



Article

The Transition of Samsung Electronics through Its M&A with Harman International

Jung hyun Kim ¹, Monica Young-Shin Chun ², Duong Thi Hong Nhung ¹ and Jeonghwan Lee ^{1,*}

¹ Department of International Business and Trade, Myongji University, Seoul 03674, Korea

² Department of International Business, Seoul National University, Seoul 08826, Korea

* Correspondence: tankee@mju.ac.kr; Tel.: +82-2-300-0792

Received: 24 June 2019; Accepted: 30 July 2019; Published: 5 August 2019



Abstract: The automobile industry is experiencing unprecedented change. Despite its century-old history based mostly in the art of mechanics, increased development of technology and heightened awareness of environmental issues has pushed traditional automobile manufacturers to completely re-examine their strategies. It has also newly invited nontraditional players such as electronic and IT tycoons namely, Samsung, Google, and Apple into the game. The advent of electric cars with cutting edge technology requires active participation and collaboration from diverse industries requiring cross-over joint ventures and M&As. In this light, the recent acquisition of Harman Incorporated for eight billion dollars by Samsung Electronics in 2016 is a significant event that signals great change. As the electronics tycoon expands its boundaries preparing to become an important player in the automobile industry, this study examines how Samsung increases and integrates its knowledge base and innovation capability through the M&A deal with Harman in attempts to enhance its competitiveness in the rapidly evolving automotive market.

Keywords: open innovation; M&A; automobile industry; autonomous driving; electric cars; post-merger integration

1. Introduction

Information and communication technology (ICT) based companies such as Google, Samsung, LG, Intel, and Apple are making aggressive investments in the automotive industry nowadays. According to these companies, software and electronics are playing an increasingly important role in cars with automotive electronics estimated to account for upwards of 30% of a modern vehicle's cost [1]. Conversely, traditional automobile manufacturers are also engaging in active partnership with IT companies, fully aware that they cannot manage the massive task of digitization alone.

R&D intensive firms normally operate at high risk, investing in technologies whose success cannot always be predicted. They constantly face problems of high front-end costs, loss of technological leadership, technological obsolescence risks, and substitutable technology. Many strive for sustainability by constantly diversifying, developing, and maintaining a portfolio of technologies with various product life cycles [2]. This is the reason why technology giants are continuously changing their strategies and approaching the market in different ways. In an attempt to enhance their competitiveness, Samsung strives to integrate its existing intellectual capabilities with new resources and capabilities from other firms through M&As [3].

Studies of the dynamic capabilities perspective stress the importance of the distinctive processes of the firm operating in environments of rapid technological change, constantly identifying new opportunities and organizing effectively. It allows firms to integrate, reconfigure, and build their resources [4], effectively integrating new and specific knowledge into the firm's operating system, making it an important means for enhancing the firm's capabilities [5]. According to Samsung

Electronics (from here on referred to as Samsung), the market for automotive electronics is expected to grow to over \$100 billion by 2025. Apple and Google in Silicon Valley have been quick to take advantage of this opportunity, betting big on building connected and automated vehicles which they could potentially license to traditional automobile manufacturers. Samsung's initial focus is more hardware-oriented [6] and it claims that it foresees highly profitable business opportunities in the automotive industry in this area.

Following the changes in the automobile industry, Samsung made a bold decision. It initially began streamlining its operations to prepare its step forward into the automobile industry. Samsung began restructuring from 2014 by selling Samsung General Chemical Co., Samsung Total, Samsung Techwin, and Samsung Tales to Hanwha [7]. It also sold Samsung SDI's chemical division to Lotte, and its printing business to HP, and is reportedly looking to sell its PC-making division to Lenovo.

Meanwhile, Samsung concurrently planned for its transition to an automotive supplier as one of the company's long-term objectives [8]. Samsung created a fund to invest in an array of technologies needed to enable autonomous driving and connected cars, converging its electronics powerhouse with automotive machinery. While Samsung viewed connected car technologies as one of its key potential areas for growth, it also looked into the automotive electrification business as its future growth engine initiating negotiations with Magneti Marelli and Harman International.

Such efforts led to the success of the company's biggest acquisition ever on 11 March 2017 when Samsung Electronics purchased Harman International Industries Incorporated, valued at \$8 billion, under the terms of the M&A agreement, HARMAN stockholders received \$112.00 per share in cash [8]. According to insiders, such acquisition was considered to be less risky, yet could be a lucrative bet for the near future (Forbes, 2017). For Samsung, the acquisition of Harman was just the beginning of a major reshuffling of its business portfolio, preparing for the unfolding fourth industrial revolution. This is an example of the company's dynamic capability, reconfiguring its operational capabilities and developing new ones to address the changing business environment [4].

2. Changes in the Global Automobile Industry

The Era of Automotive Revolution

The automobile industry faces unprecedented change as its landscape is quickly and drastically shifting from its classic dependence on internal combustion engines towards eco-friendly electric, plug-in electric, and plug-in hybrid electric vehicles (EV, PEV, and PHEV). Pure electric cars are even referred to as a computer on wheels, hinting that the future of mobility is fundamentally a very different product from traditional automobiles. This new wave in the automotive industry consequentially opened up a blue ocean, inviting new players such as high-tech tycoons and startups.

With the advent of such new players, cutting-edge technology will diffuse at a rapid pace as electrification, autonomous driving, vehicle sharing, and connectivity revolutionize traditional automobile manufacturing processes and value chains. Eventually, it will require current players, suppliers, OEM (Original Equipment Manufacturer) partners, and tier-one suppliers to come up with new strategies. They will have to reorganize their assets, streamline operations, and steadily expand through M&As with non-automotive companies.

While traditional automobile companies were hardware intensive, mostly focusing on mechanics, on-going and upcoming innovations will need to put greater emphasis on software aspects. Stereotypes will shift, requiring new strategies and areas for development in four key areas. First is the increasing trend toward electrification. Auto manufacturers will need to prepare for an increasing hybrid-electric, electric, and fuel-cell market. With heightened awareness on environmental problems, countries such as China are aggressively supporting the growth of electric car companies and tightening regulations towards less environmentally friendly diesel cars. Second, vehicle sharing is another paradigm shifter. Trends towards the sharing economy, otherwise known as peer to peer (P2P) or collaborative economy, are also affecting the automotive industry. To an extreme, this could obliterate the necessity

of owning a car at all. Firms must be prepared to reflect such trends and change in consumer tastes perhaps becoming active suppliers of automobiles targeted for car sharing. Third, connectivity is also an important keyword for describing the future of automotive landscapes. As vehicles become increasingly smarter, infotainment telematics, smart traffic services, and personal mobility linked applications will play key roles in enhancing safety and convenience. Lastly, autonomous driving technology has been developing at a rapid pace, some cars already offering semi-autonomous driving features. However, currently, there still exist obstacles such as regulations, ethical issues, and insurance problems for the full commercialization of autonomous driving.

Changes in the competitive environment and consumer preferences, the sheer size of market potential, and the global value chain are increasingly attracting formerly unrelated players into the field. Whereas traditional automakers were based on vertically integrated business models with OEMs in full control of supplier networks, the new business landscape rife with tech players and startups puts greater focus on horizontal business models encompassing and integrating diverse industries together.

3. Innovation through M&As: Supply Sides Aspects

Besides well-known automakers, what is fascinating about the automobile industry is its massive supply chain. With so many parts and components, under a single automaker exists thousands of suppliers. It is traditionally considered a labor-intensive industry with high fixed assets, requiring massive factories and distribution channels worldwide. Auto parts suppliers themselves though lesser known to the average consumer are huge players who shape and play important roles in the automotive industry. Currently, traditional suppliers in the automotive industry are struggling for change to keep up with this fledgling new era of the automobile industry. They are actively seeking strategic partners and M&A opportunities that will help them maintain their position as important key suppliers of auto parts in this industry. Likewise, tech companies are seeking new opportunities by merging with traditional auto suppliers. It is no surprise that CES, the biggest Consumer Electronics Show held yearly in Las Vegas, now hosts a handful of automakers such as Audi, Mercedes, Hyundai, and Volvo to name a few, showcasing concept cars packed with the latest automated driving, virtual reality platforms, and enhanced digital dashboards for greater content consumption technologies. The following section is examples of M&A cases of auto part suppliers.

Intel merged with Mobileye in 2017. Mobileye has key technologies in the advanced driver assistance system (ADAS) which enable autonomous driving via sensors and cameras. A \$15.3 billion deal, with 100% stock transfer, Intel officially bet on autonomous driving in the automobile industry which it estimates to become a \$70B industry by 2030 [9]. Continental AG acquired Israel's Argus Cyber Security in 2016. Argus, whose technology guards connected cars against hacking, was acquired for around \$400 million. Such cybersecurity covers the security for internal communications of vehicles with network-connected features, everything from engines, brakes to air conditioning and infotainment [10]. The marriage between Denso and ASMO in 2017 was aimed for more environmentally friendly and safer mobility, developing, manufacturing, and selling small motor systems for electrification and automated driving systems. It would help with the technology development for high-precision and high-value-added motors that require sophisticated technical innovation, and product development for vehicles focusing mainly on electromechanical products (Denso media, 2017). LG, another Korean electronics giant, recently approved the acquisition of ZKW group, which is a leading manufacturer of automotive lights and headlight systems. Capping a deal worth more than EUR 1.1 billion, ZKW's lighting business boasts an enviable position of being the first and only company worldwide that produces matrix LED headlamps and laser headlights. LG and ZKW will focus on developing intelligent lighting solutions that display high-resolution information and warnings on roads collected from sensors, including autonomous driving cameras and automotive communications (LG Electronics, 2018). Lastly, in 2015, an affiliate of Ford, Visteon Corporation, agreed to sell 70% of its shares worth \$3.6 billion from its Halla Visteon Climate Control Corp's (HVCC) share to Hahn & Company (Hankook Tire). Most of Hahn & Company's revenue comes from its tire division and Halla Visteon Climate

Control (HVCC) is the major supplier of climate controllers and thermal devices such as compressors, powertrain cooling, fluid transport, and electric to Hyundai & Kia.

4. Innovation through M&As: The Rise of a New Contender—Samsung

Samsung Electronics Co., Ltd. is best known as Apple's rival and a global leader in smartphones, high-tech electronics manufacturing, and digital media [11]. For the past several years, Samsung has been a passive player in the M&A market. However, at the beginning of 2016, it began exploring different industries, looking for opportunities of innovation, merging, and acquiring startups, especially those in the automotive field. It has focused on developing and securing automotive industry-related technologies such as autonomous driving, ADAS, and ECU (Electric Control Unit) software.

According to the knowledge-based view [12,13], knowledge is the most important strategic asset. Amid constant change and intensifying competition, firms are constantly challenged to rapid changes in technology. Firms cannot create such technological knowledge necessary survival solely from within, and to some degree, knowledge needs to be sourced externally. Firms may use cross-border M&As to gain access to such important knowledge. However, this does not always guarantee superior results since knowledge is often tacit, specific, and complex. Firms must go through a process of acquisition, assimilation, transformation, and exploitation in order to apply newly acquired knowledge to innovation [14]. Absorptive capacity is widely recognized as the 'ability to recognize the value of new, external information, assimilate it and apply to commercial ends [15].' The knowledge stock of the firm becomes important for heightened absorptive capacity as it will be able to understand as much as it knows. It is understood that such absorptive capacity is part of a firm's dynamic capability, allowing the firm to assimilate, learn from and take advantage of knowledge stock newly gained through the M&A.

For practical purposes of business analysis [4], Teece et al. (1997) proposed three important elements for the dynamic capabilities framework, which are sensing, seizing, and transforming. Under the Samsung Group umbrella, Samsung SDI was already the world's 6th battery maker for electric cars. This allowed Samsung to sense and forecast customer segments and demand for electric cars [16]. With electronics fueling the new era of the automobile industry, Samsung's advantage is its deep knowledge bases in electronics and its ability to quickly understand, recognize the value and absorb many of the technologies required in the up and coming new era of the automobile industry. Indeed, many discussions regarding the future of mobility are based on advances in battery, semiconductor, communications, and artificial intelligence which are all areas Samsung is familiar and excelling in. Samsung also had patents that allowed the company to seize opportunities in developing smart electric cars. Thus, we can say that technological similarity and technological digestibility is important [17]. Samsung was quick to sense a promising new market segment but also fast to reconfigure and transform its business in order to assimilate and accommodate a new business partner. The company's ability to effectively streamline its business is most definitely part of the firm's dynamic capability as often, big corporations are slow or too rigid to seize new market opportunities within a rapidly changing environment. Indeed, Mikalef and Pateli [18] argue that heightened IT capability (the ability to mobilize and deploy IT resources) acts as a dynamic capability that enhances the evolutionary fitness of a firm by reinforcing its agility in capitalizing new market opportunities and operational reconfiguration. Ultimately Samsung will need to transform the newly acquired knowledge to create knowledge synergy. It should ultimately be successful in jointly developing new knowledge with the newly acquired firm. Knowledge synergy is an institutionalized process of creating, sharing, and reusing knowledge where it becomes formalized and shared internally to create new value [5].

All in all, such dynamic capabilities have enabled Samsung to focus its attention and efforts in raising funds specifically for automobile-related M&As, and the company welcomed 10 startups under its umbrella. The newly fostered fund kicked-off with buying shares (\$90 million) of TT Tech, an Austrian startup in safety software for connected cars, providing services like functional safety, deterministic networking, real-time systems, and complex software integration for autonomous and

other piloting programs [19]. Raising \$10 million, it also acquired TetraVue, processor of flash LIDAR technology, a method for surveying the environment using laser-powered light which it uses as an “eye” for autonomous piloting of vehicles. An Israel based self-driving innovator, Brodman17 is a deep-learning-based computer vision systems supplier for autonomous driving. Samsung’s fund raised around \$11 million, it praised the Israeli technology for its light weightiness and compatibility, which enables it to be mounted on almost any kind of processor. Samsung also targeted battery technologies, Solid Power is the next generation battery startup providing solid-state batteries to OEMs with lower cost and higher power than lithium-ion batteries. Samsung also acquired Mapillary which offers independent mapping data systems for autonomous vehicles, database from street-level images which is then computerized and analyzed as data.

5. Harman International Incorporated

Harman International is a US-based global enterprise specializing in vehicle infotainment, telematics, connected car features, and vehicle automation software. It designs and engineers connected products and solutions for automakers and consumers, having a worldwide presence with 30,000 employees around the world [20]. Under the Harman umbrella, there exist many organizations, mostly formed through numerous M&As. These include AKG®, Harman Kardon®, Infinity®, JBL®, Lexicon®, Mark Levinson®, Revel®, AMX, Crown, JBL Professional, Martin, Soundcraft, Studer, BSS Audio, Dbx, Digitech, JBL Synthesis, and ARCAM [20]. According to Harman press releases [20], its revenues were reported to be around seven billion dollars, mostly from automobile components and software, 65% to be precise. In fact, more than 50 million automobiles on the road today are equipped with Harman audio and connected car systems. No doubt, Harman is a big player in the automobile industry.

Harman operates under four main business divisions, namely, connected cars, lifestyle audio, professional services, and connected services (Figure 1). The connected car division concerns the facilitation of voice control as part of an integrated strategy to reduce distraction, increase safety, and simplify HMI (Human Machine Interface). For example, the Harman Ignite modular is an end-to-end cloud platform that supports all popular voice-based assistants and work is ongoing to expand their suitability for automotive applications by adding contextual in-car sensor information as well as intelligence from other devices and clouds [20]. Second, its lifestyle audio division owns many well-known consumer-friendly brands such as JBL, AKG, Mark Levinson, Harman Kardon, Infinity, Revel, Bang & Olufsen (automotive division), and Lexicon. Each brand has its own identity and positioning in the marketplace. Not all are entirely only focused on automobiles, but Harman nicely integrates them with auto sound systems. Its diverse brand portfolio also enables smoother correspondence and integration with vehicle manufacturers [20]. The third main division is professional solutions. This division concerns professional audio, lighting, video, and control products and systems. It is currently penetrating the entertainment markets with comprehensive systems, including enterprise automation and complete IT solutions for a broad range of applications. The division also launched 11 new products in 2017, several of which were recognized with innovation awards from industry experts [21]. Lastly, the connected services division is in charge of designing and developing all necessary software (Cloud, Mobile, Analytics Capabilities, Design, and Software Services) for use in Harman products.

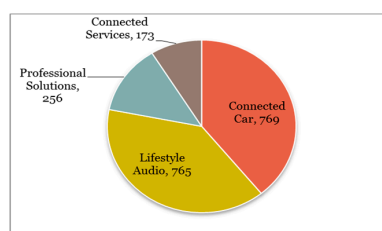


Figure 1. Harman’s Business Division. Unit: Million USD. Source: Mckinsey.

6. Samsung and the Automobile Industry

Samsung Electronics Co., Ltd. is the flagship company of Samsung Group, representing over 70% of the group's revenue in 2012. Samsung Electronics has assembly plants and sales networks in 80 countries and employs around 308,745 people. It is the world's largest IT company, consumer electronics maker, and chipmaker by revenue. As of October 2017, Samsung Electronics' market cap stood at \$372.0 billion [22]. According to a Samsung press release [22], Samsung emerged as a major global supplier in consumer electronics and was placed top market leader in TV (since 2006) and mobile phones (since 2011). In July 2017, Samsung Electronics overtook Intel as the largest semiconductor chip maker in the world.

Samsung's current ambitious drive towards the automotive industry can be traced back to the firm's history with automobiles. In 1995, Samsung Motors Incorporated (SMI) was set up as an iconic technological center for the Korean automobile industry. Backed by support from the Nissan Motor Company, the "SM5" project was soon initiated, launching its first midsize sedan based on Nissan's world bestseller, "Maxima". In 1998, however, the firm faced good and bad news. SMI's first plant was completed and ready to roll out. However, there was also the Asian financial crisis which resulted in a stagnant economy severely damaging SMI's sales. SMI only sold 45,000 vehicles. Even worse, it was mostly sold to Samsung group employees and the company's profit quickly deteriorated. [23]. After a short period of glory, Samsung holding company was no longer able to sustain its vehicle manufacturing plant and filed for bankruptcy. Before long, SMI fell into the hands of Renault for US\$562 million, and Renault Samsung Motors was established in Busan (2000).

Although Samsung's dream came to a halt, the firm felt that failure had come from adverse external environments, not from within the firm. Samsung was confident of its brand power and employees. It also believed that it could still leverage and create synergies with Samsung Electronics [20]. Hence it was never a surprise that Samsung's strong willingness and attachment to the automotive industry remained even after its first initial failure. Chairman Lee Gun-Hee was especially optimistic about the possibility of convergence between the automobile and electronics industry, expecting it to yield transactional synergy as the following quote suggests [23].

"In the automobile industry, 30% of all parts are electrical or electronic, a proportion expected to increase to 60% or 70% by 2010 greatly blurring the distinction between the 'automotive' and 'electronics' industries."

Opportunity arose when rapid changes and growth in the automotive industry began emerging. Electrification, digitization, and autonomous driving all under the single roof of the car meant that a strong technology-based portfolio and synergies from all fronts were required [24]. This was an attractive opportunity for Samsung to look into connected technologies, particularly automotive electronics. In fact, the company had already identified this area as a strategic priority expecting the market to grow to more than \$100 billion by 2025.

At the same time, not only due to external environmental changes, Samsung from within the company was looking for its next-generation growth engine. By acquiring Harman, Samsung would be able to gain solid ground in the automotive component business since Harman was already a prominent Tier 1 supplier, had deep-rooted relationships with a wide range of customers that included established names such as General Motors, as well as high-growth companies such as Tesla [20]. In fact, Harman was a leader in connected car and infotainment solutions, with already more than 30 million vehicles currently equipped with its connected car and audio systems, embedded infotainment, telematics, connected safety, and security [1].

In June 2016, Harman had an estimated 24 billion backlog order from its automotive customers. Samsung at the time was also a crucial business partner of Harman supplying DRAMs, flash memories, and displays with evermore growing demands for automotive application components. If it could successfully close the M&A deal, Samsung would be able to bolster its software engineering capabilities to some extent, as Harman had a team of roughly 8,000 software engineers who were working on cloud-based consumer and enterprise experiences, as well as end-to-end services for the automotive

market [20]. The marriage of two firms with world top class brand value would create synergies that would allow the firm to take advantage of one another's design and marketing techniques, close ties with vehicle OEMs enabling them to seize further opportunities for innovation and explosive growth. Harman would also be able to leverage Samsung's expertise in connected mobility, semiconductors, user experience, displays, and its global distribution channels [1].

7. Samsung and Harman

Samsung's M&A with Harman

In November 2016, Samsung shocked the technology market with the news of buying Harman International Incorporated—a top-class leader in automotive application components and AV (Audio Video) systems supplier for \$8 billion. Samsung was not only trying to upgrade its products with sound solutions and premium AV equipment but also seeking a path to tap into the growing smart car market. In particular, Samsung aimed to step into the connected car market in both hardware and software while Apple with CarPlay and Android Auto were only focusing on software. Harman, along with Samsung's knowledge base in IT technology, was expected to complement and aid Samsung to further make its mark in the automobile industry. The M&A deal was not all smooth as initially there were minor oppositions on Harman's agreement to not seek other potential buyers during its negotiations with Samsung. However, with the acquisition deal supported by over 50% of shareholders in the shareholders' meeting held on February 2017 and the approval of antitrust regulators [22], the M&A deal went through.

On 11 March 2017, Samsung announced it had successfully completed the acquisition of Harman. To this day, this acquisition is Samsung's largest deal. It immediately won Samsung a position at the heart of the car-tech market. Under the terms of M&A agreement, Harman stockholders received \$112 per share in cash, with a total payment of \$8 billion. The deal abided all necessary regulatory approval in the United States and certain foreign jurisdictions [6]. This M&A deal was considered a favorable deal among all related parties—Samsung, Harman, and Harman's stockholders. Instead of carrying out green-field investments as Samsung had invested in Vietnam and China, this type of M&A strategy helped Samsung to increase market share immediately, create synergies, and reduce potential risks. Before the transaction, Harman and Samsung were able to target only their own respective market areas, whereas after the acquisition, their reach has more than doubled with increasing synergies between the two. Samsung would get a close and direct link to leading automakers, clear insights into automakers' visions of the future, and their customers' desires.

On another note, until the last minute, Samsung was weighing two solid automotive competitors, Harman and Magneti Marelli, for partial or whole acquisition. Before and after merging with Harman, Samsung had been eyeing Magneti Marelli for its lighting, in-car entertainment, and telematics technologies that are supplied to Fiat-owned brands such as Fiat, Chrysler, and Jeep which are mass-market brands and Maserati and Alfa Romeo which are luxury brands. Samsung's key affiliates such as Samsung Display and Samsung Electro-Mechanics had already partnered with Fiat on automotive displays and camera sensors. Not surprisingly, Samsung heir, Lee Jae Yong has been Magneti's board of director member since 2003. Although recent negotiation derailment due to issues regarding overlapping businesses of the two, Samsung's confidence and commitment on the automotive business through its M&A with Harman affirm investors that Samsung continuously considers Magneti as a future business partner.

8. The Post-Merger Integration Process

8.1. Governance Structure

Post-merger integration (PMI) processes are inherently tricky. Despite the intended good intentions, there exist numerous incidents of PMI failure. According to a report by Deloitte in 2015, over 90%

of M&As did not generate the expected value or return on investment. M&As may help firms acquire knowledge but not guarantee its creation [25]. This could be due to differing characteristics of knowledge bases, effects of structural integration, or environmental contexts of the transaction [26–28]. At the employee level, anxiety due to changes in status, responsibility challenges, the learning of new routines, new policies and cultures, an ‘us vs. them’ dynamic could lead to demotivation, stress, insecurity, and a sense of inferiority [28–30]. This can further lead to the departure of key personnel such as star scientists and engineers as they feel they are not being fully recognized in the newly merged organization, defying the very purpose of gaining access and creating new knowledge. Hence caution to not create too much disruption with the M&A event is critical for a successful PMI process.

Samsung became the parent company of Harman following the M&A. It oversaw all of Harman’s existing operations such as Harman’s personnel, labs, headquarters, and facilities, as well as all of its customers and master brands like AKG, Lexicon, Infinity, etc. Samsung was especially careful not to disrupt the organization autonomy and the dynamics of Harman with the desire to preserve the company’s unique capabilities for continuous innovation. It did, however, make some leadership changes, where Mike Peters became the Executive Vice President and President of the Connected Car Division at Harman beginning April 2017 and Nick Parrotta became Chief Digital and Information Officer. Other general managerial level HR was left intact.

On the other hand, Dinesh Paliwal, who served as Chairman of the Board of Directors at Harman until March 2017, now works a member of Board. Harman’s post-acquisition Board of Directors is led by Young Sohn, who also serves as President and Chief Strategy Officer for Samsung Electronics. Moreover, the two other novel members of the Board are Hee-chan Roh, who is President and Chief Financial Officer at Samsung Electronics, and Tae Moon Roh, who is CTO and Executive Vice President, Head of Mobile R&D Officer at Samsung Mobile.

In general, post-acquisition Harman operates as a standalone affiliate of Samsung, overseen by a Board of Directors led by Young Sohn. However, Dinesh Paliwal also remains CEO of Harman, leading the company with Harman’s current management team. In other words, Harman is allowed to retain its distinct strategies and work independently from Samsung. Rather than imposing its own structure, Samsung chose a governance structure that did not significantly disrupt Harman’s previous organizational structure. Perhaps Samsung is well aware that centralized control could bring about adverse effects like depriving the target firm’s management team of autonomy, leading to demotivation and resulting in poor performance. In addition, the culture clash between the acquiring firm and target firm is always considered a common reason for M&A failures. While Samsung is a South Korean multinational conglomerate and the world’s leading producer of smartphones, Harman was a U.S audio and car infotainment supplier. To avoid potential culture clash issues, Harman was therefore allowed to remain as an independent subsidiary. Besides, Samsung also established Automotive Electronics Business Team since December 2015 to seize the initiatives for Samsung in the automotive industry. This team then worked closely with Harman’s task force team to achieve the full growth potential and synergy.

8.2. Research and Development

This M&A deal gives both companies transformative opportunities in the automobile industry and also the possibility to seamlessly connect lifestyle-related technologies of the home, mobile, and workplace with automobiles. Another important aspect of a firm’s dynamic capability is coordination and integration. With the M&A, Samsung was careful to coordinate and deploy tasks effectively identifying complementarities and synergies while reducing task redundancies and promoting collaboration between the two newly merged firms. It also effectively evaluated its own and partner firm’s resources and capabilities to integrate and embed to its own and exploit them in new or revamped operational capabilities [31]. In particular, Samsung’s and Harman’s leadership in each of their respective areas of expertise perfectly positions Samsung as the preferred partner to its OEM customers (Samsung-Harman press release). In addition, bringing together Harman’s iconic audio

brands and capabilities with Samsung's leading display technologies will deliver enhanced audio and visual experiences to consumers and professional markets [4]. On the other hand, Harman now can take advantage of Samsung's cutting-edge technologies and knowledge bases. Samsung spends more than \$15 billion on R&D each year, employs 300 thousand people across 80 countries, owns and operates 34 R&D centers. It has an unparalleled network of established technology companies, startups, universities, and other key stakeholders [6]. Coupled with this, Harman is one of the major players in automotive business and owns more than 5600 patents in key domains, including safety, design, navigation, connectivity, networking, HMI, etc. [20].

Cooperation between Harman's Connected Services division and Samsung SmartThings will lead to greater possibilities for exploring business opportunities in the Internet of Things (IoT) era. The research personnel of Harman that has remained post-M&A is now teaming up with Samsung SmartThings to further advance IoT related projects. Such synergies are expected to accelerate the transformation of the two firms helping to create a more connected world through cloud, mobility, and analytics solutions. Samsung is a leader in the IoT area courtesy of SmartThings. With presence in over one million houses worldwide, the SmartThings Cloud currently connects to more than 10 million devices. The global team of Harman Connected Services engineers is working with the SmartThings team to develop and support the SmartThings app and device development. Not only are they cooperating and integrating third-party devices to improve its current ecosystems but also jointly working to create roadmaps for the future [32]. By partnering with the Harman Connected Services team for SmartThings applications and device development, Samsung is now able to further develop smart device innovations and revolutionize IoT for consumers, enterprises, and automakers.

The following section introduces some of the key examples of newly released joint products and projects following the Samsung, Harman M&A. First is the release of smartphone compatible earbuds. Within months of the acquisition, Samsung partnered with AKG—one of the well-known brands of Harman—to create AKG tuned earbuds for the release of the Galaxy S8 and S8 Plus. Following this, Samsung continuously worked closely with AKG and Dolby Atmos to create an immersive audio experience for Galaxy S9 and S9 Plus compatible earbuds, which it believes is unmatched to any other smartphone earbuds in the market. The Galaxy S9 and S9 Plus feature spectacular stereo sound that is 1.4 times louder than their predecessors. As a result, the amazingly rich audio experience on the Samsung Galaxy S9 and S9 Plus got a lot of positive reviews [20].

Another example is the connected cockpit dashboard (Figure 2) which converts traditional data into a customizable, seamless instrument panel providing infotainment and IoT services across multiple displays. The MBUX (Figure 3) consists of two features, either two 7.0-inch screens, or two 10.25-inch screens, or a mixture of the two display sizes. One screen sits ahead of the driver, while the other is located in the center of the instrument panel. Both are powered by a GPU supplied by Nvidia, a company best known for producing GPUs for gaming PCs. The center screen is operated with an intuitive touchpad, or can also be operated by buttons on the steering wheel's right spoke, while the screen ahead of the driver is controlled using the steering wheel's left spoke.

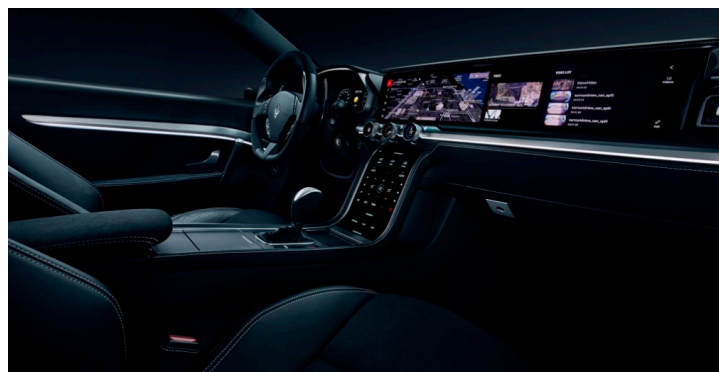


Figure 2. Harman Connected Cockpit Dashboard. Source: Harman International Incorporated.



Figure 3. Harman MBUX. Source: Harman International Incorporated.

Advanced driver assistance systems or ADAS (Figure 4) is Harman and Samsung’s successful development of the Surround View, which helps drivers’ spot things on the road which they might otherwise miss, even in the dark. Their Forward-Facing Cameras help drivers stay in lane while also spotting potential obstacles that may lead to accidents. The team of engineers from Harman and Samsung has created a new era of connected safety with advanced driver-assistance systems. Generally, Harman’s experience with connected car technologies, such as over-the-air updates, cloud service, and data collection combined with Samsung’s extensive sensor, camera, and consumer experiences offers an amazing ADAS product. Automated driving aims to develop new products and technologies that bring a safer, more connected, and superior driving experience. Samsung and Harman are collaborating in artificial intelligence, machine vision, autonomous mobility, high-performance computing as well as connectivity, automotive-grade safety, and security—all within an open architecture framework [8] to make this possible.

Telematics (Figure 5) is another area where Harman and Samsung are collaborating together to deliver the industry’s first 5G-ready automotive solutions and multi-band conformal antennas. This enables and secures fast and reliable data communications in automobiles [20]. 5G boosts speeds up to 100X faster than the current 4G LTE standards providing incredibly fast high-resolution streaming, immersive virtual and augmented reality features, and seamless cloud-based applications in fast-moving cars [20].

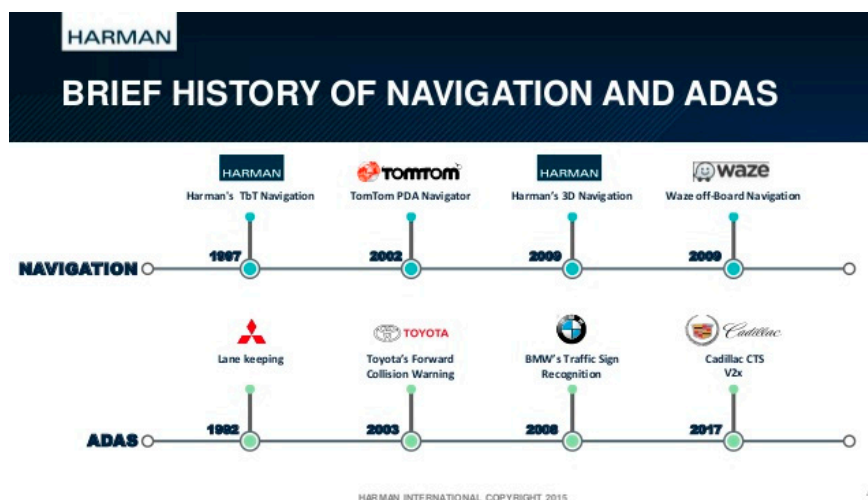


Figure 4. Harman Advanced Driver Assistance System (ADAS). Source: Harman International Incorporated.



Figure 5. Harman Telematics. Source: Harman International Incorporated.

The Maserati infotainment system (Figure 6) is the 28-inch QLED (Quantum dot LED) local-dimming infotainment display and OLED (organic light-emitting diode) instrument clusters which enable reliable infotainment systems that can integrate with other systems. The Maserati system helps drivers customize interior lighting, integrate Bixby (and/or Alexa and Google), and allows the driver to ask questions to the car by voice. The system can check the owner’s schedule, check the dealer’s schedule, and set up service appointments, all through its voice interface feature. Other Tier 1 suppliers are offering a similar feature.

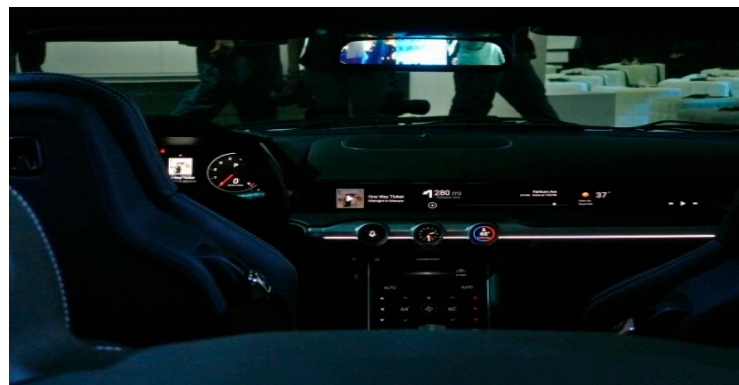


Figure 6. Harman-Maserati Infotainment System. Source: Harman International Incorporated.

The Harman Mini cluster (Figure 7) was designed with Samsung QLED technology Mini to combine both instrumentation and infotainment. The cluster and infotainment systems are driven by the same controller, which simplifies the system, reduces power consumption, and saves weight [11]. Lastly, coupled with Samsung’s existing technologies, the Harman Ignite system (Figure 8) consists of several of the following features that enhance user experience. The Harman Ignite Marketplace which mostly searches for markets for user downloadable apps and cloud-enabled services for drivers. The IRA (Intelligent Reasoning Agent). Harman Ignite 3.0 Personal Assistant assists users communicate with various cloud and internet content enabling personal assistance. The connected navigation features allow drivers to find the best ways and routes to destinations, while its new premium communication solutions and In-Car Communication (ICC) provides personalized and clear, frustration-free communication for vehicle occupants [13].



Figure 7. Harman-Mini Integrated Cluste. Source: Harman International Incorporated.



Figure 8. Harman Ignite System. Source: Harman International Incorporated.

9. Strategic Issues and the Road Ahead

Samsung has officially stated that it will not re-enter the automobile business, positioning itself somewhat as a minor player and a non-threatening ally to existing automakers. However, Seoul National University professor Sangin Park, who has written an extensive book about Samsung, insisted they could very well be interested in growing their footprint beyond simply being a minor partner. “If Samsung aggressively engages in the M&As, its goal seems to be more than just a component supplier,” said Park [20].

As if acknowledging Samsung’s potential to become a real competitor, Hyundai motors, the biggest automaker in Korea, has almost discontinued using Harman speakers in its upcoming models. It has replaced Harman’s auto audio systems with that of Krell’s, a competitor of Harman. Its luxury line and flagship models such as the Genesis and other models such as Kia’s K5 (Optima), Sorento, K9, Carnival (Sedona) no longer carry Harman’s audio systems. Ironically, Samsung appointed former Hyundai Motor executive to lead Harman’s office in Seoul. The new leader of Harman Korea, James Park built his career in the US automotive industry for over 30 years, working in various positions at carmakers Chrysler and Hyundai Motor America.

For Samsung, the automobile industry is quite new, unlike any of its former areas of business. In fact, automobile and automotive industries require higher safety standards and bioethics which must comply with a wide variety of different regulations in different countries, and close cooperation between carmakers and suppliers is essential. Such characteristics make long-term relationship building with an array of suppliers and third parties critical. Although Samsung is rather an expert in the areas of mobile, IT, and components including wireless communications, user interfaces, displays, and semiconductors [1], Harman’s corporate philosophy was built over automotive technology innovation

and continuous M&A successes and collaboration with OEMs. Hence, the success of the M&As depends on effectively combining these two seemingly different cultures for a soft landing. Samsung must fully appreciate Harman's deep heritage in automotive technology while slow but steady moves should be attempted for internal integration vertically and horizontally to take advantage of its parent company's knowledge bases.

With already well-established players, the automobile industry is in a red ocean. However, the upcoming mobility revolution is opening doors to new players, startups, and tech firms. Samsung has made its first step holding hands with a long-established auto components expert, and it is up to them to take full advantage of this newly formed relationship to create the necessary synergies and innovations in attempts to grow as an important player in this rapidly evolving automotive market. This study carefully focused on M&A performance based on new products released and innovative activity post-Samsung and Harman merger. However, here and now, it has only been three years since the merger. The integration was a large-scale cross border M&A, a merge between not only two different firms but also cultures. For the sake of a fair estimation on Samsung and Harman's M&A evaluation, it would be better to several more years to make further in-depth studies on organizational and individual dimensions of the merger.

Author Contributions: Conceptualization, investigation, brainstorming, supervision, and project administration, J.L.; conceptualization, investigation, and brainstorming writing (original draft), J.H.K.; validation, visualization, and writing (review and editing), M.Y.-S.C.; visualization, D.T.H.N.

Funding: This research was supported by Basic Science Research Program through the National Research Foundation (NRF) funded by the Ministry of Education (2017R1D1A1B03032685).

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Forbes. Why Samsung is Buying Harman. Available online: www.forbes.com (accessed on 13 June 2018).
2. Shantanu, D.; Vinod, K. Mergers and Acquisitions (M&AS) by R&D intensive firms. *J. Risk Financ. Manag.* **2009**, *2*, 1–37.
3. Akram, S.H.; Sanaz, S.; Mohammad, M. Competitive advantage and its impact on new product development strategy (Case Study: Toos Nirro Technical Firm). *J. Open Innov.* **2018**, *4*, 17.
4. Teece, D.J.; Pisano, G.; Shuen, A. Dynamic capabilities and strategic management. *Strateg. Manag. J.* **1997**, *18*, 509–533. [CrossRef]
5. Lu, Q.; Feng, W. Knowledge synergy and long-term value creation of M&A based on the dynamic capabilities perspective. In Proceedings of the 2010 International Conference on Management and Service Science, Wuhan, China, 24–26 August 2010; pp. 1–4.
6. "Integration is Our Secret Weapon": Samsung and HARMAN Executives Discuss the Next Chapter for Driving. Available online: www.news.harman.com (accessed on 20 October 2018).
7. Cho, J. Harman Shareholders Withdraw from Class Action against Merger with Samsung. Available online: <http://www.businesskorea.co.kr/news/articleView.html?idxno=18850> (accessed on 18 February 2019).
8. Samsung. Harman and Samsung Unveil the Future of Connectivity and Autonomous Driving at CES 2018. Available online: www.news.samsung.com (accessed on 18 February 2019).
9. Mobileye. Available online: <https://mobileye.com/> (accessed on 20 February 2019).
10. Argus Cyber Security, Argus Website. Available online: <https://argus-sec.com/> (accessed on 20 February 2019).
11. Pableen, B. What Samsung's 10 Major Acquisitions Means for SSNLF. Available online: www.Nasdaq.com (accessed on 20 February 2019).
12. Grant, R.M. Toward a knowledge-based theory of the firm. *Strateg. Manag. J.* **1996**, *17*, 109–122. [CrossRef]
13. Kogut, B.; Zander, U. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organ. Sci.* **1992**, *3*, 383–397. [CrossRef]
14. Zahra, S.A.; George, G. Absorptive capacity: A review, reconceptualization, and extension. *Acad. Manag. Rev.* **2002**, *27*, 185–203. [CrossRef]
15. Cohen, W.M.; Levinthal, D.A. Absorptive capacity: A new perspective on learning and innovation. *Adm. Sci. Q.* **1990**, *35*, 128–152. [CrossRef]

16. Čirjevskis, A. The role of dynamic capabilities as drivers of business model innovation in mergers and acquisitions of technology-advanced firms. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 12. [CrossRef]
17. Jo, G.S.; Park, G.; Kang, J. Unravelling the link between technological M&A and innovation performance using the concept of relative absorptive capacity. *Asian J. Technol. Innov.* **2016**, *24*, 55–76.
18. Mikalef, P.; Pateli, A. Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA. *J. Bus. Res.* **2017**, *70*, 1–16. [CrossRef]
19. Tech Crunch. Samsung Launcches \$300M Autonomous Driving Fund, outs \$90M into TTech. Available online: <https://www.techcrunch.com> (accessed on 20 February 2019).
20. HARMAN. Available online: <https://www.harman.com/> (accessed on 5 March 2019).
21. AMX by HARMAN. Available online: <https://amx.com> (accessed on 5 March 2019).
22. Samsung News Room. Available online: <https://news.samsung.com/global/> (accessed on 5 March 2019).
23. Lee, W. Understanding Samsung’s diversification strategy: The case of Samsung Motors Inc. *Long Range Plan.* **2007**, *40*, 488–504. [CrossRef]
24. Mckinsey. Mckinsey Connectivity and Autonomous Driving Consumer Survey. Available online: <https://mckinsey.com> (accessed on 5 March 2019).
25. Ahuja, G.; Katila, R. Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strateg. Manag. J.* **2001**, *22*, 197–220. [CrossRef]
26. Cassiman, B.; Colombo, M.G.; Garrone, P.; Veugelers, R. The impact of M&A on the R&D process: An empirical analysis of the role of technological-and market-relatedness. *Res. Policy* **2005**, *34*, 195–220.
27. Cloudt, M.; Hagedoorn, J.; Van Kranenburg, H. Mergers and acquisitions: Their effect on the innovative performance of companies in high-tech industries. *Res. Policy* **2006**, *35*, 642–654. [CrossRef]
28. Haspeslagh, P.C.; Jemison, D.B. *Managing Acquisitions: Creating Value Through Corporate Renewal*; Free Press: New York, NY, USA, 1991; Volume 416.
29. Cartwright, S.; Cooper, C.L. Mergers and Acquisitions: The Human Factor. Available online: <https://econpapers.repec.org/bookchap/eeemonogr/9780750601443.htm> (accessed on 5 March 2019).
30. Larsson, R.; Finkelstein, S. Integrating strategic, organizational, and human resource perspectives on mergers and acquisitions: A case survey of synergy realization. *Organ. Sci.* **1991**, *10*, 1–26. [CrossRef]
31. Gao, P.; Hensley, R.; Zielke, A. A Road Map to the Future for the Auto Industry. Available online: https://auto.economicstimes.indiatimes.com/web/files/retail_files/reports/data_file-A-road-map-to-the-future-for-the-auto-industry-McKinsey-Quarterly-Report-1426754280.pdf (accessed on 5 March 2019).
32. Adnan, F. Samsung Smartthings and Harman Team up to Advance the Internet of Things. Available online: www.sammobile.com (accessed on 20 May 2019).



© 2019 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).