Innovation by Patterns

a systematic internal brainstorming approach

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Abstract *– In a few pages this paper uncovers the principles of Innovation by Patterns and its field in the theory of innovation. This paper is intended to be a literature study and an overview of the relevant theories of Innovation by Patterns.*

1 INNOVATION BY PATTERNS

This section covers how patterns from successful innovations can be utilized to create new successful innovations.

Goldenberg, J. Et al. (2003) have found that it can be critical to base a company's innovation processes on customers input, as customers lack the imagination needed to help innovation in the company and customer driven innovation tends to be more of the incremental kind, thus spurring less radical new innovations. When the customers then are asked to think out of the box, to achieve radical innovations, they rarely create ideas that are easily obtained or implemented.

Goldenberg, J. Et al. (2003) claims that using the SIT method of Systematic Inventive Thinking will take free brainstorming into a highly disciplined "inside the box" approach for idea generation. The model of SIT begins with the task of listing the essential elements of a product, physical parts, software components and attributes. Secondly another list is created from the elements and attributes of the environment surrounding the product.
The two lists of elements and attributes are then taking through a process of manipulation by patterns, using from one to five different patterns.

Goldenberg, J. Et al. (2003) describes the five major patterns that can be utilized in the internal systematic brainstorming for new innovations:

- Subtraction.
- Multiplication.
- Division.
- Task Unification.
- Attribute Dependency Change.

Subtraction
Subtraction is innovation by removing one or more elements or attributes from the product or the environment surrounding it. Working on removing one element at a time and discuss how could this be a new product? If ideas comes up where the part is replaced try to force participants to stay with replacement items from within the product or its close environment, to avoid drifting away from the task at hand.

Multiplication
The multiplication pattern is applied by adding one or more copies of an element or attribute to the product. Typically the added element(s) is modified in some way compared to the original part. Goldenberg, J. Et al. (2003) presents the Gillette example:

"A classic example of this is the Gillette double-bladed razor. Simply adding an extra blade to provide one more shaving surface isn't an example of multiplication, as we define it. But adding an extra blade set at a slightly different angle, which raises whiskers so the other blade can cut them cleanly, does illustrate this pattern."

Working on multiplying one element at a time and discuss how the copied element could be modified to add more user value.

Division
Dividing you products by different lines to look for new possible products, e.g. Physical Division, Functional Division (Elements is divided by function) and preserving division (each part keep the characteristics of the whole product). Functional Division often leads to modularization of a product or service, e.g. HiFi 's move into dedicated units for LP turntable, CD, Tape, Amplifier and radio.

Task Unification
Innovation created by assigning new tasks to each element or attribute of the product or its environment, e.g. unifying two tasks in one component. An example could be to use the defrosting wires in the windshield of a car as a radio antenna and thereby improving design and cost of the car.

Attribute Dependency Change
This pattern is about spurring innovation by identifying dependencies between product elements/attributes and the environments elements/attributes, either by creating new dependencies or by dissolving existing ones. This is often utilized when a product goes from uni-sex to two different offerings separated by gender, one example is razors.

These patterns lead to a number of virtual products, no matter how strange they seem they must no be judged

out just yet. Often engineers would tend to sort out ideas that do not, at first glance, include any new value to the user or if the virtual product just seems to be useless.

The patterns of innovations work because they are capable of upsetting the minds of the developers and pushing them to get ride of their assumptions about the fixedness of a given product. Innovation by patterns usually gives a manageable amount of ideas and of these ideas every one have a built-in plausibility from the ideation workshop, (Goldenberg, J. Et al., 2003):

"… creative discoveries are more likely to emerge when people analyze a novel form and then imagine the function such a form might perform than when they try to come up with optimal forms to achieve a particular function."

Systematic Inventive Thinking is based on the research of Genrich S. Altshuller, a Russian engineer who analyzed and categorized more than 200,000 patents, to identify common templates and categories of innovation, which he called ARIZ, (a Russian acronym for Algorithm for Inventive Problem Solving). His students developed his ideas further to what became TRIZ (Theory for Inventive Problem Solving). The technique today is widely used by engineers throughout the world, (Goldenberg, J. Et al., 2003).

REFERENCES

[1] Goldenberg, J. Et al. (2003), "Finding Your Innovation Sweet Spot" Harvard Business Review, March 2003.