Genius Forecasting Vs. Forecasting Geniuses: An Innovation (and) Design Viewpoint

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Abstract: The purpose of this paper is to define, scope, and critically review the notion of "genius, or exceptional individual with a charismatic leadership, in forecasting, or anticipating the future by trained judgment in complex organizations and venture capitalism, from the viewpoint of Design Futures, contextualizing and addressing the research question. The paper is based on documental back-tracing, in line with methodological approaches in social sciences, and on reflexivity, whereby the author contributed insights with his senior industry experience, and classic case study, referred to DARPA, a leading US public organization in Deep Tech, and Philips, a leading EU manufacturer in High Tech, compared. The paper structures the field of investigation according to its theoretical background, offering a comparative analysis of the two organizations from the viewpoint of "genius forecasting" socio-cultural and managerial approaches. The notion of "liminality" based on given "sensitizing concepts" is introduced, to critically articulate such comparison, with actionable conclusions in the form of a SWOT structure. The paper is based on case study analysis within a theoretical framework, grounded in documental back-tracing and reflexivity. The paper is not based on new scientific empirical research or purposely executed expert interviews.The paper establishes a clear framework and offers actionable insights within the context of a peculiar phenomenon in terms of leadership and foresight. In particular, the paper combines a specific theoretical framework with the back tracing of a Deep Tech documental and High-Tech reflexive cases, establishing a balanced viewpoint on the notion of "genius" in Design Futures.

Practical Implications: The paper is derivative of an earlier publication commissioned by EIC (European Innovation Council), therefore its applicability is paramount in terms of offering an actionable SWOT-based portfolio of insights, for implementation.

Keywords: Design Futures; Genius forecasting; Sensitizing concepts; SWOT-based portfolio.

1. Introduction

Brilliant minds and exceptional individuals have traditionally exercised charismatic authority and leadership to show the way to *"the rest of us"*. "Brilliance" might be identified as the contemporary social currency, from social media to the performance of the self. In past stages of human adventure, anticipating the future was a key to individuals' well-being and the group's prosperity. Therefore, it was a specific function and social task allocated to exceptional individuals (Lopez Galvis & Spiers, 2022), who might have lived at the margins of social conventions and rules, like oracles or shamans, as an enabling condition to play a pivotal role in the same societies. The perceived proximity of this modality of performing foresight to fortune telling and other non-scientific domains of human enterprise (Sherden, 1998), might be the reason why no major body of literature exists yet on this approach to forecasting, despite the search for the guru, or the "genius", is as old as humankind. Perhaps this is the reason why the easiest way to define what "Genius Forecasting" is, does not lie in policymaking or business

strategy domains but in literature and liberal arts (Fortin, 2011, p. 16), urban design (Collie, 2011), and further potentiality that stretches from tourism and leisure (Yeoman, et al., 2022) to politics (Hassler-Forest, 2016). Isaac Asimov, Arthur C. Clarke, William Gibson, Bruce Sterling (Sterling, 2005), and the entire genre of science fiction offered a unique repository of future visioning.

1.1. Theoretical Background: Social Phenomena and Organizational Dynamics

The purpose of this backgrounder is to selectively underpin the key definitions of "Genius Forecasting" and "Forecasting Genius", to ground what will follow in robust, although not necessarily extensive, definitions, which are its theoretical outcome.

1.2. Social Phenomenon: Charisma

The notion of "charismatic authority", complementary to those of "legal" and "traditional" modalities of authority, was formalized by Max Weber (Weber, 1922). Since then, it has been constantly addressed, reviewed, and expanded in scientific bibliography (Tal & Gordon, 2015) at psychological, sociological, or organizational levels. Charisma entails multiple dimensions of personal expression and relational connection, including physical traits and posture, or *"words and actions"* (Wowak, et al., 2016) hence embodiment (Reh, Quaquebeke, & Giessner, 2017). Accordingly, when enacting performance based on charismatic authority, "delivery" might prevail over "content" as an influencing factor on a given audience (Caspi, Bogler, Tzuman, 2019). How does charism work, as a leadership modality? As contended, in recent literature, charismatic authority might pertain to either personal traits or relational dynamics (Vergauwe et al., 2016). Applications of Dingman's Five-Factor Model or FFM suggest that constituencies of charismatic authority might be best described at various measurement points (Vergauwe et al., 2017). Charisma as a personal trait might be related and discussed from the dynamics of "successful psychopathy" (Welsh & Lenzenweger, 2021) or narcissism (Rogoza & Fatfouta, 2020). On the other hand, beneficially, charisma might influence personal commitment and collective performance by providing focus and inspiration, e.g. at times of organizational change (Nohe et al., 2013), with revolution and crisis as potential causal determinants (Grabo, Spisak, Vugt, 2017), which might create demand for charismatic leadership in teams or groups.

1.3.) Social Phenomenon: Networking

By *"network-making power"* Castells identifies the key operational modalities that actors can embody or encounter within networks (adapted from Castells, 2009). The interplay between "programmers", who determine the knowledge flows in networks, and "switchers", who connect networks of different natures, enables the necessary thematic focus and multidisciplinary fluidity within said networks. In innovation eco-systems, storytelling by Genius Entrepreneurs acts as part of those "metaprograms", or universally shared visions, which shape the cultural discourse related to startup enterprise and technological innovation. "Design" is one of those meta-programs acting like global "operating systems" governing our socio-cultural modalities and practices as if they were applications. Even deeper in terms of articulating value in our societies, scientific knowledge and technological translations thereof lie at the heart of socio-economic value perception and creation: *"The transformation of society is regarded as predominantly shaped by scientific and technical change. In other words, the socialization of science has been contingent on the scientification of society"* (Nowotny, Scott, & Gibbons, 2001, 3).

Within knowledge networks and entrepreneurial networks, individual genius and personal charisma are paramount to achieve recognition, validation, and success. At given moments in history, no matter how much charisma was the possible byproduct of toxic personalities. Beyond individual narcissism, what seems to be desirable to enable preferable futures is a shift from "individual genius" to "collective genius" (Donnelly & Montuori 2022). In post-normal times, individual imagination is key but not sufficient because it is always rooted in the present worldview (Sardar, in conversation with Donnelly and Montuori (Donnelly & Montuori, 2022). In this post-normal context, science and scientist are expected to migrate from reductionist approaches to systemic and synthetic approaches. This appears particularly urgent when the focus shifts from Extended Present to Familiar Futures fields, to the unexplored fuzzy front of Unthought Futures which might be related to Horizon 3 innovation scope (Sardar, Sweeney, in: Sadar (Ed.), 2017, p. 111.

1.4. Organizational Dynamics: Maverickism

Mavericks, or individuals who defy, deviate, or even refuse shared normative rules and patterns in each given context (Heesen, 2019) have been assessed as beneficial to the success of business organizations (Jordan et al., 2023), under specific conditions. Mavericks are those who adopt such behavioral traits. One might therefore associate mavericks and "Maverickism" with innate talents and an individualist drive. Mavericks are pervasively featured in Western societies, at least since Romanticism, and post-modern economies. Such profile matches socio-cultural desirability traits wherever individualism is perceived as an accepted form of behavior. Even more, cultural discourses and popular culture storytelling in advanced economies posit that Maverickism is an appealing pattern. This despite the possibly lower level of social agreeableness associated with such extraverted, contrarian mindsets (Gardiner & Jackson, 2012). In creative industries, for example, it is possible to distinguish between *"mainstreams",* or integrated professionals, and *"mavericks",* who naturally cater to the cultural discourses of innovation, transformation, and revolution, at the risk of turning into *"misfits",* who drop out of the system by being disconnected to teams, goals and purposes (Jones et al., 2016). Equivalent categorizations apply to domains so diverse as science (Avin, 2019) and medicine (Grove, et al., 2022). Scientists who work in "maverick modality" might be functional to the performance of "transformative research": *"A range of endeavors which promise extraordinary outcomes, such as: revolutionizing entire disciplines; creating entirely new fields; or disrupting accepted theories and perspectives – in other words, those endeavors which have the potential to change the way we address challenges in science, engineering, and innovation"* (NSB, 2007, quoted in Avin, 2019). It is not an easy challenge to "engineer" maverick behavior in science, e.g. convert detail-oriented, process-driven scientists into risk-taking, norm-breaking scientists using a rational credit incentive (Heesen, 2019).

1.4. Organizational Dynamics: Trained Judgment

A reflection on how designers conceptualize their processes of "knowledge generation" can be identified in the contemporary notion of *"Trained Judgment",* as defined by Ben van Berkel, co-founder of UNStudio, in Amsterdam and Shanghai, and a prolific author and academic thought leader. *"Trained Judgement"* (Bevolo, 2016 citation from Berkel & Bos, 1999, from the English translation provided by UNStudio) is firstly a proactive reaction to digital data processing redefining the *"...architect versus commissioner versus regulator"* relationships in the context of networked architecture. To effectively capture the essence of *"Trained Judgement",* a process of knowing needs to be introduced and positioned in parallel to deduction and induction, that of "*abduction*", defined as: *"A method of forming a general prediction without any positive assurance that it will succeed either in the special case or usually, its justification being that it is the only possible hope of regulating our future conduct rationally"* (Fischer, 2001). "*Abduction*" represents the semiotic process by which a sign ("intuitively") finds its position in a "coding system", hence connecting a phenomenon at the *"ground"* level to meaning through para-logical means (Fischer, 2001). The relevance of output and outcome is indicated as a preferable parameter to evaluate what is abductively generated (Tavory & Timmermans, 2014).

As an active and dynamic method, *"Trained Judgement"* requires critical thinking, editing capabilities, and intuition guided by experience. *"Trained Judgment"* is:

- neither repeatable over several cycles, nor "probes",
- nor reflexive in terms of generating an own theoretical foundation.

"Trained Judgment" might be possibly categorized as an incremental evolution of past paradigms describing the creative process in applied arts, based on what appears an intuitive view of creativity. Ultimately determined by personal talent as a discriminating success factor, in an unstructured process where accumulated experience results in abductive confidence. Intuitive thinking might therefore -at least to some extent- rely on transferable skills). "Trained Judgement" as a leadership approach benefits from personal charisma and is open and flexible for mavericks to express their behavioral preferences and professional traits as an intrinsic constituency of their professional commitment. In principle, creators too prove less effective than managers at judging the validity of their ideas, as they are affected by confirmation bias (Grant, 2016). It seems that creators are capable of achieving excellence, but their self-assessment abilities are lower when selecting one option from their overall output.

2. Definitions

2.1. Genius, or Different Notions of Intelligence

The notion of exceptional individuals leading in creativity and vision thanks to their talent, historically migrated from fine arts and architecture to architects, designers, and even, more recently, lifestyle influencers. However, beyond this generic storyline, which might be interpreted as rather individualistic, contemporary creativity is regarded as the outcome of collective processes (Bevolo, 2010). For the last few decades, in consumer sectors and "shallow tech" markets, deviating from social and cultural conventions has proved increasingly productive from an innovation design and strategic marketing viewpoints, but also within scientific research, according to the principle of the Deviant's Advantage, or *devox* (Mathews & Wacker, 2002). Value recognition is a cultural and collective process, and this is the case for recognizing, selecting, and acknowledging "genius" too. This applies to startups and their ecosystems (Mehta, 2019), reframing the perception of technology-driven innovation according to the negative notion of solutionism (Morozov, 2013).

Based on the above four sketches, definitions as key foundations for this paper were elaborated and will therefore be further articulated, below. Firstly, Charisma and Maverickism might be associated with the notion of "genius" as its constituencies, whereas *"Trained Judgement"* might be described as one of its underpinning mechanisms, within organizations, networks, and ecosystems. "Practical intelligence" is often the outcome of "concerted cultivation", or a systematic and holistic educational pattern in biographies, leading to a socio-cultural advantage (Gladwell, 2008) or a sense of individual entitlement and the ability to stand for one's rights and reasons in front of authority and adversity (Gladwell, 2008). Parameters and references to understand creativity have been developed across the decades looking at fine arts, whereas it is possible to extend the field of creativity to all human activities (Bevolo, 2010), where one may establish two polarities, from artistic work to process-based bureaucratic work, or from independence to execution (Jacques, 1970).

2.2. Genius Forecasting, or Foresight by Charisma

"Genius Forecasting" is a precise identifier in the taxonomy of foresight and futures research. It relies on the social phenomenon of "charismatic authority", and the character trait of "mavericks", namely people who deviate from the given behavioral and intellectual patterns. The definition typically applies in design, fashion, and aesthetic-related fields. Here, strongly biased "futurologists", are traditionally closer to curators/ editors than scientific or participatory professionals (Bevolo & Price, 2006). Foresight professionals regard *"Genius Forecasting"* with a negative bias or a stigma (Bevolo & Price, 2006), based on the perception that such practice borders or overlaps with that of *"Pop Futurism"* (Slaughter, 2004). By the latter, we identify the popularized, acritical, and media-friendly flow of news, posts, and other content representing the future in continuity with technology trends within the present frameworks and episteme.

In extreme synthesis*, "Genius Forecasting"* might be defined as (Bevolo, 2016):

> *"... The most subjective method would be the "Genius Forecasting" which is strongly connected to intuition, visioning, visualizing..."* (Kuosa, 2012).

Alternatively, a "collective/participatory" modality of future research might be defined as:

> *"Participatory methods represent* [collective], *systematic ways of giving estimations of the most probable future..."* (adapted from Kuosa, 2012).

2.3. "Forecasting Geniuses", or Visionary Leadership

It must be clearly noted how the theoretical inaccuracy to establish a direct connection between futures researchers or foresight consultants, and thought leaders in architecture, design, enterprise, finance or business in general, who envision futures and make them happen. As much as Steve Jobs (Mehta, 2019; Grant, 2016), Rem Koolhaas, and more prominent visionaries established themselves as anticipators and facilitators of transformative change with high impact, the mission and practice of those who envision and shape the world of tomorrow is different and distinctive from the work of scholars or practitioners who study the future, academically or as a profession. At the same time, one must record how there currently is an epistemological shift in Social Sciences and Humanities from world mirroring to world-making (Gergen, 2015), or a shift of focus and interest from thinkers about the future, however visionary, to future-makers, who make the future

happen, or: *"To make people believe is to make them act"* (DeCerteau, 1984).

3. Research Question

The above reflections and definitions suggested the existence of somehow unrelated, yet converging conditions whereby future-oriented enterprises and organizations might aim at identifying and leveraging alternative, activist, and even antagonist talents:

> *What are conditions whereby "Genius" leadership is enabled (or not) to deliver its performance by manageable control within innovative, future-oriented organizations?*

Although the paper will present conclusions in terms of implementable synthesis, an attempt to create a comprehensive framework for foresight and innovation in complex organizations, as done elsewhere (Tõnurist, & Hanson, 2020), will not be within its scope.

4. Methodology

As this paper is presented as a combination of case studies, the methodological approach is relatively simplified and light, compared to an empirical/experimental research submission. It might be concluded as a methodological synthesis that a mix of bibliographically based approaches was instead adopted, namely several back-tracing operations were performed within a case study architecture:

- Case study (Yin, 2014), with particular reference to the analysis and interpretation of collected materials using both categorical aggregation and direct interpretation, combined in recurring loops (Stake, 1995), focusing on a given "identified phenomenon" and two cases;

- Back-tracing, regarding the notion of methodological structured and focused comparison (George & Bennet, 2005), following from the identification of the given phenomenon with the clear research objective to dissect and evaluate thereof according to a set of standardized questions across each case.

As focal points, this paper pursues qualified answers to the above research question by investigating two applied cases:

a) The first case study is on a Dutch multinational corporation, focusing on their design competence as deployed for urban futures and city lighting innovation, and
b) the second case study is on an American national agency tasked with Deep Tech innovation.

The specific phenomenon (George & Bennet, 2005, p.69) was identified in the "genius" behavioral performance of exceptional individuals within complex and structured organizations with innovative goals while the focus was applicative. To structure the analysis behind this paper, one epistemological notion, one methodological concept, and a consulting tool were adopted:

- Liminality (Bevolo, 2016);
- Sensitizing Concepts (Bevolo, 2016);
- SWOT (Planellas & Muni, 2020)

To define 'Sensitizing Concepts', we might resort to Grounded Theory, although this methodological feature is not exclusive to constructivism it is more general in social sciences (Charmaz, 2014). Within this paper, Sensitizing Concepts will be presented in couples, forming a conceptual space where a tension, or development space, exists in the liminal gap between them, building up on the generic notion of liminality: *"Liminality refers to moments or periods of transition during which the normal limits to thought, self-understanding, and behavior are relaxed, opening the way to novelty and imagination, construction and destruction"* (Thomassen, 2014). Conclusions will be structured according to a SWOT structure (Planellas & Muni, 2020), as the last step, to applicative advice for enterprises and organizations.

5. Cases: Philips Design / Lighting and Darpa

5.1. CASE STUDY: PHILIPS

A comprehensive definition of city.people.light should record its roots in the High Design approach established at Philips Design by Dr. Stefano Marzano, CEO of Philips Design, 1991-2011, with *"Vision of the Future"* (1995) (Lambourne, Feiz, & Rigot, 1997), in collaboration with FutureConceptLab, Milan, as its flagship manifesto program. From such perspective, city.people.light is defined as a perfect blueprint of High Design (Bevolo, 2017), integrating socio-cultural trends with concept generation through thought leadership and business networking. Under the identification "city.people.light", at least two global urban lighting innovation programs (1995-1996 and 2006-2007) and one European program (2011-2014) were run by Philips Lighting, now Signify. A national program by Philips Lighting Poland, now Signify Poland, labeled *"Architects of light"* (2012) might be considered a spin on the same format (Bevolo, 2017, p. 3). A variation and extension of the format was designed by Lighting Design Collective, to run their *"Think in a Tank"* program at the Helsinki Design Week (2014-2016) (Bevolo & Rosenius, 2021).

5.1.1. Case Synthesis: Genius Forecasting embedded in a repeatable design process

Several constituencies that pertain to Genius Forecasting might be identified within the city. people. light process:

- Qualitative research planned and executed to involve thought leaders and professional leaders, ground the program in their perceived edge;

- Workshop facilitation, where moral suasion might be exercised in terms of steering the process at the moment of making decisions;

- The status of the brand in terms of ranking (number one) and of the market size (the largest manufacturer in its industrial sector), therefore exercising an indirect however undeniable appeal to press, publishers, and professional partners.

- Individual talent and *"savoir-faire"* remained paramount in the transition from qualitative research, presented in the form of sociocultural trends and urban scenarios, to the collective generation of innovation concepts, however, said the transition was enabled by a given tool.

5.1.2. SENSITIZING CONCEPTS: Liminality

Philips city.people.light might be analyzed according to two Sensitizing Concepts in its architecture (Bevolo, 2016):

- Sensitizing Concept 1: Collective Participation

From this viewpoint, city.people.light might be described according to the following quote:

> "…*a democratic process concerned with developing practical* knowledge, *knowing the pursuit of worthwhile human purposes, grounded in a* co-creative *worldview…"* (Bradbury, 2015).

Collective participation was staged and enacted at different moments of the process; specifically in workshops and networking, positioning, and profiling the program as co-creative, contributive practice based on Design Research processes, characterized by participation and shared knowledge, according to the principles of Action Science and Action Research:

- Sensitizing Concept 2: Individual Intuition

This is a modality of leadership expressed, among others but not only, by the architect or the designer in the context of decision-making within complexity. From Rem Koolhaas to Robert Venturi and Denise Scott Brown, from Andrea Branzi (Branzi, 1999) to Ben van Berkel, thought leadership has been expressed by contrarians or visionaries in creative industries, including architecture and urban design.

- Liminality: Design Districts

In Design Districts, as analyzed by Pisano & Verganti (2008), (future) visioning emerges as an outcome of collective, dialectic processes. However, such a visioning process pertains to very distinctive moments and actors with a distributed ownership of decision-making capacity overlapping with legal control of enterprises and managerial/ contractual capacity of specific individuals.

Within said "Design Districts", according to Verganti (2009), each actor participates in a fluid, sometimes informal, constellation of networked knowledge-generation processes based on her specific role and competencies. Therefore, each actor contributes and participates in the visioning process in an active modality and without dynamics of alienation.

5.2. Case Study: Darpa

Established in 1958 in Arlington, Virginia as a reaction to the 1957 Soviet Union Sputnik space flight, positioned within the US Department of Defense, the Defense Advanced Research Projects Agency (DARPA) has the purpose of serving the national interest by enabling technological superiority of the military forces (CRS, 2021-a). DARPA funding is substantial, accounting for USD 3,5 billion, or 2020,8% of the total science and technology funding within Defense, in 2021, allocated to basic research, applied research, and advanced technology, as defined by the National Science Board (2007) as follows:

"...research driven by ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept or leading to the creation of a new paradigm or field of science or engineering. Such research is also characterized by its challenge to current understanding or
its pathway to new frontiers"(National Science Board, 2007)

Accordingly, DARPA is the cradle of many inventions and innovations, both military (precision missiles, stealth airplanes), as well as consumer and user-oriented "shallow tech" (GPS, voice recognition, and the internet, most prominently), that trickled down from "Deep Tech" programs since the 1960s.

5.2.1. Case Synthesis: Forecasting Geniuses as Innovation Leaders

"DARPA has a culture of risk-taking and tolerance for failure that has led experts, some Members of Congress, and others to view DARPA as a model for innovation both inside and outside of the federal government". (CRS, 2021-a).

To enable specific cultural traits, (CRS 2021-a), the US Congress granted exceptions to DARPA, to relate and contractually engage with specific actors in relevant fields. The high degree of freedom at DARPA enabled and encouraged successful "high risk, high reward" transformative research (Piller, 2003) as well as major failures (Barber, 1975).

The organizational structure at DARPA is functional to its goals:

"DARPA has more than 200 government employees, including 100 program managers who oversee the agency's annual budget of roughly $3 billion. DARPA does not directly perform research or operate any research laboratories, but rather executes its R&D programs mainly through contracts with industry, universities, nonprofit organizations, and federal R&D laboratories". (CRS, 2021-a, Update 15).

Within this context, program managers enjoy a status of exceptional freedom and independence (CRS, 2021-a; Defense Advanced Research Projects Agency, 2016)

At DARPA, Program Managers often work as "seeding venture capitalists", in Forecasting Genius de facto roles (Ranka, 2019). Just like Genius Entrepreneurs, DARPA Program Managers must be able to cope with a high degree of uncertainty and unclarity (CRS, 2021-a). With a success rate of 5% to 10%, DARPA does not consider aborted programs as a failure, if feedback, knowledge, and actionable learning is the outcome (Ranka, 2019). Program Managers report to the Director once a year and are not tasked with complex or time-consuming audit reporting. Evaluation by directors is not

performed according to conventional milestones, given the high tolerance levels for failure (Dugan & Gabriel, 2013). Like VC's, they do not work in isolation as they engage in constant dialogs with scholars, professional researchers, and government experts, within virtual communities of practice. The latter appear also mission-critical for purposes of recruitment by organic networking (Windham, 2019). It is possible to extract the following key points on project management and Program Managers at DARPA: (Jackel, 2019)

a. There are variations in terms of opinions, inception process, and other perceptions of DARPA by former staff and stakeholders, with particular reference to Project Managers;
b. DARPA is very individualistic in its values and practices, with PM's as its flagship;
c. Duration of tenure for PMs is limited to a period from 3 to 5 years;
d. Duration of projects managed by PMs varies from 4 to 6 years;
e. Well-defined metrics are leveraged to monitor and assess success or failure;
f. All research investments are focused on DARPA's specific mission;
g. Organizational barriers due to risk mitigation in innovation are removed, by design;
h. Coordination of projects by PMs is key to managing the externalized value chain.

Based on direct testimonials edited in the "Voices from DARPA" podcast, Episode 53, the program managers at DARPA enjoy discretional power within the organization to pursue their vision and agenda, based on their motivation and portfolio at the start of their temporary contract.

5.2.2. Sensitizing Concepts: Liminality

The work of Program Managers at DARPA might be analyzed according to the following Sensitizing Concepts:

- Sensitizing Concept 1: Organizational Integration

What strikes in the messaging and reputation of DARPA, is the motivational factor that DARPA as an institution claims to have in enabling and ensuring the freedom whereby program managers identify, articulate, and pursue their agendas in various fields, from new technological applications to social sciences.

Individual intuition is challenged by the highest standards in terms of individual performance, as failure of projects is never justified by the impossibility of the challenge. Critical thinking is therefore required in assessing ideas and intermediate milestones, rapidly and flexibly, with a focus on concrete output (Ranka, 2019).

- Sensitizing Concept 2: Individual Intuition

At DARPA, the organizational model is a mix of top-down and bottom-up, with a large preponderance of bottom-up. While directors establish a general direction, based on input from the US Department of Defense, Program Managers have the freedom to consult their technical stakeholders and knowledge networks, to propose, design, and manage specific programs. The focus is on long-term, transformative technologies (Windham, 2019).

"Continuous Evaluation" is a shared conversation between directors and Program Managers, based on metrics, with the focus on learning from both successes and mistakes thanks to the common scientific and technical background of directors, who play a dual role as coaches, and PM's, who share vision, mission, and professional grammars (Windham, 2019).

- Liminality: Transformative Deep Tech

Given the limited tenure and the specific output requirements of DARPA output, it remains a challenge to combine applicative programs, that might generate prototypes and production devices within short-term or spectacular but fully accepted failures, with Deep Tech transformative innovation, which requires half a decade or a decade from R&D viewpoint. Bonvillain and Van Atta identify the necessarily flexible mechanism in enabling such versatility in "Multigenerational Programs", that might extend across multiple tenures. By adding this element of flexibility to the DARPA portfolio, Program Managers are enabled to both test hypotheses and prove them wrong, or extend research in time, as needed (Windham, 2019).

Since DARPA has no internal lab or facility, Program Managers are the very center and trigger of highly multidisciplinary communities; therefore, they must be aware of related power dynamics dictated by the budgets they control (Jackel, 2019). An additional element of Forecasting Geniuses' contribution pertains to Multigenerational Programs where new Program Managers are tasked with the evaluation of how and if to continue existing programs, with multiple possibilities across DARPA offices and networking stakeholders (Windham, 2019).

6. DISCUSSION

According to the literature, innovation in creative industries is driven by distributed agency across mavericks and mainstreams (Jones et al., 2016). In scientific settings, collaborative and convergent processes might benefit from the interaction with one or more "mavericks", in terms of enabling different perspectives and deviating opinions to be circulated and considered (Hayashi, 2018). To achieve this goal, two references might be made from the above city. people. light case study:

6.1. Genius Forecasting Rebalanced: Metrics and Matrixes

Within the multipurpose context of the city. people. light, a specific element of process continuity was required, unifying the prior research phase (qualitative findings) with the facilitation of the workshop (design direction). Such an element of continuity was identified indeed in a matrix tool (Bevolo, 2016; Bevolo, 2017; Bevolo & Rosenius, 2021). In this case, the matrix created an interdependent and generative relationship between a) socio-cultural drivers or longer-term sociological trends defined and tracked by Philips Design, and b) design strategies, or possible ways to approach the design and management of a city, strategically. The crossing of a given trend with a given strategy created a "cell", or space of opportunity, where at the same time both:

a) a narrative scenario describes a possible city future, or "arrival" point of delivery of coded qualitative research based on thought leaders and expert interviews conducted at an earlier project phase and presented with clear identification of the sources.
b) a space of creative response by participants in design workshops, or "departure" point for collective co-creation of potential solutions in the form of visual sketches and material mock-ups, when feasible by assembling technological prototypes.

It is not the focus of this paper to further describe in details such tool. Suffice it to say, said matrix was assessed as an enabler for para-scientific comparability across workshops, as opposed to the "genius forecasting" modality of workshop process management, based on the personal interaction and individual charisma of the facilitators (Bevolo, 2016).

Being at the edge of science and technology, DARPA is under pressure both in terms of performance, given its pivotal role within the architecture of supremacy and security of the US, as well as from ethical, legal, and social viewpoints, given the potentially far-reaching implications of its output within the country and in the world (CRS, 2021-a, Update 15). Several constraints apply to the performance of DARPA as an agency, from political scrutiny to legal and social constraints in terms of impact in the US (CRS-a, 2021, Update 15). It must be said that DARPA has managed to establish a very fruitful positive perception at all political and administrative levels, thanks to its administrative integrity and output quality. For example, its teams can swiftly adapt and refocus to the delta between different degrees of freedom given to DARPA, and between R&D performed in times of peace or in times of war, since the latter might require a more direct application (Windham, 2019). As much as there is trust and independence at the heart of program management, the organizational culture at DARPA will challenge Program Managers in terms of due diligence, problem definition, problem framing, goal setting, evaluation metrics development, risk optimization strategies, and all other factors depending on her or his superior technical competencies. Metrics are in place to set goals, track output, and evaluate the outcome of projects. Program Managers hold the responsibility to design and manage such metrics as an intrinsic competence in their portfolio (CRS, 2021-a).

6.2. Forecasting Geniuses Rebalanced: Knowledge Networks

The High Design process approach is at the basis of city.people.light and it is indebted to the organic ways of working within Italian districts. A synthesis to solve the dichotomy between individual creativity, however "trained" or educated, and formalized research capabilities, might be identified in the collective nature of *"Design Districts"* as analyzed by Pisano & Verganti (2008). Here, participatory dynamics might respond to different notions and requirements of innovation

processes in both economic clusters and single enterprises (Pisano & Verganti, 2008). In specific Italian districts, design-related networked processes of meaning-making are informal, diffused, and inclusive, with multidisciplinary, cross-competitive cooperation through networks being perceived as a key success factor at the economic level, as well as a cultural trait across all involved parties. A free-floating community might represent the stable and active point of convergence of networks. This is indeed one of the specific features of the Italian "informal design process", namely its high degree of interdependency for the creation, management, and enhancement of multidisciplinary knowledge within networks populated by (sometimes even competing) individuals and firms within different professional fields, however sharing a cooperative mindset. Such "knowledge" might or might not be made explicit in the social production processes. Verganti's analysis (Verganti, 2009) describes a knowledge generation process, by nature "*experiential*" and "*relational*" (Bradbury, 2015). These qualities are mission-critical for the functioning of a specific "ecosystem.

Collaborative networks are key to DARPA, given its specific size and limited staffing, in the absence of its facilities or laboratories. In the fiscal year 2019-2020, DARPA R&D obligations were distributed across 1% foreign actors; 4% not-for-profit actors; 4% other federal actors; 18% universities and colleges; 62% industry actors; with only 11% intramural commitments assigned to DARPA internal resources (CRS, 2021-b; CRS, 2021-a). Multigenerational Programs and technology thrusts elicit and require complex and large innovation ecosystems to form around DARPA and its initiating Program Manager, from envisioning to first adopter (CRS-a, 2021, Update 15, p.6). Politically, the transitioning of technologies from DARPA to acquisition programs by the US military-industrial complex or other end beneficiaries has been described as a challenge (U.S. Congress, Senate Committee on Armed Services, 2015; CRS, 2021-a). Here, collaboration with designated partners is one of the enablers of a successful transition (CRS, 2021-a, p.17). Organizationally, considering the short-term tenure by Program Managers, whose turnover might reach yearly peaks of 25%, it is important to acknowledge the risk of duplicative efforts and lack of organizational memory (CRS, 2021-a, Update 15, p.5). The communities of practice around programs constitute an asset for longer-term programs, when the latter shift from PM to PM, according to the rotation dictated by limited tenure. On the other hand, stable knowledge networks might bias employment trends within DARPA, e.g. in terms of the gender gap, with a prevalence of male candidates (CRS, 2021-a).

7. CONCLUSIONS

The conclusions for this paper were compiled and will be presented in the form of a SWOT structured from an organizational perspective regarding "Genius Forecasting" and "Forecasting Geniuses", to actively reflect on the potential fit and the possible risks of the educated inclusion of these forms of talents in a self-aware, postmodern enterprise:

7.1. Strengths

- "Geniuses" are available, active, and proactive actors in roles and responsibilities of future-making, beyond their formal job titles, e.g. programmers and switchers within mission-critical knowledge networks on the concrete basis of practice;
- Within contemporary enterprises organized in a postmodern, post-industrial way, communication modalities (inclusive of filtered elements of individual charisma), ways of working (appreciative of selected traits of maverickism), and individual exceptional competencies (trained judgment) might implicitly enable "Genius Forecasting" practices as enacted by selected "Forecasting Geniuses.

7.2. Weaknesses

- Due to the lack of self-awareness, recognition, and inclusion of atypical competencies and deviation from standard behaviors, lack of focus on "Genius Forecasting" contributions by Forecasting Geniuses, might not be allocated and positioned in the most efficient and effective positions, programs, and phases, whereas the specific allocation of these peculiar resources might lead to a beneficial outcome, e.g. advanced identification of opportunities at Horizon 3 level;
- Due to the lack of a formalized networking management process or protocol, potential inefficiencies in the management of networking assets within individual circles might exist as opposite to the mutually beneficial collective sharing of contacts and knowledge, possibly resulting in the dilution or even the evaporation of potential advanced development contacts within circles of practice where "Geniuses" individually act like "switchers".

7.3. Opportunities

- As based on the creation and formalization of specific and proprietary processes and methods to integrate "Genius Forecasting" within specific milestones of the overall enterprise ways working, any organization has the potential to introduce, test, and validate dedicated sets of tools to trigger, frame, and track the unique individual contributions by "Forecasting Geniuses", e.g. matrixes and metrics;
- subsequently, the creation of Key Performance Indicators might be feasible to assess the effectiveness of "Forecasting Geniuses" in explicitly generating "Genius Forecasting" contributions within the overall enterprise output, to make value individually created by "Geniuses" explicit and traceable within quality systems.

7.4. Threats

- In case of the lack of vision, themes, and thematic focus acting as "metaprograms" within enterprises, Forecasting Geniuses might struggle or even fail to factually contribute to knowledge networks in their personal portfolios, resulting in mutual demotivation and unproductive frictions within both the enterprise and said networks, negatively impacting both internal teamwork and external employer branding reputation within their communities of practice;

- Missed opportunities as available within deviating directions, or Deviant's Advantage or Devox, might result in dispersion, dilution, and depauperating of implicit knowledge and potential value within the enterprise and in related networks of both individual and collective nature.

The challenge for future-oriented enterprises is to harmoniously integrate individual contributions, which are often based on *"Trained Judgement"* and non-falsifiable abductive inferences, by leveraging their communicative charisma as an asset within innovation ecosystems and structured processes. An advised approach is to therefore identify the ways of working of those mavericks who perform implicit "Genius forecasting" as recognized experts, or "Forecasting Geniuses", acknowledging them for their specific and unique value, yet integrating them into trackable, traceable, repeatable processes with objective rationales.

The main limitation of the research behind this paper is that sources, as adopted, were secondary in nature, given the back-tracing approach on documental evidence. The design of social science research procedures to examine the field at hand is therefore the most natural next step, considering the need to expand the scope from High Tech and Deep Tech to different sectors within creative industries, e.g. product design or architecture. Future research might be based on the above frameworks, establishing an empirical ground of analysis on direct sources, e.g. in-depth interviews with industry leaders within given agencies and firms where creative talent is a key asset, *versus* the actual perceptions by top management and middle management within commissioning enterprises and agencies. A coherent program for investigating such phenomena might also contribute to regional policies, e.g. in the Brainport area within The Netherlands, where innovation drives economic growth and urban planning.

In conclusion, the above reflections are both widely applicable and relatively remote within the context of creative industries. Every product designer or architect or other practitioners in any related sector might have found similarities between the behavioral traits of a "Genius" and the mindsets and behaviors they experienced in their every practice, however, what differs are the context and the frameworks. At a level of context, the specific mission to envision and to anticipate the future as experienced in High Tech (Philips) and Deep Tech (DARPA) bears no equivalence to standard product design or architecture agencies, because the latter might work within given socio-cultural and aesthetic references, whereas High Tech and Deep Tech largely pertain to the creation of new enablers for new references, e.g. shifting from public phones in the 1980's to smartphones in the 2000's. In these longer-term enterprises, a tension between what is there and what might be there is such, that a "Genius" mindset might be the only way to move forward. Secondly, at the level of behaviors, the freedom to experiment might result in much higher tolerance of atypical traits within High Tech and Deep Tech than standard design or architectural firms, especially given the increasing consolidation of the latter into corporate structures, however with much more at stake in terms of managerial scrutiny and terms of self-assessment, given the intrinsic nature of motivation by "Genius" entrepreneurs and leaders. In short, designing for shorter-term futures is a very different task than envisioning for longer-term futures, which might require different modalities of managing different types of talent. This might be the object of future research into these phenomena.

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