Innovation Management -Theory (20 points)

Q1 - (6 pt) Commentary *In late August, Moderna filed patent infringement lawsuits against Pfizer and BioNTech for infringing patents central to its mRNA technology platform. "Moderna believes that Pfizer and BioNTech's COVID-19 vaccine Comirnaty infringes patents Moderna filed between 2010 and 2016 covering Moderna's foundational mRNA technology. This groundbreaking technology was critical to the development of Moderna's own mRNA COVID-19 vaccine, Spikevax. Pfizer and BioNTech copied this technology, without Moderna's permission, to make Comirnaty". Moderna said in a press release that it is not aiming to remove Pfizer's vaccine from the market or prevent future sales of its vaccine and also is not seeking damages of its sale in specific circumstances. What Moderna really wants is a cut of its competitor's profits, said Christopher Morten, an expert on intellectual property law at Columbia University.*

Based on the above example:

- define **patents** in the context of **IP protection mechanisms** and discuss their strategic role in the pharmaceutical industry.
- suggest possible explanations for Moderna's lawsuit, beyond the opportunistic objective of extracting profits from its competitors.

Q2 - (4pt) Open question: What are the advantages and disadvantages in innovation for large and small, entrepreneurial companies? Briefly elaborate on how different types of advantages and disadvantages are connected to the main differences between the two types of firms, making use of examples.

Q3 - (2pt) Closed question Inbound and outbound open innovation refer to … (select the correct answer)
[] the direction of knowledge flows with respect to the boundaries of the organization
[] the direction of the revenue streams from new products and services
[] exploration and exploitation strategies
[] collaboration with different types of partners

Q4 – (2pt) Closed question Aside from the key objective of developing new competencies and technologies, internal R&D investments are crucial in order to:
[] make profits out of innovations
[] innovate the business model
[] build internal absorptive capacity
[] pursue coupled open innovation processes

Q5 (2pt) – Closed question Knowledge embedded in organizations… (select the correct answer)
[] is a rhetorical statement, since it is the members of the organization who possess knowledge, whereas the organization does not.
[] is a key determinant of the way the organization operates and innovates, to the point that it transcends the knowledge possessed by its members, making the latter irrelevant.
[] is equivalent to the data stored in corporate IT systems and algorithms processing it.
[] is a key determinant of the way the organization operates and innovates; it derives from the usage of the knowledge contributed by its resources within routines and processes

Q6 - (2pt) Closed question A technological trajectory describes… (select the correct answer)
[] a "technology push" type of technological progress
[] a "demand pull" type of technological progress
[] the evolution of a technology along with market needs, eventually leading to the establishment of a technological paradigm
[] the bell-shaped curve that is sometimes called "hype cycle".

Q7 - (2pt) Closed question Corporate venturing is…
[] an approach undertaken by an incumbent in order to diversify its financial investments away from its core business
[] an approach undertaken by an incumbent in order to "connect" to innovative solutions being developed by promising startups, without acquiring them outright
[] the same thing as the acquisition of a startup by an incumbent, but carried out through a separate legal entity (i.e., the "corporate venturing firm") controlled by the incumbent
[] the startup phase of a new joint venture set up by the firm together with some other partner

Innovation Management -Theory
Solutions

Q1 - (6 pt): *In late August, Moderna filed patent infringement lawsuits against Pfizer and BioNTech for infringing patents central to its mRNA technology platform. "Moderna believes that Pfizer and BioNTech's COVID-19 vaccine Comirnaty infringes patents Moderna filed between 2010 and 2016 covering Moderna's foundational mRNA technology. This groundbreaking technology was critical to the development of Moderna's own mRNA COVID-19 vaccine, Spikevax. Pfizer and BioNTech copied this technology, without Moderna's permission, to make Comirnaty". Moderna said in a press release that it is not aiming to remove Pfizer's vaccine from the market or prevent future sales of its vaccine and also is not seeking damages of its sale in specific circumstances. What Moderna really wants is a cut of its competitor's profits, said Christopher Morten, an expert on intellectual property law at Columbia University.*

Based on the above example:

- define **patents** in the context of **IP protection mechanisms** and discuss their strategic role in the pharmaceutical industry.

- suggest possible explanations for Moderna's lawsuit, beyond the opportunistic objective of extracting profits from its competitors.

SOLUTION

-Patents are a formal IP protection mechanism that gives the holder of the patent the right to exclude others from making, using, selling, and importing an invention for a limited period of time, usually 20 years from the date of filing. In exchange for disclosing the details of their invention to the public, the inventor is granted a limited-time monopoly on the use and exploitation of the invention. Companies can use patents to prevent competitors from using their proprietary technologies or making copies of their products. In the pharmaceutical industry, patents are an important strategic tool that can be used to protect the significant investments made in research and development (R&D) and to recoup those costs through the sale of patented products in different geographical markets, acting through the mechanism of patent extension. The importance of patents in the pharmaceutical industry is particularly high, due to the ease with which a drug could be imitated (i.e., reverse engineering is relatively easy) and to the low marginal cost of producing the drug, compared to the high fixed cost of R&D.

-There are a number of possible explanations for Moderna's lawsuit beyond the objective of obtaining a share of profits from its competitors

The most interesting element in the press release is that the lawsuit is not only about COVID vaccines, since Moderna is claiming that Pfizer and BioNTech have infringed the IP associated to its broader mRNA technology platform, which is at the core of the firm, and in which it has most likely placed significant R&D investments.

By suing Pfizer and BioNTech for patent infringement in the case of COVID vaccines, Moderna may be trying to prevent them from using its patented technology without compensation also in other applications.

Moderna may be trying to negotiate a licensing agreement with Pfizer and BioNTech. By suing for patent infringement, Moderna may be trying to force Pfizer and BioNTech to negotiate for compensation and reach a licensing agreement for the use of its patented technology.

Moderna may be seeking to establish itself as the leader in the mRNA drug market and use the lawsuit as a barrier to entry, preventing competitors from using this technology and catching up. By suing Pfizer and BioNTech, Moderna may be sending a signal to deter other companies from developing drugs that might come close to infringing its patented technology.

Moderna may be trying to resolve a dispute over the ownership of the patented technology. If Moderna believes that Pfizer and BioNTech are using technology that it believes is rightfully its own, it may be suing to clarify ownership and establish its exclusive IP rights to the technology.

Q2 - (4pt): What are the advantages and disadvantages in innovation for large and small, entrepreneurial companies? Briefly elaborate on how different types of advantages and disadvantages are connected to the main differences between the two types of firms, making use of examples.

SOLUTION

Large established companies dispose of a wider set of material and immaterial resources (e.g. financial resources, human resources, IP, customer base …) than small, entrepreneurial companies, which can be an advantage when it comes to innovation. They may have larger R&D budgets, more specialized employees, qualified managers and more established external networks. For example, a large firm may have the resources to conduct expensive R&D activities, such as complex clinical trials for a new drug, and may have the assets required to internally build a prototype of a new technology. Moreover, since the cost of R&D activities typically is a fixed cost, having a large customer base allow a large company to gain economies of scale, by spreading this costs over a larger production volume.

On the other hand, small, entrepreneurial companies are more agile and able to pivot in response to technological and market turbulence than large firms, that, especially when successful, may be characterized by innovation and organizational inertia. Entrepreneurial firms are often also more open than large established companies to taking risks and trying out new ideas. This can be an advantage in innovation, as it allows them to move more quickly, explore new technological and market solutions, and innovate the business model.

One disadvantage that large firms may face when it comes to innovation is that they may be too focused on the exploitation of current capabilities, leading to high short-term profits, but making them less willing to invest in long-term "exploration" projects that would require significant change in their organization, assets, market, or business model. Especially for firms operating in mature industries, innovation inertia exposes them to the risk of being disrupted. In contrast, small, entrepreneurial companies may be more willing to take risks and think long-term, as they may have less pressure to generate immediate returns for shareholders. In small entrepreneurial firms, the R&D objectives and management objectives are very well aligned and strategy evolves accordingly.

One disadvantage that small, entrepreneurial companies may face when it comes to innovation is that they have limited resources, which can make technology exploitation to bring new products to market more difficult and risky for them. They may also have limited reputation and access to established networks and markets, which can make it harder for them to find trustworthy collaborators and customers. As small entrepreneurial firms are often one-project-one-technology companies, collaborating in innovation exposes them to the risk of losing relevant knowledge or not appropriating the results.

Overall, the advantages and disadvantages of collaborating in innovation for large and small, entrepreneurial companies depend on the specific context (for example, the industry, the geographical location, the degree of technological or market turbulence) and the resources of each firm (for example, R&D investments, availability of complementary assets).

Q3 - (2pt): Inbound and outbound open innovation refer to … (select the correct answer)
[**X**] the direction of knowledge flows (from outside to inside and vice-versa) with respect to the boundaries of the organization
[] the direction of the revenue streams from new products and services (from outside to inside and vice-versa)
[] respectively exploration and exploitation strategies
[] collaboration with different types of partners

Open innovation essentially has to do with flows of knowledge, which lead from research to the launch of new products, and which occur across corporate boundaries. The first answer is therefore the correct one "by definition". The second answer could also apply if we refer to open business models. Revenue streams emerge as a consequence of these knowledge flows, but are not integral to the definition of inbound and outbound open innovation processes. The other two answers are nonsensical.

Q4 - (2pt): Aside from the key objective of developing new competencies and technologies, internal R&D investments are crucial in order to: (select the correct answer)
[] ensure the firm is able to make profits out of innovations
[] innovate the firm's business model
[**X**] build internal absorptive capacity
[] pursue coupled open innovation processes

Aside from being one of the well-known reasons for carrying out R&D, the third answer is the only one that makes any sense. The first answer is wrong, since R&D may enable innovations, but cannot ensure their profitability. The second answer is wrong, since R&D is not generally aimed at innovating a business model (on the opposite, business models may be innovated after R&D has been carried out, in order to create value out of its results). The fourth answer is nonsensical.

Q5 - (2pt): Knowledge embedded in organizations… (select the correct answer)
[] is a rhetorical statement, since it is the members of the organization who possess knowledge, whereas the organization does not.
[] is a key determinant of the way the organization operates and innovates, to the point that it transcends the knowledge possessed by its members, making the latter irrelevant.
[] is equivalent to the data stored in corporate IT systems and algorithms processing it.
[**X**] is a key determinant of the way the organization operates and innovates; it derives from the usage of the knowledge contributed by its resources within routines and processes

Both the Evolutionary Theory of the Firm and the Resource-Based View in strategic management are based on the definition found in the fourth answer. The other three answers contradict this basic definition.

Q6 - (2pt): A technological trajectory describes… (select the correct answer)
[] a "technology push" type of technological progress
[] a "demand pull" type of technological progress
[**X**] the evolution of a technology along with market needs, eventually leading to the establishment of a technological paradigm
[] the bell-shaped curve that is sometimes called "hype cycle".

The correct answer is obviously the third. A technological trajectory may be subject – at different times along the s-curve – to both technology push and demand pull, and there is no reason why it should be associated to only one of these determinants. The fourth answer is nonsensical.

Q7 - (2pt): Corporate venturing is… (select the correct answer)
[] an approach undertaken by an incumbent in order to diversify its financial investments away from its core business
[**X**] an approach undertaken by an incumbent in order to "connect" to innovative solutions being developed by promising startups, without acquiring them outright
[] the same thing as the acquisition of a startup by an incumbent, but carried out through a separate legal entity (i.e., the "corporate venturing firm") controlled by the incumbent
[] the startup phase of a new joint venture set up by the firm together with some other partner

The very definition of corporate venturing is in the second answer. All the other answers point to other types of business initiatives that would fall under other names, which are suggested in the same answers (i.e., respectively financial diversification, acquisition, establishment of a joint venture).