



Top Management Support Driving New Product Development Success Across the Automotive Industry

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ABSTRACT

Achieving new product development success has become increasingly challenging as automotive firms manage technological complexity, substantial resource commitments, cross-functional dependencies, and persistent market uncertainty. This article examines the strategic role of top management support in strengthening new product development success within the automotive industry. The analysis focuses on how executive involvement influences development outcomes through strategic direction, resource commitment, cross-functional knowledge integration, technological capability development, and effective development governance. The findings indicate that top management support strengthens new product development success when senior executives maintain strategic continuity, secure critical resources, align specialised functions, and connect technological investment with development priorities. Its contribution, however, depends on the nature and intensity of managerial involvement. Excessive intervention may constrain experimentation, professional judgement, and decision responsiveness, whereas insufficient support may weaken resource continuity, strategic alignment, and organisational commitment. Effective executive involvement therefore requires a balanced approach in which strategic oversight is maintained without restricting the operational autonomy required by development teams. The article establishes top management support as an enabling organisational capability that strengthens the conditions necessary for successful development execution. This perspective advances understanding of how automotive firms can systematically leverage executive support to enhance innovation capability and achieve more consistent new product development success under increasingly complex technological and competitive conditions.

Keywords: Leadership, Innovation, Automotive, Capability, Development

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1. INTRODUCTION

Transforming an automotive innovation from an initial opportunity into a commercially successful product demands leadership commitment that remains visible throughout the development journey. New product development requires substantial financial resources, specialised expertise, technological investment, coordinated functional participation, and strategic decisions that frequently must be made before technical feasibility or market acceptance can be fully determined. Such demands have become more pronounced as automotive firms respond to electrification, digital technologies, intelligent mobility, environmental requirements, and rapidly changing customer expectations. Top management consequently occupies a pivotal position because senior leaders determine which development opportunities deserve strategic priority, how resources are committed, and whether promising projects receive sufficient organisational support during periods of uncertainty. Contemporary research continues to recognise management commitment as an important success factor in NPD, particularly through resource provision, project direction, and coordination across functional boundaries (Ali et al., 2023). Within the Malaysian automotive industry, Yusof (2025a) positions top management support as a critical organisational influence alongside information technology capability, NPD strategy, and NPD process. These perspectives establish top management support as considerably more than formal project approval. It represents a strategic leadership commitment through which innovation priorities are translated into organisational action, resource mobilisation, development continuity, and stronger prospects for NPD success. This automotive emphasis is reinforced by Yusof and Salleh (2021), who position innovation-driven NPD as a strategic route to stronger industry performance.

Resource commitment becomes decisive when automotive development programmes must compete with immediate operational priorities for capital, talent, technology, and managerial attention. Product development projects frequently involve uncertain returns and prolonged investment horizons, creating circumstances in which short term financial pressures can weaken organisational willingness to sustain innovation. Senior management can counter this tendency by protecting strategically important projects, securing specialised personnel, authorising technological investments, and ensuring that development teams possess sufficient capacity to address emerging problems. Swink (2000) found that top management support was positively associated with development time performance, product design quality, and financial performance across NPD projects, although the strength of its contribution varied according to technological innovativeness. Gomes et al., (2001) similarly demonstrated an association between senior management support and NPD project performance across dimensions of time, cost, and final product quality, while also distinguishing between direct and indirect managerial influences. More recently, Ali et al., (2023) identify senior management as an important source of approval, resources, project clarification, and coordination during product development. Collectively, these findings indicate that financial commitment alone is insufficient. Effective support requires managers to mobilise complementary resources at appropriate development stages and maintain organisational confidence when temporary difficulties threaten strategically valuable product initiatives. Digital capability is similarly connected with NPD success by Yusof et al., (2020a). Digital capability becomes strategically useful when leadership connects investment decisions to concrete development requirements and measurable project outcomes.

Leadership influence extends well beyond the allocation of budgets and technical resources because automotive NPD depends on alignment among functions that frequently operate according to different priorities. Engineering teams may emphasise technological performance, manufacturing functions may prioritise feasibility and process stability, procurement may concentrate on cost and supplier capability, while marketing focuses on customer expectations and competitive positioning. Without sufficient strategic alignment, these differences can produce conflicting decisions, information barriers, and development delays. García Rodríguez et al., (2008) demonstrate that top management commitment interacts with the organisational climate between marketing and research and development, highlighting the importance of leadership in creating conditions that support cooperation, communication, trust, and internal commitment during NPD. Yang and Zhang (2018) further show that top management support positively moderates relationships between customer orientation and both financial and nonfinancial NPD performance, indicating that leadership can strengthen the organisational conversion of market knowledge into product outcomes. Islam et al., (2009) similarly connect top management support with team learning and NPD success, demonstrating the relevance of leadership within knowledge intensive development environments. For automotive firms, these relationships are especially important because successful product development requires continuous coordination across engineering, manufacturing, quality, marketing, procurement, suppliers, and technology partners. The alignment of NPD process and strategy is also emphasised by Yusof et al., (2020b). Effective execution therefore depends on clear responsibilities, shared information, and decision mechanisms that allow specialised functions to resolve interdependencies before they become costly development delays.

Uncertainty places a different demand on senior management because automotive development rarely progresses exactly according to its original assumptions. Technical complications, unexpected supplier limitations, regulatory changes, cost escalation, evolving customer expectations, and technological shifts can challenge previously accepted product decisions. Development teams operating under such conditions require leadership that can distinguish temporary project difficulties from fundamental strategic weaknesses. Akgün et al., (2007) demonstrate that management support interacts with team conditions and development outcomes, including team learning, speed to market, new product success, and proficiency in executing product development stages. Swink (2000) likewise shows that the effectiveness of top management support is contingent on technological innovativeness, revealing that managerial involvement does not create identical outcomes across all development environments. This distinction has important implications for automotive NPD because projects involving unfamiliar technologies may require different forms of leadership from those involving incremental product improvement. Senior executives should therefore provide strategic stability without preventing legitimate experimentation and adaptation. Appropriate support may involve accelerating decisions, accepting calculated development risk, protecting learning activities, or reallocating resources when new evidence changes project requirements. Leadership effectiveness consequently depends not on the frequency of executive intervention, but on whether managerial involvement reduces organisational uncertainty and enables development specialists to respond intelligently to changing conditions while preserving strategic coherence. Recent Malaysian automotive evidence from Yusof et al., (2024) further supports the performance importance of coordinated NPD practices.

Strategic alignment becomes equally critical when automotive firms simultaneously manage multiple product platforms, technological trajectories, market segments, and investment opportunities. NPD projects can consume considerable organisational resources, making poor portfolio decisions expensive and potentially damaging to long term competitiveness. Senior management must therefore ensure that development programmes reflect corporate priorities rather than emerging solely from isolated technological enthusiasm or departmental interests. Yang and Zhang (2018) demonstrate that top management support strengthens the relationship between customer orientation and NPD performance, suggesting that leadership can enhance the strategic utilisation of market information within product development. Yusof (2025a) provides more specific automotive evidence by examining top management support as a moderating influence within a framework connecting NPD strategy, NPD process, information technology capability, and product development success in Malaysia. Earlier Malaysian automotive research also identifies top management support, cross functional teamwork, NPD process, NPD strategy, and market research activities among the critical factors associated with development performance (Abdul Aziz et al., 2014). These findings demonstrate that leadership commitment becomes most valuable when it reinforces strategic consistency across development decisions. Senior executives should establish clear product priorities, acceptable risk boundaries, investment criteria, and market objectives so that development teams understand not only what they are expected to create, but why particular product initiatives deserve organisational commitment. Managerial judgement under uncertainty is also important, as Yusof and Razali (2020) connect risk perception with organisational decision quality.

2. LITERATURE REVIEW

Top management support occupies a distinctive position in NPD because senior executives possess the authority to shape strategic priorities, resource commitments, organisational coordination, and the conditions under which innovation activities are undertaken. Its contribution therefore extends beyond formal approval and includes the managerial actions that enable development teams to pursue complex product opportunities with sufficient direction and organisational legitimacy. Contemporary evidence also suggests that leadership support becomes more valuable when it complements other organisational capabilities rather than operating independently (Trieu et al., 2024; Curth et al., 2024). Within automotive NPD, this perspective provides an important foundation for understanding how executive commitment can influence the conversion of technological and organisational resources into successful product outcomes.

2.1 Executive Leadership Shaping Strategic Automotive NPD Direction

Strategic direction provides the foundation through which top management transforms broad innovation ambitions into meaningful product development priorities. Senior executives determine which opportunities deserve investment, how individual projects contribute to organisational objectives, and what levels of technological and commercial risk are acceptable. Their involvement becomes particularly important when NPD programmes require decisions under uncertainty and compete with established operations for organisational attention. Gomes et al., (2001) found an association between senior management support and NPD project performance across time, cost, and final product quality, while distinguishing between direct and indirect managerial influence. Swink (2000) similarly established that top management support can contribute to development time performance, product design quality, and financial outcomes, although its influence varies according to technological innovativeness. These findings remain relevant because contemporary product

development has become increasingly dependent on strategic choices concerning digital technologies, sustainability, customer requirements, and organisational capabilities. Trieu et al., (2024) demonstrate that top management support can strengthen relationships surrounding organisational agility, digital capability, and transformation, indicating that leadership provides an important contextual mechanism through which organisational resources become strategically productive. Top management support should therefore be conceptualised as strategic guidance that establishes development priorities while ensuring that NPD decisions remain consistent with the organisation's competitive direction and long term ambitions. Governance and accountability provide a complementary leadership foundation, as examined by Yusof et al., (2026) in sustainable organisational development.

Within automotive development, strategic leadership assumes additional importance because product programmes involve extensive technological interdependencies, substantial capital commitments, supplier participation, and lengthy development horizons. Management must determine whether new product opportunities justify organisational investment while balancing immediate operational performance against future competitive requirements. Yusof (2025a) directly positions top management support as a moderating organisational influence within a Malaysian automotive NPD framework incorporating information technology capability, NPD strategy, and NPD process. This configuration is important because it suggests that leadership support derives much of its strategic value from strengthening other capabilities rather than functioning as an isolated determinant of success. Customer and market knowledge must likewise be connected with strategic decision making. Zhang et al., (2024) demonstrate that customer involvement can strengthen innovation capability and subsequently influence NPD innovativeness and speed to market, illustrating the strategic value of external knowledge when organisations possess mechanisms for converting it into development capability. Lu et al., (2024) further show that different forms of customer involvement generate different NPD outcomes depending on the stage of development. Senior leadership must consequently establish strategic boundaries within which technological opportunities, customer intelligence, development resources, and organisational capabilities can be evaluated collectively. Sustainability-oriented innovation is also evident in Jamaludin et al., (2025) through their analysis of PROTON's automotive initiatives. For automotive managers, this means that process design must connect technical discipline with timely managerial judgement rather than treating governance as a purely administrative requirement.

2.2 Executive Resource Commitment Strengthening Organisational NPD Capability

Resource commitment represents one of the most tangible expressions of top management support because development ambitions cannot progress without adequate financial, technological, and human resources. NPD frequently requires specialised expertise, experimentation, testing infrastructure, supplier collaboration, digital systems, and sustained investment before commercial returns become visible. Senior executives therefore influence development performance through decisions concerning project budgets, personnel allocation, technological investment, and access to organisational capabilities. Swink (2000) demonstrates that top management support contributes to several dimensions of NPD performance, suggesting that managerial commitment can provide development teams with conditions necessary for effective execution. Gomes et al., (2001) similarly identify relationships between senior management support and project outcomes involving cost, time, and product quality. These findings indicate that resource provision should not be understood

simply as financial sponsorship. Management support creates organisational enablement when resources are available at the appropriate stage, in sufficient quantity, and with enough continuity to prevent strategically valuable projects from being weakened by competing short term demands. More recent evidence from digital transformation reinforces this interpretation. Trieu et al., (2024) demonstrate that top management support plays a moderating role in relationships involving organisational agility and digital capability, emphasising that technological resources become more productive when supported by favourable managerial conditions. More broadly, Yusof (2025b) associates technology adoption with innovation and digital sustainability. Resource governance is strongest when capability investment supports immediate execution while building reusable expertise for subsequent product programmes.

Effective resource commitment also requires selectivity because unlimited managerial support can sustain weak projects and reduce overall portfolio efficiency. Senior executives must distinguish development opportunities that warrant continued investment from those whose technological, market, or financial assumptions no longer justify further commitment. This responsibility becomes more demanding when emerging product technologies require capabilities that organisations do not yet possess. McTaggart and Loonam (2024), examining top management support for digital transformation, identify managerial actions through which executives can support complex transformation initiatives, illustrating that leadership commitment involves active orchestration rather than passive financial approval. Curth et al., (2024) likewise demonstrate that top management support is relevant to environmental innovation strategy and green product development, showing how executive commitment can facilitate innovation requiring new organisational priorities and resources. Automotive firms face comparable challenges as electrification, software integration, connected systems, and sustainability requirements reshape the resource base required for product development. Senior management must therefore evaluate capability gaps and determine whether resources should be developed internally, acquired externally, or accessed through strategic collaboration. Resource commitment becomes strategically effective when investment decisions strengthen the organisation's capacity to execute current projects while simultaneously developing capabilities applicable to future NPD. Leadership remains complementary to process capability, as Yusof (2026) links digital and entrepreneurial leadership with organisational performance. Effective execution therefore depends on clear responsibilities, shared information, and decision mechanisms that allow specialised functions to resolve interdependencies before they become costly development delays.

2.3 Executive Leadership Enabling Cross Functional Knowledge Integration

Knowledge integration represents a critical pathway through which top management support can influence NPD because product development depends on specialised expertise distributed across organisational functions. Engineering, manufacturing, marketing, procurement, finance, quality, and supply chain teams possess different knowledge bases and may evaluate the same product decision according to competing objectives. The challenge is therefore not simply obtaining expertise but creating organisational conditions through which specialised knowledge can be combined around shared development priorities. Senior management can strengthen this integration by clarifying decision authority, establishing common objectives, removing functional barriers, and ensuring that conflicts are resolved before they disrupt project progress. Gomes et al., (2001) distinguish between direct and indirect effects of senior management support on NPD, an important observation because

leadership frequently influences project outcomes by shaping the organisational environment surrounding development teams. Such influence becomes increasingly significant as external actors participate in product development. Zhang et al., (2024) demonstrate that customer involvement can enhance innovation capability and influence NPD innovativeness and speed to market, although the effectiveness of such involvement depends on the knowledge context surrounding the subsidiary. Leadership must consequently create mechanisms through which external knowledge can be absorbed and reconciled with internal technical expertise. Supplier and operational coordination also matters because Abdullah et al., (2020) connect strategic warehouse management with supply chain performance. Automotive knowledge integration is consequential because an engineering choice can alter sourcing feasibility, production readiness, quality assurance, customer value, and launch timing.

External collaboration further expands the integration responsibilities of senior management because automotive NPD frequently relies on suppliers, customers, technology partners, and specialised knowledge providers. Different external contributors offer distinct forms of value, and their participation must be aligned with development requirements rather than maximised indiscriminately. Lu et al., (2024) show that customers acting as information sources positively influence NPD performance, whereas customer participation as codevelopers demonstrates an inverted U shaped relationship, with these effects also varying according to the development stage. Dean et al., (2024) similarly distinguish customer participation in problem solving from participation in decision making, illustrating that external involvement can influence development outcomes through different mechanisms. These findings have direct implications for leadership because senior executives establish the governance arrangements determining how external knowledge enters strategic and technical decisions. Zhang et al., (2024) further demonstrate that customer derived knowledge can contribute to innovation capability when effectively combined with other knowledge sources. Automotive leaders should therefore provide development teams with sufficient autonomy to utilise specialist knowledge while maintaining strategic oversight over collaboration boundaries, intellectual property, resource commitments, and major product decisions. Top management support becomes most productive when it facilitates knowledge connectivity across organisational boundaries without generating excessive coordination or undermining professional expertise. Performance accountability is strengthened when decision processes remain transparent, a relationship also examined by Azahari and Mohamed Suhaimi (2023).

2.4 Executive Leadership Accelerating Innovation Technological Transformation Capability

Technological transformation has expanded the scope of top management support from conventional project sponsorship towards active capability building. Digital technologies increasingly influence how organisations acquire information, collaborate, experiment, make decisions, and create new products. Yet technological investment alone cannot guarantee innovation because firms must develop complementary organisational capabilities that allow technology to become embedded within productive routines. Trieu et al., (2024) provide contemporary empirical evidence that organisational agility and digital capability contribute to digital transformation, while top management support moderates these relationships to a certain extent. This finding is particularly relevant to NPD because digital technologies generate development value only when employees possess appropriate competencies, processes accommodate new information flows, and management provides sufficient strategic direction. McTaggart and Loonam (2024) similarly demonstrate the

complexity of managerial support for digital transformation and develop a framework of managerial actions through which top executives can support large scale technological change. For automotive firms, leadership must therefore connect technological investment with development objectives rather than approaching digitalisation as an independent modernisation programme. Executives need to determine which technologies improve product development, what organisational capabilities are required to exploit them, and how emerging tools should interact with existing engineering expertise. Such strategic orchestration allows technological transformation to strengthen rather than fragment NPD activities. Customer information has growing strategic value in digital markets, as illustrated by Zaini et al., (2026) through consumer review perception and spending behaviour.

Innovation leadership also extends to environmental and sustainability oriented product development because contemporary firms face growing expectations to integrate economic, technological, and environmental priorities. Curth et al., (2024) examine top management support alongside stakeholder pressure, environmental innovation strategy, green product development, and environmental performance, providing evidence that leadership commitment has strategic relevance beyond conventional operational innovation. Their findings strengthen the argument that top managers influence how external pressures are interpreted and translated into organisational innovation priorities. Within automotive development, comparable leadership challenges arise as firms respond to electrification, lower emission technologies, resource efficiency, circularity, and evolving regulatory expectations. Yusof (2025a) reinforces this organisational perspective by positioning top management support alongside technological, strategic, and process capabilities within Malaysian automotive NPD. Zhang et al., (2024) add another dimension by demonstrating how external customer knowledge can strengthen innovation capability and influence NPD outcomes. Collectively, these perspectives indicate that management support contributes to innovation when executives create strategic coherence between external change and internal development capability. Leadership must recognise emerging technological and environmental opportunities, commit resources before outcomes are completely certain, and establish organisational conditions that encourage experimentation while maintaining commercial discipline. Top management support thus becomes an enabling force through which automotive firms can convert technological disruption into structured opportunities for product innovation. For automotive managers, this means that process design must connect technical discipline with timely managerial judgement rather than treating governance as a purely administrative requirement.

2.5 Executive Leadership Strengthening Automotive NPD Success Performance

The relationship between top management support and NPD success is best understood through its influence on multiple dimensions of development performance rather than through a single commercial outcome. Successful products must achieve acceptable development time, cost, quality, customer value, technological performance, and market results, while contributing knowledge that strengthens future innovation capability. Swink (2000) demonstrates that management support can contribute differently across development time, product design quality, and financial performance, revealing that leadership influence is multidimensional and contingent upon project characteristics. Gomes et al., (2001) similarly report associations between senior management support and NPD performance in terms of time, cost, and final product quality. Contemporary research reinforces the importance of examining leadership within a wider organisational configuration. Trieu et al., (2024) show that top management support can modify the contribution of organisational capabilities to

digital transformation, while Curth et al., (2024) connect managerial support with environmental innovation and green product development. These findings suggest that top management support frequently creates value indirectly by strengthening the organisational mechanisms through which resources and capabilities influence outcomes. NPD success should therefore not be attributed simply to the presence of supportive executives, but to the ability of those executives to establish conditions that improve development decisions, organisational responsiveness, and strategic execution. This governance logic reduces unnecessary rework while allowing teams to revise technical choices when credible market or engineering evidence changes.

Automotive evidence provides a particularly important context for consolidating this relationship because product development requires coordination across technologically complex and resource intensive activities. Yusof (2025a) examines top management support specifically as a moderating influence on relationships involving information technology capability, NPD strategy, NPD process, and NPD success within Malaysia's automotive industry. The significance of this perspective lies in recognising that leadership can amplify or constrain the value generated by capabilities already present within the organisation. Zhang et al., (2024) demonstrate that innovation capability can translate customer involvement into stronger NPD innovativeness and speed to market, reinforcing the importance of organisational mechanisms connecting knowledge resources with product outcomes. Lu et al., (2024) further establish that NPD outcomes depend on how and when customers participate, confirming that successful development requires contextual judgement rather than universal managerial prescriptions. Taken together, the literature supports a strategic interpretation of top management support as an enabling capability that connects direction, resources, knowledge, technology, and organisational commitment with successful development execution. Its contribution to automotive NPD therefore rests not on executive visibility alone, but on the quality of managerial decisions that allow development teams to transform organisational capabilities into commercially meaningful and strategically sustainable product outcomes. Effective execution therefore depends on clear responsibilities, shared information, and decision mechanisms that allow specialised functions to resolve interdependencies before they become costly development delays.

3. STRATEGIC LEADERSHIP PRESSURES RESHAPING AUTOMOTIVE PRODUCT DEVELOPMENT PERFORMANCE

The growing complexity of automotive innovation has placed executive leadership under increasing pressure to make decisions that influence not only individual development projects but also the organisation's broader capacity to compete through new products. Product programmes now demand substantial investment, multidisciplinary expertise, technological renewal, rapid market response, and extensive coordination across internal and external boundaries. These conditions create a difficult managerial environment in which strategic ambition must continuously be reconciled with available resources, development uncertainty, organisational knowledge, and commercial expectations. Research within the Malaysian automotive industry identifies management support, cross functional teamwork, NPD processes, strategy, and market research as interconnected factors influencing development performance. More recent automotive evidence further demonstrates that executive commitment operates alongside NPD strategy, process, and information technology capability, suggesting that leadership effectiveness depends considerably on how these organisational capabilities are combined (Yusof, 2025). Earlier research similarly establishes that senior management can influence development time, cost, and product quality through both direct

and indirect mechanisms (Gomes et al., 2001). Consequently, the critical concerns surrounding leadership in automotive NPD extend beyond the presence of managerial support and centre on whether strategic commitment can be translated into sustained direction, adequate resources, integrated knowledge, technological readiness, and appropriate decision authority throughout the development process.

3.1 Executive Commitment Sustaining Automotive Development Cycle Continuity

Maintaining executive commitment throughout an extended automotive development cycle is considerably more difficult than securing initial approval for a promising product concept. Development programmes evolve through periods of technical uncertainty, market reassessment, cost escalation, validation difficulties, and changing organisational priorities, each of which can alter managerial perceptions of project attractiveness. A programme initially positioned as strategically important may consequently lose executive attention when immediate operational pressures become more visible or competing investments promise faster returns. This instability matters because senior leadership influences project legitimacy, resource protection, strategic continuity, and the willingness of functions to remain committed when development problems emerge. Gomes et al., (2001) found that senior management support is associated with NPD performance across time, cost, and final product quality, while also distinguishing between direct managerial intervention and indirect influences through organisational goals, learning, and knowledge systems. Yang and Zhang (2018) similarly demonstrate that management commitment can strengthen the contribution of customer orientation to NPD performance, indicating that executive involvement influences how organisational priorities are converted into development outcomes. The strategic concern is therefore not merely whether executives approve innovation, but whether their commitment remains sufficiently credible and consistent to support development when uncertainty challenges the assumptions upon which the original investment decision was based. External collaboration therefore requires governance that connects partner knowledge directly to specific development decisions and accountability points.

Instability in strategic sponsorship can generate consequences that extend throughout the automotive development network. Engineering teams may postpone critical technical decisions, procurement functions may hesitate to deepen supplier commitments, and manufacturing units may delay preparations when senior management repeatedly modifies product priorities. Such uncertainty can produce duplicated work, redesign, fragmented investment, and deteriorating confidence across participating functions. The problem becomes more pronounced when external knowledge is involved because customers, suppliers, and technology partners require reasonably stable development objectives before committing substantial resources. Zhang et al., (2024) show that customer involvement can strengthen innovation capability and subsequently influence product innovativeness and speed to market, although these effects depend on the knowledge environment surrounding development. This evidence demonstrates that valuable knowledge cannot automatically compensate for unstable strategic direction. Senior executives must preserve continuity while remaining prepared to revise decisions when credible technological or market evidence justifies change. Excessive persistence can lock firms into declining opportunities, whereas frequent strategic redirection can prevent development teams from accumulating momentum. Automotive organisations therefore face a difficult leadership problem involving the distinction between constructive adaptation and disruptive inconsistency. Strategic sponsorship becomes

effective when management provides sufficient continuity for coordinated execution while establishing disciplined mechanisms through which genuinely important evidence can trigger purposeful adjustments rather than repeated changes driven by temporary managerial pressure. Early alignment helps specialists expose technical and commercial trade-offs before they become embedded in costly downstream commitments.

3.2 Development Ambitions Challenging Organisational Resource Alignment Capacity

Ambitious product strategies frequently encounter implementation difficulties when organisational resources fail to match the scale and complexity of development expectations. Automotive NPD consumes financial capital, engineering expertise, technological infrastructure, testing capacity, digital systems, supplier capabilities, and managerial attention, often for substantial periods before commercial returns materialise. Leadership teams may nevertheless demand shorter development cycles, greater technological sophistication, improved quality, and lower cost without making equivalent adjustments to the resources available for execution. Such misalignment creates a structural contradiction between strategic aspiration and operational capability. Gomes et al., (2001) demonstrate that senior management support is associated with project performance involving development time, cost, and end product quality, suggesting that leadership contribution must ultimately become visible through conditions that enable teams to perform. Contemporary evidence also demonstrates that managerial support interacts with organisational capabilities rather than replacing them. Trieu et al., (2024) found that organisational agility and digital capability contribute to digital transformation and that top management support moderates these relationships to a certain extent. The implication for automotive NPD is substantial. Executive enthusiasm cannot compensate indefinitely for insufficient technical capability, inadequate staffing, fragmented infrastructure, or unrealistic schedules. When development expectations consistently exceed organisational capacity, teams may reduce experimentation, compress validation, postpone learning activities, or accept unresolved technical compromises merely to satisfy visible project targets. NPD performance therefore reflects whether leadership converts strategic intent into coordinated decisions that improve development quality, speed, commercial relevance, and organisational learning.

Resource alignment has become even more difficult as automotive products incorporate technologies that require capabilities beyond conventional engineering domains. Electrification, software intensive architectures, connectivity, artificial intelligence, advanced electronics, and digital development systems require specialised expertise and substantial organisational learning. Acquiring technology without developing complementary human and organisational capabilities can therefore produce expensive assets that remain poorly integrated into NPD. McTaggart and Loonam (2024) demonstrate that executive support for digital transformation involves multiple managerial actions rather than simple financial sponsorship, reinforcing the need for active orchestration of technological change. Trieu et al., (2024) likewise show that digital capability plays a mediating role in transformation, highlighting the importance of capability development alongside managerial commitment. This creates a difficult investment problem for automotive leaders because resources must support current development programmes while simultaneously building competencies required for future products. Excessive concentration on immediate projects can weaken long term technological readiness, whereas premature investment in emerging technologies can consume resources without generating commercial value. Management must therefore determine which capabilities deserve internal development, which can be accessed through collaboration, and which

investments should be postponed. The central issue concerns strategic resource coherence, where product ambitions, technological requirements, organisational competencies, and investment capacity must be sufficiently aligned for development commitments to remain credible and executable. For automotive managers, this means that process design must connect technical discipline with timely managerial judgement rather than treating governance as a purely administrative requirement.

3.3 Fragmented Knowledge Weakening Cross Functional Development Coordination

Fragmentation across specialised functions can weaken even well designed automotive development programmes when critical knowledge remains confined within departmental boundaries. NPD depends on engineering, manufacturing, marketing, procurement, quality, finance, supply chain, software, and external partner expertise, yet these groups frequently interpret product priorities through different professional objectives. Engineering may favour technical performance, procurement may prioritise cost, manufacturing may emphasise process stability, and marketing may advocate features that strengthen customer attractiveness. Such diversity can improve decision quality when knowledge is effectively integrated, but it can also generate conflict and delayed decisions when no mechanism exists for reconciling competing priorities. Gomes et al., (2001) identify multifunctional senior teams and process champions among the direct mechanisms through which senior management can influence NPD, while organisational mission, goals, learning, and knowledge systems represent important indirect mechanisms. The distinction is important because executive involvement cannot simply replace cross functional integration. Management must establish conditions that allow specialised expertise to interact productively. When senior leaders intervene only after disagreements become severe, development teams may already have experienced substantial delay or rework. The leadership issue therefore concerns the creation of effective knowledge interfaces, shared development objectives, and escalation mechanisms that resolve strategic conflicts without unnecessarily centralising technical decisions. Such coordination protects development momentum because emerging constraints can be addressed before they trigger expensive redesign or delayed commitments.

External participation further complicates knowledge coordination because valuable development intelligence increasingly originates outside organisational boundaries. Customers can contribute market insight, usage knowledge, problem identification, and development feedback, while suppliers and technology partners may possess specialised capabilities unavailable internally. However, greater participation does not necessarily produce better outcomes. Zhang et al., (2024) distinguish customers as information sources from customers as codevelopers and show that their effects on innovation capability depend partly on other knowledge sources available to the organisation. Dean et al., (2024) similarly demonstrate that customer involvement in problem solving and decision making influences product innovativeness and development speed through different mechanisms. Yang and Zhang (2018) add a leadership dimension by showing that management support positively moderates relationships between customer orientation and NPD performance. Together, these findings reveal that the difficulty lies not in obtaining more knowledge but in governing how diverse knowledge enters development decisions. Automotive executives must determine where external participation creates genuine informational value, how intellectual and strategic boundaries should be protected, and which decisions require internal authority. Poor coordination can produce excessive consultation, contradictory requirements, and slower decisions. Effective leadership must

consequently create connectivity without allowing the expanding number of contributors to transform NPD into an administratively complex process that sacrifices speed and accountability. Effective execution therefore depends on clear responsibilities, shared information, and decision mechanisms that allow specialised functions to resolve interdependencies before they become costly development delays.

3.4 Technological Transformation Intensifying Automotive Development Stability Pressures

Rapid technological change has created a difficult strategic tension between accelerating automotive innovation and preserving the organisational stability required for reliable product development. Established firms must continue delivering existing products while simultaneously developing capabilities for increasingly digital, connected, intelligent, and software intensive offerings. This dual requirement places senior leaders in a challenging position because emerging technologies frequently demand new competencies, altered workflows, different investment priorities, and unfamiliar forms of collaboration. Digital transformation research demonstrates that technology adoption produces stronger outcomes when organisational capabilities develop alongside technological resources. Trieu et al., (2024) found positive relationships involving organisational agility, digital capability, and transformation, while management support influenced these relationships to a certain extent. McTaggart and Loonam (2024) similarly conceptualise executive support for digital transformation through a set of managerial actions, illustrating that transformation requires sustained organisational intervention rather than isolated technology acquisition. These findings carry important implications for automotive NPD. Introducing sophisticated digital systems without redesigning development routines, responsibilities, skills, and decision structures may create additional complexity instead of improved innovation capability. Conversely, excessive caution can leave firms dependent on development approaches that no longer correspond with emerging product architectures and competitive requirements. Functional fragmentation becomes costly when unresolved technical trade-offs migrate downstream into procurement, manufacturing, validation, or launch activities. Coordinated early decisions preserve product integrity by resolving competing functional priorities while options remain economically and technically feasible.

Strategic difficulty also arises from uncertainty regarding how quickly new technologies should be incorporated into commercial development programmes. Management may face pressure to demonstrate innovation through visible investments before technical maturity, customer value, or organisational readiness has been established. Such decisions can create costly experimentation that remains disconnected from product strategy. At the same time, delayed commitment can weaken technological learning and reduce the organisation's ability to compete when emerging architectures become commercially important. Zhang et al., (2024) demonstrate that innovation capability mediates the relationship between customer involvement and important NPD outcomes, including innovativeness and speed to market, reinforcing the importance of capability formation rather than isolated innovation activities. Broader NPD evidence from Zhou et al., (2024) further indicates that leadership practices operate within organisational contexts that can either enable or suppress their intended benefits, particularly through job autonomy and cultural conditions. Technological transformation should therefore be understood as an organisational transition rather than a purchasing decision. Automotive executives must balance experimentation with commercial discipline, technological ambition with absorptive capacity, and transformation speed with development reliability. Failure to achieve this balance can leave organisations with fragmented

technologies, competing processes, capability gaps, and unclear development responsibilities despite substantial innovation expenditure. Early knowledge convergence enables managers to compare alternatives before functional commitments narrow the available solution space.

3.5 Strategic Control Challenging Development Team Professional Autonomy

Excessive managerial intervention can become as damaging to product development as insufficient leadership, particularly when complex technical decisions require highly specialised professional judgement. Senior executives possess legitimate responsibility for investment, strategic priorities, organisational risk, and commercial outcomes, yet automotive NPD depends on knowledge that is widely distributed among engineers, designers, software specialists, manufacturing professionals, suppliers, and market experts. When executive authority extends unnecessarily into detailed development decisions, teams may become reluctant to experiment, challenge assumptions, or respond quickly to emerging technical evidence. The resulting dependence on hierarchical approval can weaken development speed and suppress professional judgement. Zhou et al., (2024) provide contemporary evidence that empowering leadership can contribute to new product creativity through job autonomy, while also showing that an error aversion culture reduces autonomy and weakens this relationship. Their findings are especially relevant because they demonstrate that leadership effectiveness depends partly on whether organisational conditions allow employees to exercise meaningful discretion. Gomes et al., (2001) similarly distinguish direct from indirect senior management influences on NPD, suggesting that executives can shape outcomes without personally controlling every development activity. The problem for automotive organisations is therefore not simply how much management involvement is required, but where managerial authority creates strategic value and where it begins to interfere with specialised development expertise. Executive support creates value when managerial actions strengthen both project execution and the organisational capabilities required for subsequent innovation.

Insufficient executive involvement produces an equally serious governance problem because technical teams may possess autonomy while lacking the authority to resolve cross functional conflicts, obtain critical resources, or make decisions carrying significant organisational consequences. Effective NPD therefore requires differentiated decision rights rather than unrestricted autonomy. Strategic portfolio choices, major capital commitments, product positioning, substantial risk exposure, and critical programme continuation decisions appropriately require senior oversight, whereas routine technical problem solving and evidence based engineering choices should remain closer to specialists possessing the relevant knowledge. Zhou et al., (2024) show that job autonomy is an important mechanism connecting empowering leadership with new product creativity, but their results also demonstrate that leadership effects are contingent rather than universal. Yang and Zhang (2018) likewise show that managerial support strengthens customer oriented NPD relationships, illustrating that executive involvement can create value by enabling organisational processes rather than dominating them. Zhang et al., (2024) further demonstrate that innovation capability converts external knowledge into NPD outcomes, reinforcing the importance of organisational mechanisms that permit knowledge to influence decisions. The unresolved issue is therefore one of governance architecture. Automotive firms require leadership systems that combine strategic accountability with professional discretion, allowing executives to intervene decisively where organisational authority is essential while preserving the autonomy required for technical learning, rapid problem solving, and responsible experimentation. Technological capability should

therefore be judged by its contribution to development learning, execution reliability, and future innovation readiness.

4. MANAGEMENT CAPABILITIES STRENGTHENING SUSTAINED AUTOMOTIVE NPD SUCCESS

The strategic contribution of senior management to new product development extends beyond project approval and periodic executive supervision. Its significance emerges from the ability of organisational leaders to create conditions in which development activities receive sustained direction, appropriate resources, coordinated expertise, technological support, and sufficient decision flexibility. This perspective is particularly important in the automotive industry, where product development involves substantial investment, complex technologies, specialised knowledge, demanding quality requirements, and extensive organisational interdependence. Earlier evidence demonstrates that management support can influence development time, design quality, and financial performance, although its effectiveness varies according to technological conditions (Swink, 2000). More recent research also confirms that managerial commitment can strengthen organisational capabilities associated with technological transformation and innovation (Zhang et al., 2024; Curth et al., 2024). These findings indicate that new product development success depends not simply on the presence of supportive senior executives, but on how effectively managerial commitment is converted into sustained and strategically appropriate organisational action.

4.1 Executive Commitment Strengthening Sustained Automotive NPD Performance

Continuity of executive commitment provides an essential foundation for maintaining development momentum when projects encounter uncertainty. New products rarely progress from conception to commercialisation without changes in technical assumptions, customer requirements, development costs, competitive conditions, or resource needs. Senior managers therefore need to preserve confidence in strategically valuable projects while remaining sufficiently responsive to evidence that may require adjustment. Swink (2000) found that management support is positively associated with time based performance, design quality, and financial performance across NPD projects, although technological innovativeness influences the strength of these relationships. This finding demonstrates that executive commitment should not be interpreted as unconditional persistence. Instead, effective support requires informed judgement concerning when projects should be protected, redirected, expanded, or reconsidered. Islam et al., (2009) further connect managerial support with team learning and NPD success, illustrating that leadership creates value partly through the organisational conditions surrounding development teams. Within the automotive industry, such continuity is particularly important because product decisions frequently create subsequent commitments involving engineering, suppliers, manufacturing preparation, testing, and market introduction. Abrupt changes in managerial priorities can consequently generate costs far beyond the immediate project decision. Sustained commitment provides greater strategic clarity and allows development teams to pursue agreed objectives with confidence while retaining the flexibility necessary to respond to credible technological and commercial information. Staged transformation gives managers evidence for scaling new technologies without destabilising established development routines.

Consistency becomes even more important when senior executives must balance long term product opportunities against immediate financial and operational pressures. Development programmes

frequently consume resources before generating visible returns, creating a natural temptation to reduce commitment when organisational performance becomes constrained. Such decisions may protect short term financial outcomes but weaken future product competitiveness if strategically important development activities are repeatedly interrupted. The evidence from Swink (2000) suggests that management support contributes differently across performance dimensions and technological contexts, reinforcing the need for selective rather than reactive executive judgement. Zhang et al., (2024) provide a contemporary parallel by demonstrating that management support moderates relationships involving organisational agility and digital capability, indicating that leadership can influence whether existing organisational strengths are successfully converted into transformation outcomes. Applied to new product development, this suggests that management commitment can amplify the value of development capabilities when leadership remains sufficiently engaged to protect strategic priorities and coordinate organisational responses. Successful development therefore requires more than enthusiasm during project initiation. Senior executives must create governance arrangements that maintain strategic continuity throughout the development process, establish clear criteria for major project changes, and prevent temporary pressures from repeatedly destabilising development priorities. Such continuity strengthens organisational confidence and ensures that strategic product opportunities receive the sustained attention necessary to progress towards successful commercial outcomes. Clear technology governance enables senior leaders to accelerate useful innovation while containing avoidable implementation risk.

4.2 Resource Commitment Strengthening Automotive NPD Execution Capability

Resource commitment provides the practical mechanism through which managerial intentions become executable development activities. Financial endorsement alone cannot secure new product success when development teams lack specialised personnel, technological infrastructure, testing capacity, supplier expertise, market intelligence, or sufficient time to resolve technical challenges. The strategic value of senior management therefore depends considerably on whether executives can mobilise the combination of resources required at different stages of development. Swink (2000) demonstrates that management support contributes positively to important NPD performance dimensions, reinforcing the broader argument that leadership involvement can improve the organisational conditions surrounding product development. Islam et al., (2009) similarly show that management support operates within a broader environment of knowledge acquisition, information interpretation, and team learning. These findings indicate that resources should not be viewed exclusively in financial terms. Development success also depends on knowledge resources, organisational attention, decision authority, and access to complementary capabilities. This distinction is particularly relevant within the automotive industry because increasingly sophisticated products require expertise spanning engineering, software, electronics, manufacturing, quality, sustainability, and market analysis. Effective senior management involvement should consequently ensure that development expectations correspond with the actual capabilities available to project teams rather than imposing ambitious objectives without establishing the organisational capacity required for their achievement. Cross functional leadership must therefore make interdependencies visible early enough for specialists to resolve them before programme commitments become difficult to reverse.

Contemporary technological transformation makes resource decisions more consequential because firms must invest simultaneously in current development programmes and capabilities required for

future products. Zhang et al., (2024) demonstrate that digital capability positively influences digital transformation and mediates the contribution of organisational agility, while management support provides an important moderating influence. Although their study focuses on digital transformation among SMEs, its organisational implications are relevant to product development because it shows that technological resources generate stronger outcomes when combined with suitable capabilities and managerial support. Curth et al., (2024) provide complementary evidence by examining managerial support in relation to environmental innovation strategy, green product development, and environmental performance. These studies collectively suggest that executives should approach resource allocation as capability development rather than simple expenditure. Within automotive firms, investments in digital engineering, intelligent systems, sustainable technologies, and advanced product architectures require corresponding investments in talent, organisational learning, development processes, and external collaboration. A project may possess sufficient financial funding yet remain inadequately supported if critical expertise or integration capability is unavailable. Senior managers should therefore evaluate resource portfolios according to their capacity to strengthen both immediate product programmes and future development capability. Such an approach creates greater strategic coherence between investment decisions and new product development success while reducing the risk that ambitious product strategies exceed the organisation's practical capacity to execute them.

4.3 Executive Leadership Strengthening Cross Functional Knowledge Integration

Successful product development depends on the ability to combine knowledge that is distributed across specialised organisational functions. Engineering, manufacturing, marketing, procurement, quality, finance, supply chain, and technology specialists frequently approach the same development decision from different professional perspectives. These differences can strengthen product outcomes when expertise is integrated effectively, but they can also create delays, conflicting priorities, and repeated modifications when organisational boundaries prevent timely coordination. Swink (2000) demonstrates the importance of design integration alongside management support in explaining NPD performance, particularly under conditions of technological innovativeness. Islam et al., (2009) add a knowledge based perspective by demonstrating relationships among knowledge acquisition, information interpretation, managerial support, and development success. Taken together, these findings indicate that executive contribution should not involve replacing specialised judgement with centralised managerial decisions. Greater value can be created when senior leaders establish common objectives, facilitate information exchange, resolve cross functional conflicts, and ensure that relevant expertise participates at appropriate stages of development. In the automotive industry, this integrative function is particularly important because decisions concerning product design can directly affect manufacturing feasibility, supplier requirements, quality performance, development cost, and customer value. Effective management support can therefore strengthen development success by creating an organisational environment where functional diversity contributes to better decisions rather than becoming a source of fragmentation. Leadership effectiveness is consequently visible in the organisation's capacity to coordinate expertise, absorb new evidence, and preserve strategic direction under uncertainty.

Knowledge integration also requires management to recognise that increasingly important development expertise may exist outside conventional organisational boundaries. Customers, suppliers, technology specialists, research partners, and other external participants can contribute

information that strengthens innovation, but external involvement creates additional coordination requirements. Senior executives must determine which relationships provide strategically valuable knowledge and how external contributions should be integrated with internal development expertise. This challenge becomes especially significant when organisations pursue unfamiliar technologies or new product architectures. Zhang et al., (2024) demonstrate that digital capability depends partly on an organisation's ability to perceive, operate, and integrate digital resources, while managerial support contributes to the broader conditions surrounding transformation. Curth et al., (2024) similarly show that managerial commitment interacts with stakeholder related pressures in shaping environmental innovation and green product development. These findings reinforce the importance of leadership as an integrative mechanism connecting external expectations and knowledge with internal innovation activities. For automotive firms, management should establish clear responsibilities for collaboration, knowledge ownership, technical decisions, and escalation while ensuring that external participation does not weaken accountability. The objective is not to maximise the number of contributors to product development but to improve the quality of knowledge available for critical decisions. Through disciplined integration, senior leadership can transform diverse internal and external expertise into stronger product solutions and more coherent development execution. Executive sponsorship becomes credible when technological investment is accompanied by skills, decision rights, and implementation accountability.

4.4 Strategic Management Commitment Advancing Automotive Technological Capability

Technological capability has become increasingly important to new product development as firms respond to digitalisation, intelligent systems, advanced manufacturing, sustainability requirements, and changing customer expectations. The managerial challenge lies in ensuring that technological investment strengthens development capability rather than becoming disconnected from product strategy. Zhang et al., (2024) demonstrate that digital capability contributes positively to digital transformation and identify management support as a moderating factor within relationships involving organisational agility and digital capability. Their findings show that technology creates strategic value through organisational capability rather than through acquisition alone. This principle is highly relevant to the automotive industry because sophisticated development technologies require complementary skills, processes, data, organisational coordination, and managerial commitment. Senior executives must therefore determine which technologies directly strengthen product development objectives and whether the organisation possesses sufficient capability to integrate them effectively. Investment decisions should be accompanied by workforce development, knowledge sharing, appropriate governance, and mechanisms for evaluating how technology contributes to development performance. Without these complementary arrangements, technological expenditure may increase organisational complexity without improving product outcomes. Strategic management commitment should consequently connect technological priorities with specific development needs, ensuring that investment decisions strengthen the organisation's capacity to design, evaluate, and commercialise competitive new products rather than merely demonstrating technological modernisation. The resulting decision structure supports disciplined adaptation rather than rigid adherence to assumptions that may no longer remain valid.

The same leadership principle applies when technological innovation is driven by environmental and sustainability expectations. Curth et al., (2024) examine managerial support together with stakeholder pressure, environmental innovation strategy, green product development, and

environmental performance, demonstrating that senior leadership is relevant to the conversion of external environmental demands into organisational innovation activities. This relationship is increasingly significant for automotive firms as product decisions are shaped by energy efficiency, electrification, material selection, environmental regulation, and broader sustainability expectations. Executives must decide whether these pressures will be treated primarily as compliance obligations or transformed into opportunities for product differentiation and capability development. Zhang et al., (2024) reinforce the wider strategic logic by demonstrating that organisational capabilities become more effective when supported by appropriate managerial conditions. Senior management should therefore create a clear connection between technological change, product strategy, organisational learning, and long term competitiveness. Development teams require sufficient freedom to explore emerging technologies, but exploration should occur within strategic boundaries that clarify expected customer value, commercial relevance, and organisational priorities. This approach allows firms to avoid two undesirable extremes: resisting technological change until competitive opportunities have diminished or adopting technologies prematurely without adequate organisational readiness. Strategic management commitment creates value when technological ambition is matched with capability development, disciplined experimentation, and clear product objectives capable of translating innovation into measurable development success.

4.5 Strategic Governance Balancing Management Control Professional Autonomy

Effective managerial involvement requires a deliberate balance between strategic control and professional autonomy. Senior executives remain accountable for major investments, organisational risk, strategic priorities, and commercial outcomes, yet detailed product decisions frequently depend on specialised expertise possessed by development professionals. Excessive intervention can slow decision making, discourage experimentation, and reduce the willingness of specialists to exercise professional judgement. Conversely, insufficient involvement can leave teams without the authority or organisational support required to resolve resource conflicts and strategic uncertainties. Swink (2000) provides important evidence that the benefits of management support vary according to technological innovativeness, demonstrating that greater executive involvement does not automatically generate stronger outcomes under every development condition. Zhou et al., (2024) provide a more recent leadership perspective by showing that empowering leadership can enhance new product creativity through job autonomy, although an error aversion culture can weaken autonomy and reduce these benefits. These findings demonstrate that effective leadership should not be evaluated simply by the intensity of managerial involvement. The more important consideration is whether executives create conditions that enable knowledgeable employees to make appropriate development decisions while maintaining alignment with organisational objectives and acceptable levels of risk. Integrated decision forums can convert dispersed expertise into timely product choices while preserving clear ownership of technical and commercial consequences. Joint evaluation of constraints improves decision quality because technical feasibility, customer value, cost, and operational readiness are considered together.

A balanced governance structure can strengthen new product development by clearly distinguishing decisions requiring executive authority from those best handled by specialised teams. Portfolio priorities, substantial capital commitments, major commercial risks, strategic partnerships, and project continuation decisions appropriately require senior management involvement because their consequences extend beyond individual development functions. Technical problem solving, design

evaluation, experimentation, and routine implementation decisions should generally remain closer to professionals possessing relevant expertise. Zhou et al., (2024) demonstrate why this distinction matters by finding that job autonomy mediates the relationship between empowering leadership and new product creativity, while cultural resistance to error can undermine the positive effects of empowerment. Islam et al., (2009) likewise emphasise the importance of learning and information interpretation in explaining NPD success, reinforcing the need to allow development teams to engage actively with knowledge rather than operate solely through hierarchical instruction. The most productive form of management support therefore combines clear strategic expectations with selective intervention. Executives should establish priorities, allocate resources, remove organisational barriers, and intervene when strategic consequences require their authority, while development teams retain sufficient discretion to solve complex problems and learn from controlled experimentation. Within the automotive industry, this balance can strengthen responsiveness without sacrificing accountability, allowing managerial commitment to function as a genuine strategic driver of new product development success. Front-loaded coordination reduces downstream conflict by clarifying dependencies before design choices become expensive to change.

5. LEADERSHIP ARCHITECTURES ADVANCING AUTOMOTIVE INNOVATION CAPABILITY DEVELOPMENT

Strengthening new product development success requires senior management to convert strategic intention into a coherent system of leadership actions that remains effective throughout the development process. This requirement is particularly important in the automotive industry, where substantial investments, technological complexity, specialised knowledge, market uncertainty, and increasingly digital product architectures place considerable demands on organisational decision making. Evidence demonstrates that management support contributes to NPD through multiple mechanisms, including resource commitment, strategic direction, organisational learning, customer orientation, and capability development (Gomes et al., 2001; Yang & Zhang, 2018; Zhang et al., 2024). Accordingly, managerial improvement should not concentrate on increasing executive involvement indiscriminately. Greater value can be generated by improving the consistency, precision, and strategic relevance of leadership actions. The following recommendations address five priorities that correspond directly with the preceding discussion: sustained strategic commitment, resource coherence, cross functional knowledge integration, technological capability development, and balanced governance between executive control and team autonomy.

5.1 Strategic Commitment Institutionalisation Sustaining Automotive Development Continuity

Strategic commitment should be institutionalised through formal governance mechanisms that preserve development continuity while allowing evidence based adjustments when market or technological conditions change. Senior executives should establish clearly defined product objectives, investment expectations, development milestones, risk thresholds, and decision criteria at project initiation, ensuring that participating functions understand the strategic rationale supporting each programme. Such clarity reduces the likelihood that projects are repeatedly redirected according to temporary managerial preferences. Gomes et al., (2001) distinguish direct and indirect forms of senior management influence, demonstrating that organisational mission, goals, learning, knowledge systems, multifunctional teams, and process champions can transmit managerial support throughout NPD. Kahn et al., (2012) similarly identify strategy, portfolio

management, process, market research, people, and performance measurement among important dimensions of NPD best practice. These findings suggest that executive commitment should be embedded within institutional arrangements rather than remaining dependent on individual leadership enthusiasm. Automotive firms should consequently establish executive steering structures that review product programmes according to stable criteria and documented evidence. Strategic reviews should evaluate whether original assumptions remain valid, whether emerging risks require intervention, and whether development priorities continue to support corporate objectives. This approach creates leadership continuity without encouraging blind persistence, allowing strategically valuable programmes to remain protected while providing legitimate mechanisms for modification when compelling evidence demands reconsideration. Sustained performance depends on governance that links resource choices, knowledge flows, decision speed, and accountability to changing development conditions.

Portfolio discipline should complement this continuity because sustained commitment cannot mean preserving every development initiative regardless of changing strategic value. Senior management must differentiate between projects experiencing manageable development difficulties and those whose fundamental technological or commercial assumptions have deteriorated. Cooper (2021) identifies focused development teams, effective portfolio management, resource prioritisation, and accelerated decision processes as important mechanisms for improving innovation speed. Teece et al., (2018) similarly emphasise the importance of entrepreneurial leadership and dynamic capabilities when organisations operate under volatile, uncertain, complex, and ambiguous conditions. Within the Malaysian automotive context, Abdul Aziz et al., (2014) identify management support, cross functional teamwork, NPD process, strategy, and market research as critical factors associated with product development performance. More recent Malaysian evidence reinforces the importance of connecting leadership with strategy, technological capability, and development processes (Yusof et al., 2025). Senior executives should therefore adopt portfolio reviews that distinguish strategic commitment from escalation of commitment. Projects should continue receiving organisational protection when evidence supports their future value, but management should also be prepared to redirect or terminate programmes that no longer justify further investment. This discipline protects scarce resources while ensuring that management commitment remains credible, rational, and strategically focused rather than becoming an unconditional promise to preserve every approved initiative. For automotive managers, this means that process design must connect technical discipline with timely managerial judgement rather than treating governance as a purely administrative requirement.

5.2 Strategic Coherence Aligning Development Priorities Resource Commitment

Resource allocation should begin with a realistic assessment of what each product programme requires to achieve its intended strategic and commercial outcomes. Executives should avoid approving ambitious development objectives before determining whether the organisation possesses adequate financial resources, specialised expertise, testing capacity, technological infrastructure, supplier capability, and development time. Cooper (2021) emphasises adequate project resourcing and focused teams as important conditions for accelerated innovation, demonstrating that development speed cannot be separated from resource availability. Gomes et al., (2001) similarly identify relationships between senior management support and project performance across time, cost, and final product quality. Kahn et al., (2012) reinforce the importance of organisational

practices spanning strategy, portfolio management, process, people, and measurement when examining NPD best practice. These perspectives suggest that automotive firms should introduce formal resource readiness assessments before major development commitments are finalised. Such assessments should determine whether the required competencies already exist, whether capability gaps can be addressed within the expected development period, and whether competing programmes create unrealistic demands on shared resources. Management should also reassess resource adequacy at major development milestones because technical uncertainty frequently reveals requirements that could not have been anticipated during initial planning. Linking resource decisions to evolving development evidence would reduce unrealistic expectations and improve the organisation's capacity to deliver product objectives without compromising quality or development discipline. Capability development gains durability when technology choices are integrated into routines that teams can apply beyond a single project.

Capability building should receive equal attention because contemporary product development increasingly requires resources whose value extends beyond a single project. Digital engineering, artificial intelligence, software development, advanced electronics, sustainability expertise, data analytics, and systems integration represent capabilities that can influence multiple generations of products. Zhang et al., (2024) demonstrate that digital capability plays a significant role in digital transformation and that management support can moderate relationships involving organisational agility and technological capability. Dabić et al., (2023) further show that digital transformation, absorptive capacity, and open innovation can combine through different configurations to generate stronger NPD performance. Witkowski and Wodecki (2025) identify extensive opportunities for artificial intelligence across NPD and product management activities, reinforcing the expanding technological possibilities available to development organisations. Senior management should therefore establish capability investment roadmaps that distinguish temporary project resources from strategic competencies requiring cumulative development. Recruitment, professional training, technology partnerships, digital infrastructure, and knowledge retention should be evaluated according to their contribution to both current programmes and future innovation capacity. Such an approach would prevent firms from repeatedly acquiring similar capabilities for individual projects and would allow development knowledge to accumulate systematically. Resource commitment would consequently become a mechanism for building long term product development capability rather than merely satisfying immediate budgetary requirements. Effective execution therefore depends on clear responsibilities, shared information, and decision mechanisms that allow specialised functions to resolve interdependencies before they become costly development delays.

5.3 Integrated Knowledge Architecture Strengthening Automotive Collaboration Capability

Cross functional integration should be strengthened through organisational structures that enable specialised knowledge to influence development decisions without creating unnecessary bureaucracy. Product development requires marketing, engineering, manufacturing, procurement, quality, finance, supply chain, software, and other specialists to contribute at different stages, yet functional participation alone does not guarantee meaningful integration. Senior management should establish shared product objectives, clear information responsibilities, multidisciplinary decision forums, and escalation procedures capable of resolving conflicts rapidly. Islam et al., (2009) demonstrate that management support moderates the relationship between team learning and NPD success, highlighting the importance of the leadership environment surrounding knowledge creation

and interpretation. Yang and Zhang (2018) similarly show that management support strengthens relationships between customer orientation and both financial and nonfinancial NPD performance. Earlier evidence on knowledge integration further demonstrates that resource complementarity, market orientation, and information sharing can enhance integration across organisational boundaries and subsequently strengthen product innovation performance. Senior executives should therefore measure integration quality rather than simply counting cross functional meetings or committee participation. Useful indicators could include decision turnaround time, unresolved cross functional conflicts, repeated engineering changes caused by missing information, and the timeliness of specialist involvement. This would shift management attention from visible collaboration activity towards whether organisational knowledge is genuinely improving development decisions. Knowledge architecture should ultimately shorten the distance between specialised insight, collective judgement, and accountable development action.

External knowledge should also be incorporated selectively because customers, suppliers, technology partners, and research organisations can strengthen innovation while simultaneously increasing coordination complexity. Zhang et al., (2024) demonstrate that customer involvement can enhance innovation capability, which subsequently contributes to product innovativeness and speed to market, although the value of customer participation depends on the knowledge sources surrounding development. Lu et al., (2024) provide further evidence that customers acting as information sources positively influence NPD performance, whereas customer participation as codevelopers produces an inverted U shaped relationship, with the effects varying according to development stage. Andersson et al., (2024) demonstrate that absorptive capacity enables organisations to acquire and exploit external knowledge in ways that can strengthen NPD outcomes. Bogers et al., (2018) likewise emphasise the broader strategic importance of openness and external knowledge within contemporary innovation systems. These findings indicate that management should not pursue external collaboration simply because greater openness appears innovative. Automotive firms should establish explicit criteria determining which partners contribute distinctive knowledge, at which development stages their involvement creates value, and which decisions must remain internally controlled. A structured collaboration architecture can therefore increase access to external expertise while preserving intellectual property, accountability, development speed, and strategic coherence. Early cross functional dialogue also gives executives clearer evidence when escalation or resource intervention becomes necessary.

5.4 Purposeful Management Commitment Developing Automotive Technological Capability

Technology investment should be governed by its contribution to product development capability rather than by the attractiveness of individual technologies. Senior management should require every major digital initiative to demonstrate how it improves development speed, design quality, technical decision making, customer understanding, testing capability, knowledge integration, or another measurable product development outcome. Zhang et al., (2024) show that digital capability is central to successful transformation and that managerial commitment influences how organisational capabilities contribute to this process. Dabić et al., (2023) similarly demonstrate that digital transformation and absorptive capacity form important configurations associated with stronger NPD performance. Witkowski and Wodecki (2025) identify numerous applications of artificial intelligence across product management and development, suggesting that AI can increasingly support activities ranging from information processing to development decision making.

Automotive organisations should consequently create technology governance committees involving senior management and development specialists to evaluate digital investments according to strategic relevance, technical maturity, integration requirements, data readiness, workforce capability, and expected development value. Pilot implementation should precede large scale deployment where uncertainty remains substantial. Such governance would reduce technology adoption driven primarily by competitive pressure or executive enthusiasm and would instead create a disciplined connection between emerging technological possibilities and actual product development requirements. The strongest management contribution emerges when strategic oversight improves execution without displacing specialist judgement or suppressing experimentation.

Technological transformation should simultaneously protect organisational learning and development stability. Introducing new methods, systems, and organisational structures too rapidly can disrupt established knowledge networks before replacement capabilities become sufficiently mature. Dabić et al., (2023) show that digital transformation interacts with open innovation and absorptive capacity in shaping new product development performance, reinforcing the need to align technological change with organisational learning and implementation capability. Management should therefore adopt staged transformation programmes that combine controlled experimentation, workforce development, process redesign, governance adaptation, and systematic evaluation. Technology should initially be deployed where expected development benefits are sufficiently clear and organisational readiness is adequate. Lessons from pilot programmes should then inform broader implementation. This approach allows firms to accumulate technological experience without exposing entire product portfolios to premature transformation. Strategic leadership can thereby maintain innovation momentum while protecting development reliability, regulatory compliance, technical quality, and organisational knowledge. For automotive managers, this means that process design must connect technical discipline with timely managerial judgement rather than treating governance as a purely administrative requirement. Leadership should connect transformation milestones to observable improvements in development speed, learning, quality, and coordination.

5.5 Empowered Governance Establishing Clear Strategic Decision Boundaries

Decision authority should be redesigned so that senior management remains strategically influential without becoming unnecessarily involved in specialised technical work. Executives should retain authority over portfolio priorities, major investments, strategic partnerships, substantial risk exposure, project continuation, and decisions with significant organisational consequences. Development teams should possess greater discretion over technical problem solving, experimentation, design alternatives, and implementation choices within clearly established boundaries. Zhou et al., (2024) provide strong evidence for this approach by demonstrating that empowering leadership can enhance new product creativity through job autonomy, while an error aversion culture reduces autonomy and weakens the benefits of empowerment. Swink (2000) similarly demonstrates that the effects of management support differ according to technological innovativeness, indicating that managerial involvement should be adapted to development conditions rather than uniformly intensified. The evidence from Gomes et al., (2001) also distinguishes direct and indirect managerial influences, reinforcing the possibility that senior executives can shape NPD outcomes without controlling every development activity. Automotive organisations should therefore establish decision matrices specifying which matters require

executive approval, which belong to programme leadership, and which should remain under specialist authority. Such clarity would reduce unnecessary escalation, shorten decision cycles, and strengthen accountability at appropriate organisational levels. A complementary governance mechanism should strengthen customer and market accountability without allowing external demands to dominate technical judgement. Customer evidence should inform development priorities without automatically determining technical solutions.

Empowerment must nevertheless operate within a culture that treats responsible experimentation and constructive disagreement as legitimate components of product development. Development professionals should be able to question assumptions, report technical problems, challenge unrealistic expectations, and communicate unsuccessful experiments without fearing disproportionate managerial consequences. Zhou et al., (2024) demonstrate that an error aversion culture can undermine job autonomy and weaken the contribution of empowering leadership to new product creativity. Teece et al., (2018) similarly emphasise entrepreneurial leadership as essential to developing the dynamic capabilities required for innovation under uncertain conditions. Badir et al., (2020) show that managerial resources interact with internal and external knowledge resources in supporting employee level open innovation, further illustrating the importance of managerial conditions surrounding innovative behaviour. Senior executives should therefore distinguish intelligent experimentation from avoidable negligence. Technical failures arising from disciplined experiments should generate learning, whereas repeated failures caused by ignored procedures or weak analysis should remain subject to accountability. Development reviews should ask what has been learned, which assumptions have changed, and how new evidence should influence subsequent decisions. This approach would encourage teams to surface problems earlier, when corrective action is less expensive, while maintaining rigorous performance expectations. Leadership would consequently support innovation without sacrificing discipline, creating a stronger environment for creativity, technical learning, and responsible development execution. Effective execution therefore depends on clear responsibilities, shared information, and decision mechanisms that allow specialised functions to resolve interdependencies before they become costly development delays.

6. CONCLUSION

Leadership becomes strategically meaningful in product development when executive commitment is translated into the organisational conditions that allow promising ideas to progress towards commercially valuable outcomes. In the automotive industry, this responsibility has become increasingly demanding as firms confront technological disruption, digitalisation, sophisticated customer expectations, sustainability pressures, intensive investment requirements, and growing interdependence across development activities. The analysis presented in this article establishes that top management support should not be understood merely as executive approval, financial sponsorship, or visible participation in development projects. Its strategic contribution is considerably broader, encompassing the establishment of clear priorities, protection of critical resources, coordination of specialised knowledge, reinforcement of technological capability, and preservation of development momentum when uncertainty challenges established assumptions. The value of senior leadership therefore rests on its capacity to create coherence between strategic ambition and organisational execution. When management commitment provides this coherence, product development becomes better positioned to respond to complexity without losing strategic

direction, enabling automotive firms to pursue innovation with greater confidence, discipline, and organisational consistency.

More importantly, the effectiveness of executive involvement cannot be determined by its intensity alone. Strong leadership does not require senior managers to dominate every technical decision, nor does managerial visibility automatically produce superior development outcomes. Automotive product development relies on specialised expertise distributed across engineering, manufacturing, marketing, procurement, quality, supply chain, software, technology partners, and other professional domains. Consequently, leadership creates greater value when executives establish strategic boundaries while preserving sufficient autonomy for development specialists to exercise judgement, experiment responsibly, and respond rapidly to emerging evidence. This balance between strategic control and professional discretion represents a critical condition for sustaining creativity without weakening accountability. At the same time, resource commitment must extend beyond project funding towards the development of enduring organisational capabilities, particularly in digital engineering, intelligent technologies, knowledge integration, sustainability, and advanced product architectures. Senior management must therefore view individual development programmes not only as opportunities to introduce new products, but also as platforms through which technological knowledge, organisational learning, and innovation capabilities can accumulate and strengthen future competitiveness.

The strategic recommendations developed in this article further demonstrate that sustained NPD success requires leadership practices to become institutionalised rather than dependent on the preferences or enthusiasm of individual executives. Stable governance mechanisms, disciplined portfolio decisions, resource readiness assessments, integrated knowledge structures, purposeful technology investment, clearly defined decision authority, and meaningful performance measures can transform management support into a repeatable organisational capability. Such institutionalisation is particularly important because automotive development environments will continue to evolve as technological architectures, customer expectations, competitive pressures, and innovation requirements become increasingly complex. Leadership must therefore possess both consistency and adaptability, maintaining commitment to strategically important development objectives while remaining capable of revising decisions when credible evidence demands change. The objective is not to eliminate uncertainty from product development, which is neither realistic nor desirable, but to create an organisation capable of navigating uncertainty without sacrificing strategic coherence, development discipline, or innovation potential.

Ultimately, top management support becomes a genuine strategic driver of new product development success when leadership enables the entire organisation to convert knowledge, resources, technology, and innovative potential into products capable of generating meaningful market value. Its most significant contribution lies not in controlling development activities, but in creating an environment in which those activities can succeed repeatedly and sustainably. Automotive firms capable of achieving this form of leadership will be better positioned to accelerate informed decision making, strengthen cross functional collaboration, cultivate technological capability, preserve organisational learning, and pursue innovation without compromising commercial discipline. This perspective elevates top management support from a conventional managerial success factor to a strategic organisational capability with implications for both immediate product outcomes and long

term competitive renewal. As the automotive industry moves towards increasingly technology intensive and knowledge driven forms of competition, the capacity of senior leadership to orchestrate development resources and capabilities will become increasingly decisive. Sustainable NPD success will therefore belong not simply to organisations possessing superior technologies or ambitious product ideas, but to those capable of providing the strategic leadership required to transform such potential into enduring innovation and competitive advantage.

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2. Conflict of Interest

The author declares that there are no financial, professional, or personal interests that could have influenced the preparation or publication of this article.

3. Author Contribution Statement

Mohamed Suhaimi Yusof: Conceptualization, literature review, conceptual development, manuscript preparation, critical revision, and final approval of the manuscript.

As the sole author, Mohamed Suhaimi Yusof is responsible for the intellectual content and final presentation of the article.

4. Ethics Statement

This article is conceptual in nature and is based entirely on published scholarly literature. It does not involve human participants, animals, surveys, interviews, experiments, or the collection of primary, confidential, or identifiable data. Therefore, institutional ethical approval and informed consent were not required. All scholarly sources used in developing the conceptual arguments were appropriately acknowledged and cited in accordance with established standards of academic integrity and responsible scholarly practice.

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