Identifying a Global "Innovation Mirror" for Selected Industries in Turkey

The CEMS Business Project in collaboration with A.T. Kearney in Istanbul

Nova School of Business and Economics
Master of Science in Management
Work Project

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1. Overview and Context of the CEMS Business Project at A.T. Kearney Istanbul

Company Overview. A.T. Kearney is a leading, international management consulting firm founded in 1926. Today it comprises 59 offices in over 40 different countries, with more than 3000 employees and $1 billion in global revenue in 2013. Innovation management is among the core capabilities of A.T. Kearney. Alongside the European Commission it has established the IMP^{3}rove academy on innovation management for SMEs, hosts the annual "Falling Walls Lab" identifying the Young Innovator of the Year and has extensive experience in innovation competitions across countries. The CEMS business project took place in the Istanbul Office.

Market Overview. Turkey is considered to have the world's 16th largest economy in purchasing power parity terms (IMF, 2013). Throughout the past years, the Turkish economy has enjoyed steady growth in GDP and exports, a stable inflation rate and relatively low debt to GDP ratio (EIU, 2013). However, short-term economic trends, such as interest rate hikes, foreign exchange volatility, increased current account deficits and political conflicts, have challenged this growth, deteriorated asset quality and increased market risk and uncertainty (Colombo, 2014). Despite these conditions Turkey pursues an ambitious 2023 vision, which includes increasing exports from $153 billion to $500 billion by 2023 (TIM, 2014). Export value growth can be achieved through a shift from qualitative to quantitative growth via innovation. However, Turkey performs modestly in innovation, as revealed by many global innovation indices (Bloomberg, 2014; GII, 2013; WEF, 2014; World Bank, 2012). Despite a healthy National Innovation System and supply-side supportive measures, such as subsidies for R&D activities (TÜBITAK, 2013), coordination is lacking; overall R&D expenditures are low, there is a weak venture capital market and policies governing the transfer of knowledge are missing (OECD, 2012). Therefore, new initiatives have been instigated to increase innovation efforts across industries.

The Client. Since 2012, the Turkish Exporters Assembly (TIM) annually organizes the Innovation Week (IW). A.T. Kearney Istanbul acts as a strategic partner to TIM and will help TIM enhance the event with the innovation competition "Innovalig". The initiative is directed to help Turkish firms enhance their innovation management capabilities. Any firm can participate by completing a survey, which will assess the firm's innovation management capabilities along the lines of A.T. Kearney's House of Innovation (Appendix I). Each firm will then receive a detailed feedback report based on their survey. Also based on the survey results, 5-10 nominees

will be selected in different categories, such as innovation strategy and innovation results, to compete in the competition. The nominees will present their innovation approach during the IW to a jury who will select a winner. The IW will be held in November.

The Challenge. Initially, the business project challenge was to analyze the innovation management capabilities of Turkish firms based on the survey results, identifying strengths, weaknesses, opportunities and gaps in comparison to global innovation management best practices. However, during the course of the project, the challenge and scope of the project had changed due to delays in the overall project; the survey ended on 31 May. Thus, the final challenge was to create a global innovation "mirror" of industries represented by TIM. The global innovation mirror constitutes global, game-changing trends affecting each industry and their impact in terms of innovation within each industry.

Methodology. First, innovation was defined along the lines of Miller and Miller (2012) according to focus and degree of novelty. Secondly, a four-step framework was used to analyze each industry. Starting from macro drivers as defined by A.T. Kearney's Global Business Policy Council (Appendix II), five to six industry specific trends for each driver were established. Of these, game changing trends for each industry were identified and assessed according to their innovation response, constituting the innovation profile. Finally, a short-term and long-term hypothesis of innovation focus was formalized (Appendix III). Twelve global industry innovation mirrors were created based on desktop research (Appendix IV). For four industries 30 innovation ideas were collected.

Results. The game changing trends identified are industry-specific. However, a more holistic analysis revealed that all industries seem to be driven by a similar set of game changers. Most of the game changing trends can be clustered around five main areas: a change in demand, normally constituted by a shift in economic power from developed towards developing countries with an increased focus on consumer preferences in latter countries; industry convergence, allowing for the creation of a new class of products or services leveraging those industries' capabilities; social and environmental sustainability; new industry-specific business models; and heavy utilization of big data. While distinct industry dynamics and game changing trends give rise to different innovation responses within each industry, most industries respond to these trends through process innovation in the short-term and through product innovation in the long-term.

The global innovation mirrors provide the basis of discussion about how Turkish firms can capitalize on trends through innovation to increase Turkey's competitiveness.

2. Industry Convergence and Innovation Response

Innovation does not take place within only one industry; industries are converging. Industry convergence is defined as the blurring of boundaries of two or more separate industries (Greenstein and Khanna, 1997; Pennings and Puranam, 2001). It can be driven by technology, changes in consumer preferences or deregulation (Hacklin et al., 2013; Stieglitz, 2003) and can result in new industry dynamics such as increased competition, lower entry barriers, alliances or vertical integration (Bröring et al., 2006; Greenstein and Khanna, 1997). For firms, this increases uncertainty and can pose both opportunities and threats. If not addressed adequately, firms will not be able to capitalize on opportunities or counter threats, potentially rendering their business obsolete. One way to cope with industry convergence is by means of innovation (Hacklin, 2010). However, firms within industries often see their industry as silos and are unable to detect blurring boundaries. Even if they do, they do not know how to take advantage of it (Bröring and Leker, 2007). To capitalize on opportunities of convergence, it is imperative to communicate possible converging industry boundaries, their impact and possible innovation responses, for instance, through open innovation platforms. TIM's IW serves as such a platform. Firms in converging industries have the chance to get into contact with each other, fostering information exchange and possible collaboration. To further enhance the findings of the industry analysis given by the business project for the IW, an industry convergence analysis with respect to innovation can be conducted, better detecting blurred boundaries between industries and its innovation implications for Turkish firms. As a result, a more systemic approach to innovation can be made during the IW.

2.1. The Original Approach and its Limitations

Although there were two attempts to address industry convergence within the scope of the business project, the issue of industry convergence and its implications for innovation remains underdeveloped. The first attempt to detect industry convergence between industries was made in the initial phases of the business project within the scope of the original challenge. At this stage, a macro and industry-level assessment of Turkey in terms of innovation was made. This assessment included analyzing the current innovativeness of key industries in Turkey on a macro

level, which involved Turkish industry profiles, global trends in that industry and innovation practices of Turkish firms. The industries comprised manufacturing, consumer goods and telecommunications. As a final stage, it was attempted to establish possible 'spillover effects' between these industries. However, 'spillover effects' were not adequately detected as the analysis was done on the basis of limited information and understanding. The main focus of this phase of the project was the macro-level assessment of Turkey with respect to innovation and not the dynamics of certain industries. Therefore, the term 'spillover effects' does not adequately address industry convergence. Hence, it is an unsophisticated analysis of converging industries, which was not further discussed. The second attempt was made within in the scope of the global innovation mirrors. In this approach, industry convergence was addressed as game changing trends amongst industries. Its impact on innovation within that industry was developed along the lines of innovation focus, i.e. product, process, position and paradigm, and was mentioned at times in the innovation profile and hypotheses. However, the profound impact of convergence on the industries remains largely underdeveloped in this approach, as the industries are analyzed as stand-alone entities with well-defined boundaries. A more in-depth analysis of industry convergence and its impact on each industry can be done when industries are analyzed together.
A joint analysis of the industries, as proposed in the next section, will address these limitations.

2.2. A Framework of Analysis for Industry Convergence and Innovation Response

To best determine whether or how industries are converging, and how they can respond in terms of innovation, the following framework can be used (Appendix V).
The first step is to compare the industries on the basis of the identified game changing trends as defined by the global innovation mirrors. This will help determine if the industries are driven by convergence and to which extent the boundaries between these industries are becoming blurred.
The next step is determining the type of convergence between the industries. There are many different types of industry convergence defined in the literature, ranging from technological and product-based convergence (Stieglitz 2003), substitution/complementation and supply/demand convergence (Penning and Puranam, 2001), technology-driven input-side and market-driven output-side convergence (Bröring and Leker, 2007) to industry convergence as a process (Hacklin et al., 2009; Hacklin, 2010). The most pragmatic, yet comprehensive, approach to industry convergence for this analysis can be defined along the lines of Greenstein and Khanna (1997) in terms of convergence in complements or substitutes. Convergence in substitutes occurs

when previously different, interchangeable industries' products or services share features and provide the same function to end-users. The firms within these industries become competitors as their industries merge (1+1=1). Convergence in complements occurs when previously unrelated products and services are bundled together to form a new combined and integrated class of products and services with value added for the end-users. The industries become complements, often giving rise to new industries (1+1=3). The convergence types imply different industry and firm level dynamics and consequences (Bröring et al. 2006; Greenstein and Khanna, 1997; Hacklin et al., 2004), including innovation response at firm level (Bröring and Leker, 2007; Hacklin, 2010). Convergence in substitutes often increases competition, pressing firms to innovate as a response to convergence to remain in the market. In contrast, complementary convergence often implies that firms are free to choose to react on the convergence in terms of innovation. However, if a firm fails to detect and react on the convergence with other industries, they may lose a source of competitive advantage. Further, the firms will fail to acquire knowledge or technology, which may be of use to them in the future. Over time, the extent to which industry convergence is determined by complementary or substitution can evolve (Greenstein and Khanna, 1997). To guide firms in the converging industries on possible responses to the dynamics of convergence, as a next step, the framework focuses on how firms can deal with the consequence of industry convergence in terms of innovation. The response to industry convergence in terms of innovation will be assessed along the lines of innovation according to Miller and Miller (2012). As a result, an innovation profile and hypothesis will be developed for the converging industries.

The proposed framework is based on a synthesis of the frameworks used to create the global innovation mirrors and academic research on industry convergence and its implications. As academic research on industry convergence and the link between convergence and innovation response is sparse, this framework is based on a qualitative assessment and is therefore subject to limitations. However, it offers a pragmatic approach to detect industry convergence between industries represented by TIM, what impact it may have on them and how firms can react in terms of innovation.

2.3. An Example of Convergence: The Consumer Electronics and Automotive Industry

2.3.1. Application of the Framework

Starting from the game changing trends of the consumer electronics (CE) industry and automotive industry, it becomes evident that both industries show signs of convergence (Appendix VI). The CE industry is driven by a higher integration of operating systems, devices, applications and end-users. This implies that CE are entering all aspects of life, also vehicles. This trend can be linked to the automotive industry's trend of increased demand for new product customization in developing markets. Consumers in developing markets have a strong appetite for luxury and ultra-luxury cars. The automotive industry can cater to these consumers by increasing the use of CE in the cars for the luxury market segments in developing countries. This type of convergence can be seen as complementary convergence (C1, see Appendix VI, a.)). The products and services of each industry work better together than separately. Each component raises the marginal product of the others' product and both products perform a function that neither can do alone. Firms in these industries can capitalize on this trend of complementary convergence together through product and position innovation. Actors in the CE industry can create products especially tailored to the automotive industry's needs. Further, firms in the automotive industry can gain a competitive advantage through means of increased use of CE in their vehicles, which can help them reinvent their market position in developing markets.

Also, a link between the increased use of consumer electronic devices in all aspects of life can be made to the demand for smart and always connected cars. Consumers worldwide are asking for connected cars, increased safety while driving cars, and a heightened entertainment factor. CE can be used to answer this trend in the automotive industry, through products that increase the capabilities of a "smart" car, for instance through electronic parking sensors which have been built into cars. Again, this type of convergence can be seen as complementary (C2). The products of both industries add more value when bundled than when separated, and do not render each other obsolete, that is end-users cannot use the products interchangeably. Actors of both industries can work together to create product innovations that respond to this complementary convergence, as aforementioned. Also, innovation focus can be put on process innovation, as already many different CE are incorporated in many smart cars today. Improvements in current product integrations are necessary for both industries to remain competitive.

The CE's game changing trend of the focus on user experience and digital/physical embeddedness can be linked to the automotive industry's trend of increased demand for product

customization amongst the middle class of developing countries. There are many new technologies, such as 4K, 3D, and wearable technology, which have not yet been adopted by many firms. For the middle class in emerging countries, product customization in the luxury car segment can be enhanced by user experience and the technologies developed in the CE industry. Industry convergence occurs here in terms of complementarity too, as user experience technologies can complement automobiles in their functions but not replace them (C3). Firms in both industries can respond through joint product innovations, leveraging each other's technologies to create new market-relevant products. Also, the technologies created by the CE industry can also be already applied to existing products of the CE and automotive industry. Also, since many firms have not adopted user experience technologies yet, this technology could lend the automotive industry a competitive advantage, lending it the possibility to reinvent its market position.

User experience technologies can also help automotive firms capitalize on the trend of smart, and always connected cars. User experience technologies can enhance the ease of use of smart, and always connected cars. This is also an instance of complementary convergence, as the technologies of User Experience cannot substitute smart cars (C4). The bundling of the technologies with the connected car can perform a new function neither one of them can do alone. Firms in these industries can respond to this convergence by means of process innovation, that is incorporating the new technologies in products already used for smart, connected cars. Also, the technologies can be used to create new products for the automotive industry, enhancing their ability to be smart and always connected. These technologies can create a competitive advantage, which help automotive firms position themselves better in the market.

Overall, the two industries can be seen as converging in complements and the innovation responses are quite similar along the game changing trends of the industries and the resulting blurred boundaries. The resulting innovation profile of both industries shows that the industries will focus on innovating on advanced product innovation to meet the market-driven trends of demand customization and smart and always connected cars (Appendix VI, b.)). This will be enhanced by moderate process innovation to maintain competitiveness of current products. Further, automotive firms can benefit from better market positioning due to new consumer electronic products and technologies, enabling them to moderately reinvent their market position. In the long-term, as the boundaries between the CE industries and automotive industries become

blurred, actors of both industries may integrate vertically, leading to new business models. Further, as vertical integration becomes more prevalent, industry convergence will be more of substitutive nature, calling for fiercer competition and further innovation to remain competitive.

2.3.2. Examples of Innovation Response and Ideas for the Industries

Industry convergence type and innovation response presented above can be substantiated by the innovation ideas, which were collected as part of the business project for the CE and automotive industries. For instance, Volkswagen and Tesla have incorporated side-view cameras as a substitution for side-view mirrors. Cameras from CE firms complement the product offering of vehicles. This is an example of convergence C1 identified in the analysis above, where CE help the automotive industry respond to changes in demand. Similarly, Opel has established connected safety and security solutions, value-added mobility services and advanced information technology in its cars. This is an instance of C2 and C4. Consumer electronic devices enhance connected cars, e.g. through mobile control of car functions; the bundling of products of the CE industry with that of the automotive industry creates more value than the products by themselves – a convergence in complements leading to a response in product innovations. In addition, Volvo has developed a pedestrian and cyclist detection sensor. The sensor also has an auto-break function, which is unleashed once the sensors detect pedestrians or cyclists who are too close to the car. This is also an instance of C2, where product and process innovation is used to meet the demands for safety in cars through the integration of CE. Other firms in these industries in different countries, like Turkey, can also capitalize on the ideas to increase their competitiveness. Also, many technologies identified in the CE industry are not being used by the automotive industry, which can increase the value to end-users when bundled together. For instance, the 4K Ultra HD technologies, which increase the clarity of pictures by four times that of regular HD, can be used to enhance the dashboards of cars in the luxury market segment of developing countries. This is an instance of process innovation as a result of industry convergence in complements automotive firms can capitalize on. Also, the CE industry has created technologies for flexible and virtual key devices, i.e. portable devices that provide security access in multiple instances. Firms in the automotive sector can capitalize on this technology and incorporate it into their cars. This increases value to the end-users as they are able to use one device for many things, including their vehicle.

3. Reflection on Learning

3.1. Master Content Applied and New Knowledge

Master Knowledge. Within the scope of the Strategy course in the first year I learned how to approach several different industries. We conducted many case study analyses in which we had to apply a framework to an industry. This proved useful, as part of the task for the project was to approach several different industries through the application of a framework. As such, I was able to quickly understand the challenge and apply frameworks to several industries. Also, industry specific knowledge I obtained during the course Global Energy Markets was of use to me for this project. I was able to better understand industry dynamics and possible trends in energy markets that may drive innovation, for instance, how energy policies affect markets for primary and renewable energy sources.

New Knowledge. During the course of the project I gained new knowledge in the field of innovation management. Innovation is often used as a buzzword. Through the classification of innovation along different definitions, much ambiguity in the term was diminished giving me a clearer overview over the innovation landscape. Further, I was introduced to the link between innovation and firm-level capabilities that foster innovation through A.T. Kearney's House of Innovation framework. It gives rise to strategies and tactics firms can pursue to enhance their innovation management capabilities. In addition, the business project was also an introduction to project management. Although I have participated in projects in previous courses, the tools introduced in this course provide a more structured approach to managing larger projects. For instance, the GANTT chart helped our team to keep track of deadlines and the overall scope of the project, and to divide tasks. Also, the weekly project status reports not only gave us an overview of what we have achieved and what the next steps are, they also helped us to identify bottlenecks and key input factors for the next stages of our project.

3.2. Personal Experience

Strengths. Over the course of the project, the scope and deliverables of the business project challenge had changed several times. I realized my flexibility and adaptability enabled me to cope with these challenges more easily, as I was able to quickly adapt to the new scope of the project. Also, since we were dealing with many different industries, my flexibility and adaptability also enabled me to quickly familiarize myself with several industries and to produce

value-adding results. Further, one of my strengths as a team player is showing respect to others by listening to their insights and elaborating on them. I realized that in doing so you will increase the amount of information exchanged in the group, gaining new nuances and insights to the problem at hand and, ultimately, enabling the group to achieve better results.

Weaknesses. One of the difficulties I encountered was structuring and evaluating large amounts of information. For instance, I was dealing with large amounts of information for the industry analyses, coming across many different sources, reports and articles. I often started to research in an unstructured fashion, pulling data from a variety of sources. This is further exacerbated by my attention to detail. It was often hard for me to determine what are the key facts I should look out for and how to structure them. I often caught myself getting lost in detail, losing a lot of time.

Plan. I was able to improve this weakness as I analyzed further industries. I made a list of credible and industry-relevant sources where I would start looking. While doing so, if I came across a new source, I would write it down in the list, yet continue with the other sources first. In addition, I would make sure that I use only a few, credible sources, as too much data often leads to redundancy. If I realize I am paying too much attention to detail and I am losing time, I take a step back and ask myself relevant questions: what is the challenge? What are the goals of the task? What are the client's needs? This will help me to take a "helicopter" view of the situation to structure the data at hand in a way to make sense out of it.

3.3. The Benefit of Hindsight

During the course of the project we had weekly to bi-weekly meetings with the partner and consultant supervisors. This added the most value as it guided us through the project as well as challenged us to reach new perspectives and improve our analyses. Further, the overall dynamics of our team helped to improve our results. We all came from different backgrounds and were able to contribute different competencies to project. Although the project was catered to an actual client of A.T. Kearney, we never met representatives of TIM. Meeting with the client would have enhanced our understanding of the project and its desired outcomes. Further, our assessment of the industries was made on a macro and international level. The dynamics of the Turkish market and business environment were often not addressed. Going deeper into the Turkish market would have enhanced our overall knowledge of Turkey and understanding of the dynamics of an emerging market.

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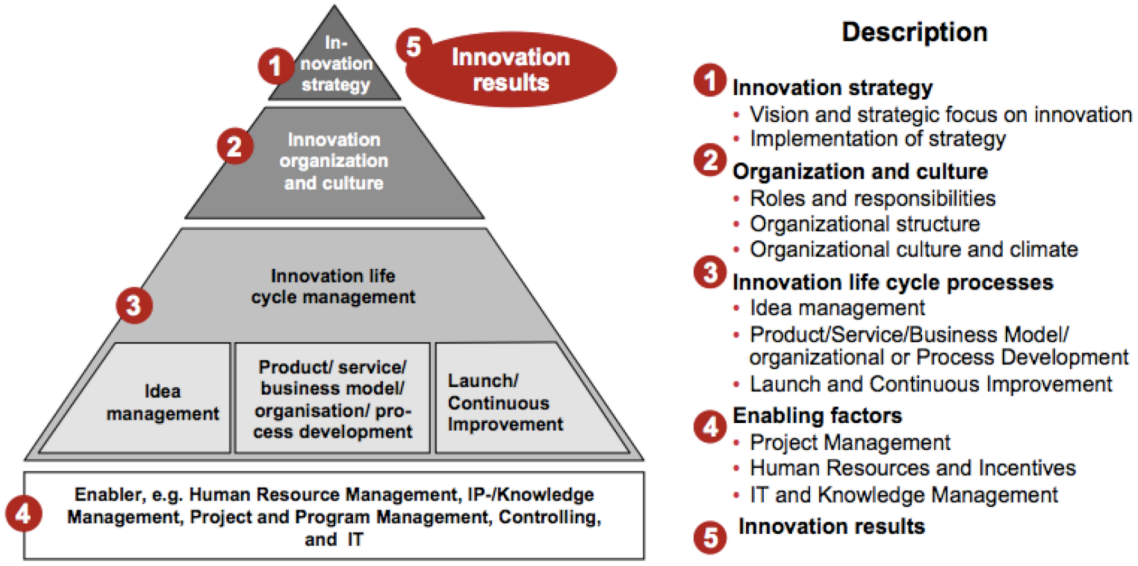
Appendices

Appendix I: A.T. Kearney's House of Innovation



Source: A.T. Kearney, 2014

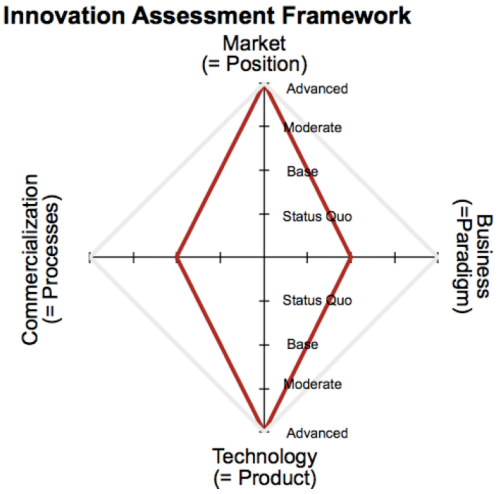
Appendix II: Macro Drivers defined by A.T. Kearney's Global Business Policy Council

Globalization	Consumer Behavior	Demographics	Regulation and Activism	Environment and Natural Resources	Technology
Realignment of global supply chain	New models of consumer engagement	War for talent	Changing role of government	Depleting natural resources	New paradigms in product design and manufacturing
Economic shift from global North to South	The insatiable consumer	Growing infrastructure needs	Rising geopolitical instability	Responding to the sustainability challenge	New and innovative R&D models
More inclusive globalization	New era of squeezed profitability				
Changing global governance					
Elevated financial volatility and risk					

Source: A.T. Kearney, 2014

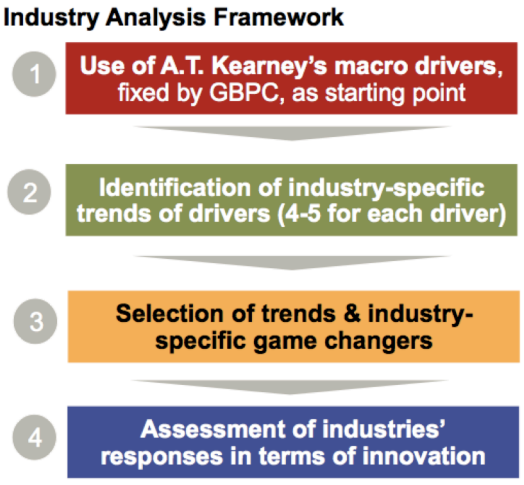
Appendix III: Methodology for Analysis and Creation of the Innovation Mirror

To analyze the industries under the innovation lens, two frameworks for analysis were established: the innovation assessment framework and the industry analysis framework.



Source: Miller and Miller (2012)

The innovation assessment framework was defined along the lines of Miller and Miller (2012), which classifies innovation along the categories focus and degree of novelty. Innovation focus constitutes product, process, position and paradigm innovation; degree of novelty is the degree to which the innovation is new to the industry, ranging from innovation, which preserves the status quo of the industry, to advanced innovation with market disruptive effects.



Adapting A.T. Kearney's strategic fore-sighting framework to fit the project created the industry analysis framework, a four-step analysis. Innovation often occurs as a reaction to market drivers and trends. As such, to best analyze each industry, the industry analysis framework started with the macro drivers as defined by A.T. Kearney's Global Business Policy Council, which include globalization, consumer behavior, demographics, regulation and activism, environment and natural resources, and technology. Secondly, a set of industry-specific trends as a response to each driver was identified. Of these, four to five industry game changing trends were identified. Lastly, the industries were assessed in terms of innovation. Within this step, the effect of the game changing trends was assessed along the lines of the innovation focus product, process, position and paradigm. The innovation profile of each industry was constructed with respect to both innovation focus and degree of novelty was created. Finally, a short-term and long-term innovation hypothesis for each industry was created. For four industries – automotive, consumer electronics, energy and telecommunications – 30 innovation ideas were collected and can be used as inspiration for Turkish firms.

Limitations

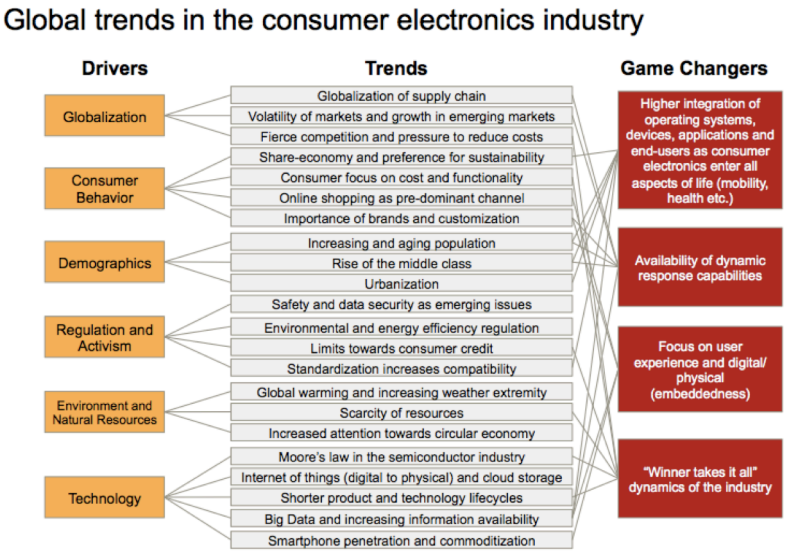
There were a few limitations to this approach. For one, the innovation profiles and hypothesis were based on a qualitative analysis as a result of desktop research. Further, innovation focus of each industry cannot be strictly separated between innovation focus, i.e. product, process, paradigm and position, There are interdependencies between the innovations, not allowing it to clearly distinguish a focus. Additionally, there are grey lines between industries. Many industries are converging; for instance, the role of IT has been increasing in all industries. Also, despite, the degree of novelty of innovation was underdeveloped in the innovation profiles and hypotheses for each industry.

Appendix IV: Example of the Innovation Mirror of the Consumer Electronics Industry

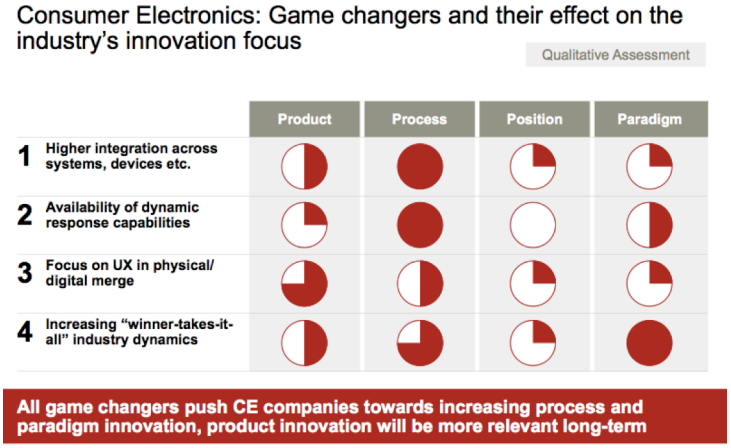
Twelve innovation mirrors were created. The industries analyzed include: automotive, consumer-electronics, energy, telecom, machinery, electrics/electronics, ship industry, food processing, textile, jewelry, wood and forestry and heating ventilation, air conditioning and refrigeration. As the project is ongoing, the consultants will analyze further fourteen industries. Innovation ideas were collected for the automotive, consumer electronics, energy and telecommunications Industry.

The following provides an example of the innovation mirror for the consumer electronics industry.

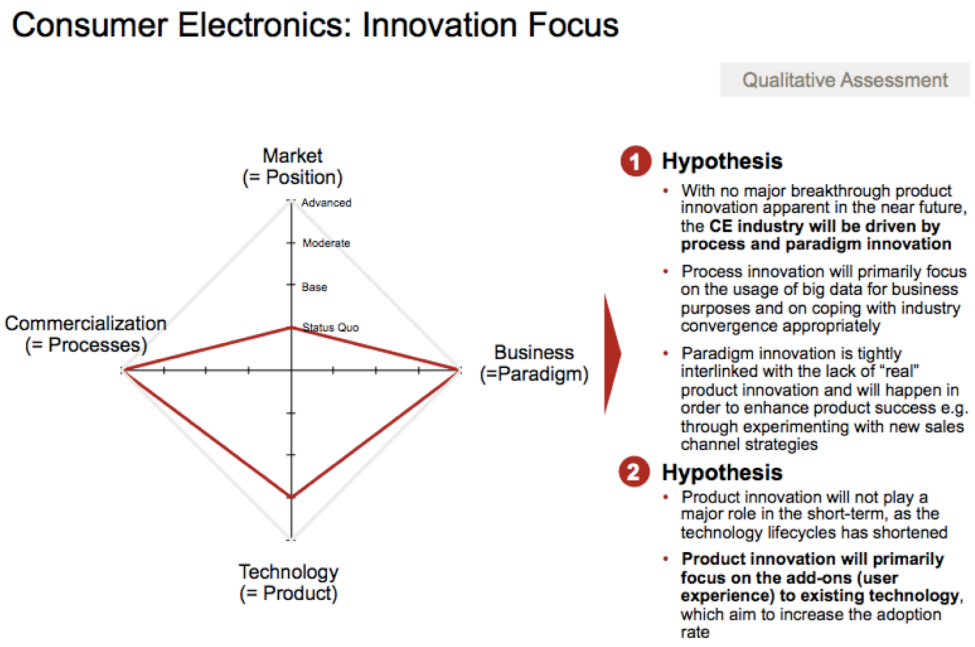
Macro Drivers, Industry-Specific Trends and Game Changers



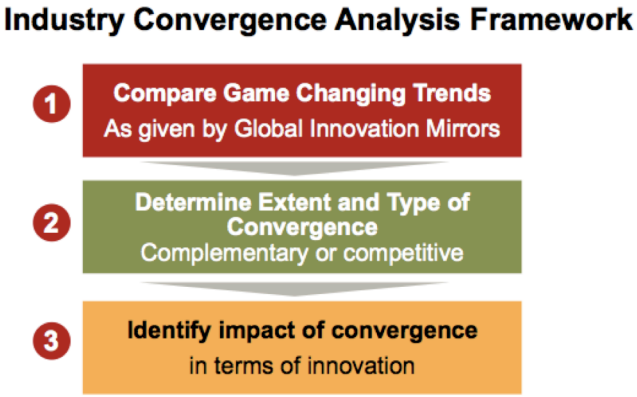
Innovation Focus



Innovation Profile and Innovation Hypothesis



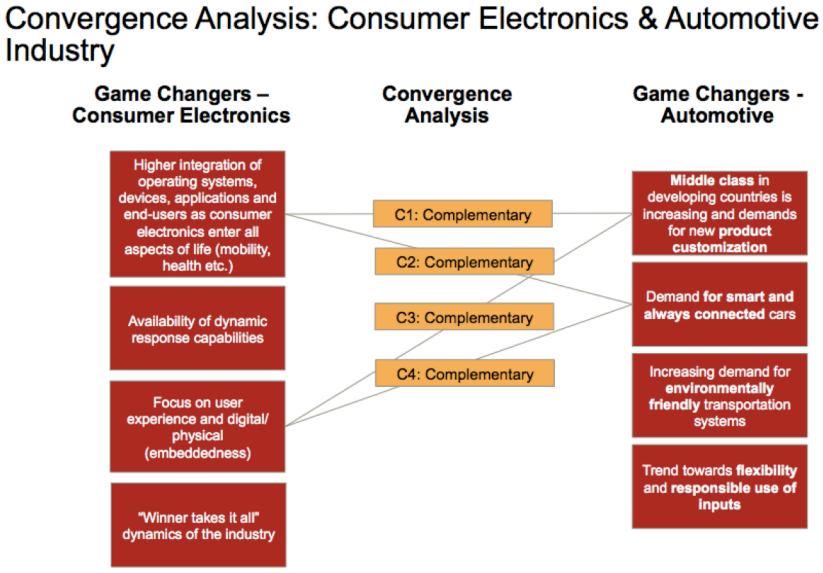
Appendix V: Industry Convergence Analysis Framework

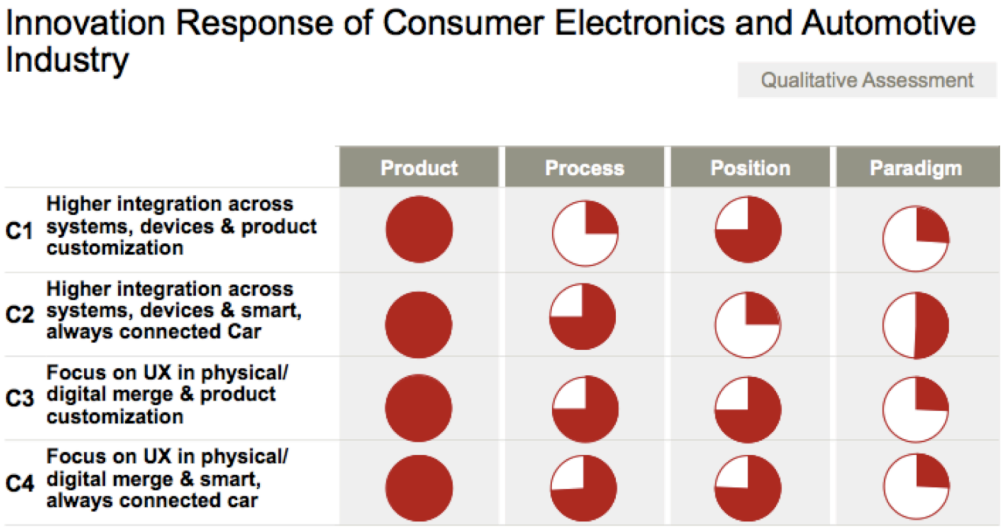


One industry does not only converge with one other industry; multiple industries can converge. The broad scope of the framework can be used to analyze more than one industry under the innovation lens.

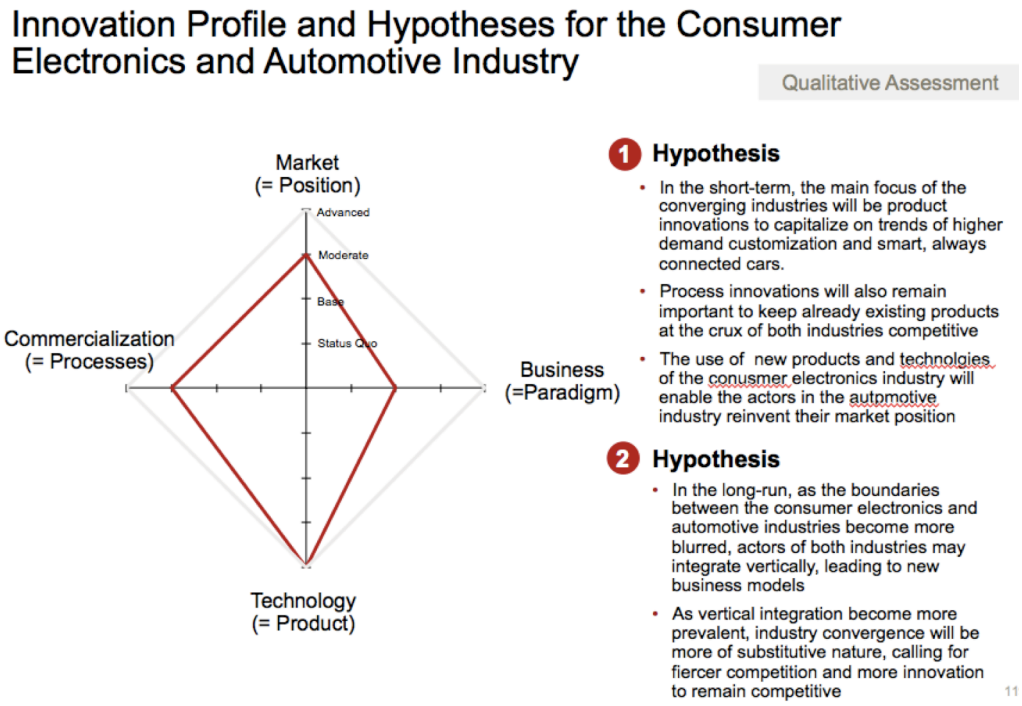
Appendix IV: Application of Framework to the Consumer Electronics and Automotive Industry

a.) Steps 1 & 2





b.) Step 3


Innovation Profile and Hypotheses for the Consumer Electronics and Automotive Industry
Qualitative Assessment
Market
(= Position)
Advanced
Moderate
Base
Status Quo
Commercialization
(= Processes)
Business
(=Paradigm)
Technology
(= Product)
1 Hypothesis
In the short-term, the main focus of the converging industries will be product innovations to capitalize on trends of higher demand customization and smart, always connected cars.
Process innovations will also remain important to keep already existing products at the crux of both industries competitive
The use of new products and technolgies of the conusmer electronics industry will enable the actors in the autpmotive industry reinvent their market position
2 Hypothesis
In the long-run, as the boundaries between the consumer electronics and automotive industries become more blurred, actors of both industries may integrate vertically, leading to new business models
As vertical integration become more prevalent, industry convergence will be more of substitutive nature, calling for fiercer competition and more innovation to remain competitive
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