



Tentamen November 2021, vragen en antwoorden

Leadership and Technology Management (Technische Universiteit Delft)

Model Answers MOT1524 Leadership and Technology Management Examination

Date: November 3, 2021
Time: 13.30 – 16.30
Place: Pulse-Hall 10, Pulse-Hall 5, Pulse-Hall 6, Pulse-Hall 7

Question 1: ASQ Technologies' innovation journey

ASQ Technologies produces photolithography systems for the semiconductor industry and is one of the leading and oldest producers in this business. ASQ could be regarded as a bureaucratic organization with different departments. In addition to sales and manufacturing, the company is also involved with the research and development (R&D) of new systems. The innovation team has 40 members and consists primarily of project managers working with internal and external resources to realize projects. The use of internal or external resources (mostly employees) depends on the availability of these resources and if the required knowledge is available in-house. Further, the innovation department operates directly under the board of directors. Project ideas are developed in Business Development, Operations and in the Board. Recently, a new R&D director was appointed, who joined the firm from a small start-up in the area of photolithography. The new director faces a number of challenges and she is not convinced about the future innovation capabilities of the firm. In order to safeguard ASQ's future as an industry leader, she considers to explore the opportunities of open innovation.

- a) What does the R&D director mean when she talks about 'open innovation'? Explain the meaning of open innovation and show how this could change the current R&D process of ASQ Technologies. [2 points]

Answer:

The R&D Director means to consider the use of 'others' in the innovation process or as defined by Henry Chesbrough (2006) as a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and external and internal paths to market, as the firms look to advance their technology' (p.1.). [1 point]

The key is to enhance networks capable of supporting new forms of collaboration and knowledge flow. The R&D process at ASQ could change in two different ways:

1. The R&D director could decide to collaborate more with other firms in order to develop their new systems, such as startups or other established firms (outside-in) [0,5 points] or
2. The R&D director could decide to market some of their patents (**inside-out**). [0,5 points]

Established firms, such as ASQ technologies, usually suffer from different kinds of rigidity over time (see Dąbrowska, Lopez-Vega, & Ritala, 2019). Such rigidities may act as barriers for open innovation.

- b) Describe and explain two of such rigidities that may be at stake here. [2 points]

Answer:

Structural rigidity: a firm-level construct that explains how and why it becomes difficult and costly to change organizational structures (internal and external). [1 point]

Capability rigidity: firm-level construct that explains how and why it becomes difficult and costly to change organizational routines and how these drive exploration and exploitation processes. [1 point]

It is not necessary to mention the exact terms structural or capability rigidity as long as it is clear what you mean by these two rigidities.

Established firms, such as ASQ technologies, often struggle to balance their exploration and exploitation activities in their organization.

- c) Explain what this means and give an example of how ASQ technologies could create such a balance. [2 points]

Answer:

This question is about a firm's ability to combine both exploitation (delivery) and exploration (new idea generation) otherwise known as ambidexterity (. It is not necessary to mention the word ambidexterity as long as you are able to show the difference between exploitation and exploration activities [1 point].

In your answer it is important to show how exploitation and exploration activities are balanced in ASQ. Rather than just creating a workforce that is able to efficiently and effectively take care of existing business activities, current knowledge-driven firms also need to support the workforce in creating all kinds of innovative outcomes, such as solutions to current problems, adapting to environmental change or developing completely novel products, services, or business models. There are different ways in which companies may enable ambidexterity (i.e. balancing exploitation and exploration activities), such as allocating a certain amount of time per week to the workforce to work out their own ideas (like this is done at 3M (but also at Google), organizing sessions in relation to new developments, or just being open to new ideas by opening an idea box and let people profit from the innovations that may come out of their ideas. [1 point for describing one of these ways].

Established firms, such as ASQ technologies seem to use many projects to manage their innovation processes.

- d) What is the difference between teams versus projects and show how projects may be able to come up with radical innovations? [2 points]

Answer:

In order to answer this question you need to provide the following:

Teams are characterized by common goals, shared identity, interdependence, interaction, mutual influence. [0.5 points] **Projects** differ from teams. The **organizational context** of projects in contrast to teams does not often have a fixed membership, work is often temporary, fluid, interrupted and distributed. [0.5 points]

Radical innovation concerns processes that are aimed at creating a very different and disruptive ways of doing things. [0.5 points] Projects can stimulate knowledge creation and be fertile sites for learning because they bring together individuals from different backgrounds to work collectively to create something radically new. The generation and exchange of ideas are key here. [0.5 points]

After spending some time at ASQ technologies, the new R&D director has got a better overview of the firm and its (future) innovation capabilities. She is no longer sure about the benefits of open innovation and wants your advice about the possible opportunities for open innovation or to do something else.

- e) Please, formulate a detailed advice to R&D director of ASQ Technologies. In this advice you either make a case for open innovation in which you show the steps needed to embark on an open innovation journey or you suggest another plan of action that will enable ASQ to remain an innovative industry leader. [2 points]

Answer:

Since ASQ Technologies is an established industry leader in the business, the **marketing of some of their patents (or intellectual capital)** may be a serious option to consider (Inside-Out approach). In order to pursue such an inside-out approach, the R&D director should decide which patents (or intellectual capital) could be marketed and what knowledge ASQ should keep to themselves. Next, ASQ should find the right partnerships and to decide about how to market their patents (or intellectual capital), either through licensing or direct sales, or to consider the opportunities for a spin-out.

In the case ASQ wants to pursue an outside-in approach in order to enlarge/strengthening their R&D capacity, the following steps are needed: establish the (external) knowledge needed, find the right external parties, decide on how to collaborate or to acquire one or more start-ups if possible.

You may earn 2 points for either a well-argued advice for the inside-out or the outside-in approach. You could also decide to make a case against open innovation and to show another convincing way to ensure ASQ will remain an innovative industry leader. There are not many options here. It is not enough to advice to change the current organizational structure as there is no proof the ASQ's current bureaucratic structure is working against them. ASQ is the industry leader and their structure seem to have enabled this.

Question 2 MOT1524: Digital transformation at Land Rover

Car manufacturer Land Rover has extended digital transformation to all sections of its operation, taking in every department and team member. As opposed to tasking one team with implementing the initiative, they endeavor to involve every part of the company hierarchy. An important aspect of the car manufacturer's digital transformation project is expanding automation. One prototype is Car Connect, which does everything from analyzing navigation services and real-time traffic reports to reading out news and choosing music. All these capabilities are controlled via a smartphone. To measure the success of the product, Land Rover has created unique user IDs for every customer to collect their experiences and feedback, as well as monitoring product performance. Land Rover wishes to leverage the potential of their digital transformation. This is motivated by the idea that they could potentially develop some new business models in relation to the customer data that they are gathering.

- a) Explain the difference between big data and little data and show what data are relevant for Land Rover in order to consider a new data driven business model? [2 points]

Answer:

A way to expand their business could be by exploring the possibilities of big and little data. You should provide such explorations. You should be able to show if you believe that there are any opportunities for Land Rover to do something with big data or with little data. Therefore it is important to show the distinction between these two kinds of data [1 point]. For definitions see for example p.236 of the book.

Next, show what kind of data Land Rover may possess and how they could use these data for possible business opportunities [1 point]. Please, be aware that this question is not about the CarConnect business model but about possible new business models on the basis of the data Land Rover may possess.

- b) In order to temper Land Rover's enthusiasm about data driven business models, it is important to warn them about some possible issues in relation to the use of the data implicit digital connectivity. Please, do elaborate on two issues associated with the use of implicit digital connectivity.

Answer:

There could be concerns related to data security and privacy issue of the technology users, since the device would create IDs for customers. Given this "ethical" aspect innovation, Land Rover must focus on making this a responsible project. That means that the organization must be able to use digital innovations in responsible ways, therefore exploiting their business and societal values while monitoring ethical issues. Data made available from digitized objects in the case of implicit digital connectivity should be treated with respect to (the ethical rights of) the actual people who own their data. Since Land Rover is in the position to collect little data by users, they should be aware of this. Even if they do not (yet). Another issue concerns the use of implicit digital connectivity. Implicit digital connectivity implies that we are so called walking data generators. This means that we each leave an increasingly large 'data trail' (data that provide information on what we have done, with whom, where and how). Users are not always aware that their behavior is being monitored and used for enabling further business opportunities. Data made available from computing applications and digitized objects in the case of implicit digital connectivity should be treated with respect to (the ethical rights of) the actual people who own their data. Since Land Rover is in the position to collect little data by monitoring the detailed use of car drivers, they should be aware of this. Even if they do not (yet) intend to use these data. Therefore, they should inform the users of their device about the future use of these private data (privacy concerns). You should explain the privacy concerns [1 point] and the security issues [1 point]

- c) In order to further the plans for digital innovations, Land Rover has hired all kinds of digital specialists over the years. Such highly skilled knowledge workers are often characterized by the term 'gold collar' workers. What does the term 'gold collar' workers mean and why does this apply to the digital specialists at Land Rover? [2 points]

Answer:

Gold collar workers are a variation on the traditional division between blue collar (manual laborers) versus white collar workers (office staff managers) in factories. Gold collar workers are first and foremost knowledge workers. They are highly skilled and companies very much depend on those people since they are hard to replace. Therefore, they need to be managed skillfully, provided with excellent working conditions, and very good employment conditions, hence the reference to gold by going above the traditional blue and white collar workers [2 points].

Land Rover's top management strongly believes that their role is primarily to provide the necessary enabling context in order to facilitate knowledge work rather than to monitor and control their knowledge work force. What is the main reasons why Land Rover works like this? [2 points]

Answer:

This has all to do with **motivation**. Knowledge workers need to be managed skillfully, provided with excellent working conditions, and very good employment conditions. Control does not seem to work very well for such workers as these people are primarily motivated by Autonomy, Mastery, Purpose (Motivation, see lecture #4). Control does not go very well with stimulating creativity and innovation [2points]

- d) Land Rover's strong emphasis on creativity and innovation has led to a number of investments in new staff members, facilities, and external consultancy services. In order to evaluate these efforts, Land Rover wants to learn whether these efforts have indeed payed off. Therefore they want to measure the extent of their creativity and innovation. Please, describe the difference between innovation and creativity and show how Land Rover could measure these two outcomes in a study of their organization.

Answer:

This question is all about the distinction between idea generation and the implementation of ideas. Creativity is the process of generating novel/original ideas that are useful. [0.5 points]. Innovation is the process of implementing novel/original ideas that are useful. [0.5 points]. Both creativity and innovation are hard to measure within actual firms. Counting the amount of ideas, for example, is almost impossible as there is a continues exchange of ideas among employees and not every single idea will or can be stored in databases. Therefore, different measures for creativity and innovation were developed. The article by Hughes et al. (2018) provide a number of measures for both creativity and innovation in the workplace. You can choose one for each category:
Creativity Measure: Any one of those is fine [0.5 points]
Innovation Measure : Any one of those is fine [0.5 points]

- Hughes, D. J., Lee, A., Tian, A. W., Newman, A., & Legood, A. (2018). Leadership, creativity, and innovation: A critical review and practical recommendations. The Leadership Quarterly, 29(5), 549-569.

Question 3: Innovation challenges at Foodini

Foodini is a high-tech company operating in the industry of grocery delivery. Its business model is based on an online delivery service that allows users to order groceries via their mobile application. Foodini is unique for its speedy delivery, as groceries are delivered within 10 minutes from the moment of order. For this to happen, employees in warehouses are fully monitoring the order of customers. In particular, while the users add products to their basket in the mobile app, employees in warehouses already start preparing the order. When the basket is ready, delivery workers ride their electric bikes and deliver the basket to the customer. Foodini wants to improve its digital connectivity applications and fully exploit the opportunities of digitalization. Therefore, the founders will hire a number of consultants to explore the potential that connectivity can enable.

- a) What is the difference between implicit and explicit digital connectivity? Provide examples for the benefit of Foodini. [2 points]

Answer:

Explicit digital connectivity refers to an explicit way of connecting people with other people and organizations. It's the use of internet-connected technologies to accomplish a goal. Implicit connectivity is the use of digital devices so that activities are tracked and data are then used for a purpose not linked to the original intention use. This might be for example, when smartphones records and tracks behaviors, or when a cookie records that we have visited on online shopping site. Both types of connectivity differ in terms of the new ways of digital technologies. For example, explicit connectivity underpins the emergence of Web 2.0, whereas implicit connectivity does not rely on human actors' input. [1 point]

Examples that could be beneficial for Foodini could include investing in social media platforms for sharing thoughts, or using online shopping channels for sharing or purchasing products (e-commerce applications). [0.5 point]

Examples of implicit digital connectivity could be storing purchase historical record through smartphones, etc. [0.5 point]

Foodini employs 70 employees, with its structure being described by its management as a highly organic, flexible and generally organized around teams. The founders did not intend this structure as it just emerged but they want to know whether this organic structure is appropriate for the future of the organization or not.

b) Please, show the pros and cons of Foodini's organic structure and advice whether to change the current structure or not. **[2 points]**

Answer:

An organic structure can facilitate communication, as an informal flat structure does not contain several layers of management and communication does not have to pass through multiple people before it reaches its destination. Moreover, organic structures are characterized by informal control, making it easier to respond to changing circumstances. In addition, in decentralized structural forms, employees are more actively participating in decision making, facilitating faster feedback and more innovative solutions. [1 point]

On the other hand, there are disadvantages when it comes to effective management, productivity, employee satisfaction and growth. One of the problems with an organic organizational design is that the flat structure means there are fewer managers, which might result in a loss of control when there are a large number of employees. Also, the lack of a formal structure and specialization might come with potential issues that can make employees confused about their roles, decrease of motivation and productivity. [1 point]

Foodini could invest in this organic structure, as a way to better react to market conditions. Such structure is useful in dynamic and unstable environments, where change occurs regularly and where there is a high level of uncertainty.

The founders of Foodini also want to explore the business opportunities in relation to a peer-to-peer sharing economic model.

c) Please, show the opportunities associated with such a peer-to-peer sharing economic model. Also provide suggestions on how this sharing economy model could apply to Foodini's business. **[2 points]**

Answer:

Sharing economy is an economic model where people share goods and services facilitated by digital channels and the internet, through peer to peer free or money-based transactions. Some of the advantages of sharing economy relate to monetizing underutilized assets, saving money and resources, flexibility and environmental impact. Sharing economy opens up opportunities for small entrepreneurs to start their own business and work more flexible hours that suit other responsibilities and interests. Also, it can generate jobs and focus on customer-driven innovation.. [1 point]

In the case of Foodini, sharing economy could take place by enabling customers to rent their bikes, or by collaborations with restaurant owners. Also, online movements such as open source initiatives could be such examples. Sharing economy in the case of Foodini could also provide flexible working arrangements for employees. [1 point]

Foodini avoids packaging food wherever they can and track their suppliers to do the same when they deliver to them. At the same time, the organization considers social and financial aspects. The founders want their innovations to be responsible and are open to explore frugal innovations.

d) Explain the key differences between frugal and responsible innovation. Which of the two types would you find be more useful in the case of Foodini? [2 points]

Answer:

Responsible innovation refers to the organization's responsibility for considering its social and environmental impacts, as well as its financial results. [0.5 point]

Frugal innovation refers to the process of reducing the complexity and cost of a good and its production. [0.5 point]

A frugal model of innovation at Foodini could offer new opportunities to make the most of technological expertise, to address societal challenges and better meet customer needs. Also, frugal innovation has advantages in terms of speed, cost, lack of bureaucracy and potential new markets. By investing in frugal innovation, Foodini could complete effectively by making a better product/service more affordable. [1 point]

or

Foodini could engage in responsible innovation and include societal values, such as sustainability, ethics, safety and inclusiveness, in their innovation strategy. Responsible innovation will help Foodini to grow its business, attract the best talent and meet the expectations of investors, by building a culture of trust. [1 point]

Foodini is looking for ways to lower the costs, while maintaining its core competencies. In this regard, the founders are looking for a technological and resource-constrained solution that will focus on the competitiveness of the core functionalities.

e) Please, formulate a possible frugal innovation strategy for Foodini. [2 points]

Answer:

Frugal innovation is the concept of “doing more with less”. In other words, it is an innovation strategy that “denotes a new frame of mind that sees resource constraints not as a liability but as an opportunity” (Newell et al., 2020, p. 268). For Foodini to formulate a frugal innovation strategy for its digital project, the following steps could be taken into consideration:

1. Developing circular networks
2. Crowdsolve solutions across industries
3. Encourage simplification of structures:
4. Use KPI's to incentivize and sustain frugal behavior:
5. Emphasize “doing more with less”

For each of these steps you should ideally indicate how Foodini should deal with these steps in order to provide a clear example of a frugal strategy. A frugal strategy focuses on innovations in resource-constrained environments, by means of sustainable resource use, essential functionality and cost reduction. As for the initiation of a frugal innovation strategy, a less developed area would be most logical, because it is characterized by resource-constrained environments. This question is not about the internal organization of Foodini but about their strategy in less developed areas. The potential for helping underserved markets with resource constraints can be beneficial for both Foodini and such region at the same time. Digital technologies, such as the use of social media could also be a good way to raise awareness. [2 points if 3 out of the 5 steps are covered]