Open Source Civilization

A Proposal to Global Challenges Foundation, New Shape Prize, 2017

1 Abstract

The Global Challenges Foundation has set a noble goal to **search and solve the critical problems that threaten the survival of the human civilization** on Earth.

However, analyzing the targets **lead to important questions**:

- They seem to be quite well known for decades, and considered critical by serious organizations;
- There have been significant efforts attacking them (or more precisely, some of them with much greater amount of money, like clean energy, pollution, diseases, … by well-known billionaires, academic and political organizations);
- The solution idea, a better control or legal environment is surely among the most researched areas (every power organization wants to attract and control their members or customers).

Despite of all these efforts, we are literally on the edge of self-destruction, and given our current momentum, it is hard to tell if we can change our fate. The proposed aims of this Challenge are important, and the previous similar efforts were essential in solving critical issues like ending the cold war or protecting the ozone layer. However, many issues (climate change, micro-plastic pollution, nuclear accidents, migration issues, …) show that we must be much more efficient before the consequences (both on the ecosystem and the human civilization) would make us unable to effectively cope with them. Or even better, **we should turn away from the obvious problems on the surface, identify and address the root causes instead of these symptoms**.

The history and current activity of our civilization looks controversial: great achievements and goals mixed with terrible actions, and right now seem to follow an active suicide path. One can conclude that mankind in a mass is inherently unintelligent or "bad", but that would neither explain our current advancements, nor give any reason to work on this Challenge. The other option is that **we are benevolent and intelligent, but we make systemic mistakes in understanding our situation, which lead to setting up wrong priorities and consequentially, bad decisions**. Our global civilization has gigantic power, organizing capability and knowledge, but individual human beings at the control panels fail to handle them properly.

The following proposal is based on this assumption, and demonstrates the following statements:

- **Our civilization became a global entity by utilizing modern technologies** (from books that store to computers that process information; and communication from telegram through television to internet and social media), but individual consciousness could not deal with the speed of this change, while our institutions (politics, education, …) failed to properly integrate them. This phenomenon was clearly identified by experts in time, who could also properly forecast the current state, while giving suggestions for remedy (although we have not used them yet).
- **Dealing with the mass of global knowledge is a delicate issue, and the true pioneers of information technology set this as the primary goal.** They also gave precise forecasts, planned and implemented fundamental solutions, but those were too far for everyday business needs, and were significantly downgraded to the products and infrastructure we call IT today.

- Human civilization is at a turning point, a leap in evolution. **Every model, the complete schema we use to describe and interact with the world is** based on information scarcity (politics, business, planning, education, communication), and the need of growth by winning competitions. They are simply **outdated by this new era of information abundance** (when our problem is too much information and the problem of assigning meaning to it) and the hard limits of having a single planet and its ecosystem.
- We have the plans, the reason and the ability to build **a global, transparent information system**, an anti-internet (in short: today a value of an information is given by how much it is believed by readers – instead of how much it is funded by facts, verifiable analyses, etc.), that **can lead to a conscious organization of our resources, and gives a chance to deal with any problem in a responsible way**. This may be any of the tasks the Foundation selected – or others that were not listed but later found to be important.

Does this proposal guarantee anything? Of course not, because there are significant factors against it.

- The proposal is based on the generally positive human attitude, which is funded by a more elaborate analysis, but still is an assumption, and building a working community solution is always much harder than destroying it.
- It goes in direct opposition with current core concepts like business and monetary interests, patents and trademarks, competition over resources and profit or shallow national pride. It will be too easy to attack on these grounds by misinterpreting the aims or abusing the means.
- Like the early IT development, the first, partial results will have serious market advantage. Even if the solutions can be kept available for the original goals, participants can be attracted away from the working groups, which can halt or seriously slow the project down, as happened with the today unknown IT pioneers.

"... the "system" of man's development and use of knowledge is regenerative. If a strong effort is made to improve that system, then the early results will facilitate subsequent phases of the effort, and so on, progressively, in an exponential crescendo. On the other hand, if intellectual processes and their technological bases are neglected, then goals that could have been achieved will remain remote, and proponents of their achievement will find it difficult to disprove charges of irresponsibility and autism." [3]

Despite of these facts, we can say that if mankind deserves survival, this approach at least has a chance, and **if there is any moment we can turn, it is now**. There is a common feeling that we are over the peak and going down, it seems that we simply can't solve our problems with our current approach, methods and institutions. We may be ready to "Open Source" our civilization, face a transparent vision, whatever depressing it might be, if… If **this vision gives explanation of the current situation and hope for a successful intervention**.

To our best knowledge, it does.

2 Description of the Model

2.1 Foreword

We have accepted that the Foundation requires anonymity in the proposal to ensure the objectivity of the jury and try to avoid giving information that would lead back to us in person. However, there are some doubts related to it.

- As mentioned in the Abstract, the targets are known, and it is safe to assume that very intelligent people have been working on them for decades, with the current results. It is not likely that after so much failure someone with "the" solution pops out of the blue. People behind a plausible idea must present personal references and working prototypes of years or decades of work in similar environment as the Challenge will appear.
- If the jury can objectively judge and successfully select the best options by just reading them, they should have come up with that earlier and been working on it for years. The solution, if exists, must reside far off the normal approach, so the proposal must present
    - references to previous, valid scientific and practical results that are not used today;
    - a sound, preferably tested and validated structure related to these forgotten results;
    - proof of experience and motivations of the people behind the proposal that makes them able to come up with such a divergent, yet valid ideas.

For this reason, the proposal contains

- a wide and sound reference to sources pointing at the importance of knowledge representation, augmented by connections to the proposal
- an analysis of our current situation based on them
- a short personal summary of the authors about their work experience and motivations
- some technical details and their connection to the Challenge
- a rough timeline
- possible results of having an Open Source Civilization (both advantages and dangers)

According to the anonymity requirement, personal segments can only contain vague hints to the actual works, documentations and experience of the authors. We can only ask the jury to believe that we really talk about decades of work on books, running systems, governmental and NGO activity, professional academic research.

2.2 On the Shoulder of Giants

There were geniuses whose work this proposal is built. Here we selected a few of them whose statements relate to the current evaluation, therefore omitted the technical background of the work and people like Alan Turing, John von Neumann, Claude Shannon, Ivan Sutherland, …

2.2.1 H. G. Wells – World Brain (1938)

This collection from H. G. Wells, who is known to be a science fiction writer, contains lectures describing a very important vision of a collective brain of mankind. This should have increased the development speed of humanity, organized the efforts of scientists, and allowed negotiating tensions that threatened with a global catastrophe – dated after the first, and before the second world war.

The global brain structure and function are properly explained but could not be realized at that time. Today, we face similar situation with growing national, ethnic and religious tensions, global fears and problems. More than ever, we need a shared vision and realistic plans for a fair and sustainable future, and to create them, a global, transparent "brain".

2.2.2 Vannevar Bush - As We May Think (1945)

Vannevar Bush literally had an outstanding role in the history of mankind, being the head of allied scientists during World War II, where most of the technologies we use today started. Just after the war ended, he outlined the next major task ahead of us: a better way to collects, organize and interact with our knowledge. This is essential because the current research and the results appear in such amount that the researchers of the same field cannot read fast enough to keep up with the progress. This is a fundamental limit to all scientific activities and can lead to losing our ability to improve. The coined solution was "Memex" that stands for "memory extension": a system that allows people browse the collected knowledge of humanity.

2.2.3 J. C. R. Licklider - Libraries of the Future (1965)

Inspired by the Memex idea, in 1961-1964 a research was conducted towards how a library should look and work like in 2000, both influencing and using the development of information technology. J.C.R was a psychologist interested in the area, chosen to lead this group (although as finally turned out, he did not actually read the Bush article). The result is a thorough analysis on the amount of knowledge (to estimated number of characters), the required speed and features of the supporting systems and human interfaces, among others including today's internet and all elements of the modern GUI.

2.2.4 Douglas Engelbart – Augmenting Human intellect (1962)

Douglas Engelbart dedicated all his life to a single purpose: collect and invent all technologies that are required to materialize the information system required for human cooperation. His vision was the A-B-C development process, where A: the actual operation of any organization is supported by an on-line information system; so that B: the continuous analysis and improvement is possible based on active data. This "improvement process" is basically the same regardless of A (like: solving communication issues, organizational hierarchies, supply chains), therefore above B there is a C level, where such global improvements can be made.

He created this system called NLS (oN-Line System), and in 1968 he gave the "Mother of All Demos", a live video conference with his colleague, working together on the same documents. He spent the rest of his life explaining the importance and potential in this approach – however, the changing direction of IT towards products and platforms was "good enough" for organizations and took away the development resources from his research.

2.2.5 Ted Nelson - Xanadu, the vision downgraded to current internet

While Engelbart worked on the technology, Theodore Nelson kept on focusing on the materialized form of knowledge: text. His project, Xanadu is a way of interacting with texts knowing that scientific writing is always using and reorganizing other texts and adding a little amount derived from a new understanding of the sources. Therefore, it is essential to be able to walk around both directions of references to see how an idea came, and where it lead others. This approach was close to realization but finally lost against what we know as Internet today, with one-way links and information evaluation based on "likes". The greatest expert scientists regularly have conference on the Future of Text and refer to Xanadu.

2.2.6 Alan Kay / Seymour Papert – human interfaces, education experiences

They have successfully created information systems with interactive interfaces, and conducted several very inspiring researches with children, finding genuine ways for teaching by letting school kids simply interact with information systems providing simulations or experiments to them. Later Alan Kay, as the leader of Xerox PARC, created working implementation of modern IT infrastructure (networked workstations, message and file transfer, windowed user interfaces, Object Oriented Programming, …) These technologies (together with most of the participants) were taken by Steve Jobs and following his vision transformed to "products for the masses", and to the IT as we know it today.

2.2.7 Neil Postman - Amusing Ourselves to Death (1985), Technopoly (1992), ...

Like the Engelbart – Nelson relation, Alan Kay's counterpart was Neil Postman, professor at School of Education, New York University. He focused on the changes in the human mind and community operation, that all major technology improvement has created in the past and are creating in the present. First, he analyzed the effects of mass media and television, later he turned to how we use computers as a communication medium, how it changes our vision, cognition and interaction. He was known as a "luddite", though he only proposed a conscious debate, arguments not only focusing on the assumed benefits but the possible dangers of this radical step.

2.2.8 Albert-László Barabási – Network Science (1995-2015)

To mention a more current researcher, Albert-László Barabási is working on the science of networks. He began it in a more theoretical way, but as the processing and storing capacity of computers and networks grew, and the more data and relations became available, Network Science became a major and very efficient tool. Today it is impossible to analyze, model and control complex systems from biology to politics without their results. Scale-free networks (the same as envisioned as the basic framework of knowledge by the pioneers of information technology) are practically the backbone of any community operation today.

2.3 Open Source Civilization

2.3.1 The Core Problem

The "force behind improvement" is the greater statistical probability of survival and reproduction of an entity somewhat better adapted to its environment – this is called evolution. Biological evolution is based on physical and biological attributes and requires millions of years to gradually shape the various species as we know them today.

Human history is radically different. Physically we are not too far from the apes, furthermore we are far behind comparing our abilities or fitness to our biological environment. We don't even know for sure if a human from 10.000 BC could successfully integrate to our current civilization and would be a farmer, singer, politician or a scientist. However, it is proven that modern human beings can fall back to the level of animals (or by some criteria, way under) in specific conditions. It is safe to say, that our "hardware" from our bodies and neural system, or even the basic motivations of survival are almost equal to our ancestors and does not explain our current state. [10, 11]

Our special ability lies elsewhere: we can change our very environment, to which we adapt, and change it further. The key of this process is the ability of collect, organize and transfer knowledge, or in short: informatics, in this sense including philosophy, communication, linguistics, theology, etc. and the youngest: information technology where we use specific machines to manage information in the way only human beings have done until now.

Like biological evolution, individuals play only statistical role in smaller and greater communities that keep and inject knowledge into them. These are communication methods, roles, behavioral patterns and practical knowledge that allows the individual to support the advanced environment. This environment allows the community to spend resources on rolling on: some members will teach the new generation, or even work on improving the knowledge. As the time goes, it becomes harder to improve the more sophisticated methods from the inside, but there are collisions with other communities having very different knowledge – wars are the natural selection for knowledge schemas.

This means human civilization almost ultimately depends on handling knowledge, and even keeping up a certain level requires great effort to implant the proper schema structure into the new generation. On the other hand, after the end of the cold war and for the first time in our history, (roughly) one schema structure rules almost the whole world. That is both a pleasant result because our weapons can make the whole planet unsuitable for our civilization – and a danger because without natural selection, there is no "external pressure" towards real improvements.

The warnings from the referred scientists seems valid today. The peak knowledge concentration of WW2 and the last great East-West conflict is lost, the primary goal is profitability and short-term stock market evaluation, or the regular elections that leave ultimate wealth concentration intact. In the "developed part of the world" practically live in a global Calhoun experiment with frighteningly similar results. [12]

We find it very hard to "inject" the knowledge of the previous generations to the new, it is even very hard to find analytical self-reflective thinking, properly funded opinion. Despite the enormous amount of data and connection bandwidth, noise overwhelms information, a populist boast wins over responsible analysis, we "like" and "share" opinions without processing and creating our own.

2.3.2 The Role of an Information System

The responsible and conscious knowledge processing is like a healthy blood circulation of a body – without it no organs can operate and the whole system is in lethal danger. Today we do not live in the real, physical world, but in what we can understand from one that our ancestors have created, with its current rules, infrastructure, technology, science and legends. We make our decisions and further change this world only based on this understanding; if this is not correct, especially if it poisoned by systemic errors, we simply can't make good decisions. We can't even ask the right questions in a distorted language and thinking schema.

Our civilization grew greater than any human can handle; the complete knowledge "does not make sense" for any individual. Our survival depends on a better circulation system, one that is strong enough to support a global organization without putting too much power and responsibility into anyone's hands. We should be able to see through it in large scale, select the segments that we can and want to deal with during our life, and trust that others will find their segments therefore the whole organization will work on.

For mathematicians, this means we should model the global civilization with a scale-free network, with its power and weakness that we should be prepared. It is like the Mandelbrot set: everyone "knows" its shape after a glimpse, and this knowledge can be applied to any of its parts because it repeats all the time. However, you can never "truly know" any part of it because its perimeter is infinitely complex at any magnification. A human mind can't handle and behave according to this, even a machine can't "know it all". But a machine has the power to calculate and show any part with good enough resolution to help a human make a conscious, responsible decision instead of guessing.

This is what we need. A magnifying glass on our current state, a dynamic medium where we can combine our individual and different understanding of our situation. An environment that acts like an extension to our thinking and memory, through which we can reach the mind of others. A modeling tool that help us making experiments with ideas, actions and show the results. If it works in virtual reality games, modeling the whole cosmos or the events in a rocket engine or a hydrogen bomb; it should also work with a health care system, at organizing a disaster recovery, finding out better ways for our technological or transportation infrastructure.

2.3.3 Case Study

About the details and power of a constantly improved computer augmented cooperative operation, Douglas Engelbart's articles and lectures are the best reference. Here we present a generic model of augmented problem solving as a case study, to point out the key elements and refer to them later when describing the core features and risks of such an information system. It is left to the reader and later, the actual problem-solving experts to translate to and apply this model, or hopefully later, our information system.

2.3.3.1 Describe the Problem

Regardless of the actual problem, the first task is to give a clear description of the situation and the aims. To accomplish this, we already need serious amount of knowledge: the terms and their definitions, connections, meaning. It is also good to see similar problem descriptions and aims if possible, which obviously help us having a deeper analysis, unveil perhaps skipped aspects and risks.

The required terms generally belong to various "business domains", and except for some very rare cases, most of them likely are global. If you run a hospital, it is highly unlikely that your needs are different from many other existing hospitals; if you have problems with flood management, the physical rules and soil reliability models work regardless of the location. If you can reach out to a global knowledge store, even the problem description phase gives you much more insight than you could have alone. Furthermore, the information can even be free, either available from academic sources, or in many cases, business entities may be interested in publishing it. For example, a radiological equipment vendor is interested in opening the used data structures and formats, so that various vendors can write software to process their data. There is a very strong motivation towards this direction following the Internet of Things integration and open communication requirements.

If you are the first or have new needs or improvements in some of the accessed fields, you can publish this knowledge back to the global system, thus immediately improve the problem analysis capacity of anyone having a similar issue. This global cooperation in understanding can drastically improve our common power, but more importantly: a global empathy by building these languages together.

2.3.3.2 Build a Team

Now you have a clear picture of the task: the current and the required situation, so you can plan a path between the two. To accomplish this part, you collect the required competences and resources, create roles and build a hierarchy from them. You can "test" the system by laying out the solution process create a schedule and resource allocation. You may even test your system with adding some deviations and mistakes along the way. As you still use an information system, all your ideas and changes are logged, so you can later analyze and optimize the development process.

This process and the related terms (role, hierarchy, tasks, schedule, etc.) are generic, so regardless of any detail specific to the current problem, you can use generic team building, process planning and testing tools, examples and external consultants. Similarly, your ideas, reasoning and development process can be shared and help others facing the task of team building.

2.3.3.3 Populate the Team

Now you search for and invoke people with the required competence to take the roles in solving your problem. In a global knowledge base, you will find these experts close to the domains that you used to describe the problem; with reliable certificates and references to previous projects. During the negotiation, they overview your problem description and plans, can even improve them according to their experience. You also should adapt your team structure and schedule to their availability and competence, like merging some roles to a single person, or split tasks among multiple participants.

As described here, the planning phase should easily adapt to new information arriving gradually, which can be hard to manage both with keeping the plans coherent and avoiding personal conflicts among the participants. An information system where the side effects, reasons and history of changes are transparent is essential at this phase, so you can adapt your initial ideas to the actual resources, not only keep it valid but perhaps improve it by the changes.

2.3.3.4 Execute

Now you step into the active phase. Managing process execution is a completely generic domain with terms and actions like task assignment, resource allocation, schedule management, milestones, checklists, warnings. It is very similar to any program source code, only the team members execute the commands and report their progress. There is no extra administration burden on your team, they interact directly with the plans and live data through the information system, and therefore the actual state is always transparent. There is no need to manually create reports, publish your progress, update export tables, websites, etc. All these services can be defined in the system and populated with live data automatically.

In many cases, there are multiple optional plans depending on what you find out during the process. You can create such plan network, reserve resources according to their probability. But sometimes you meet with a situation that you have not prepared for. In this case, an information system can help – if it contains thousands of logged processes, can automatically look for similarities, and display the most relevant ones together with the decisions and outcomes. Similarly, any of your execution logs may help to another team in a critical situation – regardless of the actual outcome.

2.3.3.5 Improve

Because all the activity is managed through the system, the progress history can be collected in the required granularity and analyzed both on the fly (like deadline warnings, collisions, resource shortages, …) or retrospectively; individually or statistically over a longer period. The analytic services are again a separate knowledge domain, your task is to connect them to your environment and data, optionally with the help of expert consultants and experiences of previous similar analyses. With these insights, you can modify your plans and knowledge base, create new alternative process plans, manage your active and reserve resources – and the same way, your ideas and findings can be shared and used by others on the same field, anywhere and time on Earth.

2.3.3.6 Share

Although sharing was added to each segment, it is important to know that any data can be sensitive and secret of your organization, or even between different levels of the team hierarchy. The access control configuration is a critical element of any knowledge domain. However, this "meta information" is also related to the actual domain, so the protection schemas are also available in the global knowledge base, and your solution about information sharing can again, be shared.

Naturally, to solve a task you always need a unique, customized combination of various domains, from task management to schedule organization, through your problem domains and findings to final reporting and analysis. But as you solve tasks one after the other, with more experience from using the global knowledge base, these domains settle down and tend to separate from each other. After a "boiling period", they form atomic, interconnected networks that are easy to share and reuse. Within a short time, the global knowledge base and the vast amount previous patterns and experience in using them become vital element of dealing with any problem with speed and reliability far beyond our current methods.

Our individual brains become integrated members of a single, global, human mind.

2.3.4 Core Features

All these ideas are so straightforward, but at the same time seems completely unreal having any experience with real information systems. What is the difference? This vision builds upon the original aims and ways of the forgotten pioneers of informatics – and in direct opposition of current, product and profit oriented approach ruling the world of information technology. To build the previously described knowledge base, we had to return to the roots, and follow a very time consuming "learning and analysis process", starting with questions like: what is programming? What is an information system? How can we translate the case study above to our own task of building any software, and then specifically, the software that can gradually become the global knowledge base?

It is important to understand that the software is a form of knowledge itself: a combination of understanding the structure and behaviors required to implement the actual task; the software components that provide required functions (user interface, data storage, communication, etc.); and the language that glues them together. With this approach, any software dissolves into separate domains with their own language representing the components, their configuration and states – and the services they provide. Therefore, building a software is defining the required components, and make them behave as required. This universal description has nothing to do with programming languages, platforms, toolkits or actual tasks, and equally usable and efficient in any programming environments. Its validity is proven by software design tools (like UML), which are usable to design any system, in any programming environments.

The first target is the domain of component (or in broader sense, term and service) definition. Being generic, the terms required to define any term, must be given by itself. The whole knowledge base will use these terms to see the structure of all terms – and similarly, if anyone is interested in how the system builds up, they can go down to any depth, to the core terms. Everything uses the same description methodology, there is no magic of source codes, configurations, etc. Whatever you use, you can see it – and you build your system using the same tools as we use to build the software you use to interact with it. This forces us to give you the best tools to build your knowledge base – because we use the same tools to build the system.

Naturally, we need to add various other technical components (covering the services of the actual running platforms, persistent data storage, network communication, etc.) that are required to launch the system on a computer, or to let multiple computers interact with you or each other. These components are interesting for other software designers who will improve them, migrate it to other platforms or integrate other components (like an intelligent equipment, or special algorithms).

We also need a simple interface that allows direct interaction with the knowledge base. This is a "browser" that can display the knowledge network from a selected point of view; allow walking around by following connections among the elements; tagging and collecting elements of interest, create, store and recall snapshots of previous displays; searching for any element by freely chosen criteria. It should also allow modifying these elements, save the modifications temporarily or permanently back into the knowledge base.

For "programming", we should add the "control domain" containing the core process flow elements (sequence, iteration, selection), accessing data and sending preconfigured messages to other elements. Practically, this is enough to describe any algorithm, either to be executed by a computer, or a process plan executed by the team members. It has the same requirements: managing resources, sharing time.

These services sound too technical, and indeed, they are delicate pieces of software. On the other hand, these elements are the fundamental building blocks of rational thinking, planning and execution – but with such precision that allows a computer to behave according to them. Naturally, the current proposal is not the best platform to completely describe such a system – this approach is currently both under testing in real life development and academic research. At both sides, the results are promising.

2.3.5 Risks and Responses

2.3.5.1 Data protection

A global knowledge base requires sharing the public, protect the local, and hide the private information. This system allows integrating data protection directly into the execution core, which means even the execution software does not contain and receive any data that is configured to be hidden. This idea was successfully tested in sensitive industry environments.

2.3.5.2 Data fraud

In various cases, the users of an information system are motivated to "cheat", report false information to their control systems. In this case, the system is not for management control and oversight, it holds their live data and behaves according to what it knows. False information will lead to improper responses and hazardous operation, so it should be avoided. On the other hand, any activity is logged, so the false information can be tracked back to its source, and the operating environment can be fixed to motivate fair operation. Finally, we can choose environments where participants are motivated in the clean operation of the system.

2.3.5.3 Feature/vendor lock

We talk about a global system, global rules, global software – does it mean monopoly? In this case, no, because this is not locked to any implementation, language or platform, only a standard notation of knowledge. It is not like a product, but like mathematical rules or the syntax of mathematical expressions. Anyone can improve our components, replace them with their own, or separate their private knowledge base from the global as they like.

2.3.5.4 Validity

Knowledge is power, it can be abused either by hiding critical results or poisoning the global, trusted knowledge base with false information. Even though currently we have no resource to deal with this problem, we do not forget about it, and there is a proven solution. Bitcoin and other crypto-currencies have no central authority that reliably controls their movement, but a shared, global system running on thousands of machines. Each participant is motivated to break the system and create some bitcoins in their wallets, and some surely have huge computing capacity. However, the Bitcoin solution is solid enough to withstand such attempts. Consequentially, when this knowledge base becomes vital to our global operation, we can make it secure enough.

2.3.5.5 Fight for respect – open source

The final risk is human issue: we naturally thrive for respect in our communities, and this motivation can be hazardous when we talk about the framework of our civilization. We have furious debates and wars over the simplest matters, in local communities, global politics or science. However, we have positive examples as well: the open source communities, where the participants help and learn from each other, equally interested in creating better solutions that make systems more reliable, efficient, etc.

This proposal tries give a global environment to scale this approach up to global level by allowing all experts control and merge their knowledge for the benefit of anyone needing it. This cooperative, collective improvement approach may finally lead to the state of a global Open Source Civilization.

2.4 Roadmap

2.4.1 Authors

The author has worked for 20+ years as software developer, system architect and analyst. Started his career at an industry leading data mining / artificial intelligence and agent developer company. Worked for multinational companies as developer, architect and software quality assurance engineer; designed and implemented government data management systems; and, as member of various innovative startup software companies. Recently went back to university, received the MSc degree and continued working on this system as official academic PhD research.

The co-author has MSc in agronomics and economics. Worked 20+ years in various environmental protection and minority support projects both at NGOs and EU controlled government agencies.

Together we have very strong motivation and sufficient experience both to create a working prototype of this information system, and to make it useful for a chosen demonstration system in a selected target problem area.

2.4.2 Current state

The core architecture is the result of 15+ years of software design and development, when these concepts were tested and improved behind various real-life projects. The first useful knowledge base application, “Construct” became operational 2 years ago, it was used to design its own structure.

The current academic research finally added the required background and confidence that this approach is not just an exotic hobby but returning to the long-forgotten roots on informatics. However, this state was reached mostly in spare time, behind other tasks. We are confident that given a chance to work on it full time, we can reach to a fully working demonstration version within a year, without involving new resources.

2.4.3 Short Term Aims

If we can extend our team, we have several close colleagues who could help creating not only core technical demonstrations that may be convincing only for selected experts, but state of the art components that proves the excellence of this idea for a larger audience. This may include multi-platform demonstrations, augmented reality environment for interaction with the knowledge base.

The additional resources can also be used to build advanced interaction components for one or more target problem domains, probably involving researchers from universities and helping them setting up their knowledge bases for their own domains.

2.4.4 Scaling up

When this knowledge base gradually becomes convenient and self-teaching, the core development team will step back to a technical support and development control role. We should keep the core domain coherent and control its continuous development; support the new team members in improving the system with their new ideas; and work on a reliable global backend for this service.

We strongly believe that the owners of the various domains will consistently improve the structure and coherence of the global knowledge base, and we will all benefit from their work.

3 Argumentation demonstrating how the model meets the assessment criteria

3.1 Core Values

Decisions within the governance model must be guided by the good of all humankind and by respect for the equal value of all human beings.

Open Source Civilization is not a solution, but an enabling technology that gives transparent control to hopefully responsible people. As analogy, written words changed the world for the better and worse; this will be another mirror reflecting all aspects of human behavior, and the willingness of facing it. On the other hand, we have used our power already and got to a situation where only even better awareness and restored responsible approach can help. From this point of view this is like reopening Pandora's box to release hope.

3.2 Decision-Making Capacity

Decision-making within the governance model must generally be possible without crippling delays that prevent the challenges from being adequately addressed.

As detailed in the model description, this system creates and executes process plans without any manual intervention, based on methods tested in real world applications (like oil refinery design). Having the ability to directly interact with all aspects and plans, all data related to the issue in question, is simply the most efficient way of decision making.

3.3 Effectiveness

In order to effectively address the global challenges and risks, the governance model must include means to ensure implementation of decisions.

Same to the core values: this is an information share and transfer mechanism. If used properly, it enables us, human beings to collect our knowledge, set priorities and address our problems. Among others, communities will be able to set up their own governing rules - just like we, developers will set up ours based on existing models; share, analyze, reuse or modify existing models.

Deeper analysis can be found in articles and lectures given by Douglas Engelbart, who devoted his whole career to design the most efficient improvement mechanisms. We should use his results when building up the cooperation management modules.

3.4 Resources and Financing

The proposed governance model must have sufficient human and material resources at its disposal, and these resources must be financed in an equitable manner.

The ultimate advantage and drawback of this era in IT is the vast amount of computing power and existing platform and solution for core technical tasks.

Consequentially, what the referred geniuses can only envision, we can create with relatively small effort. In fact, we already have partial implementations of the referred system core, we would only build the required "custom business logic": roles, terms, interactions, user interfaces related to specific target areas. This means we can reach solid results by only using the Prize.

It also seems quite easy to add financial support by either provide research and organization platform for existing organizations with solid budgets (well-known foundations against diseases, environment protection, disaster recovery, etc.)

Furthermore, the knowledge management features can be used by any organization (received very positive feedback from the university and a multinational pharmaceutical company by just describing the simplest features). We could create a commercial product that could further extend our access to experts and other resources.

The greater danger is that when the efficiency of this approach becomes obvious, there might be serious attempts to lock it to big vendors, national or business entities via financial, legal or patent based attacks.

However, we strongly believe that after demonstrating the power and aims of this approach optimally within a year, there will be no question of its importance, and the resources will be available for the core development, while the actual problem-solving organizations will take their share in improving the knowledge in this system far beyond what we can imagine today.

3.5 General Security

The governance model must guarantee international security and prevent disputes from escalating into war or other large-scale armed violence. Nations and ethnic groups must be guaranteed protection from external attack and must receive assistance in handling internal disputes fairly.

We strongly believe that empathy is a fundamental human value, and all the mentioned tensions are results of information scarcity, oversimplification of problems to business terms. With a shared global knowledge, when everyone can see the consequences of their actions and decisions, we think we will want to find fair solutions, and will want to create a sustainable, positive future for ourselves, the next generations and the whole planet.

If this is true, the users of this system will create peaceful models and will do their best to solve instead of causing problems.

3.6 Flexibility

A successful governance model must allow revisions and improvements of its structure and components.

The data storage mechanism (not detailed here for too much technicality) ensures that history is kept "forever". This is essential because when knowledge elements refer to each other, we must not only know their identity, but the actual states seen by the person who set up the connection. This is like referring to an idea: the owner may change his/her mind at a later point of time, change or cancel the idea to which I referred. We must both know that we referred to the source at a specific point of time, and that it has changed since then.

More details of this concept are available from Ted Nelson's Xanadu document model.

3.7 Accountability and Transparency

It is a fundamental requirement of a successful governance model that it performs the tasks it has been charged with, and that decision-makers can be held accountable for their actions. This includes mechanisms against abuse of power, which can invalidate decisions and actions that exceed the mandate of the governance model, and which can step in when decision-makers and relevant institutions are not doing their job correctly. This requires transparency and extensive insight into power structures and decision-making processes.

The proposed information system is completely based on "configurations", which includes the term definitions, access restrictions, "anything" known to the system, all processes planned and executed in the system, and all data collected on the way. Consequently, in theory, this gives a total transparency, added that some information may be "transparently hidden" due again transparent data privacy rules. Of course,

any information system may be corrupted if the owners of the infrastructure are motivated to do so - however, again in theory, this system can be protected from such motivations similarly to cryptocurrencies.

But we rather believe that having a transparent knowledge base that finally gives us a chance to clearly see our current (critical) situation, and a much greater, focused power to address them should be enough to humanity to grow up to the challenge, become conscious owners of this world, and responsible builders of our future.

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