

STUDY THE STAKEHOLDER'S THOUGHTS ABOUT THE NEW PRODUCT DEVELOPMENT (NPD) WITH THE NEW PRODUCT CREATION SYSTEM (NPCS) IN AUTOMOBILE INDUSTRIES

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Abstract:

Day by day new product development becomes more challenging in terms of understanding its terminology, integration, collaboration, etc., Also, the faster industrial revolution is one of the significant factors in addition to the above. Moreover, the time to develop new products results in delayed deliveries due to various combinations of justifications in the projects. The success of delivery depends on the collaborative engagement of all stakeholders irrespective of function and responsibilities however the index of “product development” is emphasized as only pertaining to R&D professionals. This needs to change; hence we proposed a study taking two major names New Product Development and New Product Creation Systems widely used in automobile industries and analyzing which will have more inclusivity among the industries' practices. Analyzing these will help any automobile organization put the right name in place for product development in the project management process. This paper aims to find which terminology NPD or NPCS has more inclusivity in the organization and how people understand it has a link with all the functions or only with a specific product development function.

Keywords: *New product development, NPD, New product creation system, NPCS, product development, project management. Project Analysis.*

1. Introduction

Product development is the process of developing new products as per business requirements. Current technological developments such as innovations in robotics, automation, and digital interconnectivity enable an agile form of manufacturing which allows smaller lot sizes and

more frequent changes to product designs and production processes (Holmstrom et al., 2019), even in automated and agile production systems, it is expected that human workers will remain a focal part of a production system (Alavi et al., 2014). The new product development process is a sequence of stages and activities an enterprise employs to conceive, design, manufacture, and commercialize a product (Ulrich K. T et al, 2015). Digital interconnectivity is more important and interlinked by human workers will remain a focal part. The emphasis point is that human linkage in the process is high and it is also critical, We need to find the duplicate process and eliminate the same, closest process which takes too much time in the space of the project management process, and developing its product requires high clarity, the key point is that we need to check which is possible and which is not possible when human intervention and interface are high and the factors which influence them to understand is a key element. In automobile industries, the process of product development is highly complex, and it may vary from firm to firm. The linear approach product development process has a process linkage within the organization and outside the organization, understanding the process by its name is very important for a leading automobile firm. The new product development process is elaborated in Figure 1. (Giada Gastaldello– 2021). New product development is one of the key factors for progress and competitive advantage in each country (Irena SILINEVICA et al., 2016).

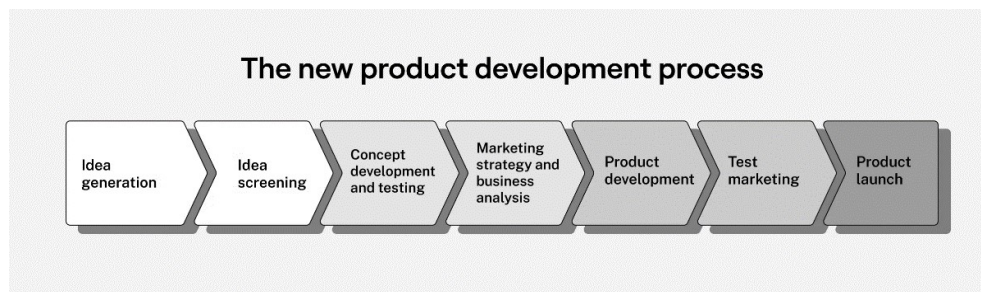


Figure 1 – New Product Development Process

Source: maze.co/collections/product-development/new/

2. Research motivation and scope:

Research motivation comes from an investigation on an automobile firm bus manufacturer located in Chennai India (the name of the company is anonymous for security reasons). The aim of the research study is to do a model assessment to find which name reaches people's connectivity on understanding the new product development is an all-functional role or specific to one functional role. The research intent is to analyze, NPD (New product development) vs NPCS (New product creation system) in the automobile OEM (Original Equipment Manufacturer) using a Likert 5-point scale analysis (Ira H. Bernstein et al, 2005). Companies with superior R&D units have traditionally been technology-driven innovation leaders. However, since the turn of the millennium, many of these companies have radically changed their innovation strategies by opening their innovation processes to external stakeholders (Michael Bartl et al, 2005). According to Wheelwright and Clark (1992), NPD is defined as effective activity organization and management to bring products to market with low development costs and short development times.

3. Existing Methodology

There are various models proposed by different authors, but all start with an idea to build a product that meets the customer's technical specifications and ends with a product launch or introduction to the market. The number of stages, phases and their description varies from model to model. Detailed in Table 1. Online Source: <https://engineeringproductdesign.com/knowledge-base/new-product-development/> [Accessed 19 September 2023].

Table 1: NPD various models with respect to various author

Models	Phases
IEC60300-1	Concept and definition – Design and development – Manufacturing and installation
Andreasen & Hein, 1987	Recognition of need – Investigation of need – Product principle – Product design – Product preparation – Execution
Pugh, 1990	Market – Specification – Concept design – Detail design – Manufacture
Fox, 1993	Pre-concept – Concept – Design – Demonstration – Production
Roozenburg & Eekels, 1995	Analysis – Concept – Materialisation
Pahl & Beitz, 1996	Clarification of task – Conceptual design – Embodiment design – Detail design
Blanchard, 2004	Conceptual design – Preliminary system design – Detailed design and development – Construction – Production
Cooper, 2005	Scoping – Build business case – Development – Testing and validation – Launch

Most new process developments start with a new idea of product synthesis. Conceptual design is useful to generate different ideas, check feasibility, and make a preselection of the most promising process concepts. (Alexander Mitsos, et.al., 2018). In automobile OEMs, new product development has a lot of challenges like scope, time, cost, resource, knowledge, skill, product/service, market, statutory requirement, government regulations, etc., all are major factors that drive the project to be a success for any organization in NPD. For the current competitiveness in industrial realities, the necessary condition is the ability to combine productivity, ergonomics, and operating models that are participative. (Laudante Elena et.al., 2016). Organizations need to do their homework carefully at the beginning for long-term success. Not many people are quite comfortable moving out in the field and talking to end-users to find out what type of product would be an instant hit among them. If such people are entrusted with the responsibility of developing a new product, it would be extremely difficult for the brand to find acceptance among the target audience. Online Source: <https://www.managementstudyguide.com/challenges-in-new-product-development.htm> [Accessed 18 September 2023]. One essential step in process development is conceptual design. The impact of decisions taken in this early phase of process development is huge and modifications in later phases are harder to implement and therefore more costly. (Alexander Mitsos, et.al., 2018). The development of new products is important to maintain an organization's competitiveness in the long

term and for a successful launch, it is essential to capture and understand market demands (Nikabadi & Sepehrnia, et al., 2019).

4. Data Collection and Analysis

Need to find, how NPD reaches across the organization and is understood by all the stakeholders in the organization, this is also one of the major challenges for the organization to meet the market on time. We need to validate the same. The name New Product Development (NPD) in the industries has understood it's a responsibility of all the functions in the business or not and the proposed name New Product Creation System (NPCS) in the industries has understood it's a responsibility of all the functions in the business or not., this was validated using a simple questionnaire survey (Google form) 5-point Likert scale by following questions.

The questions are A, B, C, and D coded for analysis, the corresponding details of the questions are detailed below:

- A) The name New Product Development has a relationship with all functions of the Business.
- B) The name New Product Development has no relationship with all functions of the Business.
- C) The name New Product Creation System has a relationship with all functions of the Business.
- D) The name New Product Creation System has no relationship with all functions of the Business.

4.1 Methodology: Data collection: Primary Data - Using a 5-point Likert scale. Below is the summary. Analysis was done with samples of 55 (no. of respondents) out of 75 Executives from various functions of Automobile manufacturers located in Chennai Tamil Nadu in India. The questionnaire option ratings are Strongly disagree-1, Disagree-2, Neutral-3, Agree-4, Strongly Agree-5.

Table 2: Primary data collected from respondents using Google form.

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Respondent	A)The name New Product Development has a relationship with all functions of the Business.	B)The name New Product Development has no relationship with all functions of the Business.	C)The name New Product Creation System has a relationship with all functions of the Business.	D)The name New Product Creation System has no relationship with all functions of the Business.
1	5	2	4	3
2	1	5	5	1
3	5	1	5	1
4	2	3	5	2
5	4	2	4	2
6	4	5	4	3
7	2	5	4	2
8	5	1	4	2
9	1	4	5	1
10	5	1	5	1
11	3	2	4	4
12	5	1	5	1
13	4	3	4	3
14	4	2	4	2
15	4	1	4	2
16	5	1	5	1
17	5	2	5	2
18	4	2	4	2
19	5	1	5	1
20	3	3	2	4
21	5	1	5	1
22	3	3	3	3
23	4	2	3	3
24	5	1	5	1
25	5	1	5	1
26	3	3	3	3
27	2	2	2	2
28	5	1	5	1
29	5	1	5	1
30	2	3	4	3
31	5	1	5	1
32	3	4	4	2
33	3	3	4	2
34	1	5	5	1
35	1	5	5	1
36	1	5	5	1
37	1	5	5	1
38	1	5	5	1
39	1	5	5	1
40	1	5	5	1
41	1	5	5	1
42	1	5	5	1
43	5	5	5	5
44	4	2	4	2
45	4	3	3	4
46	5	1	5	1
47	5	1	5	1
48	5	1	2	4
49	2	4	2	4
50	5	1	3	3
51	1	5	5	1
52	2	5	5	1
53	3	3	5	1
54	2	4	5	1
55	1	5	5	1
Average	3.25	2.87	4.35	1.85

Based on the data collection 5-point Likert scale analysis done.5-point Likert scale was discovered in 1932 by Rensis Likert to measure attitude, Table 3 details the range value applied in the analysis.

Table 3: Likert 5-Point scale and its range

	Scale	Range
Strongly disagree	1	1 to 1.80
Disagree	2	1.81 to 2.60

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Neutral	3	2.61 to 3.40
Agree	4	3.41 to 4.20
Strongly Agree	5	4.21 to 5.00

Table 4: Range value of the output data

Average Score for each question	A	B	C	D
Total Respondents - 55	3.25	2.87	4.35	1.85

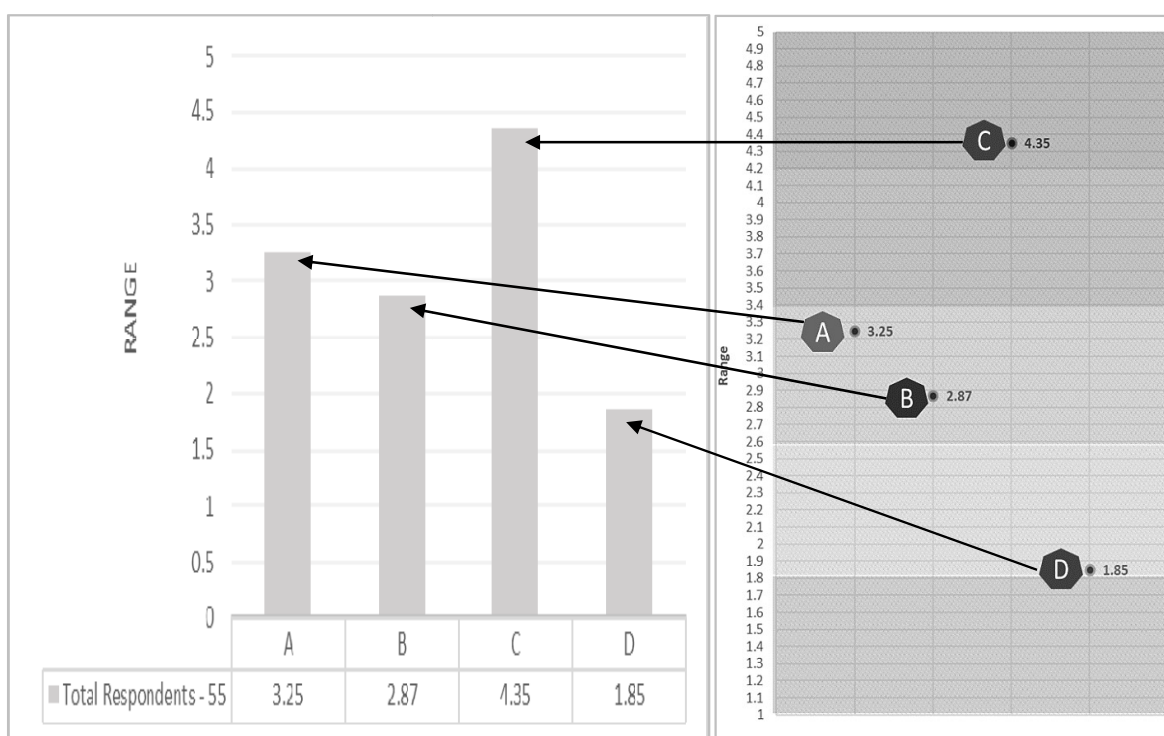


Figure 2 – Range position chart

5. Conclusion and Limitation: From the analysis, the outcome is that it was strongly agreed that Question C) The name New Product Creation System has a relationship with all functions of the Business. The proposal/recommendation is that the automobile industries can take it and change the name from NPD to NPCS. The limitation is that this study was conducted in South Indian automobile commercial vehicle manufacturers, and there is an opportunity for further study across the global automobile industries. The NPD process is a very long process in the automobile industry and its name is an important factor in understanding all the functions involved and plays a major role in the success of new product launches and market advantages. These limitations suggest many empirical research opportunities.

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