

### Purpose

The purpose of this Innovation Management (IM) position paper is to present an overview in summary form of key literature (academic and practitioner) that has informed the shape of innovation management in the digital business context.

### Innovation as a Concept

The word ‘innovation’ comes from the Latin word ‘innovare’ meaning ‘to make something new’ [1]. However, the term is often used when invention is what is really meant [1], [2]. This confusion between invention and innovation is a major problem when managing innovation in the organization. Senior management can be of the mind that innovation involves allocating large parts of their budget to research and development. That may indeed be the case for an organization operating in a cutting-edge sector, but innovation for other organizations is more likely to involve subtle and continual improvement across the organization [2]. In reality, innovation is more aligned with ‘creativity’ in that it involves bringing novel or new ideas into a business in order to change and improve an existing way of operating [2]. It is the process of turning opportunity into new ideas and of putting these into widely used practice [1].

From a business context, the world is going through one of the most intense periods of transformation than any time before. During this time, the ability to innovate – to evolve, adapt, and improve, is now more critical than it has ever been [3]. *“Indeed, in the midst of commercial globalization, shifting cultural and social norms, and increasing scarcity of natural resources, our continued success as a species may depend on it”* [3]. If organizations aren’t moving faster than their competitors, they are no longer able to effectively compete. They risk getting left behind as others take the lead in changing their offerings, their operational processes, or the underlying models that drive their business [1], [3]. Kodak is an example of such an international organization that failed to see the importance of innovation in their ability to compete and to maintain their dominant position in the market of photography. What is even more sobering about this story is that they, themselves, were pioneers of digital technology in developing one of the first digital cameras in 1975. However, they failed to acknowledge its importance in their strategic vision – resulting in bankruptcy in 2012. They spotted its importance but failed to do anything about it [3], [4].

Another significant issue in the area of innovation is the sole focus on ‘products’. This product (only) focus is a guaranteed way to fail. Successful innovators use many types of innovations (i.e. product performance, product system, service, channel, brand, customer engagement, profit model, network, structure, process) [3] and rely on systems of individuals and teams working on a cross-functional basis

across the organization. It is not the responsibility of engineers and scientists; instead, it is that of the entire workforce and its leadership [3].

## Innovation Management Critical Capability

This section presents the key components of the Innovation Management Critical Capability (CC) of the IT Capability Maturity Framework (IT-CMF). The Innovation Management CC is comprised of three key categories: *Manage Innovation*, *Execute Innovation*, and *Support Innovation*. These are now discussed in greater detail below.

### Manage Innovation

One of the key components of a successful Innovation Management capability is the development of an innovation vision and strategy. Senior management frequently ask, ‘why aren’t we better at innovation?’ And given the significant volume of material and guidance readily available in this area, it begs the question, ‘why is innovation still a difficult area for organizations to master?’ [5]. One of the key reasons that organizations struggle with following guidance on establishing an innovation strategy is the assumption that all organizations are the same, the supposition that they face the same obstacles in developing new products and services or lines of business as other organizations. The reality is that challenges differ from organization to organization and hence generic advice may be wasteful, even harmful if applied in the wrong situations [5]. This diversity highlights the importance of developing a tailored innovation strategy to address the needs and challenges of each individual organization. The key to successful innovation has little to do with how much budget is allocated to it but is directly related to the “*effort expended to align innovation with strategy and your customers, and to manage the entire process with discipline and transparency*” [6]. It is not necessary to have a comprehensive innovation strategy from the outset; however, some basic guidelines need to be defined. It is important, for example, to know what *innovation* or *new ideas* mean to the organization. A good way of establishing this is to determine the innovation vision i.e. ‘what is the contribution of innovation to the organizational strategy and what is it trying to achieve with innovation?’ Examples include such things as growth, new market conquest, market leader in a particular market segment, innovation leader, etc. The answer to this is effectively the cornerstone of all innovation management activities [7].

In addition to establishing a vision and strategy for innovation, another key component of an Innovation Management capability is adoption of an effective innovation governance approach. Innovation governance describes how the management team of a particular organization has chosen to allocate responsibilities for innovation within the organization [8]. This includes a holistic system to set and align goals, define policies and values, prioritize processes, allocate resources, measure performance, and assign roles, responsibilities, and decision-making authority for innovation [9]. Whilst many organizations may not use the term ‘Innovation Governance’ to describe what they do, most companies manage innovation according to a particular organizational model that senior managers can describe. Overall responsibility for innovation may be allocated to a particular person (or number of people), usually at management or C-suite level as part of their existing role or as a dedicated role. Alternatively, a group can be assigned this role. This group tends to come from management/senior management

level and is cross-functional in nature. In some companies, a group of champions or evangelists are appointed to drive innovation across the organization. These tend to be self-motivated, and upper-middle to senior managers who are not necessarily idea initiators, but who promote the most promising ideas of others in the organization [8]. In reality, larger organizations do not necessarily restrict themselves to a single model for steering innovation. They may choose not to steer innovation centrally but to let each of their business groups or divisions adopt a model of their choice [8]. Whatever model is selected, there are many benefits of an effective innovation governance system such as to:

- build a holistic 'big picture view' of the organization's innovation process
- sharpen the organization's ability to build market foresight
- ensure leaders display openness, curiosity, and humility
- reduce the risk of flawed or late innovation choices
- better assess the future impact of disruptive technologies
- link innovation and business strategies explicitly
- focus all functions on the challenge of innovation commercialization
- build a path for new generations of innovation leaders [9].

Strong leadership is essential to any organization's ability to innovate [1]. Leaders must have the necessary ambition, share in the purpose, and role model the desired behaviours; it is up to them to keep the innovation energy flowing [1]. Successful leaders are focused and crucially enable their workforce to maintain motivation. Too often organizations try to focus on too many things at once [1] - by its very nature, innovation needs a lot of unscheduled time as it is impossible to know where an idea will emerge from or how much time it should be allocated [1]. Innovative leaders themselves need to be very honest about their strengths and weaknesses and be fearless in acknowledging any gaps in their own abilities. Some leaders are natural enthusiasts and good at emphasizing the positive. Others make great taskmasters in that they are unafraid of giving people bad news or telling people something isn't good enough. It is vital for leadership to achieve an equilibrium between the two types, and the only way to do this is to be honest about their own skills and limitations. If leadership are unwilling to accept and acknowledge their weaknesses, they don't allow those with complementary skills to fill the gaps. Effective innovation leadership is as much about honesty and humility as it is about focus and inspiration [1].

Whilst there is acknowledgement of the importance of great leadership (whether the responsibility of individuals or a group) in achieving a successful innovation capability in the organization, it is critical that leadership establish and maintain a culture of innovation in order to be successful [10]. Too often management discourage their workforce from inventing new ways of doing things — pushing them instead to follow procedures and to stay within established guidelines. This results in staff thinking that innovation is 'not their job'. Successful organizations don't rely on a limited number of people to discover innovations [10]. Instead, they create a culture in which every employee, across every function, is encouraged, supported, and empowered to innovate — whether it is in processes, products, or services, as organizations require innovation on all fronts. Establishment of a truly innovative culture leverages the knowledge and creativity of the whole workforce, any one of whom might generate either

an incremental innovation or a breakthrough idea [10]. An excellent example of this is Apple whose success was fueled not only by new products, but also by innovative approaches to packaging, retail sales, customer access, and partner agreements. Similarly, Toyota's growth came as much from innovations in manufacturing, inventory control, and management systems as it did from new automobiles [10]. However, it is very difficult to foster a culture of innovation, given the day-to-day pressures to perform and conform, which is why many managers often pass on the responsibility for innovation [10]. And leaders cannot simply dictate a new culture; it is not realistic for an organization to become more innovative just because that is what they are told they must do and be [11]. Organizations must develop new routines that fit in the context of the existing culture and guide the workforce towards a culture that embraces innovation. Studies in the area of organizational change have found an organization's existing culture to be one of the key barriers to making real change [11]. However, once a culture of innovation has been established, this results in not only new customer offerings but also improved margins, greater customer relationships, and stronger partnerships with other organizations [10].

The use of networks has also been widely acknowledged as an effective approach in developing an innovation capability i.e. to understand, shape, and use the networks of connections (i.e. formal and informal, internal and external) that impact or support the achievement of the business/innovation strategy. The scope may include, among others, roles, responsibilities, organizational hierarchies, communities of practice, key influencers, and social networks. This may be in the form of generating new ideas from both inside and outside the organization. To exemplify this, internal network development may focus on cross-unit networks inside organizations. This is based on the premise that employees who don't know each other aren't in a position to collaborate on new ideas and the occasional cross-functional brainstorming session is not sufficient. This approach also assumes that people who are unfamiliar with each other will be in a position to work together to generate ideas on demand. In reality, what is required is continuous dialogue and knowledge exchange between people from different units of the organization [5]. Proctor and Gamble (P&G) are an example of an organization who has adopted this approach for many years. The result of this has been many successful cross-fertilized product and business creations i.e. development of Olay Daily Facials. The idea was to develop a face cream that was an excellent cleanser and moisturizer. Experts from P&G's skin care, tissue and paper towel, and detergents and fabric softeners groups collaborated, and their combined knowledge about surfactants, substrates, and fragrances helped P&G create and launch a highly successful new product [5]. However, these collaborations are not accidental, but the result of well-established organizational mechanisms. P&G has developed 30 communities of practice (CoP). Each CoP is made up of a team of volunteers from different areas of the organization and focused on an area of expertise (i.e. fragrance, bleach, analytical chemistry, or skin and hair science). The teams solve specific problems that they are presented with, and they engage in monthly technology summits with representatives from P&G's ten business units. The organization has also posted an "ask me" feature on its intranet, where staff can outline and specify a business problem or need. Their questions or concerns get communicated to 10,000 P&G employees worldwide and are ultimately funneled to those people with relevant expertise. At a more fundamental level, P&G has a policy of promoting from within

and moves people across countries and units. Consequently, its employees build extensive personal cross-unit networks [5].

### Execute and Support Innovation

One of the key challenges for leadership in the field of innovation is how to distinguish between different ideas that emerge during the innovation process. Which ideas should be selected? Which ideas should move to prototype stage? [5], [12]. Initiating this innovation process requires firstly the development of a lot of ideas (good *and* bad ones) and connecting them in creative ways [12]. Some organizations have lots of good ideas, but they are not properly screened and developed. Instead, these ideas die in budgeting processes that highlight the incremental and the certain, rather than the innovative. What is needed is improved screening capabilities, as opposed to better idea generation mechanisms [5].

Innovation leaders are held accountable not simply for the success of the prototype, but for their decision to move an idea or prototype forward. Leaders have to use their own judgement to decide which idea to move forward and, unless there is a template by which to judge ideas, they will be ultimately unsure how to undertake this selection process. Hence, it is imperative to have clear criteria upon which to select the best idea. Criteria to aid the selection of ideas include such things as clarity, usability, stability, scalability, stickiness, integration, and profitability [12]. Leaders often have to make hard decisions - every time they make a decision, they are at risk. Whether the idea has succeeded or failed, they need to be able to communicate to others why they chose one path over the other [12].

The following exemplifies an effective approach for developing an idea into a successful innovation. In 2007, following coverage of the 2003-2004 Bush campaign, Bill Adair, Chief Reporter with the St. Petersburg Times in Washington, felt guilty about the lack of fact checking being undertaken about politicians' claims. Adair expressed to his editor his wish to launch a fact-checking website before the next presidential election in 2008. Adair started by creating a prototype and got approval from senior management to develop the fact-checking site. Adair then pulled together a small team of people with diverse backgrounds, broke away from the day-to-day activities of the newspaper, and went into development. By 2009, PolitiFact (as it was named) was such a success that it won a Pulitzer Prize. Adair attributes a lot of its success to the collaborative approach adopted through the execution phase. The idea was incubated (removed from the larger business), developed, and launched to great success [11]. IBM has also made extensive use of this incubator approach over the years through its 'Emerging Business Organization' which has produced businesses based on innovative technologies such as Linux, generating over \$2 billion in annual revenues. Hewlett-Packard is another example of an organization who has used this approach and its printing business has grown to become the dominant source of its profits [13].

Following effective assessment, filtration, and incubation, an idea may be deemed ready for exploitation or launch on to the market or target environment as an innovation. It is imperative that a carefully thought out and strategic approach is adopted. In effect, it doesn't matter how great an organization's idea selection process is if only a few good concepts have resulted or if the subsequent

development process is weak. It is also a waste of resources to develop state-of-the-art capabilities for rolling out products or services when there is nothing worthwhile to diffuse [5]. Hence, it is the complete execution of the 'idea to innovation' process that is critical to manage effectively. Many organizations run into difficulty 'monetizing' good ideas [5]. Decisions about what to bring to market are made at a local level, and 'not-invented-here' thinking dominates. Consequently, new products and services aren't properly rolled out across geographic locations, distribution channels, or customer groups. For organizations such as this, the key focus should be in aggressively monetizing what it has already been able to develop, not in paying further attention to idea generation or idea conversion [5].

Having explored how innovations evolve from simple ideas or concepts, there are a few other areas that are crucial to effectively support an Innovation Management capability. The first of these is Research and Development (R&D), which is an obvious source of innovation through the possibilities that emerge as a result of scientific research [1]. In the 20<sup>th</sup> century, the rise of the large organization brought with it the rise of the research laboratory as a key apparatus of progress. Bell Labs, ICI, Bayer, BASF, Philips, Ford, Western Electric, Du Pont – all were founded in the early 1900s and collectively produced a continuous stream of product and process innovations which addressed the needs of rapidly growing markets for automobiles, consumer electrical products, synthetic materials, industrial chemicals, and so on [1]. Organized R&D at this time became a systematic commitment of specialist staff, equipment, facilities, and resources to address key technological problems or challenges [1]. Still to this day, R&D is a crucial component of innovation and a key factor in developing new competitive advantages [14]. This research can be extended to include research partnerships between industry and research institutions [15] or participation in communities of practice or special interest groups [1] to solve particular challenges that face organizations or industries as a whole. Additionally, the role of Open Innovation as a means of introducing new ways of organizing the innovation process within companies has gained significant attention [16]. An example of an organization who are hugely successful in this area today is Intel, who are seen as the 'holy grail' organization in terms of R&D and innovation. In 2006, Intel significantly sped up its product life cycle process through something called 'Tick-tock', which is an alternating system of innovation which uses microarchitecture innovation and process innovation to continually drive ahead. This is effectively another way of saying that each year they modify one or two things that are critically important for the speed and power of microprocessors. Their massive investment in R&D and never-ending ability to ship new and better products means that other companies simply cannot keep pace [17].

To effectively support innovation activities in the organization, there is also a need to utilize and make available appropriate tools, technologies, and frameworks in support of this goal. These tools could be in the form of mind map technologies, innovation matrices, customer journey maps, brainstorm cards, tech and trend matrices, OCAI model assessments etc. and can address issues or challenges in terms of ideation, strategy, problem solving, and culture. These tools, technologies, and frameworks enable organizations to be empowered to create change in their environment. For some, this may mean redesigning the business model of their startup. For others, these tools can support collaboration through easily bringing people together, on an international basis [18].

## Conclusions

In summary, engagement is required from all levels across an organization to make innovation successful. As Keeley et al (2013) stated, “*innovation is a team sport. In fact, an organization that depends on individual innovators alone is destined to fail. Understanding how you can wire innovation into your organization – and build a robust internal innovation capability – is an imperative for any organization doing business in today’s dynamic world*” [3, p.33]. The importance of a clear and coherent vision and strategy for innovation, as well as the necessary leadership, people, and culture for innovation are key to its success. The satisfaction of seeing ideas evolve from prototypes and ultimately to new customer deliverables keep innovators looking for what’s next. The alternative is those organizations who fail to invest in innovation – they are quite simply putting their future at risk. Their business is unlikely to prosper, or to compete if they fail to seek innovative solutions to emerging problems [1].

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## About IVI

The Innovation Value Institute (IVI) is a multi-disciplinary research and education establishment co-founded by Maynooth University and Intel Corporation. IVI researches and develops management frameworks to assist business and IT executives deliver digitally enabled business innovation. IVI is supported by a global consortium of likeminded peers drawn from a community of public and private sector organizations, academia, analysts, professional associations, independent software vendors, and professional services organizations. Together, this consortium promotes an open ecosystem of research, education, advisory support, international networking, and communities-of-practice. IVI is supported through Enterprise Ireland's and IDA's Technology Centre programme.

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