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Q&A. How do digital platforms for ideas, technologies, and knowledge transfer act as enablers for digital transformation?

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Q&A

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Q. How do digital platforms for ideas, technologies, and knowledge transfer act as enablers for digital transformation?

A. Digital platforms, along with their supporting tools and features, have emerged as important enablers for firms to leverage distributed knowledge (Sedera et al., 2016), because they offer new ways for organizations to collaborate with the external environment for ideas, technologies, and knowledge. Indeed, studies have explored efforts to promote such collaboration on digital platforms with various popular names, such as crowdsourcing platforms (Afuah & Tucci, 2012), open innovation platforms (Frey et al., 2011), and online marketplaces (Dushnitsky & Klueter, 2011). Among others, the open innovation phenomenon highlights that these platforms have a far-reaching impact on how various parties innovate together through alliances, networks, and ecosystems (West & Bogers, 2014). This impact is observable in the explosive surge in the popularity over the last decade of digital platforms for research and development (R&D), idea generation, prediction, freelance work, peer production, co-creation, product design, and public engagement, to name but a few. For example, Dell's IdeaStorm (Hossain & Islam, 2015a) and Starbucks' MyStarbucksIdea (Hossain & Islam, 2015b) are two digital crowdsourcing platforms that are used to engage crowds to solicit ideas from them (Bayus, 2013; Chua & Banerjee, 2013). Moreover, intermediary platforms, such as InnoCentive and IdeaConnection, are organizing online competitions to solve the problems of various organizations (Hossain, 2012).

Although digital platforms provide new possibilities and competence, they however also bring new challenges for organizations, which call for new ways of organizing in order to fully embrace their potential. Understanding the role of these platforms in digital transformation is therefore crucial. We must recognize equally the opportunities and challenges digital platforms provide for organizations, and we need to understand the mechanisms and potential outcomes of various digital platforms. Consequently, we should consider digital platforms as a mechanism for accelerating the digital transformation endeavours many organizations are undertaking today (Berman, 2012). Despite the high significance of various digital platforms, there is limited knowledge in the extant literature about the effect of digital platforms on the organization. Thus, here we discuss *how* digital platforms for ideas, technologies, and knowledge transfer act as enablers for digital transformation.

Digital Platforms for Ideas, Technologies, and Knowledge Transfer

Digital platforms are becoming increasingly important, but many companies are still struggling to reap the benefit from these platforms. Digital platforms enable organizations to bring knowledge from outside to solve many problems organizations cannot accomplish internally (Jeppesen & Lakhani, 2010). Eisenmann, Parker, and Van Alstyne (2006) defined platforms as the "products and services that bring together groups of users in two-sided networks". Digital platforms also work as a carrier of innovation (Klerkx & Leeuwis, 2009). As Lopez-Vega, Tell, and Vanhaverbeke (2016) pointed out, searching for external knowledge is crucial for organizations' innovative activities, and the searching space can be local or distant as well as experiential or cognitive. Digital platforms work as an important carrier for searching external knowledge. Digital platforms for ideas, technologies, and knowledge transfer are two-sided in nature: solution seekers are on one side and solvers are on the other (Eisenmann et al., 2006). The shifting towards a more digital arena implies a new way of sharing knowledge internally and across organizational boundaries. Often, the knowledge sharing via digital platforms entails a high degree of continuous interaction between the two sides. This in turn means that new skills, tools, and management structures are necessary to incorporate external knowledge inside the organizations. Additionally, organizations need to overcome the "not invented here syndrome" – a negative attitude toward external knowledge (Lichtenthaler & Ernst, 2006) and the "not sold here" syndrome – protective attitudes toward external knowledge exploitation (Lichtenthaler et al., 2010).

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Organizations can use various types of digital platforms based on their particular needs. They can have their own platforms or use intermediary platforms that complement the internal innovation of other organizations, especially large ones (Lichtenthaler, 2013). Intermediaries have specialized knowledge to aggregate a large pool of knowledge owners. Yet, using them may not give solution seekers any unique edge as their competitors can use the same platforms (Garavelli et al., 2013). Digital platforms can have commercial and non-commercial motivations; each type of platform has its distinct mechanism and demand different expertise for digital transformation. Based on an extensive review of the existing literature and popular press, we have identified seven major categories of digital platforms for ideas, technologies, and knowledge transfer and they are discussed in the following sections.

1. Problem-solving platforms

Problem solving is a popular application of intermediary digital platforms. Examples of popular problem-solving platforms are InnoCentive, IdeaConnection, Hypios, Innoget, and NineSigma. These intermediaries are commercial in nature: their main source of revenue is the upfront payment from the problem-seeking organizations that receive all the solutions submitted by the solvers (Hossain, 2012). The assumption is that a good solution is more likely to emerge from many solvers than an individual solver. Some scholars argue that problem solving through innovation contests may generate similar or redundant solutions (Girotra et al., 2010), but others argue that, even though there might be a redundancy of solutions in parallel settings, it is insignificant even in a very narrow area (Kornish & Ulrich, 2011). Another example of a problem-solving platform is OpenIDEO (openideo.com), a global community used by many organizations to solve world's pressing problems. It leverages innovative design process and online community to create solutions for societal problems.

2. Ideation platforms

Large firms use idea platforms to find designs for their products. For example, LG used the CrowdSpring idea platform to solicit a new phone design at the cost of $20,000 USD, rather than spending millions of dollars on contracting a design firm for the same purpose (Winsor, 2009). Higher financial rewards may not result in more effort from the designers, and only a few designers are active and effective in design competitions (Araujo, 2013). Therefore, encouraging these active designers to collaborate with peripheral designers is crucial to have diverse designers in design activities (Fuge et al., 2014). For this purpose, some intermediaries help organizations to create digital platforms suitable for interacting with different parties. For example, CMNTY (cmnty.com) and Spigit (spigit.com) develop innovation management software for other organizations to launch digital platforms. 99designs (99designs.ca) and Crowdspring (crowdspring.com) have made it easy for many entities to find low-cost designs from "crowds". On the 99designs platform, users create design contests for other users. Designers submit ideas for evaluation and receive financial rewards if their designs are selected (Araujo, 2013). Another example is the Zooppa platform (zooppa.com), which has served over 400 global brands in the production of video and graphic content by completing over 750 community-created projects, through which it awarded $6 million for 145,000 creations.

3. Co-creation platforms

Co-creation is a means of opening the innovation process through external individuals across the world (Füller et al., 2011). Companies are increasingly using mass customization to differentiate themselves from their competitors and find new ways to expand their business. Cafepress and Spreadshirt are two companies that have shown a new way to serve customers through co-creation (Brabham, 2010; Enders, 2010). The CafePress digital platform (www.cafepress.com/cp/info/about/) claims to be "the best online gift shop" with over one billion items that are co-created from a global community of over two million designers. Similarly, creative co-creation is used for tattoo design (CreateMyTattoo), music bands (Sellaband), lifestyle and interior products (Mookum), video makers (Userfarm), to name but a few. Another digital platform, Quirky (quirky.com), has paid out over $10 million USD to its community of around one million members who have contributed more than two million ideas.

4. Online marketplaces platforms

Online marketplaces such as NineSigma and Yet2 play an important role in increasing the use of patents by external entities. Firms may significantly enhance their performance in leveraging external knowledge by developing their reputation as a knowledge giver (Lichtenthaler & Ernst, 2007). According to Dushnitsky and Klueter (2011), there are two main categories of digital marketplace for knowledge trading: venture capital and intellectual property (IP). In the first category, seekers submit their ideas as a business plan and venture capitalists select the ideas to fund. In the second category, owners list the IP available for licensing or other ways of appropriation. According to Dushnitsky

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and Klueter (2017), "online marketplaces are more suitable to serve an industry with (a) a higher cost of searching for technologies in that industry, (b) greater ambiguity about the underlying technology's potential applications across industries, and (c) greater ability to protect inventions from expropriation". An example of this type of digital platform is Threadless (threadless.com), an online t-shirt marketplace where designs are created and selected by the community members. Each week, about 1000 designs are submitted to this online platform for the public vote and 10 designs are finally selected based on average score and feedback of community members, with designers receiving a portion of the proceeds of sales based on their designs.

5. Public crowdsourcing platforms

Digital platforms for the public sector represent a novel way to engage citizens in various public programs. In the United States (US), federal agencies are using the Challenge.gov (challenge.gov) platform as an alternative mechanism to solicit ideas for pressing challenges facing the US government. Challenge.gov has a list of challenges run by 100 agencies across US federal government. So far, federal agencies have offered over $250 million USD in prize money with the participation of over 250,000 solvers. In Singapore, the government has implemented various digital platforms that combine datasets from a wide range of agencies to engage its citizens (Yang & Kankanhalli, 2013). NASA is turning to crowds to explore human space exploration challenges through the open innovation service with a series of contracts. Thereby, it aims at using these challenges to tap into the diverse talents available around the world (NASA, 2015). The non-profit organization iBridge Network runs a digital platform where innovations, such as research results, computer software, copyrighted works, and patented inventions, are listed so that potential entities can use those items for useful purposes. It expedites technology transfer in several ways: i) greater focus on one-to-many transfers, ii) accumulations of innovation from multiple research institutions, iii) direct transactions from a provider to an adopter, iv) option for fee-based and license-based transactions, and v) management as a non-profit platform.

6. Collective intelligence

Collective intelligence is sharing information through collaboration, collective effort, and competition to find a concerted solution to a problem. Collective intelligence shows how applications support human interaction and decision making (Gregg, 2010). Digital platforms are increasingly used in collective intelligence and predictions. Collective intelligence markets (e.g., Lumenogic), crisis information (e.g., Ushahidi), data mining and forecasting (e.g., Kaggle), and crowdsourced image labelling (e.g., Google Image Labeler) demonstrate novel ways of digitization for collective intelligence. Tools that are used for collective intelligence are found to have better performance than theorists can explain: they may be better for idea generation than idea evaluation. However, managers needs to trade-off loss of control and diversity of expertise (Bonabeau, 2009).

7. Freelance and microtask platforms

Microtasking platforms provide opportunities for many organizations to accomplish tasks using crowd labour. For example, computers can use an application programming interface (API) to post tasks that are to be accomplished by humans. Here, requesters post tasks that online users complete and receive a small amount as payment per mini task (Ipeirotis, 2010). Several platforms, such as Amazon Mechanical Turk, Clickworker, Microtask, and txteagle help their clients to transform paper documents into digital format through the widely distributed crowds, each of whom does small task of a large project (Chrons et al., 2011; Kanefsky et al., 2001). TopCoder administers fortnightly online single-round matches and weekly competitions in graphic design and development. It sells software licenses using the growing body of components developed through competition. Pharmalicensing claims to have over 22000 technologies and a network in 110 countries. Chaordix leverages the knowledge and ingenuity of crowds to quickly identify market trends. Some intermediary digital platforms develop software solutions to manage ideas, projects, and products, thereby helping organizations to have sustained creation and enhancements of new products and services.

Conclusion

How digital platforms act as enablers for digital transformation is a pivotal issue, not only for companies but also for academics and policy makers. As demonstrated in the previous sections, there are various categories of digital platforms that are used to solve simple to very complex problems. The digital platform is a recently emerged phenomenon, and as such, it is underdeveloped in practice and under-researched in the academic literature. However, we can see that companies can benefit significantly from various digital platforms that can work as catalysts for digital transformation. Therefore, companies can consider digital platforms as an integral part of their digital transformation agenda.

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Even though digital platforms for ideas, technologies, and knowledge transfer are mostly considered as two-sided, there is a range of parties involved in the successful solving of problems. In a company's own digital platforms, managers need to learn how to deal with external people who are not employees and are only loosely connected with the company. They need to learn how to manage people who are on the other side of a digital platform. A key challenge for companies is to understand and narrate the problem in a simple manner so that external experts can easily understand the problems put forth.

Network effects also play a crucial role in the success of digital platforms. For example, to find the best solutions, ideas, technologies, and knowledge, the platform calls need to reach different experts across the world. Technology owners, for example, can license out their technologies to various parties across disciplines. Hence, the value of technologies is dependent on several external factors. Solution seekers prefer to work with intermediary platforms that have a high number of registered and potential solvers, and therefore, the sides stimulate each other for greater participation and contribution. Solvers, especially those who are successful, not only work with a platform once but also return repeatedly to the same platform to contribute.

Each category of digital platforms works with distinct mechanisms and therefore it is essential for a company to understand these mechanisms in relation to the what it wants to accomplish. Despite numerous studies on digital platforms, the understanding of their role in digital transformation is scarce. It is important to explore digital platforms from the lens of digital transformation. The current literature contains knowledge on what motivates crowds to participate in and contribute to digital platforms (sometimes without any monetary return), how an interdisciplinary team is better than homogenous groups to solve pressing problems, and how companies can appropriate their technologies for external use. However, there is limited understanding of how companies deal with various important activities, such as formulating a problem statement, finding a right set of experts to solve problems, and the financial aspects of using external experts. This discussion may provide a basis for future research in the exciting and rapidly developing field of digital platforms to accelerate our understanding of digital transformation.

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