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Technologic Innovation Process Improvement

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Abstract

Before decade 80 the presented models for innovation process were assumed that were based on simple linear process. Then after more researches nonlinear processes were evaluated and variety of researchers tried to recognize innovation process. In this paper the process of technologic innovation and different models in this area are compared.
keywords: Technologic innovation; Improvement; Process

1. Introduction

The process of technologic innovation, is the process of changing the new idea to the commodity(product, service) or a new developed process. As Freeman (1982) said " Innovation is a set of technical, industrial and commercial operations"[1, 5, 6]. Therefore describing it as the simple linear models is difficult. But until 80th century presented models for innovation process was assumed that were based on simple linear process, which began with basic researches and resulted in creating the idea and finally producing commodity or new process [4, 7, 8]. By widely researches and precise investigations on innovation process behaviours in different situations contortion were observed which could not be described as simple linear process. So non-linear processes were evaluated and various researchers attempted to identify innovation processes (Shum Peter 1934, Eskmo Keller 1966, Freeman 1974, Nelson 1982, Rubich 1987…..)[1, 10, 11] will be mentioned below (Dodgson 1997)[2, 8, 9]. Finally the valid and important model of series of Klein Rosenberg value was presented as evolutionary model.

2. Science Pressure Model

During years 1950-1960 the process of innovation described according to the linear model [3, 12]. It was assumed in this simple model that innovation begins with new scientific research and in the next levels achieves to the product development, producing and marketing, and at last commodity, service, or new process will successfully be sell. Figure below shows the linear innovation process.

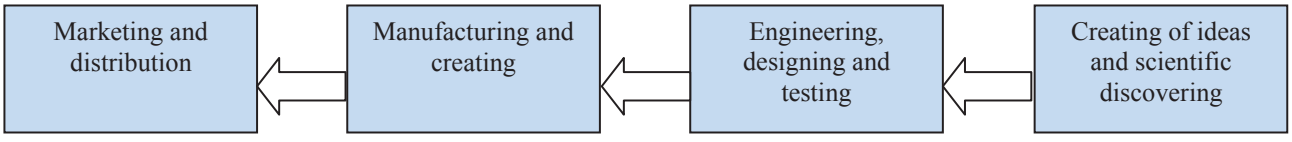

Figure 1 Science pressure model for innovation process.

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Based on this model creating forerunner market needs to develop scientific researches, and markets requirements are describe upon researches and developments activities and it is not independent. Namely the key of success of innovation according to this model is massive investment in research and development [13, 14].
After world war II this model was supported specially in army when the atomic bomb was discovered and produced based on physical researches, until in early 1980 most of the politicians of Europe coordination organizations accepted this viewpoint that producing a commodity, service or a new process was the result of discovers and basic scientific researchers, and by using of the ability of commercializing the employees, became producible and saleable. In this model there is no appropriate feedback between the phases, so the only response is simple industry like petrochemical.

3. Extension of Markets Model

From early 1960, the 2nd innovation linear model was formed based on economic viewpoints. In this model innovations were the result of demands and needs of markets, and demands directly effected on making the new needs of technology development. Most of the models herein most of the innovations are the outcomes of units which are directly in connection with customers, as they know their requirements and find the better positions for investing. Market determines here which research and development projects should be invested and the focus is on customers needs.

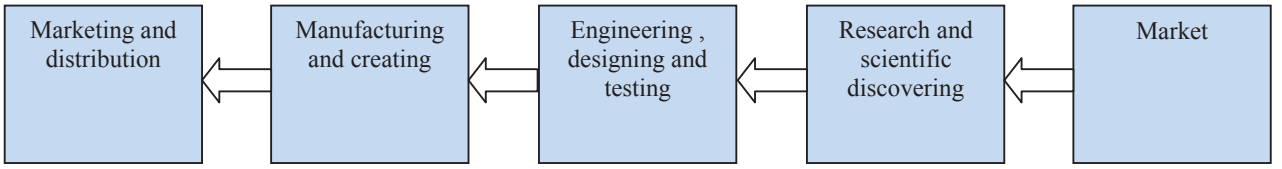

Figure 2 Extension of Markets Model for innovation process.

4. Syndetic Model

By studying the 2 linear simple models above, most of the researchers conclude that innovations process can not be clearly described in linear model. But sometimes scientific investigations result in new products and also sometimes markets requirements make researches to innovate. Indeed the goal of 3rd model is to illustrate sequence of operations in innovations and the feedback between research, development and market units. It means that sometimes and in some industries, market requirements impacts research and development division to perform new scientific research and sometimes innovation has been consequence of independent research and development activities.

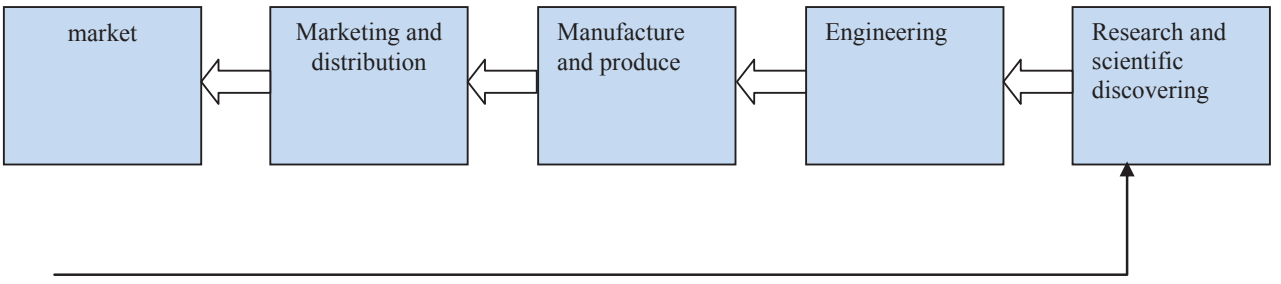

Figure 3 Syndetic Model for innovation process.

5. Uniform and Networked Model

However the 3rd model was not responsible to many of innovation in companies (or even National) level. Therefore models of 4th and 5th generations were continuously formed in short periods, and in new models interval feedbacks were given more attention. In 4th generation parallel developments beside horizontal uniforms were noted. And more attention is paid to the customers and their requirements, supplier resources were also part of companies' resources. Herein the focus is on research, developments, operation and production [15].

(producible modelling) the attempt in 5th generation was on uniforming development strategies between different interior and exterior organizations in a way that interested of a commodity or service have closed strategies. By applying of new organizational techniques like parallel development instead of sequential one toward the organization with process thought, can achieve this new viewpoint of innovation. For instance we can get closer to this model by applying expert system and simulating models in research and developments activities or using networks for making powerful connections between customers and suppliers. Focus of this model is on company flexibility against alternation and acceleration in development, and more focus on quality rather than final price.

6. Value Continuum Model

May be Kline – Rosenberg model is the best nonlinear one to describe different elements of innovation process. It sums up the process in five phase:

1- Recognition of potentials and market's requirements
2- Innovating or creating the analysis plan for producing new product.
3- Modelling in details, Testing models and Remodeling.
4- Produce.
5- Distributing and Marketing

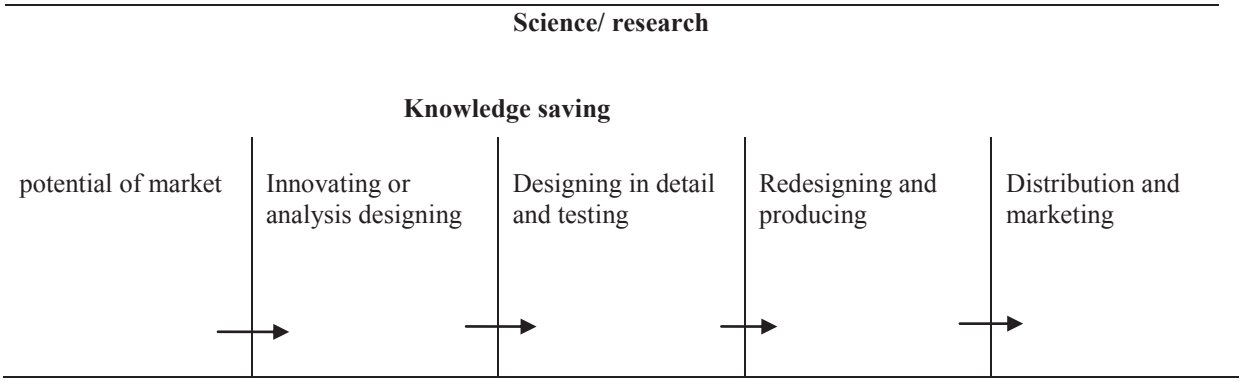

Figure 4 Kline – Rosenberg value continuum model

Therefore the most primary activities effects on the process of innovation according to this model are as follow:

1- Research and development
2- Outfit and industrial engineering
3- Operation of production and affairs before production.
4- Marketing for new production.
5- Gaining the non- physical and physical technologies.
6- Designing

7. Conclusion

Most of the researchers conclude that innovations process can not be clearly described in linear model. But sometimes scientific investigations result in new products and also sometimes markets requirements make researches to innovate. It means that sometimes and in some industries, market requirements impacts research and development division to perform new scientific research and sometimes innovation has been consequence of independent research and development activities.

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