Innovation and strategy of the firm

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## Contents

- Introduction & background
- Offensive strategy
- Defensive strategy
- Imitative strategy
- Dependent strategy
- Traditional & Opportunistic strategy
- Conclusion
Intro. & Background

• This article focuses on innovation / technology strategies

• Why?
  – Limited relevance of neoclassical short-run theory
Intro. & Background

• To look into how innovation and technologies affect firms
• In theoretical analysis, there are several types of strategies for the firms to use
  – Mainly for the purpose of conceptualization
Intro. & Background

• There is no one fixed strategy that can be applied in any real-life situations
  – Non-standardised behaviors of individuals
  – Ever changing strategies and personnel
  – Ever changing environment
Intro. & Background

• Only by adapting to rapid changing world technology, will a company survive

• No matter how firms use variety of different combinations of resources, scientific and technical skills; success of the innovation efforts is not certain (thus very high risk)
Intro. & Background

• However firms should still continue to innovate in terms of products and processes to prevent competitors from superseding them.
Intro. & Background

- List of strategies mentioned:
  - Offensive
  - Defensive
  - Imitative
  - Dependent
  - Traditional & Opportunist
Offensive Strategy

• **What is it?**
  – This strategy is designed to achieve technical and market leadership by being ahead of competitors in the introduction of new product/process

• **This strategy requires**
  – Strong R&D department
  – Special relationship with the world science & technology system
Offensive Strategy

Strong R&D department
- Compile information from various (incl. unrelated) sources
- Process & develop knowledge not available outside firm
- Consider the feasibility of normal production
- Firm with R&D must be prepared to take long term speculation and high risks while aiming to monopolize
Offensive Strategy

Special relationship with the world science & technology system

Types of access
– Indirect
– Passive availability
– Direct participation
– Gatekeeper
Offensive Strategy

Indirect - The firm does not do fundamental research as they feel that it can be access elsewhere

Pros:
- cost saving (fundamental research are expensive, time consuming and risky)
Offensive Strategy

Indirect

Cons:

- fundamental research investment is defined as “ticket of admission” to scientific and knowledge building networks (lack of theoretical knowledge at the frontier)
Offensive Strategy

Direct participation

• direct access to original research result was extremely important, although the mode of access varied considerably
  – Significant proportion of their new products and processes introduced between 1975 & 1985 could not have been developed without the result of fundamental university research in the fifteen years prior to the innovation
Offensive Strategy

- Price & Bass conclusion:
  - Although the discovery of new knowledge is not the typical starting point for the innovative process, very frequently interaction with new knowledge or with persons actively engaged in scientific research is essential.
  - Innovation typically depends on information for which the requirement cannot be anticipated in definitive terms and therefore cannot be programmed in advance; instead key information is often provided through unrelated research. The process is facilitated by a great deal of freedom and flexibility in communication across organizational, geographical and disciplinary.
  - The function of basic research in the innovation process can often be describe as meaningful dialogue between the scientific and technological communities. The entrepreneurs for the innovative process usually belong to the latter sector, while the person intimately familiar with the necessary scientific understanding are often part of the former.
Offensive Strategy

Direct participation

• Performance of fundamental research, while not essential to an offensive innovation strategy, is often a valuable means of access to new and old knowledge generated outside the firm, as well as a source of new ideas within the firm.
Offensive Strategy

• Requirement for offensive strategy
  – Very strong problem-solving capacity
  – Very high in cost thus firms need to be able to provide continuous funding for more than a decade
  – Need to hire the right people “Critical Mass” (e.g. good scientist, technologists, technicians as well as for production and marketing)
Offensive Strategy

• Firm not only need to be good in R&D, it will also need to be able to educate both it’s customers and its own personnel (additional cost to the company)
Defensive Strategy

DOES NOT MEAN THERE’S NO R & D
Defensive Strategy

• What is it?
  – It may be just as research intensive as an “offensive policy” but the defensive innovators just do not wish to be 1st in the world or left behind

• Why?
  – Heavy risks
  – Lack of capacity
  – Strong in Production Engineering & Marketing
  – Might be involuntary
Defensive Strategy

• Oligopoly Markets
  – Defensive R & D is typical
  – A form of insurance allowing the firm to react and adapt to the technical changes introduced to competitors
Defensive Strategy

• Defensive R & D
  – Concerned with minor improvements
  – Closely linked to product differentiation
  – May not have 1\textsuperscript{st} mover advantage but may develop into niche market
  – Experimental development & design are equally important, as for offensive strategy
Defensive Strategy

• This strategy requires
  – Capability of moving rapidly once they decide that the time is ripe
  – Models at least as good as the early innovators
  – Technical advances to differentiate their products, but at a lower cost
  – Devotion of resources to education & training of customers & staff
  – Emphasis on technical assistance & advice
Defensive Strategy

• A defensive innovator
  – Knowledge intensive firm
  – High proportion of scientific & technical personnel
  – Wait to see the development of the market & mistakes of the pioneers
  – Dare not wait too long
  – Either miss the boat or slip into a position of complete dependence
Defensive Strategy

• Commonly practiced in firms in the smaller industrialized countries
• Influenced by national environment and government policy
Imitative Strategy

Definition:

• Imitative firm content to follow leaders in established technologies & generally rely on pioneering works of others

• It is contented to follow some way behind the leaders

• Sometime the extent of lag will be very long and it depend on particular circumstances of the industry
Imitative Strategy

Characteristic

• Save money from buying licence unless the lag is short
• Save money from R&D and most probably training costs
Imitative Strategy

• Why imitating?
  – Captive market may be within the firm itself of its satellites
  – Geographical area where the firm enjoys special advantages (varying from politically privileged position to tariff protection)
  – Advantages in lower labour costs, plant investment cost, energy supplies or material costs
  – Advantages in managerial efficiency and in much lower overhead costs (fact that they do not need to spend heavily on R&D, patents, training and technical services etc)
Imitative Strategy

• Challenges
  – Need to rely on lower unit costs of production (therefore need to strive to be more efficient in the basic production process)
  – Have to be well informed about changes in production techniques
  – Selection of product to imitate and of firms from which to acquire know-how
Imitative Strategy

• Latecomers Theory
  – Heavy investment cost are being shared by financial institutions
  – Able to enjoy the advantages of the existence of an established world market and the availability of skills and technologies
Dependent Strategy

Definition:

• Dependent strategy involves acceptance of a satellite or subordinate role in relation to other stronger firms

• The firm does not attempt to initiate or even imitate technical changes in its product
Dependent Strategy

Characteristic

- Usually rely on its customers to supply technical specification for new product, and technical advice in introducing it
- Supplying components or doing sub-contract works
- Typically, lost all initiative in product design and has no R&D facilities
Dependent Strategy

Firms may change its strategy when:

– It seeks to upgrade its technology and sometimes its major customer may help to do so

– Subcontract firm move to become an innovating firm by upgrading of the specialized knowledge in a narrow field

– they will try to lessen their dependence by enlarging their customer network
Dependent Strategy

- Challenges
  - Face treat of being taken over
  - Have to suit the larger firm to maintain the client relationship
  - Weak in bargaining position
  - Often being ‘squeezed’ pretty hard by their customers
Traditional Strategy

Definition:

- Lack of technical capacity to initiate product changes of a far reaching character
- Ability to cope with design changes (Aesthetic design fine tuning)
Characteristics

• Firms see no reason to change its product because;
  – Market does not demand a change
  – Competition does not compel it to do so

• Technology often based on craft skills

• Scientific inputs are minimal or non-existent
Traditional Strategy

Traditional firms

• Demand for products may be strong because of their traditional craft skills
• May have good survival power even in highly industrialized economies
• Vulnerable to technical changes
• Incapable of initiating technical innovation
Opportunist Strategy

What is it?

• New opportunity is identified
• May not require any in-house R & D
• Enabling prosperity by finding an important niche
• Providing a product or service consumers need and nobody has thought to provide
Conclusion

• Satisfactory theory of firm must take account of;
  – Variety of behaviour in different industries
  – Variety of behaviour over different historical periods
Conclusion

Christensen (1995)

• Conceptual distinction between 4 generic categories of assets for innovation
  – Scientific Research Assets
  – Process Innovative Assets
  – Product Innovative Application Assets
  – Aesthetic Design Assets

• Indicates avenues of research for both economists and sociologists and organization theorists
Conclusion

• No longer satisfactory to explain behaviour in terms of response to price signals
• Firm’s adaptive responses to changes in technology can’t be reduced to predictable reactions to price changes
• Economists must pay more attention to engineers, sociology, psychology and political science