

Developing Information and Communication Technology while Artificial Intelligence has to Properly/Sustainably Learn from the Earth Ecosystem Challenges and from Humans/Machines Networks -Part 1-



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Abstract

*The paper analyses the ICT/AI advances, in the context of actual **turbulent World**, observing, metaphorically, the way the children's intelligence is impressing us by its growing, but also with ups and downs, often linked with excessive consumption of TV/social media/AI (technology), could lead us to inherent correlations or reveal elusive expectations/hopes on ICT/AI actual challenges and eventually mitigation options, as we analysed some relevant examples to confirm. The opportunity of such approach, in the actual context of World unprecedented crises (global warming, Earth resources fading, social unbalances) and geopolitical violent shifts, was also confirmed, by analysing [1], for EU level and vision, with clear implications beyond national frames, starting from the crucial link between economic growth and AI, as emphasizing the role of ICT/AI to mitigate, by its power/potential, these challenges consequences, but also pointing the difficulties to develop and control critical AI capabilities. Analysing the technology of Liquid AI [2] and the approach of Teaching AI[4], we just could better understand, along with the benefits, the limits and the vulnerabilities of hypes concerning the explosive development of AI. More than these, the emergent **AI agent networks** (ALAN) [8] seem the tip of an iceberg, remembering how much admired the social media networks (SMN) were at their appearance.*

*As conclusion, considering the transcendent combination of ICT/AI digital multiplication power with the huge dimension and complexity of future ALAN, also multiplied with an increasing factor of progress of AI performance, it will be near impossible to monitor/control all the possible undesired consequences of the new ICT/AI/HI ecosystem at Earth scale. **Consequently, ALAN have to safely coexist with HI networks, inside or especially if outside of the controlled/balanced HI/AI teams we already mentioned [3], while keeping alive the necessary processes of refining knowledge, including SMN challenges we see today, eventually with the impact on IS/KBS/ICT/AI (or our) "children" growth we here just began to talk about.***

Keywords: Liquid Artificial Intelligence, Liquid Foundation Models, Teaching AI, AI Agent Networks, Machine Learning

JEL Classification: L63; L86; M15; O31; O33

We spend a great deal of time studying history, which, let's face it, is mostly the history of stupidity. So, it is a welcome change that people are studying instead the future of intelligence
Stephen Hawking [7]

1. Facing World challenges, information and communication technology arrived to *liquid* artificial intelligence

In our turbulent World and times, the challenges come from many (sometimes unexpected) places, but always we have to remember that also beauty and hope are still around us, although, as responsible human beings, we have not to forget and ask from time to time, how long these gifts could last on these trends?

Among the beauties of life on Earth, along with the flowers and the birds, the children are perhaps the most beautiful and special roots of hope, which need instead all our care and imagination to safely grow. One of the main reasons for these is the fact that children are keeping, for humankind future, the ancestral hope of life.

As a metaphor, we could imagine, in other sphere of value and understanding, that information and communication technology (ICT), among humankind creations, is perhaps one of the most powerful, along with its amazing advances/"children", where certainly artificial intelligence (AI) is the youngest and most promising.

That is why, generally, watching children intelligence growing, we could be inspired for our future plans and decisions on ICT/AI, just after more deeply observing some facts which otherwise could seem less significant.

Starting from the reality of children's intelligence, largely agreed as averagely and even impressively growing in the last decades, we could ask: *What we like the most at actual children?* The answers could include very fast thinking and acting toward efficiently following their goals, along with high curiosity/memory and more direct/sincere speaking.

On the other side, one could also ask: *What we do not like very much, sometimes, observing children?* Similarly, far from generalizing, the answers could include that, with TV/social media/AI, i.e., technology, excessive consumption, some children tend to be less efficacy (only main purpose oriented), more egoistic, less flexible/cooperant, less emotional or even less creative.

Perhaps, such observations could be considered as simple impressions, although some of them are largely, but not scientifically yet, agreed.

Still, we believe that, continuing our metaphor, at least some similarities with AI growing could be useful for future analyses and properly/sustainably development of ICT/AI.

With simpler words, we witnessing to the amazing and exponential development of ICT and its advances on Earth ecosystem, as we also repeatedly presented, pointing the impressive benefits but also some increasing challenges [17][19][24].

It is also important to recall and further consider the crucial digital multiplication power (DMP) and the increasing potential of ICT/AI applied at Earth scale by the unprecedented proliferation and communication of ICT applications, products, services and systems, from individuals to critical infrastructures.

The link between AI and human intelligence (HI) is also a complex factor of influence on ICT/AI progress, which is worth to be deeply and timely analysed, as we presented in [3][22]. In addition, we recall that AI results and advances are based on learning from data, which are difficult to reflect all human experience, as the next analysis will reveal.

More than these, the comparison of actual AI context with children growing could be psychologically/subliminally observed, as our technology smarter child, which is more and more useful and capable, sometimes leads us to naturally enjoy all its spiral ascensions, all over

the World, ignoring the eventual side effects of their multiplication factor. Still, it is also largely agreed that such supposition and acceptance could bring some increasing potential vulnerabilities and risks [17][21].

It is also worth to mention the very actual international debate on the influence of social media networks (SMN) on children growing and behaviour, but our opinion, already presented, is that some consequences should be beyond considered, regarding humankind general development on Earth [21][24].

Because we believe that these research premises have to be enlarged, the importance of holistic approach, for children education or ICT/AI development, remains crucial, as our analyses, far from proposing to be exhaustive, could reveal, based on other and our previous work [23][20][17][19].

Some recent examples could confirm, if we also (deeply) read “between the lines”, the reasons of such doubts and at least the necessity to watch more carefully “our beloved *children growth*”, at least in order to identify aspects which could properly/sustainably optimize ICT/AI development.

The opportunity of such approach, in the actual context of World unprecedented crises (global warming, Earth resources fading, social unbalances) and geopolitical violent shifts, is also confirmed at EU level and vision, with clear implications even beyond national frames, starting from the crucial link between economic growth and AI, as presented in [1]:

“For two decades, European economic growth has challenged the continent’s global competitiveness and inhibited its rate of per capita income growth. AI adoption could help economies accelerate labor productivity, driving growth and countering potentially negative economic, political, and societal consequences. But it also has the potential to worsen Europe’s competitive position if the continent misses the opportunity to take a more central role in AI’s development.”

Clear counting of some factors of the World challenging context we have mentioned (potentially negative economic, political, and societal consequences) is perhaps at least of the same importance like the AI subject itself, especially because here also it is emphasized the role of ICT/AI to mitigate, by its power/potential, these challenges consequences:

“Europe’s window of opportunity to accelerate its embrace of AI is narrow but clear. The biggest impediments to AI adoption across the continent are concerns over trust, security, and (national) dependency. Addressing these will likely accelerate adoption and, as a result, help reinvigorate the world’s third-largest economic region while building economic resilience. Sovereign AI capabilities potentially provide such a path if Europe can develop and control critical AI capabilities, enabling greater flexibility in the form of national, economic, operational, and technical independence.”

We could observe, between the lines, beyond *concerns over trust, security, and (national) dependency*, the difficulties (*if Europe can*) to *develop and control critical AI capabilities* and also a very high objective for AI features: *greater flexibility*.

If up now only some of the points of our metaphor have been revealed (as *driving growth* or *greater flexibility*), we could further analyse a more concrete, but also complex area, where some AI development economic implications are presented, focusing on the *liquid foundation models (LFMs)*, a new generation of AI models [2]:

“Ramin Hasani: When we started our machine learning research about a decade ago, we wanted to draw inspiration from nature and physics on how cells process information, and then we introduced the learnings into the machine learning world—for example, studying animal brains to build new and better algorithms...At MIT, in Professor Daniela Rus’s Computer Science and Artificial Intelligence Laboratory, we had been focusing on AI for robotics. We developed algorithms that are significantly more compressed than typical AI systems at the time and that perform much better. For instance, driving a car autonomously

was possible with a handful of neurons compared with artificial neural networks with millions of parameters.”

Beyond observing the significance of MIT level of research and the Romanian resonance of one of the team members name (*Professor Daniela Rus*), we remark the spectacular impact of such ICT/AI innovations on a critical industry area (*driving a car autonomously*), but we have to further watch all the implications:

<<We realized we could take that brain-inspired technology and apply it to many different domains, going from robotics to predictive markets to healthcare. We also saw that the technology can bring a lot of value and outperform the existing models in a much more efficient and compact way. We called these flexible forms of intelligence systems that we designed “liquid neural networks”—as in “liquid” for flexibility. These flexible intelligence systems facilitated better decision-making in highly automated tasks, such as autonomous driving.[That’s when we told ourselves that] we might want to expand the horizon of what we can do with this core technology and build and scale Liquid AI so we can go from predictive AI to generative AI. LFMs became the core building block of our technology, which built on everything we learned from nature, physics, and algorithms from our decade-long research at MIT.>>

As the author purposes include *reducing cost without sacrificing quality*, other details present also multiple advantages of the new technology:

“Ramin Hasani: The systematic way we design intelligent algorithms for enterprise applications allows us to provide a lot more control, certainty, and reliability into the deployment of AI systems. LFMs, in contrast to transformer-based models, give you confidence that you have the most cost- and energy-efficient AI stack delivering the highest quality. LFMs are the optimal choice of generative AI models to serve on a device—outside of data centers, in factories, in a car, and on your phone, laptop, and PC—or inside a data center for ultra-low-latency applications. These models will systematically reduce the cost of intelligence while delivering the same frontier-model quality on specialized applications.”

The new AI models are further presented as very useful for enterprises and general purposes applications:

“That was the core premise of Liquid AI: efficient and reliable AI for all. We wanted to give enterprises the confidence to know that when they use AI, they are getting the best possible version, one that is coming from a fundamentally new kind of technology. And this new technology is not just an alternative bet. It’s a first-principles way to look into the possibilities of general-purpose computers and get them to perform tasks with the energy requirements that the task actually entails.”

Still, coming back to our approach of watching more carefully “our beloved *children growth*”, we have to observe, again between the lines, that the syntagm *reducing cost without sacrificing quality* is more and more difficult to measure, as, for ICT and especially AI, the metric is hard to quantify and the *general-purpose computers* could support only a part of the specific/performance of AI applications.

This way we have just arrived at the point where we have to notice the importance of scaling AI, with considerable advantages, as above presented, but also with influences on performances and with other consequences, just in sensitive areas as *trust and security*.

Here we could enter an even more complex and complicate area of criteria for evaluating and developing ICT and AI, especially in the mentioned turbulent World and times, where *teaching AI* to be more and more closed to humans is a goal.

2. Teaching AI while its agents networks seem to start to talk

Although, there is a long and winding road toward AI with human performances and even an impossible mission, we have to agree that ICT/AI development, with its exponential speed and mentioned digital multiplication power for both technological and functional/proliferation areas, has a crucial role on supporting the sustainable progress of the Information Society (IS) on the way toward the Knowledge Based Society (KBS), along with the HI, finding the optimal ways on refining knowledge (RK) complex processes, wherever necessary, **for finding sustainable progress solutions in all areas of human activity** under the continuous changing Earth ecosystem and subjective humankind behaviour [20][26][3][14][9][18][15][11][12][25][27][16].

On the other hand, as the difficulties of optimizing World context evolution increase, the role of AI progresses should increase, but without neglecting its limits and risks, as the next example, even for an extreme case, presents [4]:

“When a medical imaging artificial intelligence (AI) began misclassifying malignant tumors as benign after subtle adversarial perturbations, having been trained on data vulnerable to pixel-level manipulations invisible to human clinicians, it exposed a foundational weakness in modern machine learning (ML). Unlike radiologists who would cross-examine suspicious findings against patient history and multimodal evidence, current AI systems lack the capacity for such epistemic validation, revealing their dangerous reliance on passive pattern recognition rather than active knowledge verification.”

At this AI failure case, we have to notice that the crucial role of AI ethics [3][6] and the need of safe balance of AI/HI teams work [9][15], are again confirmed as mandatory, before looking for new technical improvements of AI design:

“This failure epitomizes the broader limitations of conventional ML paradigms. Much like an overtrusting student who never questions their textbook, today’s models achieve behavioral competence by passively ingesting supervisory signals without developing genuine understanding. The result is systems exquisitely sensitive to data quality issues, distribution shifts, labeling errors, or adversarial perturbations, that human experts would instinctively detect. The student–teacher analogy reveals the root cause: contemporary AI excels at pattern mimicry but lacks the metacognitive machinery to evaluate its own learning. Where human learners develop discernment through iterative feedback, neural networks remain trapped in their initial training distribution, unable to distinguish reliable signals from spurious correlations. This deficiency becomes catastrophic when models encounter real-world complexities, as demonstrated by medical AI’s failure.”

We consider and have already presented, [19][3], that the solutions for improving AI performance and safety require to work on HI and AI teaming, while deeply analysing and selecting data for learning, as it is also confirmed further:

“In this article, we argue for a transition from mimicking human behavior and thought to pursuing rational reasoning, enabled by critical learning (CL). Our framework embeds verification directly into the learning process, combining rigorously vetted golden data sets with continuous alignment checks and integrated critical reasoning modules. Like expert clinicians validating hypotheses against domain constraints, CL systems actively interrogate their knowledge rather than passively absorbing it, transforming AI from statistical pattern matchers into discerning, adaptable learners.”

Here we have to notice a possible observation to the approach from [2], which could confirm our opinion that it is not sufficient for advanced AI to mimic the nature and humans actions, but to have a holistic approach from case to case, considering the challenges of above mentioned real-world complexities [26][18][16][12][20][3].

This way, we salute the above mentioned condition of *combining rigorously vetted golden data sets with continuous alignment checks and integrated critical reasoning modules*, which must point, **on our opinion, the main generally requirements, implying in fact HI/AI teams balance and dynamic safely rules, for future design and improvement of ICT/AI systems, although the huge difficulty of their implementations will continuously increase, along with the World challenges and crises.**

Other examples would sometimes contest the claims of premature AI advances or possible risks of, as [5]:

“Google model translated Bengali without being trained for it ...Sundar Pichai’s old clip on AI behaviour goes viral...The model was not learning Bengali from scratch in real time ...Instead, it had already been trained on vast multilingual during its initial development.”

As such claims and debates will certainly go on, in the fast changing, complex and complicate processes of developing ICT and especially AI, which often do not have quantifiably metrics for evaluation of their features or performance, such analyses should be timely made and properly considered [10][3][19][17].

As a matter of fact, an emergent and prominent area has to be also considered, naming the recent development start of *AI agent networks* [8], where, on our opinion, we can only see today the tip of an iceberg, as long time ago we pointed the SMN [17][13][22].

Just like before mentioned, while wondering how our intelligent children grow and begin to speak more and more to everyone or AI also surprise us every day with new advances, now we have to remember how much we admired the SMN at their appearance. Today we have just to observe, all around the World, the increasing worries about SMN influence on children grow and...beyond, to the Earth.

Our opinion is that, considering the transcendent combination of ICT/AI digital multiplication power (where *translated Bengali* was just a joke of beginning), mentioned above, with the unmeasurable dimension and complexity of future *AI agent networks* (AIAN), also multiplied with an unprecedentedly increasing factor of progress of AI performance, it will be near impossible to monitor/control all the possible undesired consequences of the new ICT/AI/HI ecosystem at Earth scale. Perhaps, such reasons inspired Stephen Hawking and other scientists to donate millions of USD to control AI development for the humankind safety [7].

Now we may just read, again beyond the lines, how far AIAN could go into a new “attractive” universe with unpredictable time, space and performance limits [8]:

“Agents will range from personalised assistants and domain-specific experts to super-agents representing large corporations, government entities, and national healthcare systems. Rather than simply automating predefined interactions and workflows, agents in The Agent Network will autonomously discover one another, share expertise and services, and co-create value in an open and evolving organisation or marketplace of ideas, services, and capabilities.”

Without entering other details, we have to notice or try to imagine how, increasing AIAN autonomy, performance and unmeasurable access to data all over the World could rise the probability of undesired vulnerabilities and risks, where actual fake news and frauds would appear like...inoffensive games.

As a consequence, beyond the space of this paper, we may preview the complexity and the crucial consequences of development start of *AI agent networks*, as only a part of the emerging context of a new and turbulent World, where such networks have to safely coexist with the HI networks, inside or especially if outside of the controlled/balanced HI/AI teams we already mentioned [3], while keeping alive the necessary processes of RK, including the SMN challenges we see today, eventually with the impact on IS/KBS/ICT/AI (or our) “children” growing we here just began to talk about.

3. Conclusions

Continuing to analyse our turbulent World and times challenges, coming from many causes, sometimes unexpected, we have to remember that also beauty and hope are still around us, but, as responsible human beings, we have not to forget and ask from time to time, how long these Earth gifts could last upon aggressive trends, i.e., on which expectations we may trust. This way, we observed that, **among the beauties of life on Earth, along with the flowers and the birds, the children are perhaps the most beautiful and special roots of hope, which needs instead all our care and imagination to safely grow. One of the main reasons for these is the fact that children are keeping, for humankind future, the ancestral hope of life.**

Starting from an inspiring and mobilizing metaphor, we could imagine, in other sphere of value and understanding, that ICT, among humankind creations, is perhaps one of the most powerful, along with its amazing advances/"children", where certainly AI is the youngest and most promising. That is why, generally, watching children intelligence growing, we could be inspired for our future plans and decisions on ICT/AI, just after more deeply observing some facts which otherwise could seem less significant.

Observing the reality of children's intelligence, impressively growing in the last decades, we analysed, far from generalizing, what we like the most at actual children, or, on contrary, what, sometimes, we do not like very much. The answers include very fast thinking and acting toward efficiently following their goals, along with high curiosity/memory and more direct/sincere speaking, but on the other side, some aspects (less efficacy-only main purpose oriented, more egoistic, less flexible/cooperant, less emotional or even less creative), often linked with TV/social media/AI, i.e., technology, excessive consumption, could lead to inherent correlations with ICT/AI actual challenges.

As such observations could be considered as simple impressions, although some of them are largely, but not scientifically yet, agreed, still, we believe that, continuing our metaphor, at least some similarities with AI growing could be useful for future analyses and properly/sustainably development of ICT/AI, because we witnessing to the amazing and exponential development of ICT and its advances on Earth ecosystem, as we also repeatedly presented, pointing the impressive benefits but also some increasing challenges [17][19][24].

For argumentation, we have considered the crucial DMP and the increasing potential of ICT/AI applied at Earth scale by the unprecedented proliferation and communication of ICT applications, products, services and systems, from individuals to critical infrastructures and also the link between AI and human intelligence (HI), a complex factor of influence on ICT/AI progress, which is worth to be deeply and timely analysed, as we presented in [3][22]. In addition, we pointed that AI results and advances are based on learning from data, which are difficult to reflect all human experience, as our analysis eventually revealed.

The comparison of actual AI context with children growing could be psychologically/subliminally observed, as our technology smarter child, which is more and more useful and capable, sometimes leads us to naturally enjoy all its spiral ascensions, all over the World, ignoring the eventual side effects of their multiplication factor. Still, it is also largely agreed that such supposition and acceptance could bring some increasing potential vulnerabilities and risks [17][21]. It is also worth to mention the very actual international debate on the influence of SMN on children growing and behaviour, but our opinion is that some consequences should be beyond considered, regarding humankind general development on Earth [21][24].

We believe that these research premises have to be enlarged, due to the importance of holistic approach, for children education or ICT/AI development, which remains crucial, as our analyses, far from proposing to be exhaustive, could reveal, based also on our previous work [23][20][17][19].

The analyses of some recent examples confirmed, (deeply) reading “between the lines”, the reasons of such research/doubts and at least the necessity to watch more carefully “our beloved *children* growth”, at least in order to identify aspects which could properly/sustainably optimize ICT/AI development.

The opportunity of such approach, in the actual context of World unprecedented crises (global warming, Earth resources fading, social unbalances) and geopolitical violent shifts, was also confirmed, by analysing [1], for EU level and vision, with clear implications even beyond national frames, starting from the crucial link between economic growth and AI, as presented emphasizing the role of ICT/AI to mitigate, by its power/potential, these challenges consequences. It is also important that, beyond *concerns over trust, security, and (national) dependency*, for AI, the difficulties to *develop and control critical AI capabilities* are a very high objective for AI features, along with *greater flexibility*.

Analysing some AI development economic implications, as presented by [2], focusing on the *liquid foundation models (LFMs)*, *a new generation of AI models*, we observed a potential spectacular impact of such ICT/AI innovations on a critical industry area (*driving a car autonomously*), but we have to further watch all the consequences, because, coming back to our approach of watching more carefully “our beloved *children* growth”, we have to observe, also from [2], again between the lines, that the syntagm *reducing cost without sacrificing quality* is more and more difficult to measure, as, for ICT and especially AI, the metric is hard to quantify and the *general-purpose computers* could support only a part of the specific/performance of AI applications. Concluding, we have to notice the importance of scaling AI, with considerable advantages, as above presented, but also with influences on performances and with other consequences, just in sensitive areas as *trust and security*.

This way we further have analysed an even more complex and complicate area of criteria for evaluating and developing ICT and AI, especially in the mentioned turbulent World and times, where *teaching AI* to be more and more closed to humans is a goal. Still, as the difficulties of optimizing World context evolution increase, the role of AI progresses should increase, but without neglecting its limits and risks, as it is also presented by [4], even for an extreme case. Considering this AI failure case, we have to notice that the crucial role of AI ethics and the need of safe balance of AI/HI teams work [3][6] are again confirmed as mandatory, before looking for new technical improvements of AI design. We conclude and have already presented, [19][21], that the solutions for improving AI performance and safety require to work on HI and AI teaming, while deeply analysing and selecting data for learning. **A possible observation to the approach from [2] could confirm here our opinion that it is not sufficient for advanced AI to mimic the nature and humans actions, but to have a holistic approach from case to case, considering the challenges of above mentioned *real-world complexities* [4] and noticing the condition of *combining rigorously vetted golden data sets with continuous alignment checks and integrated critical reasoning modules*, which must point, on our opinion, the main generally requirements, implying in fact HI/AI teams balance and dynamic safely rules, for future design and improvement of ICT/AI systems, although the huge difficulty of their implementations will continuously increase, along with the World challenges and crises [26][18][16][12][20][3].**

More than these, other studied examples would sometimes contest the claims of premature AI advances or possible risks, as in [5] (*Google model translated Bengali without being trained*), while the fast changing, complex and complicate processes of developing ICT and especially AI often do not have quantifiably metrics [10][3][19][17]. An emergent and prominent area has to be also considered, naming the recent development start of *AI agent networks* (AIAN) [8], where, on our opinion, we can only see today the tip of an iceberg, as long time ago we pointed the SMN [17][13][22].

A conclusion is that, wondering how our intelligent children grow and begin to speak more and more to everyone or AI also surprise us every day with new advances, now we have to remember how much we admired the SMN at their appearance. Today we have just to observe, all around the World, the increasing worries about SMN influence on children grow and...beyond, to the Earth. Our opinion is that, considering the transcendent combination of ICT/AI digital multiplication power (where *translated Bengali* was just a joke of beginning), above mentioned, with the unmeasurable dimension and complexity of future (AIAN), also multiplied with an unprecedentedly increasing factor of progress of AI performance, it will be near impossible to monitor/ control all the possible undesired consequences of the new ICT/AI/HI ecosystem at Earth scale. Perhaps, such reasons inspired Stephen Hawking and other scientists to donate millions of USD to control AI development for the humankind safety [7]. Now we may just read[8], again beyond the lines, how far AIAN could go into a new “attractive” universe with unpredictable time, space and performance limits.

Without entering other details, we have to notice or try to imagine how, increasing AIAN autonomy, performance and unmeasurable access to data all over the World could rise the probability of undesired vulnerabilities and risks, where actual fake news and frauds would appear like...inoffensive games.

As a final conclusion, beyond the space of this paper, we may preview the complexity and the crucial consequences of development start of *AI agent networks*, as only a part of the emerging context of a new and turbulent World, where such networks have to safely coexist with the HI networks, inside or especially if outside of the controlled/balanced HI/AI teams we already mentioned [3], while keeping alive the necessary processes of RK, including the SMN challenges we see today, eventually with the impact on IS/KBS/ICT/AI (or our) “children” growing we here just began to talk about.

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