Network of publicly available laboratories for knowledge sharing, research and development on demand

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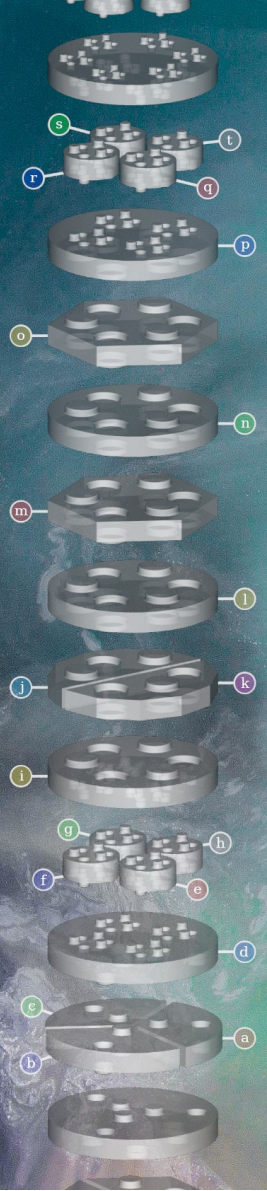

Enjoy	q	Comprehend	r	Create	s	Share	t
p	Freedom - responsibility						
Responsibility							o
n	Responsibility - accountability						
Accountability							m
l	Accountability - subject						
Solo	j			Together			k
i	Subject - action						
Use	e	Study	f	Modify - Transform	g	Make & distribute copies	h
d	Action - "object"						
Software - Procedures - Operations	a	Matter - Energy - Spacetime	b	Information - Data - Variables	c		

$$G_p = \begin{bmatrix} o & q & r & s & t \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

$$G_n = \begin{bmatrix} m & o \\ 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$G_l = \begin{bmatrix} j & k & m \\ 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

$$G_i = \begin{bmatrix} e & f & g & h & j & k \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

$$G_d = \begin{bmatrix} a & b & c & e & f & g & h \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

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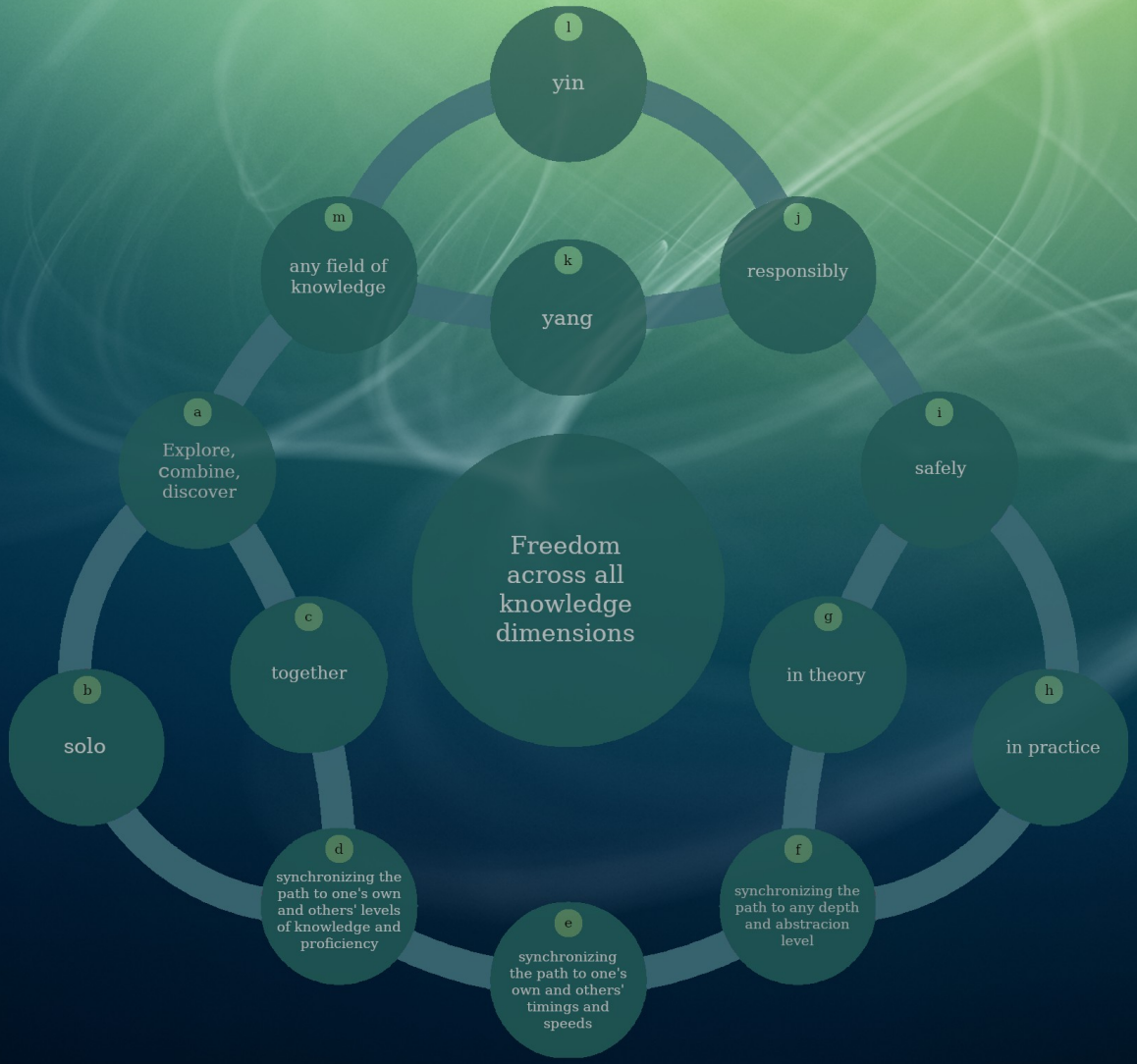

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The illustration is not limited to the presented knowledge fields. Every laboratory is not limited to operate in the knowledge fields its description refers to. They are just optimized for them

- customers 6
- key activities 7
- organization 8
- partnerships 10
- customer releshionships 11
- possible common costs 15
- revenue streams 15

notes

* [1] - Micro Electro Mechanical Devices
* [2] - Nano Electro Mechanical Devices
* [3] - Computerized Comunication, Command, Control, Intelligence, Survaillance, Target Acquisition and Reconnaissance
* [4] - Precision Guided Munitions

Leonardo da Vinci laboratories complex

* aerospace engineering research laboratory
* mechanics research laboratory
* thermodynamics research laboratory
* fluidodynamics research laboratory
* robotics research laboratory

Ada Lovelace laboratories complex

* computer science research laboratory
* high performance computing research laboratory
* quantum computing research laboratory
* machine learning research laboratory
* data analytics research laboratory

Huygens laboratories complex

* electronics research laboratory
* photoelectronics research laboratory
* optics research laboratory
* microelectronics research laboratory
* MEMS[1] and NEMS[2] research laboratory

Democritus laboratories complex

* material science and engineering research laboratory
* metallurgy research laboratory
* polymers research laboratory
* ceramics research laboratory
* composite materials research laboratory

payloads | people | ideas | information | resources | equipment | money | payloads

backbone links | air | internet | sea | space | road | railway | backbone links

Galileo Galilei laboraries complex

* radioastronomy research laboratory
* astrophysics research laboratory
* space exploration research laboratory
* microgravity research laboratory
* Europa (Jupiter moon) in situ research laboratory

Ettore Majorana laboratories complex

* nuclear science and engineering research laboratory
* particle physics research laboratory
* neutrino research laboratory
* quantum physics research laboratory
* gravitational waves research laboratory

Socrates laboratories complex

* deep sea research laboratory
* biology research laboratory
* exobiology research laboratory
* disease prevention and medical care research laboratory
* music, art, literature research laboratory

Arjuna laboratories complex

* cryptography and cryptoanalysis research laboratory
* quantum cryptoanalysis research laboratory
* combined and multidomain warfare research laboratory
* C4ISTAR[3] and cyberwarfare research laboratory
* PGMs[4] and logistics research laboratory

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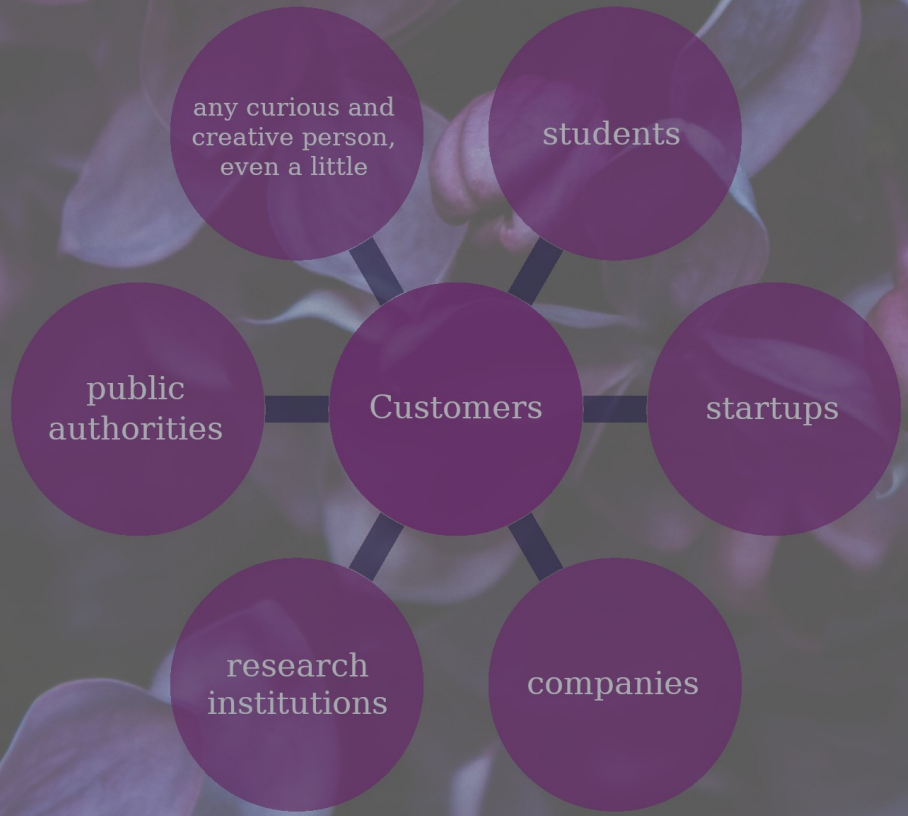

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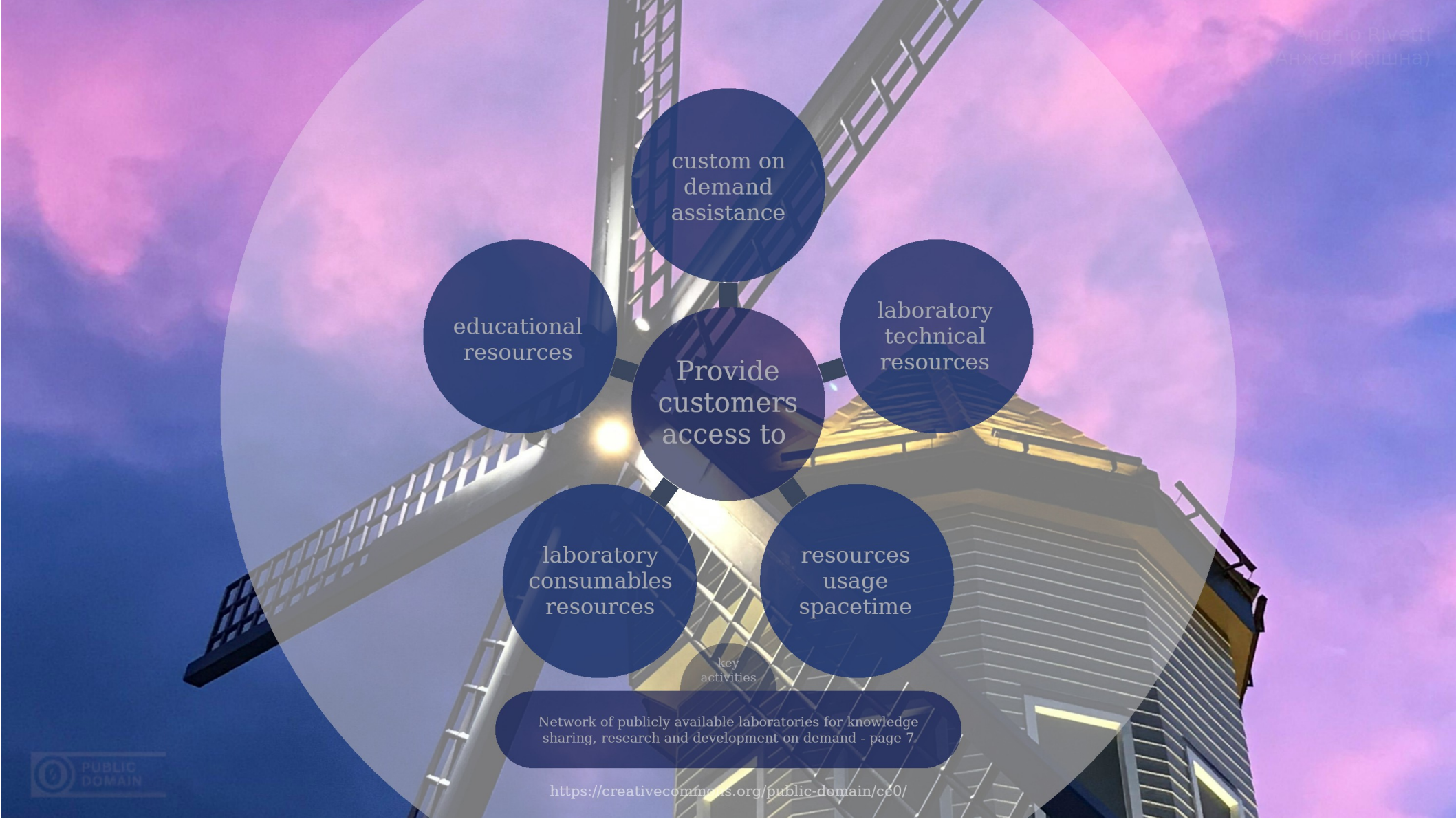

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The "LABoratory - Customer Authentication, Authorization and Accountability Component" (LABCAAAC) is the system responsible for managing customers' identities, permissions and responsibilities. On the customers' side, is made of a device containing customers' cryptographic public keys signed by KNOWCERT authority

γ

The "LABoratory - CUstomer MONey Component" (LABCUMONC) is the system responsible for managing the financial interface between customers and laboratories: laboratory resources' access in exchange for customers' money. On the customers' side is made of a money rechargeable device

δ

The "Request for Actions on LABoratory RESources (RALABRES) is the component responsible for receiving every laboratory resourse usage request, every resource check in and check out from the outside the laboratory to the inside and viceversa, from the laboratory custody to the customers hands and viceversa

f

The "Resources Availability and Distribution POLicy" (RADPOL) is the component responsible for the enforcement of the authentication, authorization and accountability of every resource handover request and live usage. It operates under the conditions configured in a set of policies it makes sure are fully satisfied

g

The "Resources Aailability and Distribution BROker" (RADBRO) is the component responsible for every resources availability handover from the laboratory custody to the customers hands and viceversa, from the outside the laboratory to the inside and viceversa (internal and external logistics)

h

The "LABoratory SAfety Resources Usage eNVironment" (LABSARUNV) is the component responsible for providing a safe spacetime for every customer for every resource usage. For safety reasons, it is in constant comunication with the RADPOL component

i

"Educational resources", as its name suggests, are a set of customers' self service accessible informations such as texts and files hosted inside some material supports such as books and memory storage devices. They are intended to share knowledge on what things and concepts are and how they work.

b

"KNOWFICERT (KNOWledge FIelds CERTificates) provider" is the component responsible for authenticating customers' identity and issuing knowledge fields certificatates only after it verified customers' identity and knowledge fields proficiencies

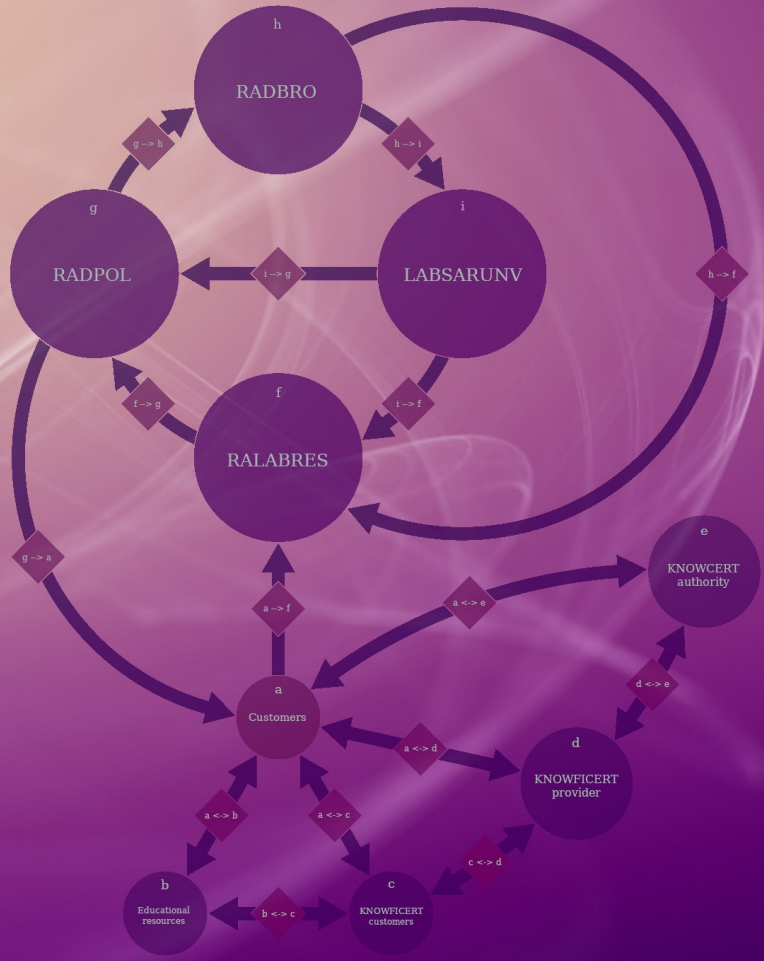
d

"KNOWFICERT (KNOWledge FIelds CERTified) customers" is a set of certified knowledge fields proficiency customers. Some of them may signal they availability to provide custom on demand assistance to other customers struggling to comprehend something via self service

c

"KNOWCERT (KNOWledge CERTification) authority" is the component responsible for issuing identities to new customers, trust certificates to KNOWFICERT providers and to verify they do correctly their jobs. It also cooperates in defining and maintaining RADPOL component

e



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Customers access educational resources. They can read books, consult databases, digital knowledge repositories. They can also create and maintain new knowledge, assuming consequent responsibilities

a <-> b

Customers interact with knowledge fields certifiad customers, seeking for custom on demand assistance from them for example to comprehend something they struggle to do so via self service

a <-> c

At this stage, customers intend to get certified for specific knowledge fields. The certification process requires to empirically prove that they know something they claim or believe to know. They can also request to became part of KNOWFICERT provider

a <-> d

Knowledge fields certified customers can access educational resources too, create and maintain new knowledge, assuming consequent responsibilities

b <-> c

KNOWFICERT customers can request to get certified for new knowledge fields they previously did not comprehend deeply enough or simply ignored them. They can also request to became KNOWFICERT providers for specif fields they prove they dominate

c <-> d

KNOWFICERT provider customers can request to became part of the KNOWCERT authority. This is a high responsibility role that they have to prove they are adequate for it. Viceversa, KNOWCERT authority monitors KNOWFICERT providers and takes measures if necessary

d <-> e

Customers LABCAAAC side comes from here. Customers can also request to became part of KNOWCERT authority, but they have to prove they are adequate for this very high responsibility role by passing extensive empirical verifications checks

a <-> e

At this stage, customers interface with RALABRES. They can see all the available resources the laboratory offers, request to introduce resources, request laboratory resources availability to perform actions on them

a –> f

Everything customers have requested passes throughout RADPOL. For example, to make sure they have all the required know how to operate safely before any handover occurs

f –> g

At this stage, customers come out from RADPOL. They may be authorized or not to use or buy laboratory resources, if they requested it

g –> a

At this stage, handover is authorized. Depending on what customers choose to be the next step, appropriate logistics is organized and executed

g –> h

At this stage, customers may want to directly buy the resources or maybe they want to add other laboratory resourses before proceeding further inside LABSARUNV

h –> f

At this point, a safe laboratory resources usage spacetime is ready. Further preparations to host customers' laboratory resources usage are ongoing

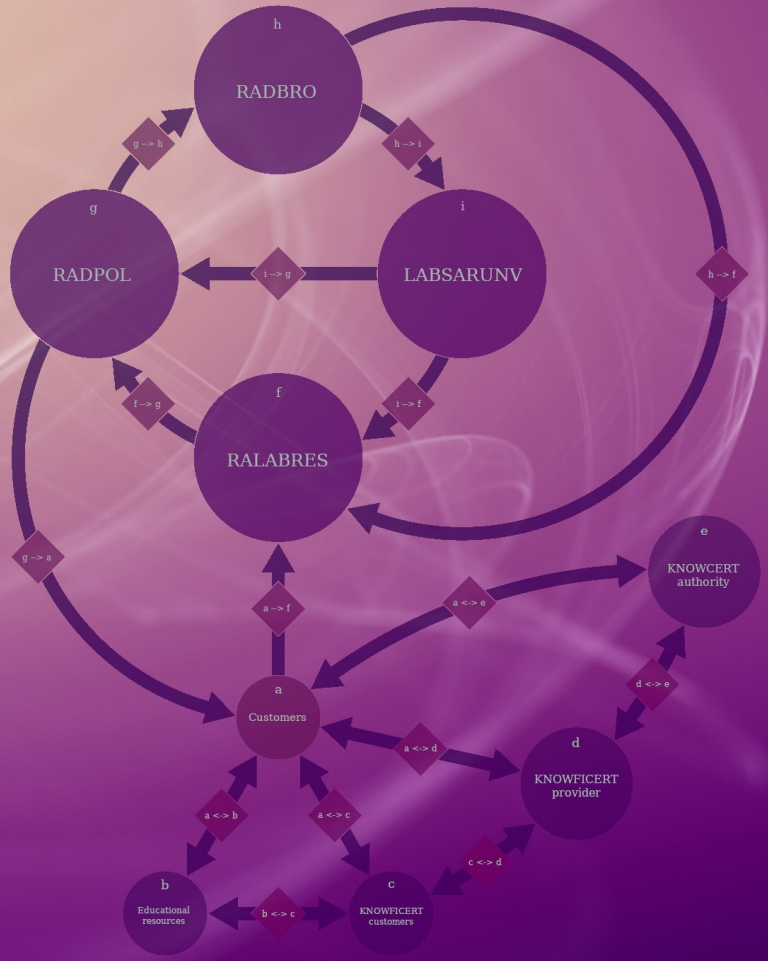
h –> i

At this point, for security reasons, RADPOL authority steps in to remove customers' authority on laboratory resources

i –> g

At this stage, customers exit LABSARUNV. They can request to buy some or all the resources used that are owned by the laboratory, or return them back to the laboratory custody

i –> f



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α - customer perception of "self"

β - customer perception of "others"

customer side
αAlice - αALI
αa

customer side
αDaniel - αDAN
αd

customer side
βAlice - βALI
βa

customer side
βDaniel - βDAN
βd

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customer side
αJennifer - αJEN
αj

customer side
αGiuseppe - αGIU
αg

customer side
βJennifer - βJEN
βj

customer side
βGiuseppe - βGIU
βg

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b

this represents "Alice" in the state of "receving" (this is what I mean by *yin*) messages (μ) from "Daniel" in the state of "transmitting" (this is what I mean by *yang*) messages. The comunication is syncronous

a

this represents "Alice"'s feedback channel in the transmission state. "Alice" can comunicate throghout this channel to "Daniel" doubts, requests for more custom explanations and examples, etc

c

e

this represents "Daniel" in the state of transmitting messages to "Alice" receiving them. It can be, for example, by a face to face comunication or by remote via some telecomunication technology

d

this represents "Daniel"'s feedback channel in receiving state. "Daniel" can receive important information about the effects of what and how he transmits messages to "Alice" and fine tune the transmission accordingly

f

h

this represents "Giuseppe" in the state of transmitting messages to "Jennifer" receiving them. In this case, the comunication is asyncronous. For example, this may be a book or a digital resource made by "Giuseppe"

g

this represent "Giuseppe"'s feedback channel. Since the comunication is asyncronous, so is the feedback channel. The feedback channel may be even closed, rejecting every feedback knocking on "Giuseppe"'s feedback entry "door"

i

k

this represents "Jennifer" in receiving state. The comunication is asyncronous. For example, "Jennifer" may be reading a book, consulting digital resources made by "Giuseppe"

j

this represents "Jennifer"'s feedback channel. The feedback channel is asyncronous. "Jennifer" may send feedbacks, but with less probability of them being welcomed compared to a syncronous comunication

l

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comunication cost (COMCOST)	messages comprehension efficiency	broadcast efficiency	comunication syncronization (COMSYNC)	δ - possible money transfer
high	high	low	α - β same timings	
low	low	high	α - β different timings	μ - messages transfer
comunication cost (COMCOST)	messages comprehension efficiency	broadcast efficiency	comunication syncronization (COMSYNC)	δ - possible money transfer

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Use

Study

Modify - Transform

Make & distribute copies

Software - Procedures - Operations

Matter - Energy - Spacetyme

Information - Data - Variables

Interface

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Possible common costs	Revenue streams
laboratory resources procurement	leasing laboratory resources
paying workers	selling laboratory resources
purchase of consulting services, R & D, etc.	providing consulting services