Advanced Micro Devices (AMD):
Strategic Plan for Managing
Technological Innovation

TM 583 – Section C

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Section 1 – Strategy

TCO F – Given an organizational and industry context, identify and suggest a deployment strategy that will facilitate the success of a technologically-driven organization.

Advanced Micro Devices (AMD), founded 1968, in Sunnyvale, California is a producer of Central Processing Units (CPUs), the main computing component in modern computers. AMD's primary capability is the design and engineering of consumer, workstation, and server CPUs. Initially, AMD competed with Intel by reverse-engineering the original 8080 processors and then creating their own x386 variant, but a lack of funding stymied sustained, long-term innovation (Valich 2008). In many ways, this scenario is quite indicative of the role AMD has played throughout its history: the underdog. They leveraged their core competencies of microprocessor engineering by assimilating the designs and processes of competitors and then building upon that knowledge to create profitable (usually) products and services. However, AMD has experienced PR missteps (like the Phenom I TLB bug debacle on an already late-to-market product) from which they have struggled to recover. In order to re-gain the confidence of partners, suppliers, and consumers, AMD must prove, once again, that it's not the size of the dog in the fight, but the size of the fight in the dog.

Looking toward the future for AMD, it is clear that they need a new deployment strategy for managing technological innovation and leveraging core competencies for a sustained competitive advantage. The answer is that they must be able to deliver a complete platform: CPU, main board, and dedicated graphics. By doing so, AMD will enter into new partnerships with other technologically driven firms, build new competencies, and take greater control of the end user experience for the better. Further, with the ability to create complete computing platforms, AMD can enter into new markets in the cell phone and mobile Internet device markets with fully-developed offerings.

AMD will create product value, brand recognition, and protect its intellectual property (IP) to produce positive cash flows for investors, leverage supplier partnerships, and retain market share. This strategy is advantageous because it provides AMD with greater control and influence on the computing market and creates more competition in the marketplace. The primary strategy is for AMD/ATI to have the best performing integrated platforms and discrete graphics products, in any given price bracket.

Section 2 – Core Competencies

TCO C – Given an organizational and industry context, identify the core technological competencies of the organization.

AMD/ATI's core competencies are engineering/architecting the graphics processor unit and peripheral subsystems and provide free monthly driver updates. The market for personal computers (PCs), servers, has basically always been dominated by Intel. Intel has been able to leverage its massive R&D budget to produce computing platforms for most all markets, deliver a sound public image and guide the direction of the computing industry. AMD has captured and maintained a much smaller market share through a value proposition because they have typically offered products with a superior price to performance ratio, even if their best products are still trumped by Intel. However, AMD's successes have come from their understanding of Intel's x86 computing instruction sets and subsequent processor technologies.

However, in 2006, AMD took a significant risk by acquiring Canada-based Array Technologies Incorporated (ATI), makers of the Radeon family of graphics products, for $5.4 billion (Bangeman 2006). At the time, Intel's Core 2 architecture had just hit the market. The performance of this new family of processor products allowed Intel to quickly regain the market share they had lost during the Athlon vs. Pentium 4 years. So, not only was AMD witnessing their successes evaporate, significantly lowering revenues and

morale, but they were making a huge monetary investment which could either break the firm or catapult it into new markets and new revenues.

Looking at Porter's Five Force Model, clearly AMD knew that just because they were entering into new markets, they still needed to be aware of the various market dynamics in order to accurately assess a number of important factors. First, they had a preexisting relationship with NVIDIA, Inc., who produced motherboards/northbridges for AMD CPUs. Further, NVIDIA has been a major player in the discrete graphics market for quite some time and are known to produce quality and performance oriented products and thus controlled a significant (but varying) market share and customer base. ATI had historically been the main competitor to NVIDIA, with the two firms going back and forth with the various price segment and overall performance dominance in the market. AMD had to weigh:

- Threat of substitutes – NVIDIA
- Threat of potential entrants – VIA, SiS, Intel
- Bargaining power of buyers – Price/performance ration
- Bargaining power of suppliers – TSMC (complex semiconductor contractor based in Taiwan who produces chips for multiple clients)
- Degree of existing rivalry – NVIDIA

Strategic Intent – Leverage the reputation, innovation, and concentration of ATI's resources to allow AMD to deliver a complete platform, custom tuned to their processors AND expanded their core competencies.

Section 3 – Industry Dynamics

TCO A – Given a company situation, be able to describe the industry dynamics of technological innovation.

The computing industry exists in the most rapidly changing set of markets on the planet. As such, technology firms like AMD must constantly evaluate and re-evaluate the dynamics of the industry to understand where their abilities fit and what opportunities/risks exist. In order to survive, AMD must have an in-depth understanding of these dynamics, a well-crafted innovation strategy, and well-designed processes for implementing chosen strategies. Given NVIDIA's propensity for proving quite formidable in overall delivery in terms of the orchestration of engineering, marketing, leveraging relationships with software vendors certainly presents a significant portion of AMD's focus. Further, Intel has been rumored to be in the process of developing a discrete graphics product, codenamed "Larrabee".

Schilling points out that the dynamics of industry are a powerful driver of competitive success. Virtually across the board, firms are grappling with the accelerating pace of innovation necessary to remain viable. Further, many firms derive most profits from products less than five years old. When you throw in global and e-commerce, AMD, as any firm must be aware of the challenges they face in the CPU, and their newly acquired ATI graphics division. The drive to create a complete platform is imperative to the future success of AMD. In fact, AMD plans to leverage their processor

competencies to create single CPU dies which will house processing, a memory controller, GPU, and PCI Express controller. If realized, this innovation will allow for very low power, and therefore, longer battery life, mobile devices like laptops, netbooks, smartphones, and even desktops and servers. In order to succeed in managing innovation, AMD must have: an in-depth understanding of dynamics, a well-crafted innovation strategy, and well-designed processes for implementing their strategies.

Section 4 – Technology Sourcing and Internal Innovation

TCO D – Given an organizational context, develop a plan to increase the innovative capabilities of the organization both through collaboration strategies and internal innovation.

In order to build upon its core competencies, AMD purchased graphics firm ATI in 2006. This $5.4 billion investment was an expensive purchase for AMD since they were losing market share (and revenues) with the introduction of Intel's Core 2 architecture, and the resulting products based on this design, in that same year. AMD needed to increase its ability to produce internal innovation so, it bought a firm with proven success executing successful products, maintaining beneficial relationships with stakeholders, and marketing itself well to various markets.

When AMD acquired ATI, it assimilated a wealth of knowledge in the form of dedicated graphics, mainboard logic chipsets, and mobile products. Since the size and structure of an organization impact ability to innovate and effectively implement technology, AMD/ATI must utilize an ambidextrous approach. This method entails a balance of organic creativity and mechanistic process to capture the firm's full potential.

Formalization, standardization, centralization

Collaboration strategies

Section 5 – Product Development Strategy

TCO E – Given information about a company's industry and organization, formulate a technological innovation strategy through its new product development strategy.

The most important factor for AMD is their ability to incorporate the ATI technologies into their overall technology strategy. It is imperative that AMD executives closely consider the implications of leading the newly absorbed talent and creating an environment conducive to their success. AMD and ATI have experience with failed products and services. This new technology conglomeration is best advised to communicate failures candidly, to internal collaborators. The sooner they establish their weaknesses, the sooner they can address them and turn them into strengths. Further, management must get involved early in the project, not when there is a problem. Managers from ATI and AMD must capitulate to the needs to the overall organization and work together on projects for the mutual success.

Management can foster internal innovation by creating cross-functional teams to work on R&D and marketing projects to tap those latent creative forces within the organization. According to Schilling, firms should use the following factors to control product uniformity and success in a given market.

Eight factors for product success:

1. The developing organization, through in-depth understanding of the marketplace, introduces a product with a high performance-to-cost ratio.
2. The create, make, and market functions are well coordinated and interfaced.
3. The product provides a high contribution margin to the firm.
4. The new product benefits from the existing technological and marketing strengths of the business.
5. The developing organization is proficient in marketing and commits a significant number of its resources to selling and promoting the product.
6. The R&D process is well planned and coordinated.
7. There is a high level of management support for the product from conception to launch.
8. The product is an early market entrant.

Section 6 – Strategy to Protect Innovations

TCO B – Given a company situation, be able to determine whether and how to protect its technological innovations.

The intense competition in computing markets demands that purveyors protect and harness their technological innovations. Since AMD has absorbed new competencies like discreet graphics and motherboard logics, they now compete in new markets AND they now must grapple with more competitors overall. As such, it is that much more imperative that they protect their internal innovations with patents, copyrights and trade secrets. Further, it is important to note that AMD must use the TSMC, a semi-conductor manufacturer based in Taiwan, to produce their GPUs. This network externality must be maintained and cultivated just as it had been when ATI was independent or risk disrupting the flow of microchips into the OEM and consumer channels.

Additionally, AMD/ATI must another major network externality: dominant design. Organizations such as the IEEE, FCC, FTC, ISO, NSA, etc. exert a strong influence on many standards, form factors, communication protocols, and dominant design which must be addressed in order to compete in full compliance with regulatory organizations. Further, AMD/ATI must protect the innovations of the new company formed by this acquisition and the resulting technologies from this competency absorption.

AMD has a number of methods with which to protect its innovation, including patents, trademarks, copyrights, and trade secrets.

When AMD introduces a new technology to market, it will have to patent it to protect from imitation and give the firm tools to prosecute any company that infringes on these patents. AMD will retain the copyrights and trademarks associated with ATI for marketing an branding purposes. This move is advantageous for AMD because it allows them to present the business as two distinct entities, though they are one, and thus leverage their marketing department to tap more markets.

Lastly, the acquisition of ATI shows the absorptive capacity of and the need to absorb new technologies for firms to expand into new markets and internalize the talent needed to create breakthrough technologies which will shake up the market in the future. AMD is banking on their ability to integrate these graphics capabilities with their established CPU engineering to create integrated processing devices capable of a multitude of operations for the needs of the next generation of computing devices.

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