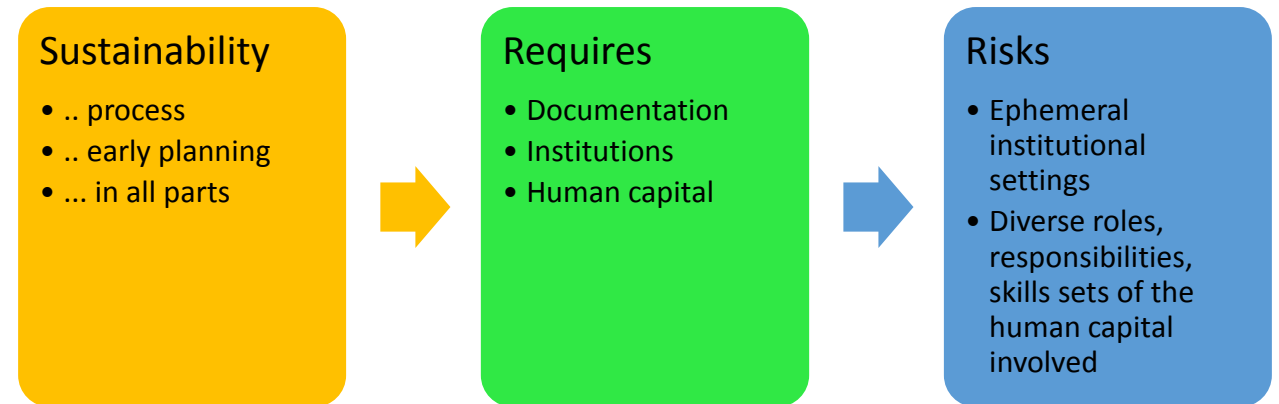
- Key of sustainability are people
- Investments in people needs to be reflected in flexible organizational structures as well as in the developments of new development paths
- Formal descriptions of roles and functions can support the knowledge transfer, but people are much more than this.

Stable institutions, profound and agile education, defined career paths and functions are preconditions for sustainability

Whatever guidelines, business models, and alike we develop, we need people who understand them, execute them, change them!

Discussion

- What do you think about the balance between the different factors we listed? What is a necessary what a sufficient condition for sustainability



- Measures we can take as community to address the concerns around human capital (career paths, training, ...)

References and pointers

- CENDARI Project, <http://www.cendari.eu>
- Christine L Borgman, Paul N. Edwards, Steven J. Jackson, Melissa K. Chalmers, et al.. "Knowledge Infrastructures: Intellectual Frameworks and Research Challenges" *Deep Blue*(2013)
Available at: <http://works.bepress.com/borgman/318/>
- DARIAH Reference Architecture, <https://priddy.github.io/DARIAH-RA/service/>
- Humanities at Scale Project, <http://has.dariah.eu/>
- RM-ODP: The ISO Reference Model for Open Distributed Processing, Antonio Vallecillo <http://ae.aim.nl/weblog/ISO%20TR9007/odpeng%5B1%5D.pdf>
- Sustainable European Research Infrastructures - A call for action. COMMISSION STAFF WORKING DOCUMENT. Long-term sustainability of Research Infrastructures - SWD(2017) 323 final