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# Meta-Intelligence: Forming the Scaffolding that Forms You

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**Abstract:** This research investigates a crucial but under-explored pattern of innovators' approach conducive to the generation of innovation, from idea to commercial development; innovators possess the capacity to critically reflect and to, simultaneously, actively manage their environments. "Meta-intelligence" captures the capacity to interrogate and to curate one's environment. Meta-intelligence entails critical reflection on a dynamic situation one is embedded in and, also, actively managing it. Placing oneself in the appropriate context is a signature characteristic of meta-intelligence in action, innovators place themselves in contexts that propel them forwards. Data from interviews were collected through qualitative research and indicate that practitioners of innovation display meta-intelligence in their innovation-generation efforts. Bricolage serves as a key theory as the repertoire of experiential schemata nurtures meta-intelligence. The findings align with dynamic capabilities theory in connection to the innovative capability and the managerial activity of transforming.

**Keywords:** Innovation Generation; Scaffolding; Bricolage; Qualitative Research; Meta-Intelligence; Dynamic Capabilities; Transforming

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## 1 Introduction

How can organisations achieve the aim of sustained innovation generation? What kind of relevant support should be provided by the organisation to the individual to achieve this aim? How can the individual select and apply empowering structures?

The research setting is the current highly dynamic technology-driven business context where organizations constantly strive for innovation (Bodlaj et al. 2020). This reality, however, comes in stark contrast to the relative obscurity that characterises the process *per se* of innovation generation (Büschgens et al.). Interviewees were, thus, chosen for their direct engagement with innovation in their organizational roles and responsibilities. Their roles ranged from CEOs and business owners to entrepreneurs and managers. The goal of this research is to identify and to describe the way in which meta-intelligence is crucial for organizations' capacity for innovation.

The pinnacle of freedom, the meta-intelligence of choosing one's own scaffoldings in the context under discussion, is for an agent to choose one's own restrictions, to choose the containers of one's malleable/protean self. For if no choice is made by the agent, the choice will be made by the default conditions, allopoietically instead of autopoietically.

## 2 Underpinning theory: Bricolage

Innovation constitutes an established source of competitive advantage (Tushman et al., 1997) and, thus, innovation generation warrants an increasingly important place in the spotlight of research, given the consistently high pace of technological progress. Bricolage theory offers an appropriate framework for uncovering the *repertoire* of resources and practices leveraged by innovators. In order to model the crucial role of internal and external factors leveraged, the concept of scaffolding, temporary supportive structure, is applied to the analysis. An extant gap lies in researching the impact of hybrid work on innovation-generation. The theoretical framework of this research draws from bricolage (Duymedjian and Rüling, 2010), making do with what is at hand, in conjunction with scaffoldings, temporary supporting structures.

Bricolage, making do with what is at hand, highlights the capacity of the agent to work with what is readily accessible, to utilise available resources recombining them to arrive at a solution (Duymedjian and Rüling, 2010). Building a diverse *repertoire* of tactics and strategies allows the bricoleur to tackle challenges flexibly and effectively. Scaffoldings, temporary supportive structures, may be internal (e.g., core beliefs and analogies about innovation) or external (e.g., a digitised archive of past company projects) and their impact may be either conducive or hindering to innovation generation (Makris and Soderquist, 2022). The findings align with dynamic capabilities theory in connection to the innovative capability and the managerial activity of transforming.

The “materials at hand” constitute scaffoldings that the agent purposefully chooses; the agent consciously places himself or herself within this context and allows the formative impact of the context to be directed to them so as to generate innovation. As a result, innovators leverage internal and external scaffoldings in order to navigate the fuzzy, messy, and uncomfortable process of innovation generation. The challenge is to maintain the ability to constantly re-evaluate one’s *repertoire*. What has worked in the past may not continue to do so rendering the current *repertoire* partly obsolete; thus, legacy issues may need to be addressed in order to keep the repertoire up to date. Importantly, devoting resources in innovation well ahead of the actual need (Nohira and Gulati, 1996) aligns with the notion of enriching one’s repertoire in a prescient manner well before the relevant need arises (Makris and Soderquist, 2022).

### 3 Research design

A qualitative approach was adopted in a selection of European organisations during the Covid-19 pandemic. 21 semi-structured interviews were conducted with innovation practitioners from European-based companies. Interviewees were chosen for their direct engagement with innovation in their organizational roles and responsibilities. Industries included education, advertising, professional services, retail, and software development. Interviews were conducted over synchronous online interfaces and lasted between 45 and 60 minutes each. Following Strauss and Corbin, open coding, axial coding, and selective coding constituted the three phases of data analysis (Strauss and Corbin, 1990). Data for the aggregate “meta-intelligence”, along with other constructs in tandem, were drawn from a subgroup of interviews shown in table 1 (Makris and Soderquist, 2022).

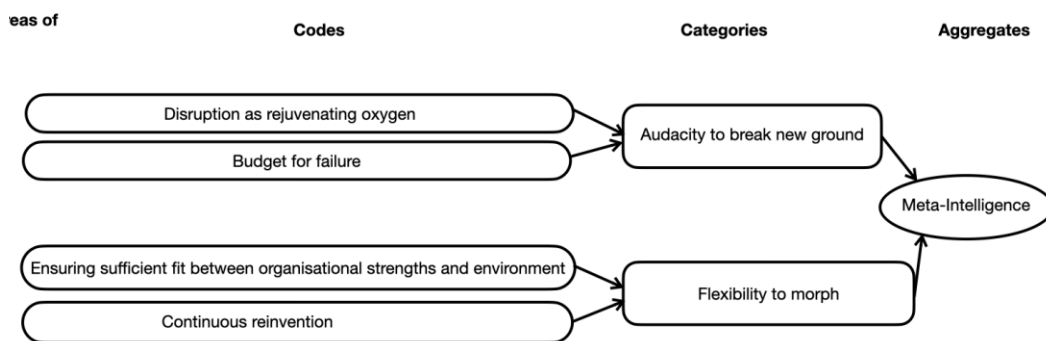
Date	Industry	Position	Org. Size
24-Apr-20	Retail	Co-founder - CEO	Medium
4-Apr-21	Consulting	Manager	Large
12-Apr-21	Retail	Manager	Large
28-Apr-21	Advertising	Manager	Large
24-May-21	IT	Manager	Large
26-May-21	IT	Co-founder - CEO	Small
18-Jun-21	Tourism	Manager	Large
13-Jul-21	Education	Faculty	Large
2-Nov-21	IT	Manager	Large
29-Nov-21	Logistics	Co-founder - CEO	Small

Table 1. Interview list associated with the data for *meta-intelligence*

## 4 Findings: Meta Intelligence and Illustrations

Innovators actively assess and, crucially, intervene into the environments they are embedded in. In a potent combination of critique and autonomy, they judge their surroundings and either consciously accept them or they actively intervene in them. By surroundings, all types of ecologies are considered; institutional, informational, technological. Innovators are acutely aware that their surroundings decisively in-form them.

The findings that emerged from the data in connection to *meta-intelligence* were codi-



fied in the following data structure shown in Figure 1.

Figure 1. Data Structure for Meta-Intelligence

### *Disruption as rejuvenating oxygen*

Several practitioners have shared stories of how an unexpected external event become a catalyst for value-adding changes. Uncomfortable as disruption may be, it is treated as a potentially fertile event from innovators.

*“When a pebble falls into a pond, fear it not, for it oxygenates the water. Stagnant water is to be feared”*

noted an interviewee, co-founder and CEO of a pioneering retail company. He went on to narrate how the strategic choice to incorporate special needs employees into the operations created disruptions to the shop floor as significant modifications were necessary. The inconvenience was temporary while the benefits were long-lasting. Employee morale was boosted as they felt proud of their social contribution. That positive self-image was also received by the customers.

The effect of recognising the positive impact of disturbance may be captured by the code *Disruption as rejuvenating oxygen*.

### ***Budget for failure***

One interviewee, experienced in both the private and the public sectors, provided an especially revealing insight regarding the radically different approach of the two sectors in connection to innovation. Specifically, he expressed his point in the following way:

*“The private sector has a budget for failure, the public sector does not. The doctrine of the public sector revolves around minimising waste so as to safeguard taxpayer’s money. However, this allows little room for genuine experimentation, for trial and testing, for error, for innovation, in the end. Thus, it needs innovation leadership as much as it needs bottom-up participation.”*

The manager’s observation has at least two significant implications. First, that the public sector may be at a structural disadvantage *vis-a-vis* the private sector, due to the aforementioned reason. This points to a radical shift in culture and resource allocation, if this is to be overturned. Surely, the applicability of this observation varies from culture to culture. The second implication relates to the private sector directly. The above quote, even if it focuses on the public sector, allows us to become highly cognisant, conscious, and aware of the need for an explicit budget for failure, when innovation is the goal. “Failing forward” is a relevant phrase, “trial and error” is another one. The crucial element is to devote the necessary resources to that end.

The significance of explicitly devoting resources to failure as a prerequisite for innovation generation is captured by the code **budget for failure**.

The following two codes: ‘*Disruption as rejuvenating oxygen*’, and ‘*Budget for failure*’, lead to the identification of the category **Audacity to break new ground** that emphasizes willingness, boldness, fearlessness to pioneer new paths.

### ***Ensuring sufficient fit between organisational strengths and the environment***

One finding that emerged from the interviews was the significance of the capacity of the innovator to recognise opportunities; innovators seem to possess the skill to place themselves in the appropriate context. They recognise and steer towards opportunities associated with events that will allow them to put their core competencies to work. Specifically, one co-founder and managing partner of a digital agency expressed it as follows:

*“In our field, new tools, new platforms, new methodologies are part of the daily agenda. Ideas for innovation come out of our clients as well as from our vendors, mainly Google and Facebook. We look to align our strengths as a company with the needs of the clients and with the fresh opportunities offered by technology. In case we do not already have an established product to meet a client need, we try to develop it.”*

In the above quote, one can observe the constant appraisal of the organisational strengths with respect to the environment. On the one hand, the organisation, at any point in time, possesses a set of core competencies. These are dynamic in at least two respects, as illustrated by the above quote:

- First, they are only retained if they remain relevant to the ever-shifting client needs. Thus, if a product or a methodology no longer serves clients' needs, it is discontinued.
- Second, competencies arise from recent technological innovation as well as from customer needs. New technological capabilities in conjunction with shifting client needs show the way forward to the organisation.

Hence, the organisation changes in terms of competencies, the environment changes in terms of needs and technological advances. The constant element amidst this dynamic framework is the fit, the alignment between organisation and environment. This type of dynamic alignment ensures investment on valuable assets and divestment from obsolete ones. Innovators seem to possess a capacity for constantly realigning the organisation with its environment.

The above findings point to the need for **ensuring sufficient fit between organisational strengths and the environment** as a core aspect of the process of innovating.

### *Continuous reinvention*

A well-established theme associated with the process of innovating is the capacity to adapt to changing circumstances. This theme is, unmistakably, evocative of the Darwinian process of evolution and emphasises the dynamic character of an entity that innovates; the entity itself (individual, group, or organisation) undergoes change because of innovation. An experienced manager of a software multinational exposed this point through the following quote:

*“We have seen a number of competitors, especially during the pandemic, who did not manage to adapt. Without innovation, you risk becoming loss-making, obsolete, forgotten.”*

The manager referred to the current context of the global health crisis as the changing circumstances to which an organisation has to adapt. The capacity to adapt requires the flexibility to update certain characteristics. The interviewee referred to competitors which did not display that flexibility and had to bear the respective cost.

The ability of an organisation to genuinely re-invent itself to fit the dynamic business environment leads to a degree of flexibility that ensures resilience and can be captured by the code **continuous reinvention**.

The following two codes: *‘Ensuring fit between organisational strengths and environment’*, and *‘Continuous reinvention’*, lead to the identification of the category **Flexibility to morph** that emphasizes the ability to change smoothly in order to adapt to shifting parameters.

The above categories culminate in the aggregate of *meta-intelligence*. **Meta-Intelligence** is about placing one's self in the right context. Knowing one's self, recognising opportunities, avoiding threats, going for opportunities, and accepting the risk, It corresponds to a

state of mind among innovation practitioners that embraces and infuses the system of scaffoldings in their mental models, mental models that then are activated to guide thinking and action in a constant interplay between the cognitive and structural aspects of innovation generation.

## 5 Discussion and conclusions

The data point clearly to the benefits accrued to innovation practitioners when meta-intelligence is at work. The culmination of this research is the concept of **meta-intelligence** that captures the capacity of the agent to *curate their scaffoldings*. Given that environmental conditions are dynamic and, similarly, the agent is also in a state of becoming, it is crucial to maintain awareness of when the beneficial effect of a scaffolding expires and to replace it accordingly. The construct is expressed as “meta” “intelligence” in order to contrast it with the conventional notion of intellect as one may possess a strong intellect and yet, ironically, not be able to place oneself in the appropriate contexts and scaffoldings. Conversely, an agent with regular intellect may possess the capacity to leverage it by choosing appropriate contexts and scaffoldings. A spectrum exists in terms of meta-intelligence. Less meta-intelligence indicates restricted capacity for choosing scaffoldings that are constructive. Increased meta-intelligence, on the other hand, indicates increased capacity to choose scaffoldings that are constructive.

Scaffoldings, temporary supportive structures, are neither positive nor negative. Their net impact depends on whether they continue to add value given the agent is in flux and the environment is dynamic. The process of repetitively passing through the model during innovation generation, round after round, is evocative of Nonaka’s SECI model (Nonaka, 1990), which has been an inspiration for the similarly dynamic and organic character of our proposed model, see figure 2. From this emerges the need to check scaffoldings for their impact. The capacity to actively evaluate and curate scaffoldings is captured by **meta-intelligence**. As the agent engages iteratively and more intentionally with evaluating and updating, as necessary, scaffoldings, meta-intelligence is developed even further.



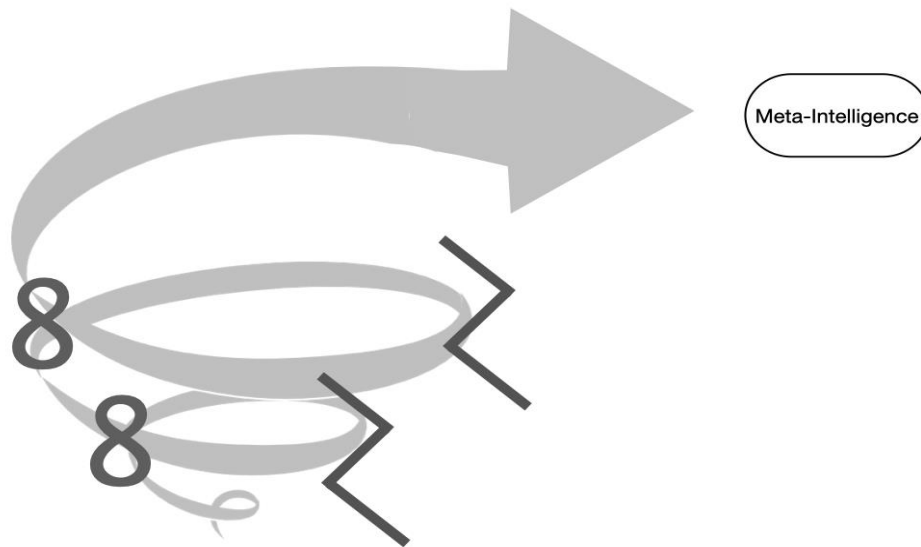


Figure 2 Meta-intelligence spiral  
(Image credit: Author)

From a bricolage perspective, scaffoldings are treated as an element of the *repertoire*. It is distinctly “at hand” as it operates in the proximity of the agent. Viewed through this prism, the scaffolding creates an affordance, a possibility space, that can be either enabling or restrictive. Re-conceptualizing innovation generation in terms of meta-intelligence is the core contribution of this research.

In conclusion, innovation practitioners stand to reap significant gains by acknowledging and by leveraging *meta-intelligence*. Meta-Intelligence entails that agents may actively place themselves in contexts of formative influences. The crucial aspect is that innovation generation is a function of those environments. In that sense, the surroundings constitute scaffoldings that heavily determine the degree and intensity of innovation generation.

## 6 Areas for feedback and development

Meta-intelligence involves placing oneself in an opportune context. To what extent is this characteristic of innovators?

Is a constructively critical stance towards one’s institutional, informational, and technological ecology crucial in achieving improvements that align with innovation generation?

How beneficial is self-awareness of innovators as they trying to manage contexts in which they are, themselves, embedded?

Is meta-intelligence a factor that affords cultivation?

Are visceral, embodied metaphors elements of a repertoire, a library of sorts, that empowers an expanded possibility-space in a type of pattern-recognition process by the agent?

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