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# POSITIONING A START-UP IN A VALUE NETWORK DOMINATED BY ESTABLISHED INTERNATIONAL ACTORS

Eveon, a David in a world of pharmaceutical Goliaths

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*Managing to evaluate the distribution of value between the various actors implicated on the creation, the production, the marketing and distribution of an innovative offer remains an enormous challenge for a start-up. This value sharing is even more difficult for a start-up where the incumbent companies are big and have high negotiating powers. This is the kind of ecosystem in which Eveon found itself, a start-up and pioneer in the design of automatic medical devices, attempting to find its place amongst the giants of the pharmaceutical industry. This case shows how a start-up can define its position in a value chain when confronted with a number of strategic options and Business Models.*

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One of the biggest challenges when setting up an innovation based company is how to identify, as early as possible, the business model that will enable the company to capture value from its innovation. What client segments should be targeted? What are the clients' value criteria? What key processes and resources will be required? Which partners should be chosen? How can we evaluate the value we should be able to capture? These are some of the many questions that need replies as early as possible to enable innovators to create their start-ups. Choosing the start-up's position within a value network is one of the most critical and difficult stages in business model development. The difficulty lies less in the identification of the actors involved in development, or production or in taking the innovation to market, but rather in evaluating how the value captured will be distributed between the network actors and the start-up.

Value sharing becomes even harder when it concerns a start-up faced with established actors that are big companies with huge negotiating power. This is the type of ecosystem in which Eveon found itself, a pioneer start-up specialising in the design of automatic medical devices and trying to make its name amongst the "giants" of the medical world. This case shows how a start-up defines its position in the value chain, when faced with a number of strategic options that result from identified business models.

## THE START-UP, THE MARKET AND THE VALUE CHAIN

Eveon, which means "injection" in Greek, is the name of a start-up which has developed a smart injection medical device for the safe administration of medication without syringes. The idea behind the device is based on two factors:

Traditional syringes and their modern counterparts, such as pre-filled syringes or injector pens, have major drawbacks as far as safety and reliability are concerned (One million needle stick injuries occurred in the USA in 2006 alone).

Observation work carried out on mosquitos and in particular on their sensors, pumps and sampling systems has shown that a mosquito always manages to prick in exactly the right place, to the right depth and painlessly. As a result of this research, the founders of Eveon imagined and developed a new injection device.

## A HUGE MATURE GROWTH MARKET WITH OPPORTUNITIES

Eveon's market is a growth market. Aging populations in wealthy countries along with population growth and improving living standards in the developing world will maintain market growth for medication and injection devices at around 5% per year for the foreseeable future. This growth is inciting governments to improve the control of health costs through the reduction of, amongst other things, the cost and duration of hospital stays. Eveon's device fits this trend perfectly as it proposes an injection solution that is entirely automatic and individualised and which can easily be self-administered at home. The first patents were deposed in 2007 and the idea became a business project rewarded by a number of prizes for innovation.

## AN INNOVATIVE PRODUCT WITH KEY BENEFITS

Eveon's fully automatic and safe medical injection device (DMI) can be used for: subcutaneous, intradermal, intramuscular and intravenous injections and is based on four major innovations:

- | **A microsystem micropump (MEMS)** enables volumes varying from from litres to millilitres be injected with precision. Adjustment of MEMS parameters allows injection times to be controlled to take into account solution viscosity and hence avoid damage to the solution's molecules through shearing. In addition, unlike mechanical syringes with pistons, injection doesn't require the use of silicon or rubber.
- | **Integrated sensors** detect and analyse body tissue (thickness, depth, consistency...) in order to accurately differentiate between muscles, nerves, derm, veins etc.
- | **A retractable needle**, either standard or custom-made, penetrates to the correct depth only when in contact with skin. Following injection, the needle retracts itself and is neutralised by means of a mechanical and electronic safety mechanism.
- | **A cartridge** containing one or several standard vials allows for easy and cheap adaptation to existing filling lines in the pharmaceutical industry. The cartridge is adapted for both mono and multi dose products.

## LARGE INTERNATIONAL COMPANIES AND TRADITIONAL SOLUTIONS DOMINATE THE MARKET

The direct competitors of Eveon's DMI are device developers such as the engineering and R&D services of large international groups like Becton Dickinson and Novo Nordisk as well as design and development companies like Ypsomed and Crossject. Suppliers are needle, sensor and micro-pump manufacturers.

The market for injection devices is mainly covered by traditional plastic syringes (85%) which are sold for a few euro cents each. In 2002 more sophisticated injection devices made up a mere 15% of the market but this proportion is growing yearly. Global growth of the injection market was +3.4% per year over the period 2002-2008 leading to a market volume of 100 billion dollars in 2008. Growth in the traditional syringe segment is pulled by that of pre-filled syringes.

## MORE SOPHISTICATED DEVICES ANTICIPATE MARKET AND REGULATORY CHANGES

New more sophisticated injection devices aim to build on this by providing innovative solutions to facilitate treatment at home, through:

- | Increase in comfort of use: less pain, ease of use (autoinjection)
- | Proposing new technologies: safe needle free systems, new means of administering medication (ID)
- | Adapting to new products: development of products that require fewer injections, freeze dried products

In the injection device market, the development of more sophisticated solutions is therefore stressed to anticipate and adapt to new regulations and to respond to the needs of medical staff who request safer systems and self-injection solutions.

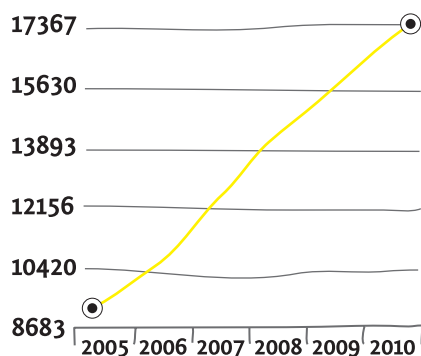
## CHOOSING A MARKET SEGMENT

In the health sector, Eveon identified six potential applications for its injection device: bio-medication, vaccines, insulin, heparin, cosmetology/dermatology, first aid for the army.

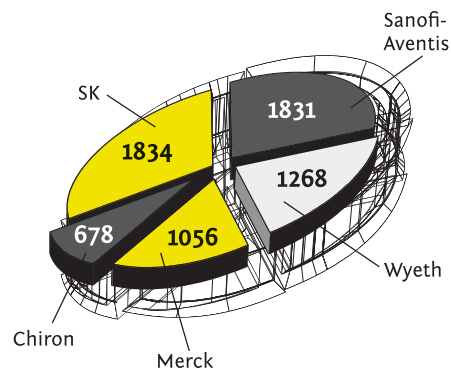
Out of these six potential segments, Eveon decided to focus on 2 priority segments the vaccine segment (1) and that of biologics (2).

The vaccine market (1), currently estimated at 6 billion euros, should go over 20 billion euros in 2012. Of all pharmaceutical products, these are the most dynamic: their sales increase by 14% per annum, twice more than that of traditional products (July, 2006). This market is highly receptive to innovation and the actors in the market are very interested in new medical injection solutions for their new generation of high added value vaccines (therapeutic vaccines and prophylactics for new pathologies).

**The rapid rise in the vaccine market**  
(in millions of dollars)



**The main market actors**  
(in 2003, in millions of dollars)



SOURCE: JOLY J. (2006) SOURCE: JOLY J. (2006)

The market for biologics (2) is the second segment retained initially by Eveon. Biologics, are made through techniques that use living resources called biotechnologies as opposed to being produced by organic chemistry, are administered for the major part by injection and are very expensive (200€/ml for Copaxone by Sanofi Aventis – multiple sclerosis - 1500€/0.5ml for Somatuline by Ipsen Beaufour – endocrinology). Biologics are used for treatments in a number of areas such as: oncology, inflammatory and auto-immune diseases (rheumatoid polyarthritis, and multiple sclerosis), infectious diseases (AIDS, hepatitis...), diabetes and cardio-vascular diseases. The biotechnology market is very dynamic with a growth rate estimated at an average of 7.7% per annum. The actors in the market are large pharmaceutical and biotechnology laboratories such as Genentech, Amgen and Merck Serono. In this high volume, high profit market with its high growth, Eveon's system provides considerable economic benefits. It would result in savings of up to 75% of the wasted volume of costly active products and would allow for shorter hospital stays as more patients could be treated at home.

The advanced technology of the Eveon solution is more adapted to the requirements of high added value treatments, as the price of the device is much less of an issue when compared to the very high prices of the injected solutions. The biologic market is therefore Eveon's priority target. A volume strategy based on domination by cost for market segments like heparin or insulin wouldn't fit Eveon's chosen position for its injection device (DMI).

## FORMULATION OF A VALUE PROPOSITION

The extended value chain of the biomedical industry is very complex and the value created by Eveon's offer is different as perceived by clients, prescribers and users. The client is represented here by pharmaceutical laboratories that choose to condition their medication using Eveon systems. The prescriber is a doctor who is ready to prescribe medication conditioned using the Eveon system. The user is either a patient, or nurse, who uses the Eveon system for herself or himself, or at work.

**Table 1: The Eveon system's value proposition**

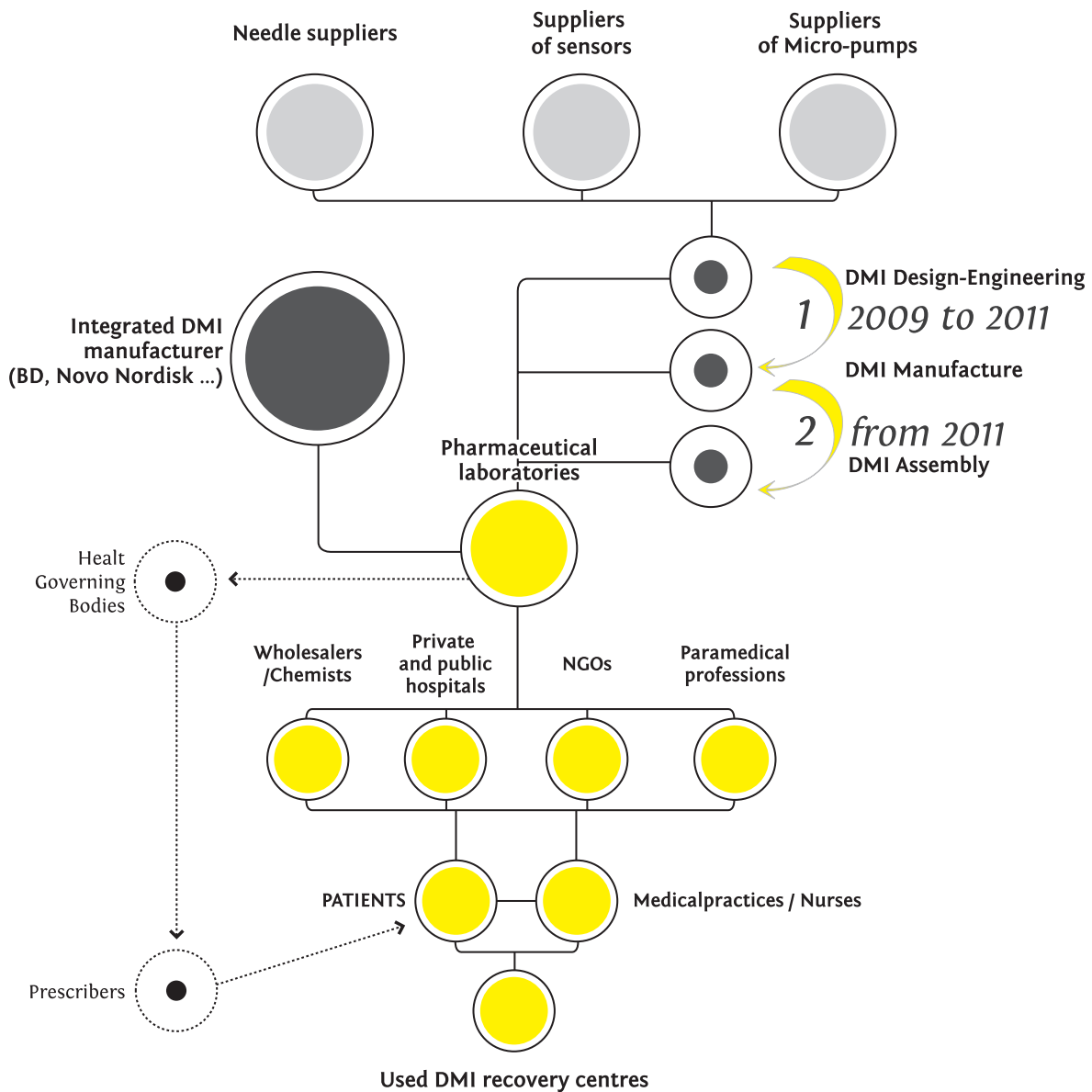
Value of the Eveon for	CLIENT Pharmaceutical laboratory	PRESCRIBTOR Doctor	USER Patient and/or nurse
Safe needle	Competitive advantage: lower risks of accidents, positive effect on reputation / image	Suppression of the risk of accidental injection of the patient	Reduced anxiety (fear of needles) Suppression of the risk of accidental injections
Ease of use: injection in 3 steps	Ease of product spreading for patients	Implementation of self-treatment by the patient Little training required and limited implication of qualified personnel	Facilitates use: enables auto-injection at home
Automatic tissue recognition	Differentiation through technology	Guaranty that the injection be done in the right place ex. avoiding veins	Facilitates use Auto-injection at home
Minimal waste volume	Savings through less product waste	Of little interest	Of little interest
Precision of volume injected	Competitive advantage : optimisation of medication efficiency at a lower cost	Guaranty that the DMI treatment corresponds to requirements	Overdose impossible Limited secondary effects

SOURCE: ROUX-JALLET (2009)

## FINDING A POSITION IN THE VALUE NETWORK AND VALUE CAPTURE

Eveon, having selected a target segment and having formulated a value proposition now had to define what value the company would be able to capture from the network of medical device manufacturers. To do this, Eveon's value network was modelled. The network covers all the actors involved in both development and production as well as in taking the product to market. It includes a number of actors from the extended value chain which covers suppliers through to distribution, and includes competitors and "transformers" (suppliers of complementary products or services). In addition to these actors other stakeholders are included such as prescribers and other market influencers like health governing bodies (Cf. diagram).

Figure 2: Value network of manufacturers of medical devices

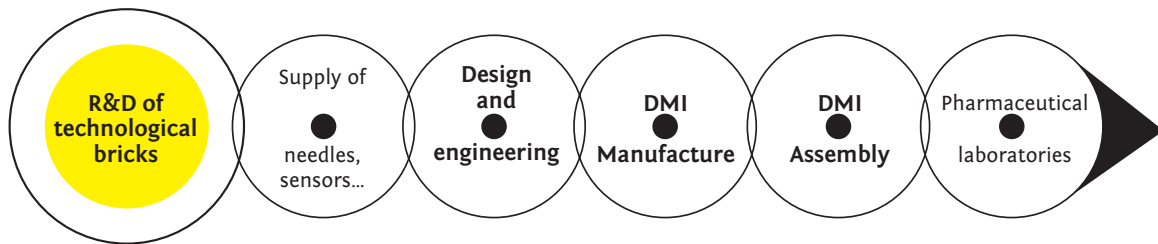


SOURCE: ROUX-JALLET (2009)

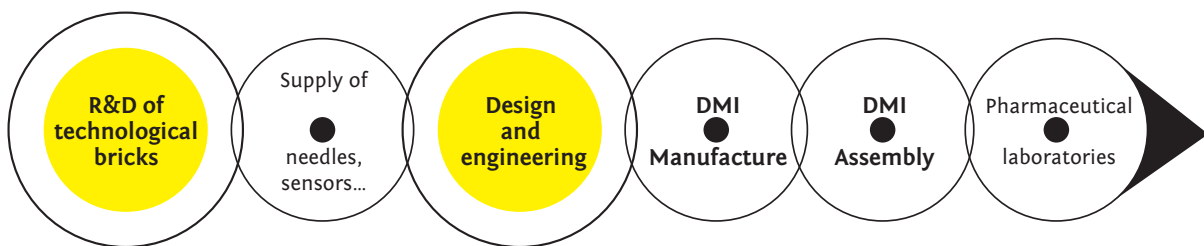
From the above medical device manufacturer value network, Eveon can identify a number of potential positions:

- | *R&D Company*: Eveon would sell its know-how (6 patents) in the form of industrial licences. A large part of the value created by Eveon would be captured by the buyers of the technology who would then be able to develop its potential. Eveon would become an R&D company whose survival depends on its capacity to innovate and sell its patents.

## Integration of Eveon into the extended value network as an R&D Company

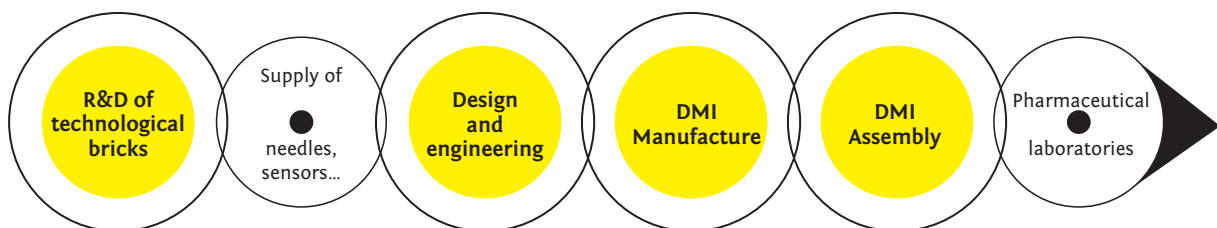


| *Engineering company*: here Eveon would develop “customized” DMI solutions for pharmaceutical laboratories. The value captured by Eveon would be low in comparison to the value captured by the clients i.e. the pharmaceutical laboratories, and DMI manufacturers. However, this position would allow Eveon to avoid heavy investment in industrial infrastructure though on the downside over time it would also result in the risk of know-how transfer to the manufacturers of DMIs.



## Integration of Eveon into the extended value network as an Engineering Company

| *Integrated company (design, assembly, distribution)*: here Eveon would sell assembled “customized” DMIs to their clients. To do this Eveon would have to control each step of the product value chain. The position of integrated company would enable Eveon to capture practically all the value generated by its innovation. It would also, however, require considerable additional financial resources and assets.

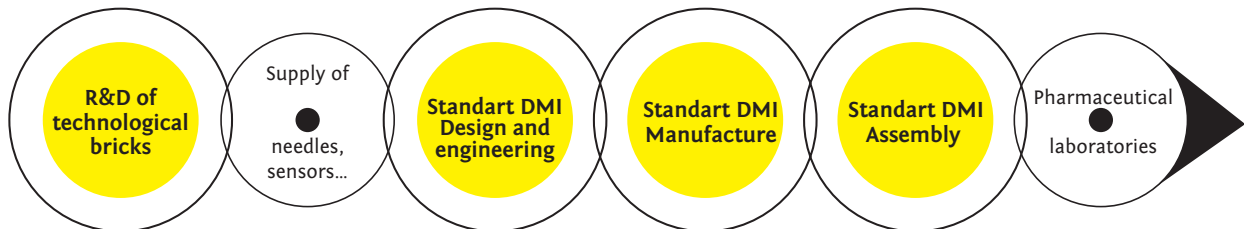


## Integration of Eveon into the extended value network as an Integrated Company

| *Standard DMI manufacturer*: here Eveon would manufacture a range of standard DMIs suited to all medication which would then be distributed through chemists. The large scale distribution of the product would depend on the acceptance of the product by both prescribers and patients and would increase the value created

and captured by Eveon. The start-up would not only have to control all stages of the value chain, but also have to compete in a highly competitive volume market where competitive advantage is price based. This position would require a high initial investment.

### Integration of Eveon into the extended value network as a Standard DMI Production Company



Based on the potential value capture in each of the four potential strategic positions and with their associated constraints, Eveon chose to become an integrated company from 2011 with an initial transition phase between 2009 and 2011. Over the transition period Eveon decided to concentrate on engineering and on the co-development of customized DMI solutions.

### HOW EVEON'S STRATEGIC CHOICE WAS MADE

The following two paragraphs analyse Eveon's strategic choices. The analysis highlights the reasons for their choice of position in the value network through a strategic trial and error approach and using Teece's model (1986).

#### Value chain positioning by strategic trial and error

Using a case study based on a start-up in the area of numerical cinema, Bathelemy and Paris (2006) highlight the difficulties involved in developing a business model for a start-up. To do this the authors use the notion of strategic trial and error which considers how a "start-up tries to seize all the opportunities it can. This enables it both to test the economic model and to learn more about some of its dimensions". According to the authors, the invention of a business model can only be based on strategic trial and error. This is explained by the large number of unpredictable external factors inherent in the construction of a market such as the reaction of consumers and the launch of new offers by competitors.

#### Eveon's temporary business model and strategic trial and error

In addition to the strategic trial and error process, is added an opportunistic learning process: the company positions itself on a "temporary" model and waits for the market to structure itself, ready if necessary to adopt another higher potential one.

Eveon's choice of position on the value chain is partly a result of this process. Due to the high uncertainty around such factors as: the reaction of consumers towards their products, the readiness of their clients to accept the introduction of DMIs into their markets, or even the need to make money, Eveon chose a transitory position, that of engineering and co-development of customized DMIs, before going on to become an integrated company. This "temporary" position in the value network must enable Eveon to implement its strategy of alliances with its clients and suppliers and to progressively internalise key competencies that the company will need to become an integrated company. To manage this transition Eveon will have to be flexible in order to adapt to clients' needs, to respect constraints related to profitability and to be able to seize all opportunities that may come up. It's in this sense that the strategic positioning of Eveon in the value network can be qualified as being a result of both strategic trial and error and opportunistic learning.



## Capturing the value created by innovation; the use of Teece's model

One of Teece's major articles (1986) shows the relationship between value creation and capture. To do this, he develops a framework in order to understand why, and under what conditions, innovative value creating companies fail to capture the value of their innovations whilst their clients, imitators or other actors in their industry benefit. He highlights the role of possession of complementary assets, appropriation levels and considers the maturity of the industry concerned. He identifies two key factors which help explain value capture resulting from innovation:

- The appropriation level: this corresponds to the ease with which a given technology can be imitated. For Teece (1986), a company with a low appropriation level implies that its technology can easily be imitated, the value capture created through innovation is therefore uncertain. On the other hand a company with a high appropriation level makes technology that's difficult to imitate, the resulting capture of innovation created value is therefore ensured. According to Teece (1986), the appropriation level is stable and depends on exogenous elements notably the nature of the technology itself and the type and level of Intellectual Property Rights protection adopted.
- Complementary assets and the reliance of the innovation on the assets. Distribution channels, marketing competencies, image or production capacity can be considered to be complementary assets. To innovate, the company can't just count on itself but has to be able to access resources it doesn't own, but which it needs. Access to these resources (including all the competencies that the company needs to exploit a technology), is a key element for a start-up in ensuring its ability to make its technological innovation available to the market.

These two factors of Teece's model determine who will be able to capture the value created through innovation (Cf. Figure 3).

**Figure 3: Who captures the value created through innovation?**

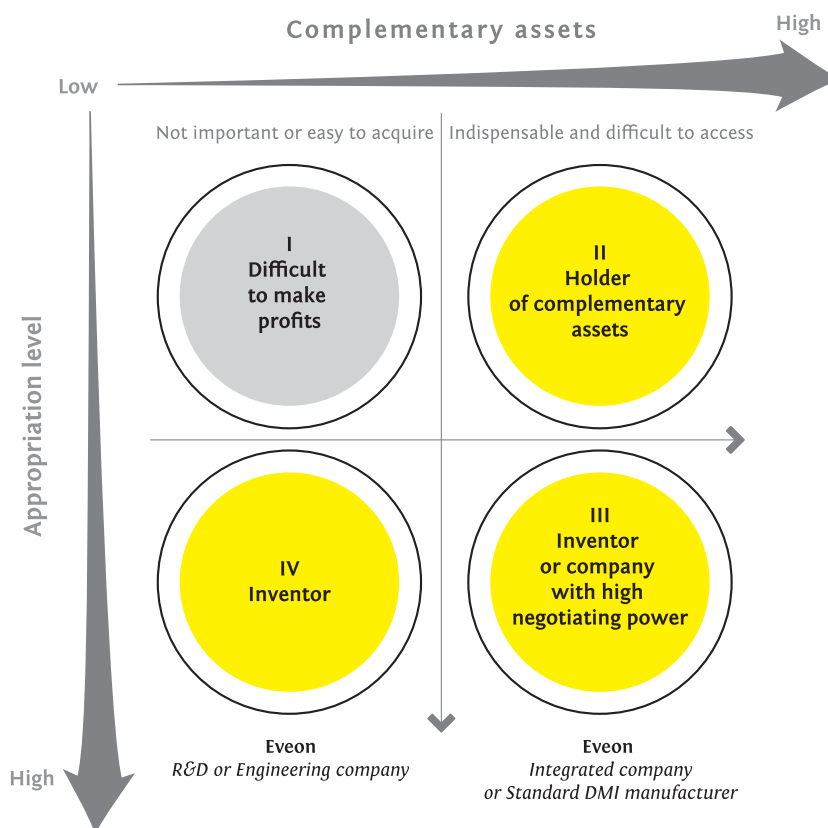


DIAGRAM ADAPTED FROM AFUAH (2003)

- | When both the appropriation level is low and the need for complementary assets is low, the technology can easily be imitated and the innovator will find it difficult to make profits (Diag. box I). On the other hand, if the need for complementary assets is high and they are difficult to access, then whoever controls the assets will capture the value resulting from the innovation (Diag. box II).
- | In the case where the appropriation level is high and complementary asset requirements for the innovation are low, or easily accessible, then the innovator captures the created value (Diag. box IV). However, where complementary asset requirements are high and access to them difficult the value will be captured either by the company with the strongest negotiating power, or by the innovator (Diag. box III).
- | On this basis, Teece defined strategic and organizational decision making models for companies. He notably formalised a decision making process with the aim of choosing between development of innovation internally (Diag. box I) and the setting up of cooperation (Diag. boxes II and III).

### Eveon; a high appropriation level, but what position...?

In Eveon' case, the appropriation level is high being based both on the six international patents which cover all the technological aspects of the innovation and on the high level of expertise involved. However, the need for complementary assets varies considerably depending on the position chosen in the value network.

The need for complementary assets is low if Eveon decides to position itself as an R&D or an engineering company but high if Eveon adopts the position of an integrated company or manufacturer of standard DMIs. In the latter two cases, complementary assets such as distribution channels or production capacity will be required and Eveon will be dependent on its clients, the large international pharmaceutical laboratories i.e. if no medication is conditioned in DMIs, the DMIs won't be sold. On the other hand, the laboratories wouldn't be able to make their medication as largely available without using the Eveon DMI, the latter being the only device capable of injecting either extremely small doses or enabling self-injection for intra-muscular injections, nor would they be able to benefit from the cost reductions due to less loss of expensive solution using the DMIs.

Eveon will be dependent on industrial partners for its production capacity, partners such as MEMS manufacturers, manufacturers of sensors, integrators etc. To build its position as an integrated company, or manufacturer of standard DMIs, Eveon will therefore need to ensure it has access to these complementary assets. To do this Eveon will have to set up partnering strategies with its clients, the pharmaceutical laboratories, who control the distribution channels. The innovation value captured by Eveon will therefore depend largely on the contractual conditions that the company will be able to negotiate.

### CONCLUSION – WILL DAVID BEAT GOLIATH IN THE END?

Like David facing Goliath, Eveon succeeded in adopting a strategic position which avoids having to confront its large international competitors head on, a confrontation that Eveon would be sure to lose. The strategic position of Eveon is firstly based on the targeted segment to access the market: the segment, which is much more demanding as far as technology is concerned, but also less sensitive to price and currently relatively undeveloped. It's also based on the choice of position in the value network. Though it would have been easier to choose the position of an R&D or engineering company (as both activities require relatively low investments in industrial infrastructure) Eveon chose the position of an integrated company. Becoming an integrated company will enable Eveon to capture almost all the value generated by its innovation. However, this position requires that Eveon access a number of unavoidable complementary assets such as the distribution channels, which are currently controlled by their main clients: the giant pharmaceutical laboratories. The share of value captured by Eveon will therefore depend on its capacity to negotiate with these large multinational groups. Will David manage to beat Goliath in the end?