A Comparative Study of Best Processors: Intel and AMD

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Abstract: **This paper presents a comparative study of best processors Intel and AMD.**

Keywords: **Intel, AMD, Processor, CPU, best,2019 processor, VS, high speed, choose which processor is best, quality of processor, performance of processor, best to buy processor, test for processor, overclock, latency, Ryzen, Kaby Lake.**

1. Introduction

A processor is an integrated electronic circuit that performs the calculations that run a laptop. A processor performs pure mathematics, logical, input/output (I/O) and different basic directions that square measure passed from a software package (OS). Most different processes square measure dependent on the operations of a processor.

A processor includes complex arithmetical logic and control unit (CU), that measures capability in terms of the following:

- Ability to process multiple instructions at a given time
- Maximum range of bits/instructions
- Relative clock speed

Most people simply say processor rather than "CPU" these days. The battle between 2 existing massive company WHO has the highest share in current market and are rivals to each other which are none another than AMDnd intel. So, the competition level has reached the height in 2019 as AMD has delivered the dominating processor within the market that is none another than illustrious ryzen second gen processor and presently the ryzen third gen are going to be even be out there in later 2019. Intel on different hand has responded with intel ninth gen coffee lake refresh chips that is none another known as as core i9-9900k. So, there's completely onerous time finding out the most effective processor in 2019.

2. Literature review

The study is qualitative in nature and population is outlined as skilled Hardware and computer code specialists. The samples were collected using convenient sampling methodology. Sampling unit is defined as a Hardware and software experience.

It includes 2 sections:

- Section one (Questions regarding Quality of the System)
- Section a pair of (Questions regarding Performance of the System)

AMD and Intel manufacturers have common goal that is high performance at a really low price. there's high demand of Servers that rank high in terms of measurability and reliability AMD and Intel manufacturers have common goal that is high performance at a really low price. there's high demand of Servers that rank high in terms of measurability and reliability. (Igiri, Asagba, & Olowookere, 2014).

At the Cournot equilibrium, we've got compared system running with Windows associated computer with UNIX operating system has performance five times with increase cost than Intel based processor; an Intel C.P.U. charges two times over AMD processor; Windows license is 1.5 times extra expensive than Intel processor; and therefore the profit of Intel is four times larger than the profit of AMD, whereas Microsoft has simply twelve.5% larger profit than Intel. (Soloviev, Natalia, Iliina, & Marina, 2009).

User surplus is 2.5 % higher ($5 billion per year) with AMD than if Intel were a single distributor. Innovation, however, would be higher without AMD which has launched new ryzen gen processors in today's market. (Goettler & Brett, 2009). it has acknowledged that for the best performance and measurability, it's important to have (1) high speed cache-to-cache communication, (2) Huge L2 or shared capacity, (3) fast L2 to core latency, and (4) fair cache resource sharing. (Lu, J., Prakash, Y, & D., 2007).

3. Research methodology

It is a primary research paper. A survey was conducted on Facebook regarding the processor which they use currently in 2019. There was a total of 122 respondents. Sample shows why consumers which processor did they use as shown in Annexure 1.

4. Objectives of the study

a) To study the quality of the processor with respect to set of hardware requirements.
b) To study the performance of the processor with respect to set of hardware.

A. Requirements

a) To determine what elements, you must look before you buy
b) any processor

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c) To find out percentage of users who use amd and intel processors.

5. Analysis and interpretation

According to latest research conducted, there are few test results which are shown below compared to AMD and Intel Processor which are as follow. The System configuration is been specified and various test results has been recorded. Test System & Configuration.

A. Test results

(Alcorn, Toms Hardware, 2019)

Tactlessly, the Spectre and Meltdown patches found us updating our testing copy after the Ryzen 2000-series unveiling, which has brought to two different test result. We have several entries in both records, but neither is entirely complete (yet). As such, we've combined the test meres based upon relative results to the leading processors.

The numbers above represent gaming performance using eight game titles. We're using a geometric mean of the 99th percentile frame rate data, which we convert to a frame per second (FPS) metric, as our overall portion of gaming performance over the entirety of our gaming test suite. We used the Nvidia GTX 1080 GPU for our tests at HD resolution.

We compare a geometric mean of application performance in compression, decompression, Handbrake, Blender and the Adobe Creative Cloud Suite to generate an application performance score.

The top-two responses to our survey were Ryzen 2600 processor followed by Intel core 8th Gen processor. This speaks volumes as to the hole Intel dug itself into, due to lack of competition from AMD. Processors that are 4-7 years old still run today's gaming PCs, and don't bottleneck today's application, as long as graphics cards keep getting faster (where there has been relatively more competition than the CPU market). Many of the users use AMD Ryzen processors than Intel Core "Coffee Lake" and "Kaby Lake." So, in the period following Intel's launch of 7th generation "Kaby Lake" (slightly before the launch of Ryzen), more AMD processors are used among our readers. This of course doesn't mean that there are more AMD users, since we're not counting pre-Ryzen Intel generations such as "Skylake" and "Haswell."
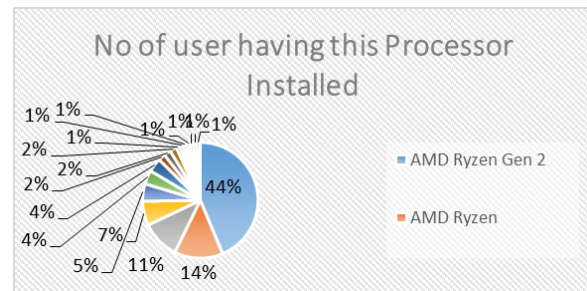

Fig. 1. No. of users who currently use various processors

As shown in Figure 1, We have collected samples of people who have invested and bought the processors as per there needs and standards and it has found that 44% of users have invested in AMD Ryzen Gen 2, then second most popular processor was nothing but Ryzen gen 1 with 14% of users and then nothing but not least we have Intel 8th gen processor users.
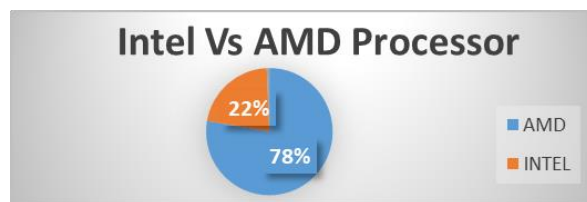

Fig. 2. Ratio of users who have Intel, AMD processors

As shown in figure 2, we have classified different AMD and intel users as one and found out there are over 78% of amd users and only 21% of intel users in 2019.

According to our research we have carried out we asked few users why they choose the respective processor and it was found out that Ryzen processor were much cheaper and provide more cores and thread compared to intel core processor. Whereas Intel users have clearly justified that they are looking for high performance and more stability and less heating compared to Ryzen processor. What elements you must look before you buy any processor. You can't lose with AMD or Intel in

performance: According to research conducted it has found that performance of amd and intel are highly debatable. Intel performs best on gaming and browsing whereas AMD handles tasks and perform excellent in case of video editing and graphic designing. Intel Processor MRPs are higher due to ongoing production shortages so you may find better deals on AMD Ryzen CPU until production issue ease

- Clock speed is more important than core number: Higher CPU clock speed translate to complex and snappier performance in simple, common tasks such as gaming and other video editing tools, while more cores will help you get through time-consuming workloads faster.
- *Get the latest generation:* According to latest research it's found out that old generation processor doesn't last much in current market as technology advancement has crossed the peak so old generation will have hard time competing with the new one.
- *Budget for a full system:* According to latest research it's found out that upgrading the Processor will not solve all the issue you have to be prepare for which parts for all necessary components such as Motherboard, RAM, PSU. (for E.g.: AMD RYZEN 2600 runs best and perform its full functionality if it is running with B450 Motherboard), so everything is interdependent and thus compromising on any part is not an option.
- *Overclocking isn't for everyone:* For most people, it makes more sense to spend $20-$60 more and buy a higher-end chip just to overclock but priorities come when you are low in resources and have to work with existing system. (YOU HAVE BEEN WARNED, this will decrease the life of Your CPU).
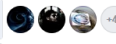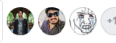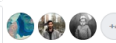
6. Conclusion
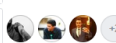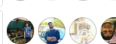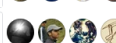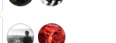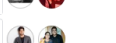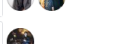
According to the assessment that has been made based on different metrics, each processor had its advantages and downfall. The AMD Phenom outperformed Intel core i7 in L1 and L2 cache memory size and its inexpensive .The AMD processor delivered the beast chips which is none another than ryzen processor which brought revolution to market which is much more cheaper than Intel processor as ryzen chips delivering Hyper-Threading technology better than Intel which is more cheap than a higher version of Intel processor, higher operating frequency, AES encryption and decryption, larger L3 cache memory based on all these results, a recommendation could be made to use the AMD Ryzen processor if a higher performance is needed and the budget can be low.

Annexure 1

I am conducting a research so wanna know your opinion on which processor u all use and comment down why did u choose that processor. Please take a moment everyone and if your processor is not mentioned please add the option.
Thanks for participating!!
Cheers Elite Gaming Store!!

- AMD Ryzen Gen 2 — Added by you
- AMD Ryzen — Added by you
- Intel 8th Gen (Coffee lake) — Added by you
- Intel 6th Gen (SkyLake) — Added by you
- AMD FX — Added by Siddharth Gunjal
- Intel 7th Gen (Kaby Lake) — Added by you
- Intel 4th Gen (Haswell) — Added by you
- AMD Ryzen 2400g — Added by Saraansh Sablania
- 9 series? — Added by Aditya Shah
- Intel core 2 duo — Added by Bhargav Gosai
- amd a10 6800k — Added by Javed Barlaskar
- AMD ThreadRipper — Added by you
- Intel Celeron — Added by Mohak Chhabria
- Ryzen 3 1300x — Added by Swagheel Ameer
- Intel 3rd Gen and 2nd Gen — Added by you
- Ryzen 2600x — Added by Nipun Jain
- athlon duel core ddr2 and fx 4300(both dead) — Added by Adwait Thete
- Intel 1st gen — Added by Naman Kapoor

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