THE HISTORY OF AMD PROCESSORS:
PAST PRESENT AND FUTURE

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MEMORANDUM

TO: Rachel O’Brien, Teacher, Academic Upgrading
FROM: Brian Hinds, Student, Academic Upgrading
DATE: June 11, 2014
SUBJECT: The Evolution of AMD Processors: Past, Present, and Future

Here is the report you requested for June 11, 2014, on the evolution of AMD Processors: past, present, and future. The following report provides information about the evolution and development of AMD processors throughout history.

The research into the history of the AMD processors provides answers about how technology has influenced AMD processors. The first AMD processor was a clone of the Intel 8080 microprocessor. It is important to acknowledge this because it demonstrates how AMD processors have evolved over the decades. The history also shows the transition of AMD processors with the merger of ATI Technologies. Observing AMD processors today with their different architecture, speed and power, this opens opportunities for people to easily adapt to new technology. In addition, this information demonstrates and informs how AMD processors have progressed.

The prospect for AMD processors indicates future improvements in architecture, technology and overclock features. As a result, AMD processors may be incorporated into more devices such as, smartphones, computers and mobile devices. People will acknowledge how much AMD processors contributes to technology and motivate the younger generation to be a part of this technological advancement.

Thank you for the opportunity to explore a topic that was interesting, informative and educational. This research has helped me to understand the technology behind the devices in our society today and how much AMD processors have contributed throughout history to these technological advancement. If you have any question or feedback regarding this report, please call me at (519) 594-2377 or e-mail me at bhinds@ymail.com
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EXECUTIVE SUMMARY

This report provides information on the Evolution of AMD processors throughout history.

The History of AMD Processors

AMD processors were first a clone of the Intel processor, but after the merger with ATI Technologies AMD went on the manufacture microprocessors. The first families of AMD processors were the Opteron, the Sempron and the Athlon 64. As technology advances the AMD architectures evolved, creating better, faster, and more powerful AMD processors.

Types of AMD Processors

There are different types of AMD processors available today. When building a computer, the choice in AMD processor is tailor to the type of computer being built. Today’s AMD processors technology allows consumers to choose between speed, power, graphics, and overclocking ability.

The Future of the AMD Processor

AMD processors will continue to evolve in style, technology and programming features. As technology develops, AMD processors will be incorporated in more devices such as smartphones and mobile devices. The processors will be much smaller, have more cores, and produce better graphics.

AMD processors history is important to explore because it provide information on the processor’s origin, how it evolved and the technology behind the device.
THE EVOLUTION OF AMD PROCESSORS:
PAST, PRESENT, AND FUTURE

INTRODUCTION

With the ability to use an AMD powered device that provides speed, power and overclock features is important to people who are computer enthusiast. AMD processors are devices that increase the processing ability of a device to improve operation. AMD processors help in different type of computing environments, improving servers, home computers and mobile devices performance. AMD Processor has evolved throughout history and continues today.

Purpose, Scope, and Limitations

The purpose of this report is to examine the many ways AMD processors have evolved throughout history.

Sources and Methods

This report has been prepared using a combination of sources. These sources include PowerPoint presentation, online articles and video interviews.

Report Organization

This report explores the history of AMD processors, the type of processors available today and the future of AMD processors.
THE HISTORY OF AMD PROCESSORS

On the venture for better computer performance, Advanced Micro Devices have discovered ways to improve their AMD processors through different technologies that were available to them. With the development in technology, AMD processor’s architectures have improved and continue to develop throughout history.

Examples of Early AMD Processors

Earlier AMD processors were characterized in groups of families. One of these families is the AMD Opteron microprocessor family, these were server class processors. (cpu-world.com) explains that all Opteron processors released were socket 940 and required motherboard with expensive registered RAM. Even though Opteron processor ran at a lower frequency than Athlon XP processors with a higher Terminal Design Power, Opteron processors were essentially fast Athlon 64 processors. Opteron processors were manufactured in three different versions: uni-processor systems, dual-processor systems and octo-processor systems. These AMD Opteron processors are still in use today. (See Figure .1, AMD Opteron).

The AMD Sempron processor family is a budget line of processors that spans two different micro-architectures the K7 and the K8. Despite being branded as a low budget processor, Sempron processors were branded as Athlon XP processors. Similar to Athlon XP processors, Sempron Processors are marked by speed while the Athlon XP is rated relatively to the Intel Pentium 4 family (Gennadiy Shvets 2003 – 2010). (See Figure .2, AMD Sempron).

The AMD Athlon 64 is the first Windows 64-bit processor. This processor runs on AMD64 technology, this technology allows the processor to run both 32 and 64 bit applications. According to amd.com, “With the introduction of the AMD Athlon CPU, AMD provides customers a solution that can address their current and future computing needs.” (para. 2) With the Athlon 64, customers can embrace the 64-bit technology computing on their own terms and achieve compatibility with existing software and operating systems. (amd.com, 2014). (See Figure .3, Athlon 64).

Note. Figure 1, Figure 2, and Figure 3 from Google image search, Retrieved June 11, 2014
Historical Development that Contribute in the Evolution of the AMD Processor

AMD Processors began to evolve as technology developed.

AMD microprocessors began production in 1969. Advanced Micro Devices was founded by Jerry Sanders and Edwin Turney and grown to become the second largest global suppliers of microprocessors. The company specialized in the production of computer processors, microprocessors and motherboard chipsets. AMD also manufactured graphic and embedded processors for all types of computer systems. (WebHostingReport 2009 – 2014)

After the merger of ATI Technologies in 2006, Advanced Micro Devices began to manufacture chipsets for handheld devices, mobile phones and digital television sets. However, some chipsets were used for Intel processors and Radeon graphics line. (WebHostingReport 2009 – 2014) With the development of technology, AMD processors now incorporate processing cores and graphic cores into a single processor. (See appendix a blueprint).

TYPES OF AMD PROCESSORS TODAY

Since the use of computer has evolved, the need for different types of computer build is needed to cater to particular groups of people.

In our society today, there are gamers, developers, media editors, and public servers that are used for Cloud base storage. Gamers desire processors that have several cores for gaming and graphics. Developers desire processors that can manage programming loads to develop software. Companies that do media editing and graphic designing desire processors that have built in graphic and processing power. Sever class companies that offer Cloud storage or online server for online gaming desire processors that have eight cores or more. There are different types of AMD processors available today and each of them targets different market.

Types of AMD Processors

There are many different types of AMD processors available today. There are three main families of processors that are being manufacturing today. There is the Kaveri processor, they have built in graphics cores and target gamers, and these went into production January of 2014 and are classified as APU (Accelerated Processing Unit). The Richland processors, they have built in graphic cores but were succeeded by the Kaveri due to new technology and architecture. Then there are the Bulldozer processors that have multi cores ranging from four to eight cores, but no graphic cores.
AMD Processors Technology

Otherwise from the selections of AMD processors, it is important for us to acknowledge the technology behind them. Steamroller core is one of the current technologies behind the Richland and Kaveri processors. The steamroller core is aim to increase performance per clock that were offset by lower clock speed. In the Accelerated Processing Unit side of the equation, Steamroller is far better than its predecessor, the Piledriver. (See Figure 4, for steamroller chart)

Another type of technology is the graphics core, this technology delivers advance graphic technology. The graphic core increase performance and image quality in the AMD processors. With this technology, there is no need for a discrete graphic card in a computer system. The Graphic Core Next (GCN) Architecture is a new approach in designing Graphic Processing Unit (GPU) for AMD processors making it a top choice for gamers who expect the best. (Dr. Harris Gasparakis, 2014)

The next newest technology is Heterogeneous System Architecture (HSA). This technology gives the AMD Kaveri processor the ability to incorporate both the Central Processing Unit (CPU) and the Graphic Processing Unit (GPU) in one processor. This makes it possible for the AMD processors to be use in various devices. These devices are computers, smartphones and mobile devices. With all these technological development Advanced Micro Devices got the most compelling APU that was ever built. (Joe Macri, 2014) (See Appendix A for chart on HSA technology chart).

(Figure 4, Steamroller chart)
THE FUTURE OF THE AMD PROCESORS

AMD processors have evolved throughout the years, and they will likely become even more advanced in the future.

The Influence of Future Technology in AMD Processors

Technology continues to play a big role in the future of AMD processors. Smartphones and tablet are now categorized as portable computer devices. There is a need for more powerful devices that have low power consumption. Next generation gaming consoles such as the Xbox One and PlayStation 4 use the new AMD processor technology. This enables them to perform better, both in speed and graphics performance. The influence technology has on AMD processors for future generations will be in more jobs and smarter devices. (Dave James June 16, 2013).

Technology’s Impact on the AMD Processor

There is a roadmap projection for the AMD processors. As technology continues to evolve, new architectures are invented. For the rest of 2014 to 2015 a lineup of AMD processors has been announced, and one will succeed the current generation. The AMD Carrizo processor, which is labeled as the Kaveri successor is schedule to go into production 2015. There is also the AMD Kabini and Beema processor that are both are schedule for the last quarter of 2014 going on to 2015. (Joe Hruska December 3, 2013) (See Appendix B for roadmap projection) The HSA technology impacts AMD processors in an unparalleled way opening new ideas and programming opportunities for developers. HSA technology will enable AMD processors to target the mobile market; this market does not mean only smartphones but other devices. In summary, the impact of technology on AMD processors will revolutionize the technology industry. This will allow impossible technologies to become reality.
SUMMARY

AMD processors have evolved throughout history. The first AMD processors were Intel 8080 microprocessor clones. After the merger with ATI Technologies, Advanced Micro Devices began to manufacture AMD processors. AMD processors were then categorized into families to target their application.

As new technologies are introduced such as HSA, Steamroller core and Graphic core, AMD processor’s architecture have made it possible to improve speed, power, performance, and programmable feature of the chip. Present day AMD processors offer many types and technologies to people of various enthusiast groups. Since there is a lot of information available about AMD processors, it is important to seek the knowledge of a professional computer enthusiast to explain what is available and recommended.

Finally, AMD processor will continue to evolve and develop in the future. It is possible that for every smartphone, tablet, computer, laptop, smartwatch, and smart TV will have an AMD processor in it. The anticipation of continuing advance in technology will increase the development of new architectures. Developers will be able to create programs for more devices platform, result in more employment in the computing industry.

To conclude, AMD processors have an interesting history. From humble beginning, AMD processors have evolved into an amazing device and shall continue to advance well into the future.
APPENDIX

Appendix A

Heterogeneous System Architecture technology has revolutionized the AMD Processor in terms of performance, power and features. The chart shows how HSA incorporates CPU Cores and GPU Cores into one processor.

UNLEASHING DEVELOPER INNOVATION WITH HSA FEATURES

WITH HSA, BOTH THE CPU AND GPU CORES ARE COMPUTE CORES

FIRST LOOK OF "KAVERI"
Appendix B

AMD Processor Roadmap

The projection of AMD processors for the future looks promising, with new processor lineup. As technology advances, the architecture of the AMD Processors evolves.
WORK CITED

Internet, article from AMD website, no author:
AMD.com. (2014). Athlon CPU Overview

Internet, PowerPoint presentation, with author:
Dr. Gasparakis, Harris. (June 29, 2014). Computer Vision Powered by Heterogeneous System Architecture (HSA)
Retrieve from http://www.slideshare.net/DevCentralAMD/computer-vision-powered-by-heterogeneous-system-architecture-hsa-by

Internet, article from extremetech website, with author:
Hruska, Joel. (December 3, 2013). Leaked AMD roadmap shows Excavator arriving in 2015 – and possibly the end of AMD’s big-core x86 business

Internet, article from pcgamer website, with author:
James, Dave (June 16, 2013) How AMD’s hardware in next-gen consoles will affect PC gamers
Retrieve from http://www.pcgamer.com/2013/06/16/how-amds-hardware-in-next-gen-consoles-will-affect-pc-gamers

Internet, video interview:
Macri, Joe. (2014). The Four Technologies that make up AMD's Kaveri APU
Retrieve from https://www.youtube.com/watch?v=domI4Gro3mc

Internet, article from cpu world website with author:
Shvets, Gennadiy. (2003 – 2010.) AMD Opteron microprocessor family
AMD Sempron microprocessor family

Internet, PowerPoint presentation, with author:
Smith-King, Tony. (2014). Silicon Check. HSA? Check. All Done? Wrong!
Retrieve from http://www.slideshare.net/DevCentralAMD/keynote-tony-king-smith

Internet, article from Wikipedia website, no author:
Wikipedia. (June 1, 2014). Socket FM2.

Internet, article from WebHostingReport website, no author:
Retrieve from http://www.webhostingreport.com/learn/amd.html