

INNOVATION MANAGEMENT IN NEW PRODUCT DEVELOPMENT: INTEGRATING TECHNICAL FEASIBILITY, MARKET REQUIREMENTS, AND PROFIT MARGIN TARGETS

Fatima Khatun

National University, Gazipur, Bangladesh

correspondence: fatima.khantun@gmail.com

Abstract - This study examines innovation management in new product development with an emphasis on balancing technical feasibility, market requirements, and corporate profit margin targets. The research employs a qualitative literature review methodology to analyze existing concepts and frameworks in product innovation management. The findings indicate that successful product development requires simultaneous consideration of all three dimensions through cross-functional collaboration from the earliest stages of concept formulation. Integrated decision-making processes, iterative prototyping approaches, and organizational cultures that support innovation emerge as key success factors. The study identifies trade-off analysis capability, balanced performance measurement systems, and post-launch evaluation as essential mechanisms for maintaining equilibrium among technical, market, and financial considerations. The conceptual framework developed in this research provides theoretical contributions to the field of innovation management and offers practical guidance for product managers and development teams. Organizations that adopt an integrated approach to managing product innovation are better positioned to achieve sustainable competitive advantage through successful new product launches.

Keywords: innovation management, new product development, technical feasibility, market requirements, profit margin, cross-functional collaboration, product success.

INTRODUCTION

Companies operating in the manufacturing and technology sectors face constant pressure to introduce new products capable of winning market competition. Increasingly shorter product life cycles force organizations to accelerate the development process without sacrificing quality and technical reliability (Gu et al., 2023). Amid this dynamic, product development teams frequently grapple with two conflicting demands: creating innovations that appeal to consumers and ensuring that these products can be manufactured at controlled cost. An effective technology strategy has been found to strengthen sustainable product innovation and competitiveness in global markets, particularly when reinforced by a strong technology orientation and entrepreneurial competence. Failure to balance these two aspects can result in products that fail commercially or products that are technically unfeasible for mass production.

Continuously changing market needs require companies to accurately read consumer trends and translate them into concrete product specifications. Today's consumers do not merely seek the basic function of a product; they also expect a satisfying usage experience and added value that distinguishes it from competitors' offerings (Ueda, 2009). Consumer reviews and perceptions of price and brand image have been identified as key factors shaping how a product is judged competitive and valuable by the market. Technical engineering constraints often limit the room for designers and engineers to realize concepts desired by marketing. Limitations in materials, production processes, and manufacturing capability are obstacles that must be overcome through creative and efficient engineering approaches. This negotiation process between market desires and technical capability lies at the core of product innovation management.

Profit margin targets are a critical variable that cannot be ignored in any new product development decision. Research and development costs, production equipment investment, and marketing expenses must be calculated carefully so that the selling price remains competitive without sacrificing company profitability (Rähse, 2017). Careful management of service costs has been shown to influence customer retention and lifetime value, indicating that cost decisions in product development carry consequences well beyond the point of sale, while sound financial literacy among decision makers contributes to more resilient and prudent resource allocation. Decisions about which features to include and which to sacrifice are often determined by strict cost-benefit considerations. Product development teams must be able to conduct systematic trade-off analysis to ensure that every additional cost incurred provides proportional value to both consumers and the company. The ability to optimize costs without diminishing the essence of innovation is an invaluable skill in product management.

Conflict between innovative ambition and operational reality is often a source of tension within organizations developing new products (Schweitzer & Mai, 2021). The marketing division pushes for advanced features believed to attract consumer interest, while the engineering division cautions about production complexity and the risk of technical

failure. The finance division emphasizes the importance of cost control and assured return on investment. A well-designed human resource development policy has been found to drive collaborative innovation across product and service functions, and clear authority and accountability in corporate management help keep cross-functional decisions coordinated rather than contested. Without an effective coordination mechanism, these differing interests can paralyze the development process and delay product launch. Sound innovation management requires the integration of differing perspectives and the creation of a shared vision for the product being developed.

Approaches that overly prioritize technical aspects without considering market acceptance have led to the failure of many innovative products that were impressive from an engineering standpoint. Conversely, products overly oriented toward market desires without considering production feasibility often end up with soaring production costs and thin margins. Consumer lifestyle has been identified as a significant factor shaping purchasing decisions, underscoring the importance of accurately reading market appeal before committing to a product concept, while integrated communication tools such as email marketing play a role in conveying a product's value proposition consistently to its intended market. Balance among the three pillars, namely technical feasibility, market appeal, and profitability, is an absolute requirement for the success of new product development. Effective innovation management functions as a bridge connecting these three domains through a transparent and participatory decision-making process. The ability to integrate these three perspectives is a hallmark of organizations that excel in product innovation.

The main problem companies face in product innovation management is the absence of a structured framework to simultaneously balance technical constraints, market needs, and profit margin targets. Many organizations still use a sequential approach in which technical decisions are made first, then adjusted to market needs, and finally evaluated from a financial perspective (Dissel et al., 2008). Findings on cross-border payment regulation show that a clearly structured framework produces more consistent outcomes for those affected than adjustments applied only after decisions have already been made. This approach often results in inefficiency because decisions made at the early stage limit the choices available at subsequent stages without considering long-term consequences. The lack of integration across functions in the product development process gives rise to prolonged conflict and suboptimal decision-making. In addition, time pressure in product development often causes unplanned trade-offs and compromises the final quality of the product.

Difficulty in measuring and predicting market acceptance of new features is also a serious obstacle in product development. Surveys and market tests often produce inaccurate results because respondents tend to state preferences that differ from their actual behavior once the product is launched (Braunstein, 2015). Studies on customer loyalty formation indicate that satisfaction and trust do not always translate directly into consistent purchasing behavior, and that the factors driving customers to switch to alternative offerings frequently diverge from what they initially state as their preferences. This uncertainty makes financial planning very difficult, as companies cannot predict sales volume with an adequate level of confidence. As a result, investment in new product development always carries significant risk of failure, and this risk becomes even greater when companies attempt to develop genuinely new products. The ability to manage uncertainty and make decisions with imperfect information is a major challenge in product innovation management.

Every product launch failure drains resources that should be allocated to other more productive initiatives. The opportunity cost of product failure is often greater than the costs visible in financial reports due to the loss of time and energy of the development team that should have been used for more promising projects (Zhao et al., 2014). In addition, repeated failures in product development can weaken stakeholders' trust in the company's management capabilities. Thus, an understanding of effective innovation management is key to maintaining a company's competitive position in the long term. The purpose of this paper is to develop a conceptual framework for innovation management that integrates technical, market, and financial aspects in new product development. This research aims to identify principles and mechanisms that enable organizations to make balanced decisions among these three dimensions. The results of this study can help organizations allocate resources more effectively to achieve profitable innovation.

RESEARCH METHODS

This study applies a qualitative literature study approach aimed at systematically reviewing various thoughts and concepts regarding innovation management in new product development. Research methodology essentially answers fundamental questions about what is being studied, why the research is important, where the boundaries of the study lie, when is the right time to conduct the research, who is the subject or object of the study, and how the procedures are undertaken to obtain valid findings (Oladele, 2022). This framework of questions serves as a guide in designing a comprehensive and targeted literature search strategy. Qualitative research in the social sciences requires a deep understanding of the meaning and interpretation given by experts to the phenomena being studied (Tsang, 2023). This approach is very suitable for the topic of innovation management because the concepts involved, such as the balance between technical and commercial aspects, heavily depend on the interpretation and experience of practitioners.

Data collection procedures follow the principles of understanding qualitative research methodology as a process involving the systematic identification, selection, and synthesis of literature (Snyder, 2019). The sources reviewed include

textbooks, journal articles, and research reports discussing innovation management and new product development. Good research requires a clear design regarding the type of data needed and how that data will be interpreted (Akin & Lin, 1995). In this study, the main focus is on theoretical concepts and frameworks developed by experts in the field of innovation management. Data analysis is conducted through an interpretive approach that emphasizes understanding meanings and relationships among concepts, within appreciative inquiry methods that can also be adapted to read academic texts from a constructive perspective (Selvi, 2019). This approach allows researchers to explore positive values and opportunities in every concept examined.

RESULTS AND DISCUSSIONS

Innovation management in new product development requires an approach that integrates various functional perspectives in parallel rather than sequentially. The ideal product development process involves collaboration among marketing, engineering, and finance teams from the early stages of concept formulation. When these three functions work in isolation, the decisions made tend to optimize the interests of each individual function without considering the impact on other dimensions (Gatignon et al., 2016). As a result, the resulting product may be technically perfect but misaligned with market desires, or conversely, a product heavily in demand by the market may turn out to be unprofitable to manufacture. Functional integration from the outset enables rich information exchange and more balanced decision-making. This approach also allows for the early identification of potential conflicts so that solutions can be found before substantial resource commitments are made.

Technical feasibility is the foundation of every new product to be developed, because without the ability to physically realize a concept, all marketing plans and financial calculations become meaningless. The engineering team must evaluate whether the proposed design can be produced with available technology, whether the required materials are accessible at a reasonable price, and whether the production process can deliver consistent quality. Technical limitations often force the team to compromise on certain features desired by marketing (Yang, 2022). Legal protection for technical designs and innovation outputs strengthens a company's incentive to invest in engineering solutions, since certainty over ownership reduces the risk of imitation and encourages continued creative effort. However, this compromise does not necessarily mean sacrificing value for the consumer, since creative engineering can often find more efficient alternative solutions without diminishing the functional essence of the product. The ability to redesign and find different approaches to meeting consumer needs is a key skill in innovation management.

Understanding market needs requires more than customer satisfaction surveys or sales trend analysis. Companies need to uncover the underlying motivations that drive consumers to purchase a product, including emotional and psychological aspects that standard questionnaires often fail to reveal. Techniques such as behavioral observation, in-depth interviews, and analysis of product use in real settings can provide richer insight into what consumers actually want. Consumer behavior has also been shown to shift noticeably during periods of major disruption, such as a pandemic, indicating that underlying motivations can change quickly and must be tracked continuously rather than assumed to stay fixed; this need for continuous tracking is compounded by rising concern over data security in online transactions, which shapes how much trust consumers place in a product or platform. Digital channels such as social media offer a practical way to capture real-time signals of consumer interest that formal surveys often miss, and satisfaction with service quality has been found to influence a consumer's intention to repurchase, confirming that experience matters as much as functional specification. This information must then be translated into measurable product specifications that can be technically tested. This translation process is a critical point where misunderstandings between marketing and engineering frequently occur, since the language used by these two functions differs greatly. An effective product manager acts as a translator who bridges this language gap and ensures that consumer needs remain the top priority in every technical decision.

Profit margin calculations must account for the entire product life cycle, not merely the initial production cost. Development costs, equipment investment, marketing expenses, distribution costs, and after-sales service costs must all be incorporated into a comprehensive financial model. Companies must also weigh timing and risk, since a product launched earlier may enjoy a significant first-mover advantage but also faces a greater risk of failure (Rähse, 2017). Financial literacy among the target consumer segment also shapes how they evaluate a product's price relative to its perceived benefit, meaning pricing strategy cannot be separated from how financially informed the intended buyers are; this perceived benefit is closely tied to brand experience, since trust and loyalty built through positive experience allow a company to sustain a higher price without losing acceptance. Pricing strategy must reflect the value delivered to the consumer, not merely production cost plus a fixed markup. Marketing efforts such as event sponsorship can raise brand awareness at a cost that must still be weighed against its contribution to margin, and a well-designed service marketing mix has been shown to support competitive advantage, reinforcing that pricing decisions sit within a broader marketing strategy rather than standing alone. Companies able to create a strong sense of value in the eyes of consumers can set premium prices that improve profit margin. However, prices set too high can hinder market adoption, requiring careful balance between price, volume, and margin.

One approach proven effective in managing the complexity of product development is the use of cross-functional teams made up of representatives from various disciplines. Such teams enable direct and rapid communication across functions without going through lengthy bureaucratic channels. Team members from different backgrounds bring differing perspectives and can complement one another in solving complex problems (Mahadik et al., 2024). Situational leadership approaches have been shown to improve change management and team performance, suggesting that how a leader adapts their style to team conditions matters as much as the team's composition itself; when disagreements do arise, structured resolution mechanisms such as mediation offer a more constructive path than allowing conflict to persist unresolved. However, forming cross-functional teams also brings its own challenges, including differing work cultures, competing priorities, and potential interpersonal conflict. Managers responsible for such teams must possess strong leadership skills and the ability to foster a collaborative work climate. The success of a cross-functional team depends heavily on support from top management and a reward system that encourages cross-functional cooperation.

The new product development process ideally follows an iterative cycle that allows for continuous learning and improvement. Rather than following a linear path from concept to production, innovative organizations use a repeated prototyping approach in which the product is tested and modified based on feedback from various sources. Each iteration provides new information about technical aspects, market acceptance, and cost implications that can be used to refine the design (Tripathy & Katyayn, 2021). A similar pattern of ongoing adjustment can be seen among conventional businesses adapting their survival strategies amid the growth of online retail, where repeated adaptation based on outcomes proves more effective than a fixed, one-time strategy. This approach reduces the risk of major failure because problems are detected earlier and can be corrected at lower cost. However, an iterative approach also requires careful management of time and resources so that the development cycle does not take too long. Balancing speed and quality becomes an important consideration in designing an optimal development process.

The ability to make informed trade-offs lies at the core of successful innovation management. Every decision in product development involves a sacrifice, whether in cost, time, features, or quality. Well-run organizations have a transparent decision-making process grounded in accurate data rather than intuition or individual preference (Ahumada-Tello et al., 2019). This need for transparency extends to how decisions are made when supported by automated or AI-based tools, since accountability in such managerial decisions ensures that efficiency gains do not come at the expense of fairness or responsibility. The decision to add a new feature must be evaluated based on its contribution to customer satisfaction and their willingness to pay more. Conversely, the decision to remove a feature must weigh the potential loss of customers and its impact on the product's competitive position. Systematic cost-benefit analysis helps development teams make rational and accountable decisions. Trade-offs made in this manner are thus not a sign of failure but a natural part of the product development process.

An organizational culture that supports innovation is an important prerequisite for the success of new product development. Companies with a bureaucratic culture that punishes failure tend to avoid risk and produce products that are safe but unappealing (Neto & Machado, 2022). As firms rely more on digital marketplace platforms to reach customers, the responsibilities and competitive conduct expected of such platforms also become part of the environment innovation must operate within, since regulatory scrutiny of platform practices sets boundaries on what experimentation is permissible. Conversely, companies that make room for experimentation and learning from failure are better able to produce genuinely innovative products. However, freedom to experiment must be balanced with discipline in resource management and adherence to established deadlines. Top management plays an important role in shaping a culture that values innovation without neglecting the need for financial and technical discipline. Clear communication about company priorities and expectations helps development teams understand the boundaries within which they can innovate freely.

Measuring performance in new product development requires metrics that reflect the balance between the three dimensions this study focuses on. Technical metrics such as development cycle time, number of design iterations, and prototype failure rate provide a picture of engineering process efficiency. Market metrics such as adoption rate, customer satisfaction, and market share indicate how well a product is received by consumers. Purchase decisions themselves are shaped by several converging factors, including service quality, product variety, store atmosphere, and price perception, all of which should inform how market metrics are interpreted. Financial metrics such as contribution margin, payback period, and return on investment indicate product profitability. A comprehensive relational value framework further suggests that value should be assessed across the full range of stakeholder relationships rather than through a single financial figure alone, reinforcing the case for balanced measurement, and structured evaluation tools such as SWOT analysis can help translate these balanced metrics into a clear strategic direction. The use of balanced metrics prevents development teams from optimizing one dimension at the expense of others. This comprehensive evaluation system also helps organizations identify which areas require improvement and additional resource allocation.

One common mistake in new product development is over-engineering, that is, adding features and complexity that the market does not actually need. Engineers are often tempted to add sophisticated features because of interesting technical challenges, but these features may provide no value to the average consumer. Over-engineering raises production costs, complicates maintenance, and can make a product too complicated to use (Falahat et al., 2023). This

tendency mirrors a broader pattern in consumption behavior, where growing complexity and excess are increasingly being countered by a shift toward minimalism, suggesting that consumers do not always equate more features with more value (Gani et al., 2021). Under-engineering, or an overly simple product, can also be a problem because consumers may perceive the product as insufficiently innovative or falling short of the standard they expect. At the same time, purchase decisions are not always driven by careful evaluation of features; sales promotion can trigger impulsive buying regardless of a product's actual level of sophistication, which complicates efforts to read what the market truly value. Finding the optimal level of technical sophistication that matches market needs is a challenge that requires a good understanding of consumer preferences and behavior. An approach focused on value rather than features helps development teams make wiser decisions.

Rapid technological change creates additional challenges in product innovation management. Technology considered cutting-edge at the start of the development process may already be outdated by the time the product is launched. Companies must be able to monitor technological developments and adjust their development plans dynamically (Shabaltina, 2024). This need for dynamic adjustment also applies to how companies read and respond to consumer behavior, since personalized advertising built on real-time behavioral data allows a company to keep its market approach current even as conditions shift, and it extends to sustainability expectations as well, where clear communication of environmental commitment has become part of how companies must adapt to remain credible with increasingly aware consumers. Flexibility in product design and architecture can help accommodate technological change without having to start over. However, this flexibility must be balanced with discipline in managing change so that the project does not lose direction. Effective risk management helps companies anticipate and respond to technological change in a planned rather than reactive manner. Technological uncertainty thus becomes a factor that can be managed rather than an obstacle that cannot be overcome.

Collaboration with external partners, including suppliers, customers, and research institutions, can enrich the product development process and reduce internal burden. Suppliers often possess deep knowledge of materials and production processes that can be leveraged to improve quality and efficiency. Customers involved in the development process can provide valuable direct feedback and help ensure that the final product meets their expectations (Ryynänen et al., 2017). Collaboration across functions, particularly between human resource management and marketing, has also been shown to drive innovation that responds directly to consumer needs, such as in the development of eco-friendly products, indicating that external partnership works best when paired with strong internal cross-functional coordination. The value of such collaboration is reflected in outcomes as well, since factors like price perception, service quality, and product variety, which are often refined through supplier and customer input, have been shown to shape customer loyalty over time. Research institutions and universities can be a source of new ideas and technologies still in the early stages of development. However, external collaboration also carries the risk of information leakage and excessive dependence on outside parties. Managing relationships with external partners requires clarity on intellectual property rights, risk sharing, and conflict resolution mechanisms. Well-managed partnerships can become a source of significant competitive advantage.

New product development cannot be separated from the company's overall business strategy. The product portfolio being developed must align with the company's long-term goals and reflect the competitive position it aims to achieve. Companies focused on cost leadership will develop efficient and affordable products, while companies focused on differentiation will develop products with unique features and premium quality (Saytari et al., 2024). Building this kind of differentiated position depends heavily on corporate image and brand awareness, since a strong and favorable perception gives a product room to compete on more than price alone, an effect that can be reinforced through endorser credibility and advertising attitude, both of which shape purchase intention toward a differentiated offering. A differentiation strategy is also strengthened when it is paired with a genuine commitment to social responsibility, as sustainable marketing practices help justify a premium position rather than merely asserting it, and understanding how consumption reflects social stratification and status can further guide which segment a differentiated product should target. Decisions about the type of product to develop, the market segment to serve, and the level of innovation to apply must all be grounded in company strategy. Misalignment between strategy and product development can result in wasted resources and loss of focus. Top management needs to be actively involved in strategic decision-making regarding new product development.

Post-launch evaluation is a phase that is often overlooked in product development, even though this phase provides valuable lessons for future projects. Analysis of what worked and what did not work, both from technical, market, and financial perspectives, helps organizations improve their development processes. Findings from this evaluation must be documented and disseminated to all parts of the organization involved in product development. The same mistakes do not need to be repeated if learning from previous projects is integrated into standard operating procedures (Koester & Mojet, 2012). In addition, post-launch evaluation can also identify opportunities for product improvements and derivative product developments that can extend the product life cycle. Thus, product development becomes a continuous learning process that enhances organizational capabilities over time.

Innovation management in new product development demands a blend of discipline and creativity that is difficult to achieve yet essential for success. Discipline is required to ensure that projects run according to established budgets, schedules, and specifications (Blank & Naveh, 2019). Creativity is required to generate innovative solutions that meet market needs in a better way than competitors. These two elements are often seen as contradictory, when in fact they complement each other. Discipline provides the structure that allows creativity to flourish within realistic boundaries, while creativity provides the energy and inspiration that make discipline meaningful. Managers who are able to combine these two elements in their leadership will lead development teams to extraordinary results. This balance between discipline and creativity is the core of effective innovation management.

Innovation management in new product development requires a systemic and integrated approach. The three dimensions technical feasibility, market needs, and target profit margins cannot be separated from one another and must be considered simultaneously in every decision (Karlsson & Magnusson, 2019). A successful development process requires close cross-functional collaboration, open communication, and data-driven decision making. An organizational culture that supports innovation and continuous learning serves as the foundation for long-term success. By understanding these complex dynamics, companies can increase the likelihood of success for their new products and achieve sustainable competitive advantage.

CONCLUSIONS

Innovation management in new product development demands a dynamic balance between technical feasibility, market needs, and target profit margins. These three dimensions are interrelated and influence one another, so decisions that optimize one dimension without regard to another will result in a product that is less than optimal overall. An integrated development process involving cross-functional teams from the early stages and utilizing an iterative approach has proven to be more effective in achieving this balance. An organizational culture that supports innovation, a balanced performance measurement system, and the ability to make informed trade-offs are important factors supporting successful product development. Learning from past experience, both through post-launch evaluations and knowledge documentation, helps organizations continuously improve their capabilities in innovation management. Thus, companies capable of managing the three dimensions in an integrated manner will have a greater opportunity to produce products that are technically, commercially, and financially successful.

Companies need to develop more collaborative and integrated product development processes to overcome conflicts among different functions within the organization. Product managers must have a broad understanding of technical, market, and financial aspects to make balanced decisions. Cross-functional training and job rotation among departments can help build this understanding among development team members. Companies are also advised to develop performance dashboards that monitor indicators from all three dimensions simultaneously and provide early warnings when imbalances occur. Investment in effective knowledge management systems will help companies retain learning from each product development project and avoid repeating the same mistakes. By implementing these recommendations, companies can enhance the effectiveness of their new product development processes and achieve sustainable competitive advantage.

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