

Research and development (randd)



**ASSIGN
BUSTER**

Critically evaluate the role of innovation and R&D (research and development) investments in creating competitive advantage. Ensure that you make use of an appropriate theoretical framework and suitable examples in support of your answer.

R&D and innovation plays crucially important role to today's firms. John Cogliandro (2007) describes innovation as the key to business success. Due to the competing in global economy such as trade liberalization and fast changing in consumer taste, firms continually expand their budget for R&D and innovation in order to gain competitive advantage (1). In the next few paragraphs, I will indicate the basic definition of R&D, innovation and competitive advantage as well as the way to achieve competitive advantage. Then by combining innovation, R&D and competitive advantage, I will show the role of R&D and innovation in creating competitive advantage. At last, I will show the risk of innovation and R&D.

“ The speed of R&D refers to the company's rate of innovation.” (Spulber, D. 2003) R&D, as the necessary first step of innovation, (Love. J. 1997) plays an increasingly important role in specialization of scientific knowledge, increasing scale of types of industry and innovative process. Innovation can be defined as the successful exploitation of new idea (DTI. 2003). Tidd et al(2005) classified innovation into 4 types: product innovation means changing in the product/service which the firm produces. Process innovation means altering the way where products/services are produced or delivered. Position innovation can be known as changing the context where they are introduced and paradigm innovation means changing in current mental model. To gain competitive advantage means firm achieves higher rate of economic profit than the average level of economic profit earned by

competitors (Besanko et al. 2007). Michael Porter (1985) suggested that there are two main ways to create competitive advantage: Cost advantage and differentiation. By achieving either of them as well as define the competitive scope, firm can know exploit its competitive advantage by using Porter's generic strategies (see 2)

After explaining competitive advantage and innovation respectively, I will put them together to show the role of innovation and R&D in creating competitive advantage. Through process innovation, firm can achieve cost advantage and through product innovation, differentiation can be gained (Spulber, D. 2003).

R&D itself can be a source of competitive advantage since through efficient R&D. Firm can obtain growth by achieving economic of speed, decreasing in innovation cost, increasing in scientific knowledge and productivity (Spulber, D. 2003). As I mentioned before, the speed of R&D can be seen as the rate of innovation. When firm facing an innovative competition, it can gain significant competitive advantages by staying slightly ahead of rivals.

One of the roles of R&D and innovation is to help firm achieve cost advantage via process innovation. A firm gain cost advantage means it offers its products that have lower cost than its competitors. This is critical to gain competitive advantage because by achieving cost leadership, firm with a lower cost may not fear a price war and it is also available for cost leader to set a lower price than its rivals in order to gain market share. (Besanko et al, 2007) Through R&D and process innovation, firm can achieve better cost efficiency and reduce its cost in production by adopting new machines, new

methods or new software. Besides, firm can also reduce its cost through process innovation by exploiting supply chain and new channel for sale. In these two ways, firm can gain competitive advantage through R&D and process innovation.

As another source of competitive advantage, differentiation can be achieved by product uniqueness and increasing buyer benefit (Porter, M 1985).

Through investment in product innovation and R&D, firm achieves product uniqueness by adopting new design, new raw material. As a result, firm can offer differentiated product to market to meet the rapid change in consumer preference. However uniqueness is not enough because competitors may imitate the successful product. Firm should also increase buyer's benefit.

Through R&D and product innovation, firm can increase the quality and add new features to the products, which can be seen as a way to increase buyer's benefit. As firm gained differentiation via product innovation, Porter's generic strategies suggest firm can exploit competitive advantage either by charging price premium of its products due to the extra benefit it brings to buyers or selling its products at average price level but offering a higher quality to gain market share (Besanko et al. 2007).

As firm has to offer its product in a narrow scope, they may take either cost focus strategy or differentiation focus strategy to exploit competitive advantage. In this situation, firm may also need to do position innovation and paradigm innovation as well as product innovation and process innovation to recon its value chain and resegment the market. Through these innovations, firm may achieve lower cost or capability of charging a price premium relative to its broad scope competitors (Besanko et al, 2007).

I select Dell as the model to explain the role of innovation and R&D in creating competitive advantage. Dell is third largest computer maker in the world just behind HP and Acer. Dell achieved its peak by developed direct-to-consumer sales model in year 1990. In 1996, Dell started to sell its computer through internet. In 1998, by adopting JIT system, Dell achieved zero inventories. In year 2002, Dell introduced the computer-related products such as software, server, storage. These related- product brings Dell huge profit. Recently, Dell is developing green computer which focus on energy saving and being as “ earth friend” (Dell, 2009)

According to Dell income statement, we find the gross profit margin of year 2008 is about 19. 1%, compared with its main competitor Lenovo which has a gross profit margin 14. 9%, Dell has a 4% advantage in cost of sales. This cost advantage stems from Dell successful R&D and process innovation. By innovating direct-to-consumer sales model and online sale as the new channel to sale, compared with the traditional sales model, Dell eliminates the channel- related cost. Through successful innovation on supply chain—reducing the number of suppliers and establishing a suppliers’ public warehouse and introducing a new method of production—JIT system, Dell also gains cost advantage. In this regard, R&D on ERP system becomes the core factor. Dell shares the order and component information with its supplier via ERP system, then base on the demand data got from ERP, suppliers from worldwide ship the component to the public warehouse. Then the Bax Global logistic company transports the components from warehouse to Dell plant every one and half hour. In these R&D and process innovations, Dell achieves lower component cost by reducing the number of suppliers as

well as lower inventory cost. As evidence, due to the balance sheet and income statement, Dell has a stockholding period of 5 days while Lenovo uses 13 days.

After evaluating the role R&D and process innovation in creating cost advantage, I am going to analyze the role of R&D and product innovation in creating differentiation advantage. Consumer driven-innovation is always the Dell's basic approach (Dell innovation approach, 2009). According to product innovation, Dell differentiates its product and increases buyer's benefit. Through adopting JIT and online sales, it is available for buyers to choose the hardware and colors via website. Then Dell produces the computers due to consumers' specific requirements. In doing so, Dell tailors its product to meet consumer's preference and therefore differentiates its product from competitors. Based on recent R&D, Dell offered green computer to market, which focus on provide consumers energy- saving computer. Green computer can save up to 70% of energy and in three years time, it has already helped consumers to save more than 2. 2 billion dollars. (Dell. M. 2008) Moreover, through innovating in exploiting supply chain, Dell gets high quality component and therefore offers higher quality products to buyers. Things above show the role of R&D and product innovation in creating differentiation advantage.

Through the analysis above, we can find R&D, process innovation and product innovation contributes to Dell's competitive advantage simultaneously. By reading annual report, Dell also gains advantage from: R&D on computer- related products which brought huge profits to Dell (see

3), a strong brand image and economic of scale by selling its product across the world (see 4).

Although R&D and innovation plays a crucial role in creating competitive advantage, it has risk. Uncertainty is the main problem since R&D and innovation never go according to the plan (Pinchot. G et al, 1999). Therefore, R&D and innovation becomes a bet. To achieve competitive advantage, firm should continually adopt new technologies or products to replace old ones. This process may lead to huge sunk cost and can be extremely costly. Moreover failure to win the bet may lead to lose existing competitive advantage for some established firms.

To sum up, R&D and innovation plays an important role in creating competitive advantage. To gain and sustain competitive advantage, firm must continually do R&D and innovation faster than rivals. However, R&D and innovation also has risk. Manager need to consider the risk and the benefit of R&D and innovation before decision making.

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