

Enterprise mobile product strategy using scenario planning

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Abstract: The Mobile industry is changing at a rapid pace and so is the behavior of enterprise workforce which uses mobile technologies. When planning for a long-term product roadmap, one has to consider a myriad of evolution trends and forecasts to determine the probable list of product functionality and their introduction timing in the lifecycle of the product. One has to look at the technology trends by market, the competitive landscape, and the mobile worker adoption trends. However, one can only come up with a prioritized list of capabilities by taking into context the company's own core competencies, skill sets, and overall mission. This paper looks at how mobile product companies can use scenario-planning methodology to formulate their product strategy and roadmap.

Keywords: Mobile enterprise, scenario planning, product strategy, wireless technology, strategic framework

To create the future, a company must first be capable of imagining it.

– Gary Hamel and C.K. Prahalad, *Competing for the Future*, 1994

1. Introduction

The introduction of the iPhone in 2007 was a significant event in the wireless industry as it changed the mobile device paradigm. Similar to what Apple did to the digital music market with the iPod, the iPhone has already changed the mobile device industry. Earlier in the PDA world, when Apple's Newton failed, Palm's PalmPilot won rave reviews and saw significant adoption. However, only a decade later, Palm is on the verge of dissolution while RIM and Microsoft are having great success with converged devices. Motorola, having dominated the analog world, missed the digital wireless evolution, ceding market share to Nokia. Subsequently, Nokia was slow to capitalize on the flip-phone mania that led to the emergence of Korean device manufacturers – Samsung and LG. History is littered with examples where leaders and innovative players in one era did not see the next one coming. They were not completely oblivious of the emerging trends; however, they often grossly miscalculated the timing and impact of mass-market adoption growth curves.

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In the face of continuous uncertainty, product strategists are constantly challenged to decide the optimal product mix and release time. How does one work on a long-term product roadmap amidst so many variables and a rapidly evolving landscape? The tool of scenario planning has been used for a long time in many industries through development of various scenarios and their integration into the decision making process. Similarly, customers need to align product availability and maturity with their own business roadmap to ensure that the new technology and products benefit, and not distract, the work force.

However, external scenario assessment without a realistic due diligence of internal competencies will provide an incomplete picture for effective product strategy. Both external and internal scenarios should be designed, analyzed, and used in the same process to give the participants a complete view of pros and cons of each approach and each strategic path.

This paper looks at the scenario-based planning technique to mitigate business uncertainty as it relates to the mobile industry. We will analyze the key inputs to such a process and how they might help in developing product strategies that can carry products and services through a longer lifecycle.

2. Basics of scenario planning

Scenarios help answer the classic “*What If*” question and also help explore how the realization of any specific scenario would impact the product strategy, thus providing a comprehensive set of options of what should be done to ensure favorable outcome. Peter Schwartz, considered a pioneer in scenario planning, said in his book [8], “Scenarios are stories about the way the world might turn out tomorrow, stories that can help us recognize and adapt to changing aspects of our present environment. They form a method for articulating the different pathways that might exist for you tomorrow, and finding your appropriate movements down each of those possible paths. *Scenario planning is about making choices today with an understanding of how they might turn out.*”

Though scenario planning as a business strategy tool for organizational decision making has been in existence for a long time, its use was first brought into corporate consciousness by researchers at Shell to anticipate changes in the world and business landscapes. Starting with Pierre Wack [3,14,15] in the 1970s, a French oil executive at Shell, the oil giant has honed the art of scenario planning with an exceptionally long-term view of things to come.

While Shell focused on bigger global structural changes that might impact the energy and oil markets, and Shell in various strategic contexts, such a tool can also work well in the narrower context of an industry or a sub-segment within an industry. Several authors [1,2,5,8,13] and thinkers have provided guidance in using scenario planning tools across different industry segments such as Telecommunications, Consumer Goods, Health Care, Pharmaceuticals, Travel and Transportation, and many others.

Scenarios capture the range of plausible future conditions within which an organization might have to operate. At the corporate level, the challenge is to build an optimal strategy for each of these possible outcomes and to analyze these strategies to determine the core and contingent elements. This creates the strategic foundation and strategic options necessary for operating with true strategic flexibility [7].

While a lot of research has focused on evaluating external scenarios, as shown in Fig. 1, one must consider internal scenarios to get a complete picture that can drive effective product strategies.

Only by doing comprehensive scenario planning, can one answer big questions like, “Should we make an acquisition?” or “Do we need to hire developers with any specific skill sets?” or “Should we expand into the far-east markets?” or “Does alliance with No. 2 player in the market make sense?,” etc. Then, scenarios can look at various dimensions of uncertainty and evolution while carefully limiting the scope

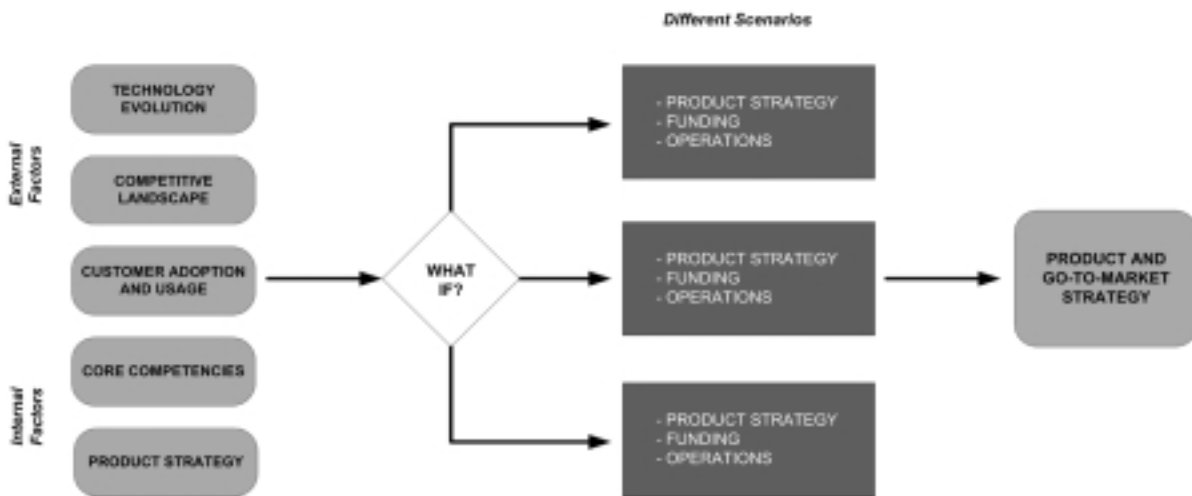


Fig. 1. Scenario planning process.

of both to get a realistic picture and have a manageable number of scenarios to work with. That is where the delicate task of scenario planning becomes important. If the planners are too conservative, they might overlook some critical emerging trends or competitors; on the other hand, if they are overly-analytical, they might waste too many resources and energy chasing evolution paths that have low probability of eventual success.

Scenario planning can help companies better prepare for uncertainties and the changing landscape of markets and global competition. In the wireless world, the convergence of different mediums namely Internet, Mobile, and TV are creating an unprecedented level of friction, introspection, fear, and opportunities (FIFO); and, if companies are not prepared to deal with the evolving marketplace, they are destined to lose market share and miss revenue opportunities on the horizon. It is not that these companies do not see these changes coming; they just have not analyzed the impact of such scenarios on their operations and thus fail to develop effective strategies to deal with the change.

3. Scenario planning in the wireless world

Researchers and planners have used the scenario planning tools in the telecom industry for looking at how technology evolution, consumer adoption, and ecosystem dynamics can play a role developing scenarios. Several organizations and industry bodies have developed “future scenarios” and “use cases” that relate to business case and technologies in the wireless world [6] including ISTAG,¹ Mobile Entertainment Forum (MEF),² ETSI/TIA Project MESA scenarios,³ MIT Project Oxygen scenarios,⁴ Mobile IT Forum (mITF),⁵ NTT DoCoMo “Vision 2010” scenarios,⁶ and Wireless World Research

¹Scenarios for Ambient Intelligence in 2010, <ftp://ftp.cordis.europa.eu/pub/ist/docs/istagscenarios2010.pdf>.

²Future Mobile Entertainment Scenarios, www.boozallen.de/media/file/future_mobile_entertainment.pdf.

³<http://www.projectmesa.org>.

⁴<http://oxygen.csail.mit.edu/Overview.html>.

⁵http://www.mitf.org/index_e.html

⁶<http://www.nttdocomo.com/pr/1999/000868.html>.

Forum (WWRF) Initiative scenarios.⁷

In many cases, planners primarily focused on the evolution of information and communications technologies, and, in other cases, they focused on a specific sub-segment or technology like Broadband, MCommerce (mITF), Public Safety (MESA), Ubiquitous Connectivity (MIT Oxygen), and Applications (NTT DoCoMo). Others focused on use case scenarios and how users are likely to use technologies, applications, and services enabled by such technologies. WWRF constructed three scenarios – Blue, Red, and Green using societal, business, and regulatory trends. The Blue scenario is a world in 2010 where wireless is the dominant technology in connecting people and machines. The Red scenario is where customers are highly experimental, and the Green scenario is a world where customers primarily want to meet their basic communication needs [6]. Players across the mobile value chain have looked at market evolution scenarios to help gauge risks and opportunities.

The crucial question becomes how does one apply these scenarios in their own context, in their own industry sub-segment, and in their own product strategy and planning initiatives. This paper will examine the elements of scenario planning that help formulate product strategy in the wireless world. Though the paper is focused on enterprise mobility, these principles can be applied to consumer businesses as well.

Also, as discussed in the next section, a sound product strategy is feasible only if it factors in the internal realities of the company: competencies, skill sets, and operations.

4. The framework for scenario planning in the wireless industry

The first step is to investigate both the macro- and micro-trends in a given industry segment, in our case, the mobile enterprise market. By understanding the technology trends, evolving customer needs, and by studying the industry trends, one can form the basis of the framework.

Macro-trends

- 1) High broadband penetration
- 2) Always-on connectivity prevalent in campuses and cities, but not ubiquitous
- 3) Most of enterprise employees are enabled mobile workers; functions will evolve as the result of mobilization
- 4) Emerging economies (especially Asia Pacific-China, India) leap to mobile

Emerging customer needs

- 5) Large periodic usage of mobile devices for simple targeted applications - Want seamless, simple access anytime, anywhere on any device
- 6) Power mobile users will perform more, and more sophisticated activities
- 7) Increased need for organizational flexibility and differentiation

Emerging Technology Landscape

- 8) Powerful and diverse mobile devices
- 9) Flexible mobile infrastructure a necessity
- 10) Security is an issue of strategic importance
- 11) Multi access channels

⁷<http://www.wireless-world-initiative.org/>.

12) Industry standards gaining importance (OSGI, etc.)

Industry trends

13) Expansion of innovative business models and services

14) Mobile is another channel

15) Consolidation of infrastructure vendors

Why does a detailed analysis of various trends matter? It has a lot of implications on the overall portfolio and target markets of the company. For example, modeling the prevalence and rate of connectivity can influence a decision to provide an infrastructure for offline access. This adds a layer of complexity to the infrastructure since device management and security become important as well (e.g. data-laden device gets lost). Moreover, levels of connectivity also differ among different segments of the mobile population based on their universe of mobility, functional role, device usage, etc.

Another trend to model out is the possible diversity of hardware/device platforms. One cannot afford to support all platforms. Then, there are varying levels of security to consider. Alternative channels of access such as telematics can add to the complexity.

People realize that they have lost their cell phones long before they do about their wallets. This indicates how mobile devices have become a social necessity. However, mobility is more than just having a device that is connected and wire-free. It is also changing the way we do things.

While one cannot fully predict all the specific future usage of devices in the enterprise sector, one can look for clues in the consumer space for probable patterns in the enterprise space. Because more devices now have built-in cameras, taking pictures (at the point of inspiration) and sharing them has become very prevalent. Gone are the days when reporters had to find a friendly flight attendant to carry precious videotape out of the country; now satellite dishes on portable units are used to transmit text and pictures as they happen in real time. Mobile devices have further redefined the boundaries of photojournalism – this was evident when most of the pictures shown by broadcast media of the devastating tsunami of 2004 were provided by people who took pictures with the cameras on their mobile phones. In this context, the role of a journalist has evolved.

However, this is not limited to the consumer space. This is also evident in the enterprise space. Enterprise mobility is clearly on the move. With more sophisticated devices comes more evolved usage of those devices such as sales people taking product placement and promotion audits with cell-phone pictures of the grocery aisles. Built-in video devices help sales people to show off the company's latest promotions. Now, savvy companies are not only enabling their technicians (with prompts and checklists) to capture information, but also equipping them with the necessary information to sell complementary products with appropriate packages, promotions and discounts. By turning every service call into a sales opportunity, companies produce incremental revenue – at almost zero cost of sales.

Use of GPS in conjunction with corporate data is another, somewhat obvious trend. For example, in Europe, where sales people drive long distances to visit a customer, they often end up wasting a lot of "windshield time" when the customer cancels the last minute. Nowadays, with Customer Relationship Management (CRM) data uploaded through the device and with the advent of GPS, they can easily schedule meetings with other customers in the vicinity.

The above trends are the positive (or momentum) factors pushing the adoption of mobility; however, such adoption can be tempered in an organization considering security and integration issues. While there are many devices coming into the organization through the "side-door," IT departments might not support basic email connectivity to those devices. Furthermore, there are varying levels of commitment to open source. It is true that Linux is quite popular in developing economies as China, but the initial return on investment might not be as high, or worse, product capabilities can be easily copied.

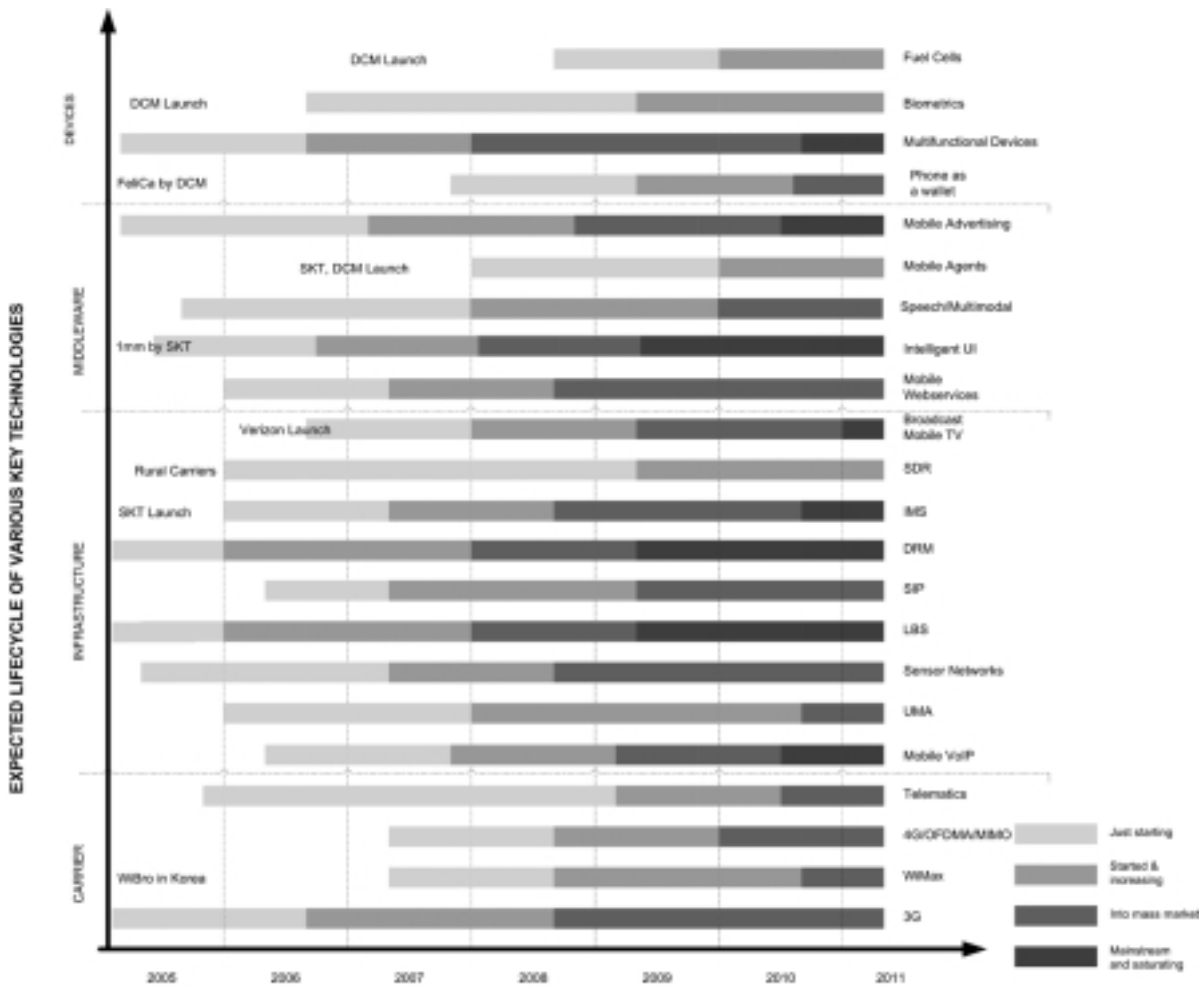


Fig. 2. Expected Lifecycle of various key technologies in North America (Source: Chetan Sharma Consulting) DCM – NTT DoCoMo, SKT – SK Telecom.

We will discuss some of the elements of the framework in a bit more detail below: Technology Evolution, Consumer Adoption and Usage, Competitive Landscape and Internal Assessment.

4.1. Technology evolution

In this section, we will discuss the specific areas that contribute to scenario planning in the mobile world. One of the most significant contributors to the process is the technology evolution path across four major areas: carrier or the network evolution, infrastructure, middleware, and devices. By studying the propensity and velocity of technology diffusion across these four areas, we can get a good understanding of how various components of the technology ecosystem are evolving.

As an example, Fig. 2 shows different technologies evolve at a different pace in North America. Similar trends exist in different countries and regions. If the product strategy does not consider such trends, it is highly likely to fail.

For example, Japan has had 3G networks since 2001 and has crossed the 80% penetration mark; but in North America, the penetration rates are over to 25% as of Q4 2007 [10]. Meanwhile, in India and China which are the two biggest growth markets, 3G spectrum hasn't been allocated yet. Therefore, if there are software products or devices that need 3G to succeed, timing the product entry into the market is essential. In the mid-nineties, Worldcom and Vulcan Ventures funded a company called Metricom, which garnered a very loyal user-base (primarily on west coast of US) for its high-speed wireless services. However, with the advent of 2.5G service, users demanded nationwide coverage and Metricom could not expand fast enough and grossly overestimated its potential subscriber base. As a result, the company shut down in 2001 after burning through billions of dollars.

Another trend that is important to the enterprise is the penetration of the converged devices or smart phones that enable mobile workers to integrate corporate applications on their devices. As of 2007, the converged device penetration in North America and Western Europe was around 12% [11]. Even though such devices constitute an increasing percentage of the new devices sold, the overall subscriber base is relatively small. If the target device for the software of an enterprise software company is a converged device, then its potential market is dictated by the growth in the converged device subscriber base. A careful assessment of the growth patterns of such devices across geographies and targeted vertical segments is critical to rolling out the respective products and upgrades. Instead of waiting, many companies have released browser-only version of their applications and, as such, are able to target a much larger audience. The obvious compromise is the user-experience – browser-based applications are typically less user-friendly than their thick-client counterparts.

4.2. Consumer adoption and usage

Next, product planners need to study the potential adoption, usage, and impact scenarios of their users. For example, let us consider a telecommunications field work force and how mobile technology might help them in their daily tasks and, consequently, affect their behaviour. By applying "A day in the life of" scenarios, one can construct use cases that describe how the user requirements, expectations, behavior and task adaptation might evolve in the future. Table 1 shows a comparative analysis of how telecommunication workers might accomplish some of their tasks in 2010 compared to 2007. Such an exercise incorporates three primary sources of input: observation of lead users behavior, usage of technology in adjacent user markets (e.g. in consumer markets) and brainstorming. This can provide valuable insights into a product's design and functional specifications.

Table 1 compares the life of a telecommunication worker in 2007 and 2010 and how one would accomplish tasks in these two scenarios. For example, such mobile workers typically receive their work instructions at the start of the day and they plan their route accordingly. As of 2007, most of this was done in a semi-automated fashion with workers picking up print outs from service depots and looking at maps to chart out their daily workflow. However, with the advent of more sophisticated devices and applications, such mundane tasks will be automated, in most cases, such that the worker does not waste time driving to the depot or figuring out the route, while the workflow will all be automated and pushed to the device. Similar automation in invoicing, troubleshooting, time management, information access, and coordination will be expected within 2–3 years.

Consumer adoption and usage process can be studied through focus groups, trials, and user-interaction. It helps in gauging and prioritizing user functionality. By laying over the user-expectations and technology evolution over a product roadmap, managers can ascertain which areas need work, in what time, and how the resources should be allocated. In 1997, Mobilestar entered the market as a wireless LAN

Table 1
Telecommunication worker task completion scenarios in 2007 and 2010

Tasks	2007	2010
Receive target list of work orders for the day	Print-out at the service depot	Download in the morning. Avoid going to the depot
Route and visit planning	Generally given the tasks in a given neighborhood. Field tech plots out their path or have maps handy	Automated and real-time route and visit planning
Look-up information on status of the line and pre-visit troubleshooting	Typically done at the depot or switch	Anywhere, anytime
Troubleshooting (in exception cases)	Call to dispatcher/depot/ colleagues	Access to drawings, etc in real-time and hence quicker resolution. Live video feed of the situation for quick consultation
Invoicing the customer	2–7 days	On the spot
Signature capture	On paper or through a non-integrated app	Integrated into application and back-end
Exception/emergency requests	Alerts, Call the field-tech to coordinate	Automated coordination
Parts lookup and ordering	Typically at depot or call to dispatcher	Real-time inventory lookup and ordering
Request capture and follow-up	Voicemail or end-of the day follow-ups	Creation, follow-up on requests in real-time
Time management	Prioritizes based on their view of the world	System helps prioritize tasks, client communication, and interactions.
Coordination with colleagues	Typically offline process that takes a long time to accomplish	Real-time look up of availability, modes of communication
Analytics to look at trends, patterns, exceptions	Typically run on PCs, not in-real-time	Graphics capability. Processing capability to run queries. Ability to share results and act on analytics result (collaboration).
Information access	End-of the day follow-up or call to office/colleagues. No real-time access to intranet	Access corporate Intranet, other nets from cell phone with capability to forward, access documents etc.
Timesheet and travel management	End-of the day or later in the week activity. Issues with entry of receipts. Prone to errors and abuse	Automated timesheet entries.
Search for information	Hard to do on mobile, typically done back at the office or call to HQ	Mobile search that returns relevant and timely results. Input can be text, picture, RFID scan, etc.
CRM	Summary information with work order	Access to all customer records
In-vehicle productivity	Primarily limited to voice. No integration with applications	Access to content using speech technology
Work-life balance	Devices and applications are not conducive to work-life balance	Efficiencies increase work-life balance
Overall User Experience	Poor. Different UI/interface for different data needs	Context driven, Push based, Great user experience

hotspot network and was funded by deep pockets like Intel and IBM, but failed to gain traction as it realized that revenue generated by tepid usage is significantly smaller than the resources required to build out a nationwide network. Similarly, Teledesic, a company focused on satellite communication, burned billions of dollars but failed to understand the simple economics that there is no demand for phone services that cost \$1/minute no matter how “cool” the idea of “anywhere, anytime” communication might sound.

4.3. Competitive landscape

As we mentioned earlier, due to the forces of convergence, competition can arise from unexpected places. While product companies need to keep an eye on traditional competitors, it is more important

than before to scan new upstarts or new entrants and strong financially-backed players, who could target their area of dominance in different and unexpected ways. How would one go about dealing with such unplanned strategy disruptions (for example, a startup focused on a functional niche starts to capture meaningful market share)? Does one react by building such the feature/functionality into the product or do they just buyout the company at low-cost rather than investing in their own product development? Does the competition have superior Intellectual Property or financial muscle? Telecommunication operators completely missed the Internet advertising boom while Google and the likes leveraged the operators' networks, and capitalized on the search-driven Internet economy. Now, wireless carriers, fearing that history might repeat itself with Internet brands dominating mobile advertising, are aggressively trying to wrest initiative.

Similarly, while Palm captured the initial PDA market with a simple and easy to use user-interface, it failed to recognize that users would demand more functionality that had become possible with constant improvement in device form and functionality. Some financially strong players can absorb mistakes and oversights, while others are not that lucky. For example, Microsoft is traditionally good at a "fast follower" strategy. The company missed the arrival of Internet, Search, and Advertising but has been quick to respond once it realized the evolving dynamics in the industry. Though it completely dominated the browser wars, Microsoft has been struggling to gain market share in search advertising. To challenge Google's dominance, Microsoft attempted (but failed) to acquire Yahoo, the number two player in the industry in early 2008.

Additionally, regional competitive forces help shape product strategy as well. For example, while Openwave, a company that was instrumental in getting mobile web to the market, was quite successful in the western world, it failed miserably in the two biggest growth markets, India and China. Because Openwave did not have an effective strategy against regional players, companies like Jataayu and others were able to forge closer relationships in the ecosystem, and thus, were able to effectively out-compete the company in those markets.

4.4. Internal assessment

Modeling out the macro trends is only half the issue. The other half of the puzzle is the mission and core competencies of the company. Trend assessment and analysis of the competitive landscape give one a good snapshot of the market, but how does one position oneself in that landscape? What can the company do well? And continue doing it in the face of growing competition? Does the company have enough of a differentiating "moat"? Does the company have the needed skill sets to deliver on time or much faster than the competition?

For example, today mobile has been most relevant in the revenue-generating roles (sales, management) or in the most-expensive customer-interaction roles (e.g. service). There are promises of high productivity, improved customer service, better visibility of field activities for these roles; and, moreover, some of these segments are tech-savvy, have budgets, etc. But providing mobile software for these roles is not enough. The critical missing piece is the data. Most enterprise applications are rendered useless as soon as the mobile worker steps out of the office, because much of the activity of customer-facing or mobile professionals is dependent on timely and accurate access to information and processes they need for their work. Customer organizations are spending millions of dollars on CRM systems, for example, to support the activities of sales and service people, but as these people are mostly mobile, the value of the CRM implementations is dramatically reduced without the needed mobile support. So, the mobile software needs to integrate with the backend software. Some users will have the patience to try and work

with the system, but many will not after the first few initial trials. If the data is stale or incorrect, the workers will stop using the application.

Then the critical and pertinent questions become: How does one integrate this data? How easy and cost-effective is it?

Moreover, customer organizations have complex needs and require a basic foundation to build upon with more evolving mobile needs. It is not enough to have devices that provide browser access to the data. This necessitates an infrastructure. Does the company have the skill-sets or resources to build it for customers? There are many cases of companies who might be first or fast-movers, but that lead lasts only a small time when a more-resourced company copies it and does it more effectively and efficiently with a broader reach.

So, it is not enough to have a framework to model trends. It is more important to have a framework to evaluate the trends with the flexibility to accommodate changing patterns and address the following fundamental questions:

- 1) What is the overall mission? What drives our company?
- 2) Where do we want to be?
 - What significant problem are we trying to solve?
 - Why do we want to solve it?
 - What does mobile mean for us?
 - Is mobile core or an extension?
- 3) How will we get there?
 - Will we provide applications? Infrastructure? Hardware?
 - What are the complementary products and services needed to provide the solution? Will we be integrated or best-of-breed?
 - Do we need to work with partners? How do we prioritize them?
 - How will we go-to-market? Can we do it alone? Do we have access to the right channels?
- 4) Why will we be successful?
 - What can we provide the solution better than anyone else? Do we have the credibility?
 - Can we sustain the advantage over the next 3 years? 5 years? 10 years?
 - What are the major risks to this position? How will we address the different probable scenarios?

This first exercise will differ based on the size, maturity, and current business of the company. However, it is necessary to create a straw man based on an initial analysis of the needs. It can evolve and crystallize with further analysis. Usually point 4 is the hardest to address. It is human to be susceptible to heightened self-confidence and ignore some fundamental flaws in one's strategy.

At SAP, a large enterprise vendor, deliberation on point 4 was the foundation for the critical scenario planning exercise, with a prioritized focus on detailing the 3-year goals towards attaining its mission. The team knew that to be successful, in the context of the current market and evolving trends, the company had to build both applications and middleware. Moreover, the product team recognized that they could only succeed in mobile by building out a healthy ecosystem. The ecosystem expanded both horizontally and vertically along the value chain.

However, all the goals worked toward the unique traits that would make SAP successful and differentiate the company in the marketplace. These traits become the core competency. In the case of SAP, the mobile team had to ensure that this was in close alignment to the core competency of the overall organization.

Examples of competencies can be product-based as flexibility and ease-of-use or services-based. One thing was clear – that the competency had to last the test of time, at least the next 5 years, even in the midst of continuing change in a fast-paced industry such as mobile. So, the competency had to be broad enough. Moreover, scenario modeling was very pertinent. What if the industry changes in another direction? What if a competitor comes with a very different business model that could disrupt the revenue stream? For example, in the software industry, Salesforce.com was a disruptive force for incumbents like SAP and Oracle. However, as the industry soon learned, that while a subscription on-demand model keeps the costs predictable for customers, integration of data with other systems is equally important. Existing suite vendors such as SAP had the advantage of integration. Sustaining that advantage, SAP could buy itself some time to deliver an on-demand offering as well, while also providing integration, thus posing a serious competitive threat to the newcomer. In addition, every goal the team set would enhance this competency, to be better at this than anyone else. For other areas, it was acceptable to be good enough or even behind other competitors (for example, some device manufacturers might compromise on battery life for the benefit of weight).

If the competency is product-based, then the entire portfolio should inherit those characteristics. Usually these differentiating characteristics become part of the platform on which the portfolio is built. Non-core characteristics can be the basis of partnerships/outsourcing/in-sourcing agreements. Segmenting characteristics, although non-core, can help expand into new markets (for example, Tylenol Day vs. PM on the same Acetaminophen platform).

Another important variable to model out is the availability of skillsets. This decision can be very critical in building out the platform. Many software companies have learned the hard way that Java programming skillsets are not easily transferable to J2ME. Moreover, one has to also model the social factors. While J2ME skills may be found in India, attrition is a serious consideration. Hence, it is urgent to model out this constraint. Moreover, the variable might not only include availability of resources over time but the distribution of resources between platform and applications.

With the overall mission and goals set out, the next step is to define the roadmap in the following order: initial target segments, growing capabilities for those segments, and new segments. This exercise employs all the different techniques of portfolio management: strategic buckets, scoring model, 2 X 2 charts, and NPV (Net Present Value). What is important is not only to consider which is the largest and/or fastest growing market, but also where can one be both differentiating AND sustain that differentiation over time.

This might require re-evaluating the trends in the context of this information and analysis. One other facet of information is the feedback from one's customers. However, this can be a double-edged sword. It is quite common for large companies in the software industry to cater to the "long-tail." In other words, the company's portfolio includes a few large winners and a lot of niche low or negative-return businesses. This happens because large customers dictate their specialized needs into the standard products, or as is common in the software industry, the vendor productizes its custom consulting project.

Hence, it is very critical to normalize the feedback by analyzing all the win-loss statements/bug-reports/interviews/focus group feedback and compare to the trend and scenario analysis. What is most important is to be able to explain any perceptible difference with a defensible cause.

4.5. Additional factors

In addition to considering technology evolution, consumer adoption, and competitive landscape, one must consider external factors that can impact product strategy namely economic factors like inflation,

political change, trade disputes; industry mergers and acquisitions (M&A) like a key partner acquired by a key competitor; awards of important patents to rivals that might hamper one's product design, etc. Such factors should be considered with a keen sense of likelihood such events might take place.

Only by understanding the complete multi-dimensional picture can one devise various scenarios and a tactical and strategic response to each plausible scenario that influences the product strategy.

While there is always a lot of uncertainty, it is a good final exercise to draw out a five-year roadmap, clearly identifying the variables, constraints, and best-and worst-case scenarios. There should also be clear KPIs (Key Performance Indicators), more transparent and measurable with time. This helps to ascertain changes in the landscape and track the variables. Clear KPIs can also bring to surface unforeseen variables.

Hence, the entire exercise is an iterative process, which includes both a framework to model trends, and has a company-specific framework to evaluate the trends that has the flexibility to accommodate changing patterns.

5. Recommendations

As we discussed in the previous section, one must take a holistic view of the potential future – both by understanding the impact of the external factors such as the technology evolution, the competitive movement, and the shifts in consumer behavior, as well as, keenly assessing the internal dynamics within a company. By having, a firm grasp on both aspects of scenario planning, executives can make much better decisions. This becomes particularly important in a rapidly changing industry landscape as communication and computing industries continue to collide, and forces of globalization render the national boundaries useless.

While scenario planning is an effective technique to help develop a solid product strategy, one must not fall in the common traps that can make the process cumbersome and ineffective. One must be cognizant of potential traps that can render the whole exercise useless.

Following are six recommendations to make your scenario planning process better:

1. **Gain management support** – Like with any other important project, scenario planning needs to have full upper management support and it should not be relegated as an exercise to keep the staff busy. The recommendations that come out of scenario planning should be seriously considered, debated, and merged into the product planning process. Scenario planning should be embraced across the chain of command.
2. **Include diverse inputs** – A scenario that merely conforms to conventional wisdom and existing thought process is of little use. Product planning and strategy should always include input from diverse teams such as product planning, development, marketing, sales, intellectual property and legal counsel, and if applicable, partners. The team should also have a good mix of management and staff. Diversity in viewpoints is necessary for good scenario planning exercise. More importantly, it can be a fatal error to limit the input to internal teams: the assumptions should be frequently and consistently tested with customers, their users and customers, industry experts, venture capitalists, researchers, etc.
3. **Have realistic goals and expectations** – Scenario planning is not a panacea that will solve all strategic problems. It is but a tool that can help in narrow down the focus by considering different inputs. It provides a framework for discussion and evaluation.

4. **Develop clear roadmaps** – The result of each scenario planning exercise is a set of requirements, specifications, and product roadmap that have a direct impact on product plans and strategy. The number of scenarios should be limited to the very relevant and plausible ones rather than considering the whole universe. Scenarios should focus on the long view and not be carried away by current events and existing marketplace.
5. **Scenario planning process should be tightly linked with product planning process** – As we discussed earlier, technology trends and competitive landscape are important inputs to the scenario planning process. If new trends emerge and the competitive activity changes, such plans and process should be adaptive enough to change and affect the product planning process. It is important to learn from scenario planning and feedback the output right into product strategy or else the process won't be efficient. The planning process should also take into consideration risks and concerns outlined by the team.
6. **Simulate, Learn, Act** – It is important for scenario planning team to come up with new and strong strategic options. With each milestone or event, company should learn and make the process of scenario planning better.

Scenario planning is a strategic conversation within a company to effectively frame the strategy and planning efforts to make cogent decisions. Managers should be willing to structure their financial resources to take into account the contingent elements and to reflect the market uncertainties, which are part of the scenario-planning framework.

6. Conclusion and future research opportunities

Mobile industry is evolving at a rapid pace and colliding with various other ecosystems (media, entertainment, online, enterprise). The pace of change itself is accelerating with each product cycle and companies need to learn to adapt in sync. Action is not just about doing. It is about being prepared to do. The most effective action will come from a state of readiness, and foresight helps create readiness. We all need to accept uncertainty. Strategy and plans are great, but surprises should be assumed. If one gets there early, one is more likely to be prepared to deal with FIFO (adapted from [4]).

By understanding the technical evolution across networks, infrastructure, middleware, and devices, by doing competitive analysis of the mobile ecosystem as well as overlapping and surrounding industries, by considering user behavior, acceptance and diffusion of technology, and by looking at external factors that could potentially change the game such as M&A, economy swings, and other events that we haven't been able to contemplate, a product strategy process can be best prepared for change and uncertainty to both tackle adverse times as well as tap into an emerging opportunities.

As discussed in the paper, external scenario assessment without a realistic internal due diligence will provide an incomplete picture and feedback into the product strategy formulation process. Both external and internal scenarios and assessments should be designed, analyzed, and used in the same process to give the participants a complete view of pros and cons of each approach and each strategic path.

The strategic framework for product strategy can be further refined by taking a look at a number of mobile enterprise product launches in different categories such as corporate email, mobile CRM and Field Force Automation (FFA) applications, mobile virus and security products, mobile middleware platforms, and others. By studying various case studies in detail, we might be able to further refine the techniques and factors discussed in this paper. Also, in each of the categories discussed (technology evaluation, customer behavior, internal assessment), one can study the best practices of success stories to further add value to the strategic framework using scenario planning.

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