Welcome to the MiND Channel.

Today’s topics are basic definitions, history and connection of knowledge and informatics.

Our first task is to understand that although thinking is a fundamental human activity, both our individual and collected knowledge are always, inherently limited, we can benefit from a supporting infrastructure.

Just like transportation: although we can walk, run or carry objects, we have created vehicles, roads, traffic signs and rules, and so on. The subsequent generations of the transportation ecosystem enabled activities that were not only impossible but unimaginable before. On the other hand, this ecosystem comes with a price. Some are visible, like accidents or the cost of maintenance from buying fuel to building and fixing roads. Other costs are hidden, like those of vehicle and parts production, local and remote pollution, or changing economics by favoring distant, cheap, mass manufacturing of goods instead of local activities. But that goes too far for now.

Informatics today is a global ecosystem to improve the amount of knowledge and our abilities to access, use and manage it; with similar benefits and risks. Let’s take a short trip back in time to visit some key concepts and milestones that provide essential hints to analyze, design and implement information systems.

The ancient Greek philosopher, Plato explained the process of thinking that it’s like sitting in a cave with a fire in the middle, facing to the wall and watching the shadows. The thinker can only understand the current situation, derive consequences and interact with the environment based only on this partial, biased projection of the reality. It is quite hard to accept, let alone, embrace this picture; it’s tempting to shrug it off because it’s dated or too philosophical. So, let’s take a contemporary version from a British statistician, George Box from 1976: “All models are wrong, some are useful.” All scientific thinking starts with creating a “sufficiently precise” terminology (place the fire), then use its terms to make measurements, find connections, etc. to model systems (the shadows). We can design, build and control vehicles based on the terminologies from mechanics, aerodynamics, fluid dynamics, etc. At this point, we don’t care that we can only statistically model the chaotic behavior of the air molecules around the wings, have no idea what gives mass to the matter on quantum level or that gravity is not a force as long as it acts like one. We can even use opposite models like in some applications light is an electromagnetic wave, in others, a stream of photon particles. We are sure that none of these models describes “the truth” but as long as we still hear from the Voyager probes and solar panels work, we are good. That creates opposite motivations to both refine the existing terminology for more efficient applications, or switch to a fundamentally different one that wraps up others.

Plato continued his story listing the hardships of thinkers who free themselves from those chains, get out and blinded the light, then return to the cave get blinded by the darkness again and finally rejected by peers who only see this struggle and no benefits. It took thousands of years until researchers represented by these gentlemen gave formal proof that the process of thinking is inherently limited. The previously imagined wrapper systems tend to grow, any sufficiently complex system will contain contradictions and even automation of the thinking process for speed and reliability will not help. Any process may turn out to run forever, and you don’t know which one, until you wait forever.

Regardless of the ultimate theoretical barriers on the horizon, thinkers must deal with much closer, practical problems. Knowledge is valuable only when it is applied properly in a live situation to select and execute a beneficial action, and improved by the experience gained while using it. Our communities gathered knowledge over centuries, it is impossible for any individual to own “all” of it, so we use physical objects to store and procedures to transfer (teach and learn) and improve it (research and experiment). Consequentially, the true value of knowledge fundamentally depends on our storage and communication infrastructure. Some of these limitations are apparent, like sending a message with a herald or the difference of having a library or working with people who read and discussed all the books. Others are more subtle, like knowing the language of a book, the meaning of the words at the time it was written or even the applied notation like mathematical formulation rules and operators. The state of the global control, transportation and communication infrastructure in the early 20th century broke these barriers and created a fundamentally new environment. Frigyes Karinthy discussed in his Chains novel that any two human beings can be connected through at most 6 friendship links; H.G. Wells urged that this would allow mankind create a “global brain” to share knowledge and resources for common benefit.

https://en.wikipedia.org/wiki/All\_models\_are\_wrong