

Future of Expertise - Part II¹

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Abstract

With the rapid pace of new service offering introductions and the emergence of new technology-enabled adoption models, stakeholders from industry, academia, and government are struggling to create and hire needed talent. This white paper on the changing nature of expertise explores the skills needed for digital transformation and its impact on the innovation process. The findings inform an update to the T-shaped adaptive innovator model of expertise, for which ISSIP continues to advocate, but in a revised form.

1. Introduction

In 2000, just over two decades ago, the average cost of a digital service infrastructure (basic compute and storage infrastructure needed to support the business) for a typical start-up enterprise company was \$5 million [1]. Today, the cost has dropped to less than \$5 thousand. This enormous decline in cost was made possible by digital transformation. The industry is struggling to effectively hire the talent needed to keep up with such transformations of infrastructure, operations and ecosystem partners. Universities are also striving to successfully graduate diverse individuals with needed skills, experience, and mindsets to hit-the-ground-running and succeed, even as some question the need for a university education. Governments realize that the sustainable wealth of nations depends more than ever on high-skill, high-pay, highly engaged workers within their borders. Simultaneously, individuals face a dizzying array of ‘opportunities’ to up-skill for more pay but struggle to choose the best path for quality-of-life. New technologies and a host of disruptive and impending world events, only add to the complexity of this important topic – the future of expertise.

This white paper summarizes presentations and dialogue among top executives from IBM, Cisco, Resilinc, Metropolitan Cities MC gmbH and Waltz Health and leaders at the intersection of academia and industry in Europe (University of Aachen and Warwick University), the US (Harvard) and Canada (Simon Fraser University), at ISSIP’s Discovery Summit: The Future of Expertise Part 2, which took place virtually September 28, 2022. This whitepaper is organized as follows:

Section 2 provides a detailed summary of the main presentations; Section 3 covers results of ISSIP’s digital transformation survey, conducted prior to the event; Finally Section 4 presents our key conclusions.

¹ Based on September 28, 2022, event <https://issip.org/future-of-expertise/>. The International Society of Service Innovation Professional is a non-profit professional association: www.ISSIP.org.

² with input from the ISSIP Leadership team.

2. Summary of the Event

[Professor Hila Lifshitz-Assaf](#) facilitated the opening session of the Discovery Summit, dispelling myths and assumptions about the respective roles of artificial intelligence (AI) and ‘experts’ in 2023 and future creative and innovation models. Next, [Professor Terri Griffith](#) moderated “The Future of Expertise at Global Scale, Speed and Complexity,” discussion with presenters and panelists Bindiya Vakil (CEO, Resilinc), Gerhard Gudergan, (CEO Metropolitan Cities), Warner de Gooijer (Global Lead, Innovation and Incubation, Cisco Systems), Sunil Kripalani (CTO, Waltz Health), and Ammar Rayes (Principle TPM, Cisco).

The following section summarizes the key takeaways from each of the presenters

A. **Would anyone shout “Eureka” in 2032? The process of innovation and creativity in the digital age** by Professor [Hila Lifshitz-Assaf](#)

What would the future of innovation be in 2032, just ten years from now? Dr. Lifshitz-Assaf fully engaged all participants (and our panelists) in an opening exercise/question, which immediately demonstrated creativity possible through AI, in an arena (music) where human creation or composition was assumed. Her presentation highlighted the evolution of the role of experts, from the traditional innovation processes, which were developed mainly around individual domain experts, to today’s more distributed processes involving crowds and AI tools. She then reviewed the process evolution with regard to organizations, which took the first step in inviting individuals, who were not necessarily domain-experts, to solve a problem together. Innovators started using web-based online platforms about a decade ago, when work distribution became possible. This allowed innovations from anywhere. Open source and crowdsourcing models have become available. Many organizations, e.g. [NASA](#), have started using the online distributed process to list the open difficult or on-solved problems and received great feedback. This has produced significant breakthroughs by nonexperts. This has started to create tension and some level of resistance from the employees of the organizations.

Dr. Lifshitz-Assaf suggested that a key problem in perception and understanding of the distributed online system is the assumption that the external experts would replace the current domain experts. She sees the same problem now happening with AI, i.e. Would AI replace human innovation and creation? This question is addressed in a recent paper entitled “Scaling up Analogical Innovation with Crowds and AI, focusing on how to re-think and re-design the innovation process, by Kittur A, Yu L,, Hope T. Chan J, Lifshitz-Assad H, etc. [5]. The idea is not to substitute but to take the best from each source using a hybrid model.

B. **Panel Discussion: The Future of Expertise at Global Scale, Speed and Complexity** by [Professor Terri Griffith](#).

- [Bindiya Vakil \(CEO, Resilinc\)](#): Resilinc has an Artificial Intelligence / Natural Language Processing (AI/NPL) engine to predict supply chain risks and disruptions and proactively mitigate risk. This is a major problem across industry sector and increasingly visible to markets and consumers, as news outlets cover disruptions from climate to pandemic impacts. Supply Chain risk mitigation is essential to ensure continuity of supplies and goods.

- [Gerhard Gudergan, \(CEO Metropolitan Cities MC GmbH, Head of Research Division at FIR\)](#): Smart industries need smart people. He presented a smart working model that reduces CO2 emissions by 20%. He mentioned that the future of talent depends on re-designing the process and concept of how to perform work. I.e.. In the digital and automation future, the working environment needs to be designed in a way that people (1) can easily reflect on their work results, (2) get knowledge needed to solve a problem, and (3) the time that formally needed for manual work is invested to provide new training materials and content.
- [Warner de Gooijer \(Global Lead, Innovation and Incubation, Cisco Systems\)](#). Core to the future of expertise includes passion for work and learning, curiosity for data and technology, Intrinsic motivation to make a difference, positive attitude toward change, and adaptability to such change.
- [Sunil Kripalani \(CTO, Waltz Health\)](#) talked about speeding the progression from entry to expert by partnering with universities to reduce the innovation cycle in healthcare. He suggests that a joint program should be formed to evaluate this area.
- [Ammar Rayes \(Principle TPM, Cisco\)](#) talked about the future of expertise that includes the following six areas: (1) combined business and technical mentality: needed to address the fast adoption of technologies, (2) Ownership: new leaders must learn the business quickly and act on behalf of the entire company, (3) Simplicity: the KISS (Keep-It-Simple-Stupid) principle is alive and well, (4) Seek Feedback: New leaders are expected to work with multiple teams to seek diverse perspective, (5) Speed and Agility: Technology is changing fast. New leaders are expected to prototype ideas quickly to meet new business agility requirements, (6) Not invented here syndrome is dead: leaders are expected to learn and use external capabilities such as cloud and open source to speed-up innovation.

C. Expertise in the Times of Digital Transformation by Joanne Wright (Senior VP, IBM)

Digital Transformation covers multiple dimensions ranging from organizational adaptation and strategy to revising internal structures, to empowering people. The four basic activities for digital transition include: reimagining your business, refining operation (to be fast), reconnecting with customers in a new way and establishing a growth mindset.

To establish a solid foundation for growth mindset among team members, Ms. Wright presented three key focus areas that are required: optimized workflows, acceleration in technology adoption and to become client centric. Experts will be set apart with skills like hunger for learning, critical thinking, expressing thoughts with clarity, teamwork, and the ability to prioritize with extraordinary confidence.

3. Updated Survey Results

[ISSIP Executive Director Michele Carroll](#) shared findings of the 'Future of Expertise' survey ISSIP fielded from June to September 2022 among ISSIP members and completed by 50 leaders from industry and academia [4]. Following is a list of its questions and a summary of responses.

Responders have overwhelmingly indicated that future skills will include

- Collaboration with AI and robots.
- Lifelong learning.
- Demand for social-emotional intelligence.
- Data-driven, science-based approaches for developing the expertise of individuals, cities, nations.
- Collective and swarm intelligence.
- Responsible actors and their AI/digital twins at all scales interacting in networks learning to invest systematically in becoming more T-shaped, with depth and breadth of expertise.
- Learning, unlearning, adapting to accelerating change.

The majority of those surveyed indicated that the future of expertise will be different from traditional models based primarily on university degrees for specific academic disciplines. While impossible to predict with any precision, future expertise will surely be some blend of the traditional college graduate education expertise, entrepreneurial and technology-maker expertise, business, government, influencer expertise (sports, art, media, political, etc.), and perhaps a few new types of technology-augmented expertise emerging, based on advancing AI capabilities, as well.

Finally, some leaders have provided their positions in the future of expertise. Top responses include:

- The T-shaped adaptive innovator model of expertise is evolving from T1 to T3 to T6. T1 was breadth (communication skills) and depth (problem solving skills). T3 was breadth (communication skills across diverse disciplines, systems, and cultures) with depth (problem solving skills deep in at least one discipline, system, and culture - e.g., computer science, healthcare, USA). T6 includes T3, and adds three additional areas of breadth (communication skills across diverse advancing technologies, work practices, and mindsets) and depth (problem solving skills deep in at least one advancing technology, work practice, and mindset - e.g., AI, agile, and growth). The service science community as an emerging transdiscipline has enumerated many of the specific disciplines, systems, cultures, advancing technologies, work practices, and mindsets with an organizing framework for the evolving ecology of responsible actors (AKA service systems entities - people, businesses, universities, nations, etc.).
- The future of expertise will be emergent expertise - the ability to gather the knowledge you need when you need it, to make technology, people, process and data decisions - creating wisdom through human and AI partners.
- The method of harnessing expertise to make it available and effective is in the craftwork stage at present. It can develop into a tested method (decision cycles) that is in widespread use, and that method itself evolves by self-examination.
- Key categories for future skills include Data Management, Content Management, Information Management, and Knowledge Management. The first real stretch beyond the technical capability, reflecting the relative success of applying the Information and using that to inform future results. The Future of Expertise does not portend managing data/content/information/knowledge in any more efficient or productive ways – although the integration of Artificial Intelligence seems to make some promises in that arena. Moreover, Expertise that has been (pre-IT) captured, contained, and disseminated largely by individuals, is now captured, stored, and accessed digitally. No longer is one person the exclusive repository of a modicum of applicable information; the person who kept great notes (Leonardo da Vinci, perhaps? Thomas Edison? You?) must

graduate to being able to sort through and find relevancy amidst the deluge of data available. (This might be a key role for AI to play.) So the Future of Expertise will absolutely rely on a set of skills that enable this future interaction with data. Lifelong learning, critical decision making, problem analysis – these and more will be the horizontal bar of the T-shaped individual, while the vertical depth of expertise may well become less relevant to the contribution and value of the individual

- The future of expertise should be the intersection of two things: us taking what we do well and what we want to do. So we should choose to do the pattern-matching and meaning-making, augmented by tech including AI, while leaving rote activities to the tech.
- The future of expertise will require professionals who possess dexterity across dimensions of specialized skills, work practice skills, and soft skills, who develop mindsets that enable them to upskill and reskill across these dimensions, and who demand and nurture work environments that are diverse, inclusive, and equitable.
- The future of expertise will require people with the skills that machines cannot do as well, and those to train the machines to do the jobs that they are able to perform with proficiency. This includes probabilistic thinking with incomplete information, emotional intelligence, intuition and other human cognitive and emotional skills that machines cannot imitate.
- The Future of expertise will be driven in part by companies' willingness to quantitatively and qualitatively evaluate what makes a solid contributor to a team. Big Tech has discovered that four-year degrees don't define success, and others are following - but the amount of time it takes formal education to react to market needs with formal or informal education options is still lagging. AI analysis and solutioning must be implemented, companies must partner with industry, and standards must be set to help humans identify what it looks like to position themselves for success. Certifications are one way, but the accreditation of certifications is in doubt - especially as remote and self-paced programs are on the rise. The Future of Expertise is complicated and will be trial-and-error - as it is once the worker gets in the job that they'll see the biggest moments that expertise matters. Proficiency is one thing. Expertise is quite different.
- While the future of expertise is in your own hands, it will change by the forces around us. Climate change, war, social unrest, economic fluctuations, will drive the need for different products, different approaches and adoption/alignment in society.
- The Future of expertise will use technology to become more proactive in understanding market needs, and alternative education forms and economic incentives, plus partnerships with in-house institutions (like apprenticeships) and certifications to more adeptly equip talent with the skills required to meet future workplace needs. And if training humans doesn't happen fast enough, those skills will be automated.
- The future of expertise will require that individuals have demonstrated their knowledge in practical applications and that they understand how that knowledge may need to be adapted to be applicable to current applications which could involve advanced technology or greater reliance on collaboration.
- It will be critical for companies to make sure they invest at least the same amount of money in developing the skills of their current & new professionals than they will invest in new technologies to improve their business processes.
- We will soon hit a pitch-point where we will fall back (retro) from the notion of "everyone is a leader" to focus on the depth of true research (not "I Google'd it") of expert practitioners. There

is a starvation for a focused, organized (vs. chaos) finding of one's purpose, which is unique. The future needs experts - the Einstein's, Mother Teresa's, Augustine of Hippo, John Paul the Great - to be the leaders amongst leaders.

- The future of expertise is (1) in people who are T-shaped adaptive innovators with communications breadth and problem-solving depth, (2) in the AI Digital Twin of each person and all the advancing capabilities of AI (consumes energy for computation, storage, bandwidth, etc.), (3) in the network of connection and interactions with other service system entities (responsible actors, such people, businesses, universities, governments, etc.), and (4) learning to invest wisely and systematically in becoming better future versions of self - with more win-win interactions and change processes.
- Expertise in any field should be rooted in a systems thinking-based meta-knowledge common to all fields useful to support working together for a wiser, smarter, and more sustainable world according to a generalized T-shaped model.
- Expertise doesn't exist in a vacuum - to be truly expert in the future, people will need a better understanding of macroeconomics/politics, a better understanding of intra-organizational influencing and a broader use of smart technologies.

4. Conclusions

This white paper summarized the ISSIP Discovery Summit on the Future of Expertise of September 28, 2022. The focus was on the identification of key skills/expertise needed for today's fast-moving digital transformation age of new service offerings. The lifelong learning, T-shaped adaptive innovator model of expertise with communications breadth and problem-solving depth, for which ISSIP has long advocated, is now being augmented as people upskill with AI, across six areas of knowledge including academic disciplines, industry sectors, regional cultures, advancing technologies, work practices, and diverse mindsets. Top skills include a growth mindset with both business and technical acumen, fast adoption of new technologies, taking full-ownership, adaptation for simplicity, conscientiously seeking feedback, speed and agility and finally the use of external (e.g. cloud and open source) capabilities to speed up innovation. And yet with growing systems complexity, simplicity is the ultimate sophistication.

References

1. Rayes and S. Salam, IoT From Hype to Reality, The Road to Digital Transformation, 3rd Edition, Springer, 2021.
2. Cloud Computing Statistics for 2021 and forecasts for 2022: <https://start-up.house/en/blog/articles/cloud-computing-stats-forecasts-2022>
3. Future of Expertise part I, Jim Spohrer and Terri Griffith, June 29, 2022, <https://service-science.info/wp-content/uploads/2022/07/Future-of-Expertise-20220708-v1.pdf>
4. Future of Expertise – ISSIP Survey: https://docs.google.com/forms/d/1qjewOkixwYitbOmGBPwr4BKtP_Fvz_LbqaJKhFZworc/edit#responses
5. Kittur A, Yu L,, Hope T. Chan J, Lifshitz-Assad H, etc. "Scaling up Analogical Innovation with Crowds and AI", Proceedings of the National Academy of Sciences, 2019.

6. Discovery Summit Part II, https://youtu.be/UiFORPA0_3E
7. Lifshitz-Assaf, Hila. "Dismantling knowledge boundaries at NASA: The critical role of professional identity in open innovation." *Administrative science quarterly* 63, no. 4 (2018): 746-782.
<https://journals.sagepub.com/doi/full/10.1177/0001839217747876>