



Competency Networks

March 2018

The myth of meritocracy

In all contexts and domains where learning is desirable

there can never be any standardised test to establish a useful ranking of domain experts,
and **the best team is always a team that brings together divergent cognitive lenses** and complementary perspectives

<https://aeon.co/ideas/why-hiring-the-best-people-produces-the-least-creative-results>



The sum is larger than the parts

Optimising collaboration:

1. **Sharing** of individual competency networks
2. Expansion of individual competency networks via **indirect delegation** to trusted agents
3. Having the **courage to specialise and to delegate**
4. **Publication of domain knowledge** in the form of formal conceptual models with the help of visual languages
5. Emergence of **stable domain specific collaboration patterns**
6. Explicit **recordings of knowledge flows**
7. **Subscribing to collaborations** around specific domains
8. Continuous **organisational learning**



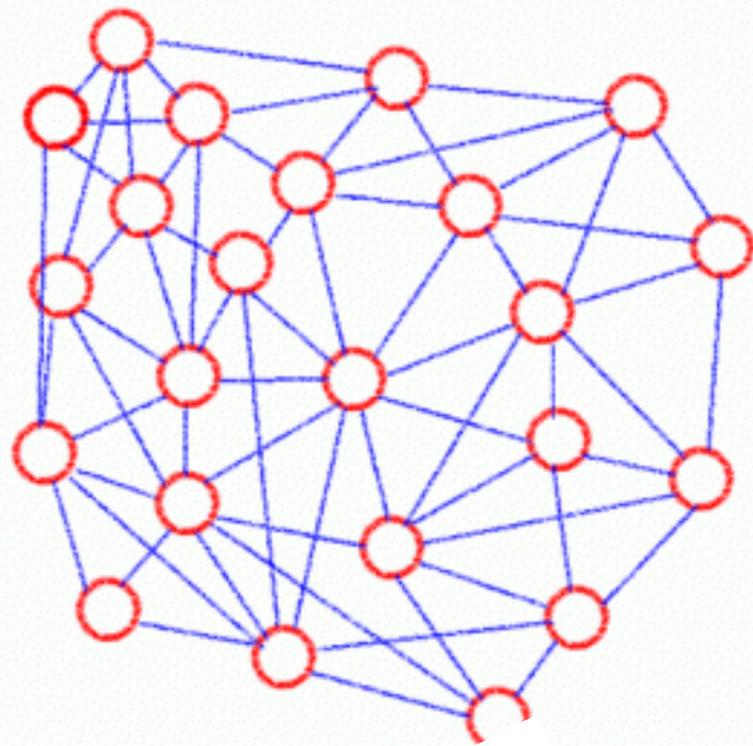
Formalising and digitising the competency network

Definition: *A competency network is the graph of experience-based pairwise trustworthiness ratings in relation to various domains between the members of a group.*

Trustworthiness ratings are tied to specific pairs of individuals; they are not directly transferable and they can not easily be aggregated. This limitation probably was one of the key reasons for the small size of pre-historic hunter-gatherer societies.

The age of digital networks gives us the opportunity to construct cognitive assistants that help us to nurture globally distributed human scale (= small) competency networks – networks of mutual trust.

Humans knew how to build and maintain mutual trust many hundreds of thousands of years ago, and our brains are still designed to operate on mutual trust. It is time to tap into this potential and to combine it with the potential of zero-marginal cost global communication and collaboration.



**The formal models
for competency networks
are straight forward
And they don't look like
LinkedIn!**

Example

Jorn's competency network – domains & trusted expertise

- **Formal conceptual modelling**
{Jorn, Xaver, Keith, Tony C, Jeff H}
 - Categories + semantic domains + models + groups + graphs + sets + logics
 - Agents / systems
 - Motivations
 - Events
 - Activities
 - Resources
 - Commonality and variability analysis
 - Containers / modules
 - Information artefacts / graphs
 - Multi-level instantiation
 - Recursive / fractal / feedback models
 - Multi state logic
 - Probabilistic reasoning
- **Product and service lines**
{Jorn, Craig C, David W, Xaver, Paul}
 - Product line architectures
 - Product line management
 - Product line engineering
 - Semantic system integration
 - Professional support services
 - Model driven automation
- **Human social behaviour**
{Jorn, Star F, Judy S, David S W, Herbert G, Joseph H, Joseph T, Peter T, Nick W...}
 - Cognitive limits of human groups
 - Neurodiversity / archetypes of cognitive lenses within groups
 - Autistic collaboration
 - Competency networks
 - Culturally defined structural organisational patterns
 - Cultural variability over space & time
 - Cultural evolution
 - Behavioural patterns in large scale groups
 - Behavioural patterns in small scale groups
- **Visual languages**
{Bret V, Jorn, John H, Chul K, Xaver}
 - Protocol design
 - Artefact design
 - Symbol design
 - Language / domain integration
 - Language validation via instantiation
- **Mathematical foundations**
{mathematicians working in these domains, Jorn}
 - Category theory
 - Denotational semantics
 - Model theory
 - Group theory
 - Graph theory
 - Set theory
- **Evolutionary theory**
{David S W, Edward O W, Jorn}
 - Evolution of cells
 - Evolution of multi-cellular life
 - Evolution of ecosystems
 - Evolution of super-organisms
 - Gene-culture co-evolution
- **So-called standards**
{standard specifications, Jorn, Keith, Xaver}
 - MOF, UML
 - SQL
- **Software industry**
{Jorn, Craig C, David W, Ted N}
 - **IT service industry**
{Jorn, Andrew, Paul, Ruben, Xaver}
 - **Entrepreneurship**
{Jorn, Pete R, Andrew, Ted N}
 - **Insurance industry**
{Parviz M, Michael E, Jorn, Osman A K}
 - **Manufacturing industry**
{W E Deming, Imai M, Jorn}
 - **Banking industry** {Charles E, Bret S, Jorn, Deirdre K, Indy J, Jacques F, ...}
 - **Telco industry**
{Paul, Jeff H, Jorn}
 - **Agriculture industry**
{Ruben, Richard S}
 - **Healthcare industry**
{Keith, Martin E}
 - **Construction industry**
{Keith, Paul}

Jorn's competency network – in summary

- **Formal conceptual modelling** {Jorn, Xaver, Keith, Tony C, Jeff H}
- **Product and service lines** {Jorn, Craig C, David W, Xaver, Paul}
- **Human social behaviour** {Jorn, Star F, Judy S, David S W, Herbert G, Joseph H, Joseph T, Peter T, Nick W}
- **Visual languages** {Bret V, Jorn, John H, Chul K, Xaver}
- **Mathematical foundations** {mathematicians working in these domains, **Jorn**}
- **Evolutionary theory** {David S W, Edward O W, **Jorn**}
- **So-called standards** {standard specifications, **Jorn**, Keith, Xaver}
- **Software industry** {**Jorn**, Craig C, David W, Ted N}
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professional knowledge

general
knowledge and skills

indirect
knowledge and skills

More on **human scale representations**

Great [long] talk by Bret Victor that may allow you to understand why my core interests are { Formal conceptual modelling, Product and service lines, Human social behaviour, Visual languages }

Humane representation of human thought : <https://vimeo.com/115154289>

It is nice to see Bret use the term ***human scale*** in the same sense that we have discussed at CIIC

- <https://ciic.s23m.com/2017/01/20/human-scale-computing/>
- <https://ciic.s23m.com/expected-results/ciic-3-june-2017-auckland/>

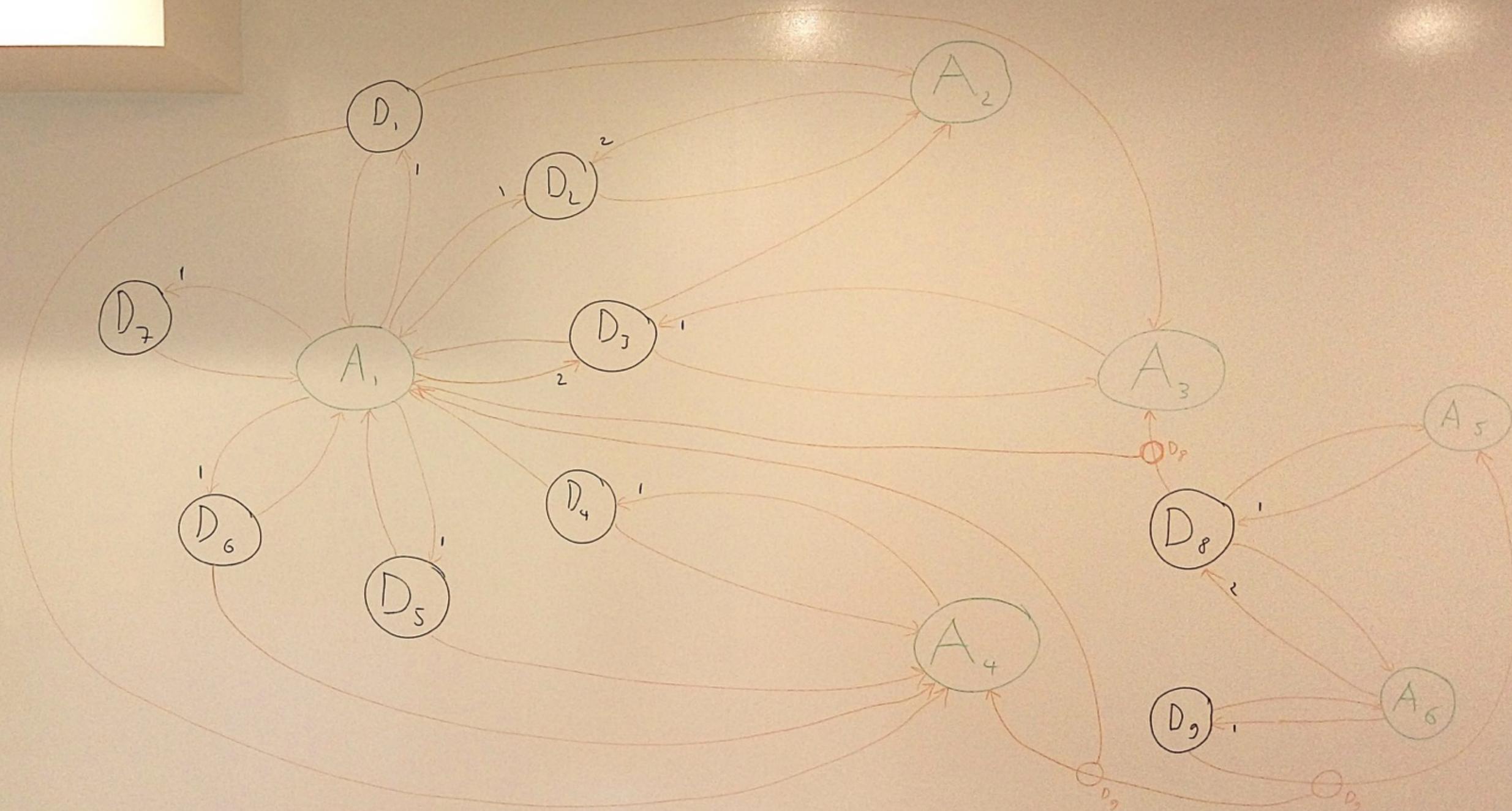
Jorn's competency network – derived trusted expertise

- **Sales** = {Human social behaviour + Entrepreneurship + Product and service lines }
+ **Sales buddy** {**Social skills**}
- **Economics** = {Human social behaviour + Evolutionary theory}
- **Design / Innovation** = {Formal conceptual modelling + Sales + Economics + Visual languages}
+ **Domain experts** {**Domain/organisation specific knowledge**}
- **Operational excellence** = {Design / Innovation + So-called standards}
+ **Industry experts** {**Industry knowledge**}

Your competency network is likely to be conceptualised very differently (= other domains, other labels) and may involve very different people

1. In some domains you will primarily **trust your own knowledge and experience**
2. In other domains you will feel **competent but refer to other people when reaching your limits**
3. In further domains you **rely on other people's knowledge and expertise**
4. And in further domains you **rely on trusted peers to know people who have relevant knowledge and expertise**
(I have not had time to include this level of indirect trusted knowledge in the above example)

- $D_1 \rightarrow \{A_1\}$
- $D_2 \rightarrow \{A_1, A_2\}$
- $D_3 \rightarrow \{A_3, A_1\}$
- $D_4 \rightarrow \{A_4\}$
- $D_5 \rightarrow \{A_1\}$
- $D_6 \rightarrow \{A_1\}$
- $D_7 \rightarrow \{A_1\}$
- $D_8 \rightarrow \{A_3 = \{A_5, A_6\}\}$
- $D_9 \rightarrow \{A_4 = \{A_5 = \{A_6\}\}\}$



This is a sketch of the competency network of agent A_1 over the domains D_1 to D_9 . In order to be of value, each agent needs to elaborate each domain beyond a label, by adding a list of core semantic identities or sub domains.

The graph shows contribution to and use of the domains that are of interest to A_1 .

Imagine each agent A_i having their own different competency networks over domains $D_{i,1}$ to $D_{i,n}$.

The simple origin of trust

consistency over time  **trust**

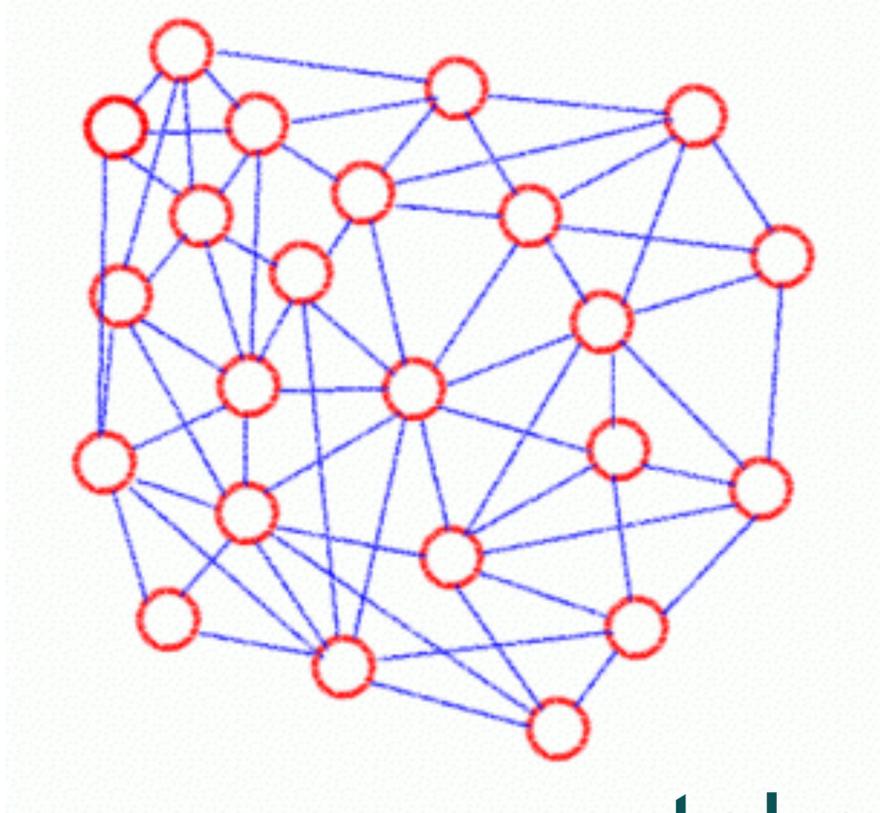
The longer the period over which
observed agent behaviour is consistent with declared intent (motivations), and
observed system behaviour is consistent with stated expectations,
the higher the level of trust

Lessons

Fewer socially constructed beliefs

1. Significantly more direct and less ambiguous language
2. **More clarity and certainty about the level of shared understanding**
3. **More mutual trust**
4. **Streamlined communication and collaboration**
5. Expansion of individual competency networks via **indirect delegation** to trusted agents





Explicit competency networks
take the guesswork out of collaboration
... and result in a **learning organisation**

Thank you!

S23M

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Nothing beats capturing the knowledge flow of leading domain experts to co-create organisations & systems that are understandable by future generations of humans & software tools.

