Contextualized Analysis of New Product Development Success Factors

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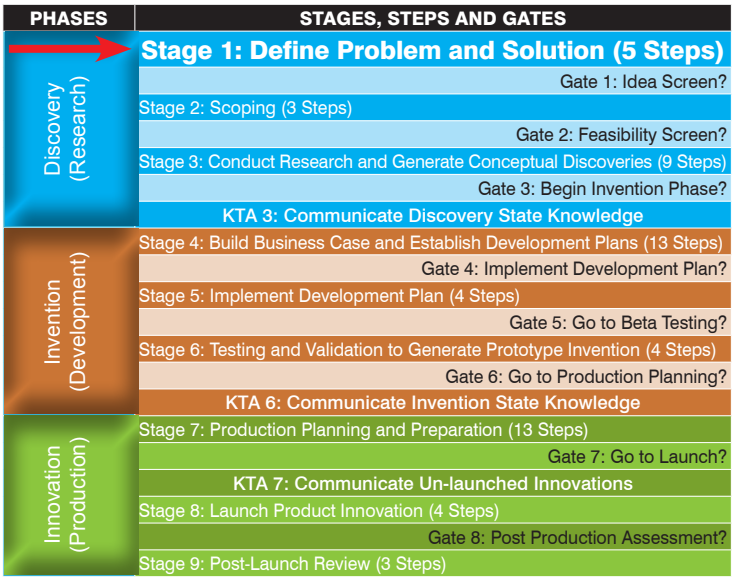
Abstract - An extensive literature review has resulted in the consolidation of key success factors for the new product development (NPD) process. A subsequent analysis has also resulted in the identification of over 40 tools designed to assist various NPD team members with different steps along the NPD path, ultimately improving the likelihood of new product success. This paper will discuss five themes derived from the excerpts as well as tools related to the problem and solution definition stage (Stage 1) of the NPD process. Themes include upfront homework and due diligence; people and teams; stakeholder involvement; employment of structured models for new product development; and outcome measurement considerations. Tools that can be used in Stage 1 include the Delphi method, market structure maps, idea generation, and net present value.

I. BACKGROUND

NPD professionals and applied researchers alike have long struggled to keep pace with the vast amounts of literature reporting NPD best practices. In response to this need, the University at Buffalo's Center on Knowledge Translation for Technology Transfer (KT4TT) has been consolidating and analyzing the incredible throng of NPD literature published within the past 25 years. The primary goal of this work is to equip NPD professionals with the information needed to successfully move their discoveries and inventions from the bench or laboratory to the marketplace as commercialized innovations.

For the purposes of this study, the Center on KT4TT established a unique NPD model comprised of 9 stages of activities, segmented into more than 50 steps to facilitate classification and comparison of key findings. Coined the Need to Knowledge (NtK) model, this framework became the platform for a user-friendly searchable knowledge base of recommended NPD practices and tools, categorized by stages and steps within the NPD process [1]. In addition to this freely-available knowledge base, a final report will summarize the key success factors and appropriate tools compiled for each stage and step in the NtK model. This paper describes findings and tools related to Stage 1 of the NPD process.

NtK Model



An earlier paper [2] discussed the methods associated with the literature review in detail. In brief, over 12,000 titles were returned from keyword searches, and nearly 300 articles were selected for inclusion based on title and keyword assessments. Approximately 200 articles remained after detailed reviews of abstracts, all of which were scoured for relevant excerpts. In total, over 700 unique excerpts have been identified and classified by their placement within the NPD process, their utility to various stakeholder groups, and their applicability to different NPD settings. All findings, citations, and case examples can be accessed via the KT4TT's knowledge base at http://kt4tt.buffalo.edu/knowlwedgebase

The secondary analysis is employing aspects of thematic analysis [3] and content analysis [4] methodologies to develop codes and identify themes in the data within each stage of the NtK model. Narratives are then being composed for codes and themes with the highest frequency of associated excerpts.

II. STAGE 1 RESULTS

Five themes related to Stage 1 of the product development process have emerged. In rank order based on frequency of excerpts, they are: upfront homework and due diligence, people and teams, stakeholder involvement, employment of structured models for new product development, and outcome measurement considerations.

According to the excerpts, upfront homework and due diligence involves clear definition of a problem and solution, as well as delineation of the project's scope [5]. This information should then be used early on in the NPD process to analyze market, technical and business factors such that a business case can be developed [6, 7]. Other important considerations related to this category of findings include teaming contracts with clearly outlined project responsibilities and specifications; provision of adequate resources; and the inclusion of key stakeholders such as consumers, experts, and suppliers [8, 9, 10, 11].

Our findings indicate that best practices involving people and teams were consistently reported with Stage 1 excerpts. In particular, there was emphasis placed upon the importance of cross-functional integration (CFI) between functions and departments [12, 13]. CFI was particularly helpful for obtaining manufacturing input early in the process, so as to avoid later-stage bottlenecks and to ensure necessary production facilities will be available as needed. Weekly meetings were recommended to ensure that all team members are aware of the project's needs throughout the NPD process [14]. Additionally, teams should be led from beginning to end by individuals with creative minds who are skilled in management [15, 16, 17].

Though CFI can help organizations to leverage expertise from internal stakeholders, external stakeholder involvement is also a recommended practice for successful NPD. In particular, product consumers should be included in NPD activities from the onset, with continuing involvement throughout the entire project [18, 19, 11]. Outside topic area experts can also benefit NPD projects tremendously, and may include researchers with industry knowledge, or suppliers who will be more heavily involved at later NPD stages [6].

Findings indicate that consideration should be given to outcome measurements in Stage 1 of the NPD process. Objective measures are preferred over subjective, and example metrics include product effectiveness, marketplace performance, and productivity [7, 20, 21].

Finally, findings indicate that the use of a structured NPD process model can be helpful for eliminating low-value activities and streamlining the overall process [22, 7]. Products requiring regulatory approvals, such as medical devices, may benefit from highly structured processes [23]. Findings indicate that a structured process combined with CFI and regular meetings can be helpful in streamlining NPD projects [14].

In addition to these themes, four tools related to Stage 1 activities were specifically mentioned by the literature. 1) The Delphi method was identified as a way to identify future or unrealized consumer needs [24]. 2) Market structure maps can be used to provide a visual representation of the competitive environment, including competitors and their products, market segments, and external forces affecting markets [25]. 3) Idea generation techniques such as wildest idea, morphological analysis or metaphor use can produce innovative ideas [25]. 4) Net present value can be used when evaluating the potential financial success of a new product development project [26].

III. ACCESSING FINDINGS AND TOOLS

All findings and tools described in this paper can be accessed via the KT4TT knowledge base [27]. The original citations from which each excerpt has been extracted have been maintained, such that individuals interested in learning more about any given excerpt can explore the original articles in more detail.

IV. FUTURE WORK

The Center on KT4TT is currently working to finish the secondary analysis of all data, complete development of an interactive and informative game board version of the NtK model, and generate publications documenting the findings from this review. Work on this project is scheduled to continue until 2013, with annual updates integrating the newest findings into the knowledge base as they come available. To recommend studies to the project team, or for technical assistance in using the project's data, please contact the lead author of this paper.

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