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Knowledge Management A Heuristic Application Approach in the Field of Marketing for New Product Development

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ABSTRACT

In general knowledge expansion plays a critical role in expansion of our thought processes and horizons, it is indeed an area of understanding of an understanding or definition of a definition or understanding of a misunderstanding or misunderstanding of an understanding. Knowledge management encompasses analytics, storage, and retrieval, application at the desired time or just for catapulting in to a new realm of a new dimension. Heuristics an area or multiple application method is to create a new dimension or just an application of multiple things, objects, subjects, situations, or environments to generate something new which never existed or thought of, would have existed in an individual form but not in combinations. This paper speaks about applications of multiple things for generation of a better solution for existing or forthcoming problems. The objective behind this approach is to enhance usage of knowledge for easier and faster solutions for a common man in creating as well as developing a new product. A new product can be a break through innovation or a catalytic or a radical innovation and can transform markets there by controlling nations with their dominating products. Hence heuristics as an approach for creating an environment for a new product development will help innovator, idea generators and marketers to apply it as a tool for instant creation of new products.

INTRODUCTION:

Knowledge management in the areas of new product development brings in few questions to answer in terms of expanding knowledge by applying odd knowledge with even knowledge or dissimilar to similar or vice versa.

Any two combinations of subjects which are independent could create a new source of understanding and there by a new dimension of knowledge which would lead to new products and new solutions to old, new and unexpected problems; therefore the questions are what are the factors that combine a situation and what are the dimensions that are currently used in a circumstance; in other words there are multiple dimensions for a product or a concept. Hence knowledge is required for creating a new product with various dimensions. New products and new markets can be enhanced by application of multiple thought processes at a time there by creating new economic drivers.

Indeed human mind is designed to think in multiple angles of space, time and resource. When we combine two things we generate a new object or a product. Hence new products could be the economic drivers of the future.

Let us take a simple example: salt plus chips will lead to salted chips and this new product brings in a new feeling while having salted chips and the

feeling is a new dimension outside the realm of just basic chips or for that matter cream plus biscuit cream biscuit, or pepper plus biscuit a spicy biscuit. Combination leads to Heuristics.

LITERATURE REVIEW:

New product development and major investments in R&D depend upon a correct understanding of technological changes and evolution (Sood and Tellis 2005):

A company that automatically jumps from knowing to doing (without going through the intermediate creative and experimental steps of "making" will find that innovation is unavailable to it, to be innovative, a company needs not only the head (knowing) and legs (doing), but the initiative hands of making (Neumeier 2009:53)

Innovation, and especially radical innovation, is the engine of economic growth and source of better products. Radical innovation changes the entire shape of industries and makes the difference between life and death of many firms (Schumpeter 1942)

In each industry some firms did not adopt a radical technology to the next and accordingly strategized their business operations to success (Srinivasan et.al 2002). Thus managers in general and new product managers in particular, need to know how to initiate and manage radical product innovation.

Objectives of the study: is to create a method through which new products can be developed by heuristics idea generation method with a faster synchronizing of knowledge for further enhancement .

The secondary objective is to help individuals, firms as well as small and medium organizations to bring out new products and manage the entire process of knowledge generated for further augmentation of existing or New products. So as to bring in a simpler process of developing and designing inventions that could be innovated.

Methodology of the study: Students and corporate participants in various works shops conducted by the authors were given a tool known as Heuristic ideation file which is in the size of 36" X 10" (inches). The tool was used as an experiment to check whether participants could instantly create new combinations for New products. It did show that almost all of them when permitted to participate in using the file could come out with a variety of useful products. Hence the tool demonstrated that it can be used for instant creation of products. As the tool captures various memories stored in the minds of the participants as well as enhances knowledge creation, retrieval, application and connecting of human minds in one go.

This method of study in group settings gave the researcher a realistic real time application of the process for generating new, funny, incredible, wonderstruck ideas. Individuals who were shy and would not open up in general but have great ideas opened up in the process.

Inhibitive individuals block their knowledge and do not express them for fear of insult, or just pre-judging themselves that their ideas are of mediocre or inferior level.

Hence Heuristic application creates an environment for better open mindedness; it also makes an individual in to an innovator.

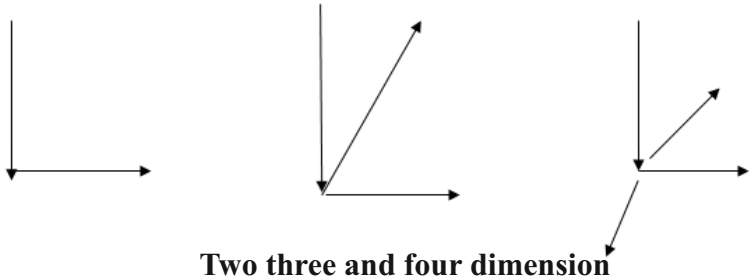
Research Methodology: A participative style of exploratory and experimental research was done in various setting encompassing students, corporate executives, semi literate carpenters, technicians, mechanics in different workshops across cities like, Bangalore, Hyderabad, Amaravthi,(the then Vijaywada) Mysore, Bellary, Mangalore, Mumbai from 2014 to 2020 covering 4000 plus participants with different cultural ethnic and academic backgrounds. The heuristic ideation tool was tested in almost all the sessions that the authors were invited as a resource person[s] jointly or individually.

Five participants were given one tool with an hour's time to come out with solutions and ideas that can be made in to products [or] that would have demand in the market. They were also told to present the same as a team in front of the audience. The researchers observed that it brought in freshness in terms of varieties of ideas and solutions to day to day problems, many of them extracted and applied commonsense of theirs as well as from other team members to find solutions People shared their knowledge and accepted others ideas with out pre-judging its applicability or reality, hence the tool helped in the entire process of idea generation, knowledge creation, construct creation, or just a concept creation, irrespective of the place, people or problems.

Therefore application of heuristics brings in incremental innovation or a radical innovation and generates knowledge; a combination that gives a better idea, as well as an instant creation of new product[s] thought process and it generates a new expansion in simple terms a new vector or a variable.

Hence adding, mixing, attaching, compar-tmenting, alternating of various subjects will lead to multiple outcomes. When two things are combined 2!= 2 And three things would result in 3! = 6 combinations or 6 outcomes. Let's assume we manage 10 verticals with 10 dimensions i.e. 10! would result in to 36,28,800 combinations, or new products.

When we apply two, three, four and multiple dimensions it would look as follows:



Two three and four dimension

Four dimensions can be further increased to multiple dimension say 360 degree dimension. These combinations give us greater scaling say multiple knowledge scaling3. It also means multiple vector scaling; gives us an idea of enhancing combinations which are near as well as far in terms of their relationships and not necessarily they need to be closely related to one another, near the relationship means near the angle and much similarity could be found in each other. Odd and even combinations will lead to wow products enhancing the outcomes.

Hence applying heuristics will lead to knowledge creation and knowledge creation will lead to a better product generation. These applications in turn need to be stored and managed. A better application will lead to a new design and new design will bring in more clarity in a product's uses application, benefits thus may lead to a breakthrough innovation or a radical, incremental innovation.

Let us further it in terms of human involvement, if more than one brain works on multiple knowledge sources, hence combinations in of two brains would be enormous and mind boggling due to brain storming and all these designs can be stored through mind maps in our memory. These mind maps would lead to path ways while retrieving a combination for a wow factor product.

Application of heuristics for NPD is the tangible aspect of a product, it also could be used for generating the intangible aspects such as price, promotion, places, location of a launch etc.

The same can be illustrated as follows with the following notation:

Xij is to indicate the particular value of the kth Dimension that is observed on the jth item or trial.

That is:

Xij = measure of the kth variable on thee jth variable.

	Dimension1	Dimension2	...	Dimension K	...	Dimension p
Variable1:	x_{11}	x_{12}	...	x_{1k}	...	x_{1p}
Variable 2:	x_{21}	x_{22}	...	x_{2k}	...	x_{2p}
:	:	:		:		:
:	:	:		:		:
:	:	:		:		:
Variable j:	x_{j1}	x_{j2}		x_{nj}		x_{np}
:	:	:		:		:
Variable n:	x_{n1}	x_{n2}		x_{nk}		x_{np}

Or we can display these dimensions as a recta-ngular array called X, of n rows and p coloums:

$$X = \begin{pmatrix} X_{11} & x_{12} \dots & x_{1k} \dots X_{1P} \\ x_{21} & x_{22} \dots & x_{2k} \dots x_{2p} \\ : & & \\ X_{j1} & x_{j2} \dots & x_{jk} \dots x_{jp} \\ X_{n1} & x_{n2} \dots & x_{nk} \dots x_{np} \end{pmatrix}$$

Lets consider x as dimensions and further create a matrix for creation of a new product:

Vectors/Di										
V_1 Colour	D_1 Red	D_2 Blue	D_3 RED	D_4 ORANGE	D_5 VIOLET	D_6 GREEN	D_7 PINK	D_8 YELLO	D_9 BLACK	D_{10} WHITE
V_2 Shape	D_1 ROUND	D_2 SQUAR	D_3 TRIANGLE	D_4 RECTANG	D_5 CIRCLE	D_6 ELECPTICA	D_7 OVAL	D_8 OCTOG	D_9 HEPTA	D_{10} STRAIGH
V_3 Size	D_1 SMALL	D_2 MEDIU	D_3 LARGE	D_4 EXTRA	D_5 CHILD	D_6 TEEN	D_7 OLDMAN	D_8 OLDW	D_9 FAT	D_{10} THIN
V_4 Material	D_1 GOLD	D_1 SILVE	D_2 PLATINUM	D_3 METALS	D_4 COTTO	D_5 SILK	D_6 LEATHER	D_7 PLASTIC	D_8 GLASS	D_9 GEMS
V_5 Texture	D_1 SMOOT	D_1 ROUGH	D_2 MATTY	D_3 GLOSSY	D_4 STONE	D_5 GLASS	D_6 POLISH	D_7 RAW	D_8 SOFT	D_9 BOUNCING
V_6 Packing	D_1 PLASTIC	D_1 GLASS	D_2 WOOD	D_3 STEEL	D_4 PAPER	D_5 WOOL	D_6 AIR	D_7 SAND	D_8 STONE	D_9 GRAPHIT
V_7 Capacity	D_1 10 Gram	D_2 20gram	D_3 1 kg	D_4 1QUINTAL	D_5 1 TON	D_6 100 TONS	D_7 1GB	D_8 1TB	D_9 1ZB	D_{10} 1TB
V_8 Taste	D_1 Spicy	D_1 Salty	D_2 Turmeric	D_3 Chilly	D_4 Sweet	D_5 TAMARIND	D_6 PUNGENT	D_7 SOUR	D_8 PEPPER	D_9 GINGER
V_9 Heat resistant	D_1 COOL	D_1 WET	D_2 BURN RESISTANT	D_3 ELECTRIC FIRE	D_4 HIGH TEMP	D_5 BLAST	D_6 FRICTION	D_7 EXPLOSION	D_8 MISSILE	D_9 METLING
V_{10}	D_1 FOLD	D_1 BEND	D_2 TEAR	D_3 CUT	D_4 BREAK	D_5 FRAGILE	D_6 SHARP	D_7 HEAVY	D_8 LIGHT	D_9 HARD

The above matrix is an example to generate any two or three or a multiple combinations for NPD.

Hence knowledge management is a function of various combinations illustrated through the following notations:

Data leads to information and information leads to knowledge

> Information is a function of= f (Collection and assimilation of data)

>data is a function of = f (patterns for similarities and dissimilarities)

> Knowledge is a function of = f (Information of distilled data)

Therefore Knowledge management for NPD= *f* (distilled data with patterns of similarities or dissimilarities)* (Multiple human minds) = Wow products

Thus we generate a new word known as kwmanalytic4 for easier understanding and calculating ROI on knowledge management investment that is done in an organization for an NPD

Subsequently ROIKNMA5 = Return on investment on knowledge management, would be the basis for understanding and calculating an organization benefit due to new product development and subsequent benefits as 'ROI' on the new products that are launched.

New products bring in new revenues and new revenues can bring in greater life for an organization. Kwmanalytics is the analytics of knowledge management.

Analytics is an integral part for understanding component contribution. The components for kwmanalytics are: three components (Data generation) x (Data storage cum retrieval) x (application for NPD). Application plays a critical role in making to the field of marketing for new product development or for implementing and making a product market ready.

Kwmanlytics= (data generation capacity X data storage cum retrieval x use and application of data for NPD)

ROIKWMA= Benefits derived due to creation of knowledge, application and launch of a new product for higher revenue generation. Hence the return on investment on knowledge generation, storage, application and retrieval is tremendous. Similar patterns of creating new products could be possible through the application of heuristics.

When heuristics are extracted a combination of vast things happens; Leading to new products with unique applications can be generated for multiple uses and higher faster benefits.

Matrix shows components for ROIKWMA:

Data generation capacity 100 point scale in rupee terms	Data storage cum retrieval 100 point scale in rupee terms	Application of data For NPD 100 point scale in rupee terms
People with talent- 70	Safety of data- 60	Incremental usage 45
Equipment[s]- 20	Retrieval- 20	Tardiness (10)
Location- 5	Type of storage- 10	Speed 25
Frequency of work-3	Extraction 5	Combinations 20
Relevant- 2	Relevant 5	Relevant 10

Knowledge management analytics should generate return on ivestment done by organizations in terms of time and resource. Knowledge management for New product development will bring in expenses and these expenses should bring in returns for further investment for increasing knowledge.

The above formulation were tested in an M/s VK Furniture in Mangalore which currently manufactures 138 products and these products are created by constant Endeavour's of various employees of the production and Marketing departments.

Observation Results: When ROIKWMA was worked out it resulted in greater value generation in terms of the business that it created.

Kwmanlytics= (data generation capacity X data storage cum retrieval x use and application of data for NPD)

Therefore the resultant is (85 x 70 x 65) = Rs.38,6750 on a annual basis which is coinciding with their balance sheet .

Conclusion: Knowledge expansion should lead to further knowledge management. Hence investment in knowledge management should lead to greater return on investment in any business. Therefore institutions should keep investing in NPD with greater heuristics for higher productivity and profitability.

Knowledge management and NPD should go hand in hand for scaling new levels of problem solving. Problem solving should result in financial gains and financial gains should result in better investment for greater research in the field of enhancing the scientific temper be in the organized or unorganized sector.

4, 5= Authors own notations and own source

Diagrams= Authors' own source

Matrix= Authors' own source

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