Reimagining Products in a Digital World

Abstract

Changing customer demands, fuelled by the emergence of digital technologies, are compelling enterprises to rethink their product strategy—concept and development. Products are evolving at an unprecedented pace and comprise more digital components than ever before. Digital technologies are enabling products to express themselves, monitor their own actions, and connect with each other. This is leading companies to move beyond their traditional and linear approach to product development, and reimagine the value chain in light of the emerging digital forces.

Embrace Digital Technologies to Reimagine the Very Concept of a Product

Enterprises are racing to revamp product design, manufacturing, sales, and customer service functions to accommodate ever-evolving customer preferences. The disruptive impact of digital technologies is such that product manufacturers are re-evaluating their core competencies, establishing new business models, and strengthening customer relationships to stay relevant and competitive. Developing profitable products is no longer just about achieving supremacy in customer experience and product excellence, but also about ensuring efficiency through the entire lifecycle of the product.

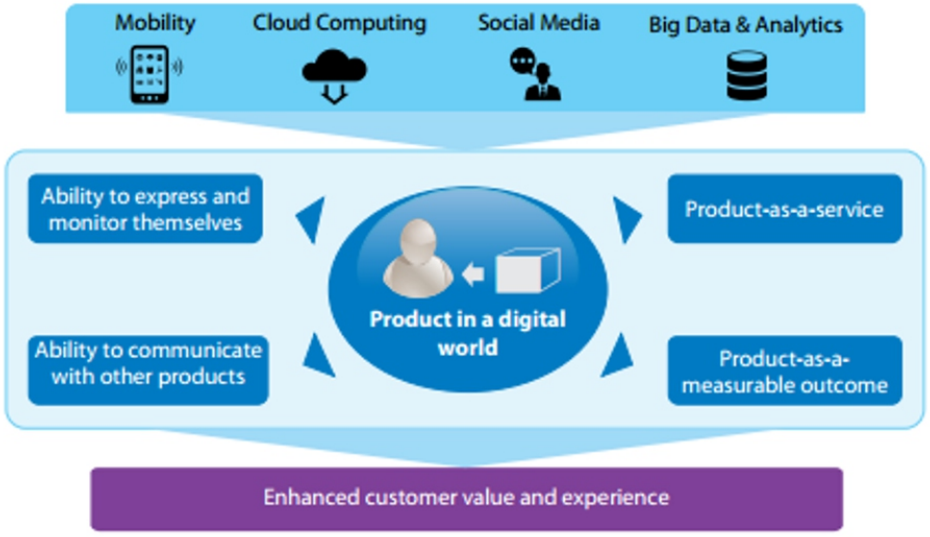

Figure 1: A conceptual view of the reimagined next-generation product

Gartner[1] predicts that in 2016, the majority of average buyers of standard brands in the mature automotive markets will expect access to some basic web-based information in their cars. Gartner also predicts that by end of 2020, more than 80% of new vehicles sold in mature markets will come with connected car functionalities.

Technology advancements that boost connectivity, and the declining prices of devices and processors, are paving the way for next-generation products. Leveraging digital technologies, the industry is rapidly churning out products with embedded smart devices, making them a lot more connected and intuitive. We briefly describe two examples in following sections:

- Connected Cars Prioritize Experience Over Usability

The automotive industry has been at the forefront of adopting digital technologies to change the future of transportation. Disruptive digital technologies are enabling cars to connect not only with their own components but also with other cars, paving the way for autonomous vehicles.

Connected cars are equipped with a wide range of services and systems such as lane change warnings, blind spot detection, and ergonomic warnings. They also provide online in-car entertainment, and offer personalized services. Connected cars also dramatically improve the driving experience through real-time monitoring and diagnostics. Combining crash prevention technologies with connected communication helps enhance driver and road safety. Transportation systems are becoming easier to manage as the connected car feeds real-time traffic data to the concerned authorities. Software features such as vehicle screens, digital services, and other applications, can be periodically updated over-the-air (OTA) for superior performance. Innovation avenues in the automotive industry are thus shifting from core technologies to the emerging digital space.

- Intelligent Drilling Enhances Performance Across the Product Lifecycle

Advanced machinery, equipped with embedded smart sensors, bring in enhanced intelligence across the drilling systems. The sensors and processors operate thousands of meters below sea level and help measure and monitor operational parameters, transmit performance intelligence to the surface and communicate data to operating centers. Decision support tools that interpret the reported data enable stakeholders to take proactive actions and improve service reliability. Intelligent systems are also proving to be useful in addressing challenges across completion and production processes. Intelligent sensors and data communication methods are improving operational flexibility and enhancing accuracy in prediction of downhole reservoirs. Remote operation centers receive uplink data of the well in real time, leading to enhanced monitoring and performance of the reservoir. These systems enable measurable performance outcome, and are instrumental in driving efficiencies throughout the lifecycle of product..

Reimagining Product Development Imperatives

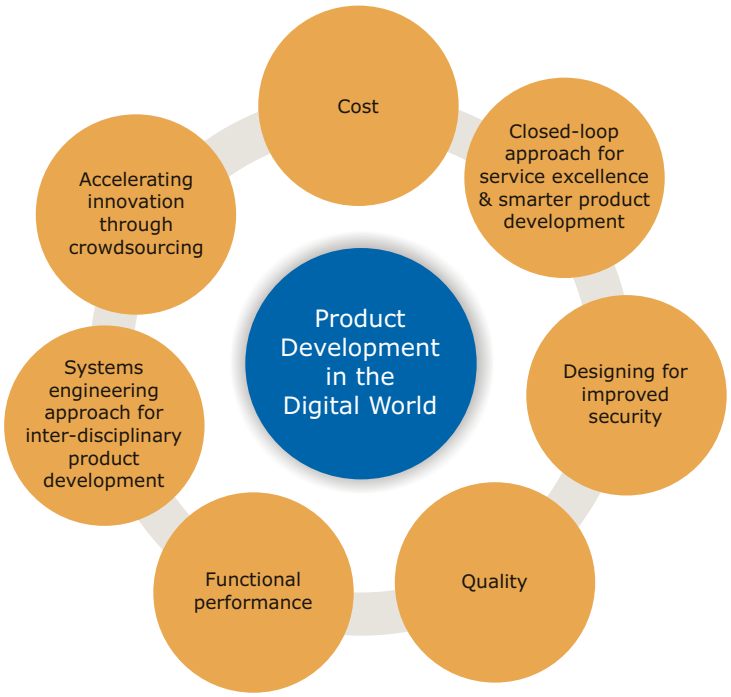

Figure 2: Reimagining product development imperatives

The key product development imperatives in the digital world are:

- Accelerating Innovation through Crowdsourcing

Advancements in social media analytics, and cloud platforms, combined with the wider reach of mobile communication platforms, broadens the choice of channels through which companies can access talent and creativity.

A successful crowdsourcing strategy starts with well-defined and structured goals and objectives, along with identifying the target social media channels and communities. Social media listening tools and Big Data analytics can help segment the crowd based on various factors such as the key challenges, consumer behavior, usage pattern, demography, and consumers of similar products. Another key factor of a successful crowdsourcing strategy lies in understanding the motivational factors of the participating communities and defining the rewarding policies and gamify the entire exercise. It is also crucial to define policies on communication, protection and management of intellectual property (IP) rights at the outset for the communities to function in a healthy environment.

A typical automobile has 10 million lines of code2 to support various features, while Boeing's 787 Dreamliner requires about 6.5 million lines of software code[3].

- Systems Engineering Approach for Inter-Disciplinary Product Development

Electronics and software are becoming vital components in the development of next-generation products. Embedded devices and software help enhance product features—even post product delivery. Today, building software for new car models is as important as the mechanical engineering aspect.

Inter-dependency on multi-disciplinary systems plays a critical role throughout the product lifecycle. This requires processes, systems, tools, and methodologies to support inter-disciplinary product design and manufacturing not only within the company, but also across the supply chain. Systems engineering has emerged as a way to manage the complexity in inter-disciplinary nature of product development.

- Closed-Loop Approach for Service Excellence and Smarter Product Development

The expressive abilities of products, combined with new era communication technologies, Big Data analytics, and economic viability, have opened up new avenues for:

- Service excellence

  Original equipment manufacturers (OEMs) across various industries offer remote monitoring services for machines, equipment, fleets, and plants. The digital forces help acquire data on product performance and operating conditions through mobile communication, carry out prognostics, send alerts, and recommend solutions for increased uptime and improve operational efficiency.

- Smarter product development

  Convergence of digital technologies is enabling the industry to close the loop between product performance and development approach. With the product's ability to express itself, it is possible to gain insights from data related to product usage, performance, operating conditions in the real time. These insights, when contextualized with relevant product development data within the organization can prove extremely beneficial to development teams in building next generation products.

The emergence of new digital technologies blurs the lines between product performance and product development, and provides opportunities for smarter product development.

- Designing for Improved Security

While products in the digital world improve safety, reliability, and flexibility, their inherent complexities also expose them to vulnerabilities. Redefining the concept of security and ensuring

a holistic deployment of its various aspects is therefore vital to a world of connected products. A comprehensive and well-balanced approach involves analyzing various kinds of risks and their impact on individuals, business, and society.

Conclusion

The advent of digital technologies is compelling enterprises to reimagine products and revolutionize product development processes to meet changing customer expectations. Next generation products are part of an ever evolving digital ecosystem that is actively connected. These products use smarter technologies to communicate their state and performance in real time. Enterprises need to revamp the product development processes to accommodate the impact of digital technologies, .thereby ensuring innovative and faster ways of conceptualizing and developing products.

References

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[2] Centre for Automotive Research, "Just How High-Tech is the Automotive Industry" (January 2014), accessed December 08, 2014,http://www.cargroup.org/?module=Publications&event=View&pubID=103

[3] IEEE Spectrum, "This Car Runs on Code" (February 2009)", accessed December 08, 2014, http://spectrum.ieee.org/transportation/systems/this-car-runs-on-code

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