

The Problems and Solutions of Custom PC Market

Dr. Neetu Anand
Maharaja Surajmal Institute, Janakpuri
(GGSIPU)
Delhi, India
neetuanand@msijanakpuri.com

Kunal Sethi
Student, 5th sem., BCA
Maharaja Surajmal Institute, Janakpuri
(GGSIPU)
Delhi, India
kunalkingsethi@gmail.com

Mananjot Singh
Student, 5th sem., BCA
Maharaja Surajmal Institute, Janakpuri
(GGSIPU)
Delhi, India
mananjot29@gmail.com

Abstract—Custom PC market has become extremely relevant especially in the time of pandemic. The paper aims to discuss the evolution of Custom PC Market, how it has risen from the ashes time and again, how desktop PCs are not going to go anywhere even in the generation of groundbreaking portable PCs. The paper further aims to analyze independent surveys conducted to gather information on how general audience is unaware of custom-made PCs, prices and specifications that they should look for while making the purchase decision. It further discusses about an application developed to solve a problem in which people end up buying PCs that are not ideally optimized as per their needs.

Keywords: Custom PC, AMD Processor, PC Manufacturer's, PC Performance, industry Players

I. INTRODUCTION

Custom PC market is not a new concept. It has been there since the very beginning of the computer era. Computers are culmination of components such as processor, motherboard, RAM, storage and various input and output devices. It is about brining all of it together to form a computer that works. For the convenience of end-customers, OEMs (Original Equipment Manufacturers) started selling pre-built solutions. The idea behind is not terrible but has its own flaws. The biggest one is – needs. Needs may vary from one person to another. A general solution may solve problem of a particular set of people but there are high chances that the solution may not be as well optimized that it can be.

Dell, HP, HCL & few other players have remained undisputed kings of the PC market for a long time because they delivered reliable generalized PC solutions to not just end consumers but organizations. While organizations continue to trust big players for the computer solutions, the diversification of the kind of components available, the price gaps and 'n' kinds of optimizations that can be done with those components does spark a conversation on how these organizations can save a lot by looking at the other side of the spectrum.

While its highly debatable whether big organizations should leave the reliable players and take another route, the same conversation with general audience is not so much

because the end-consumers can easily shift towards custom solutions which surely offer much better value for the price.

II. WHY DESKTOP PCs?

[1] A desktop PC is for you if you want a computer with a lot of flexibility. Desktop computers can easily store large files and perform games with high-resolution graphics. Desktops can also be customized to meet your specific requirements.

To improve your computer experience, you may add additional storage, RAM, and a better graphics card. Desktop PCs also don't have batteries, so you may use them for extended periods of time without having to plug them in and recharge them.

A. VFM (Value for Money)

[2] If the specs of a desktop PC and a laptop are same, the laptop will generally be more costly. Top-of-the-line laptops are often more expensive than desktop PCs, and they come with some drawbacks. If someone doesn't have to carry his/her computer here and there, a desktop makes more sense.

Buying components, setting everything up can sound a bit exhausting, that is where our application comes in. It takes away the headache of deciding which parts to buy, then helps the person order that PC for himself/herself at reasonable costs which are way lower than what ready to use laptops or even OEM assembled first party CPUs offer.

B. Not dead, PCs always rise from the ashes

[3] The personal computer was meant to die ten years ago, yet it has just recently witnessed its first significant increase in a decade. According to market research company Canalys, PC shipments will reach 297 million units in 2020, up 11% from 2019. IDC estimates 302 million shipments for the year, increasing 13.1% year over year. Gartner thinks

that 2020 will be a major year for PCs, with the most increase since 2010.

Demand for PCs has increased as a result of the continuing coronavirus outbreak. Midway through the year, supply shortages made it difficult to purchase a new laptop, and demand remained until 2020. "Demand is driving the PC industry ahead, and all signals point to this uptick continuing," says Ryan Reith of IDC. While remote learning and working from home are important factors, individuals are now using PCs and laptops for pleasure.

III. PROBLEM STATEMENT

To understand the problem statement in its complete form, it is important to understand -

A. The sudden surge in demand for PCs

[1] According to a recent estimate from the International Data Corporation, the spike in PCs caused by the covid-19 epidemic would go long into 2021-22. (IDC). Shipments of desktop and notebook PCs would increase 18.2 percent year over year in the fourth quarter, according to the business. Since the introduction of mobile devices, the PC market has been decreasing, but the epidemic that has driven people indoors has resulted in a boom in demand.

[2] There has been a strong increase in PC adoption in the previous 18 months, and the trend of families purchasing numerous PCs is only growing quarter by quarter.

According to industry players, the epidemic has jolted the PC sector out of its slumber, and PCs have emerged as the 'most trustworthy' and adaptable computer appropriate for 'stay-at-home economy' to carry out a range of everyday activities including studying, earning, amusing, and playing.

B. Chip Shortage

The biggest rival to the increased demand of PCs in the pandemic has been the chip shortage. It has been discussed widely and is a matter of concern for at least sometime going ahead.

[3] The worldwide chip scarcity is driving up prices for computers and printers, and it is threatening to do the same for other popular gadgets like smartphones. As the chip industry scrambles to meet surging demand and bridge supply gaps, price rises are snowballing across suppliers and essential materials. As a result, several of the world's largest chip producers are boosting the rates they charge to PC and other electronic device manufacturers. Officials in the industry believe the trend will continue.

According to Bernstein Research, HP has increased consumer PC pricing by 8% and printer costs by more than 20% in the last year. HP CEO Enrique Lores explained that the price hikes are due to component shortages, and that the business may modify pricing further to reflect rising costs.

Other PC manufacturers have echoed this sentiment. On a recent earnings conference, Dell Technologies Inc. Chief Financial Officer Thomas Sweet noted, "As we think about component cost increases, we'll modify our price as

necessary." In May, an ASUSTeK official stated that the company's price reflected component cost hikes.

C. Increase in prices apart from Chip Shortage

When sudden surge and chip shortage have combined forces to shake the PC market, a third force of declining profit margins for the world's biggest chip manufacturer, TSMC, which produces chips for majority of the world's electronic products has forced increase in prices. This has come out of several reasons combined.

[4] Taiwan Semiconductor Manufacturing Co. (TSMC) is gradually hiking chip production pricing. The move is expected to boost TSMC's profit margins, but it might also raises costs for some of the top CPUs, GPUs, SoCs, and other PC components. Increased demand for chips is partly to blame for the price hikes.

[5] According to a DigiTimes article, wafer processing prices using TSMC's 7nm and thinner production methods would rise by up to 10%. With TSMC's 16nm and thicker nodes, a 20 percent increase in wafer processing is expected. According to sources who talked with DigiTimes, the new tariffs would take effect in December 2021.

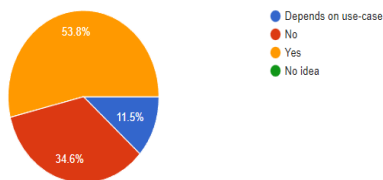
Increased demand for computers, chip shortage and further increase in prices with several factors contributing towards the same has made serious impact on purchase decisions of the end-consumer. The diversity in gadgets has increased so significantly that it is really confusing to decide what to buy for what. This diversity has also gone hand in hand with diversification of use-cases. General solutions are becoming irrelevant as the days pass. The surge has been shifting towards computers that are optimized as per the needs. However, since the customizations require knowledge of technicalities in accordance with the needs, it is not what each person from general consumer base is interested in. This as a result causes people to buy products that may not necessarily suit their needs and offer more value to the seller than the user itself.

IV. SURVEYS

According to various independent surveys, market analysis and reports, despite COVID related issues, global chip shortage, crypto currency mining and import issues in various countries like India, custom PC market is expected to grow by leaps and bounds. However, general understanding of what components to buy to get the most optimized performance in a custom-built PC is still low among the buyers. Due to this, third-party PC builders are able to manipulate people in buying components which are not truly optimized as per their needs whereas first-party pre-built PC sellers are able to sell PCs which are quite low in terms of value they offer for the money in favor of brand value and support.

To understand the problem statement even further, we conducted a survey among various kinds of people including tech-savvy college mates and general audience. The survey results did clear the picture on the following questions -

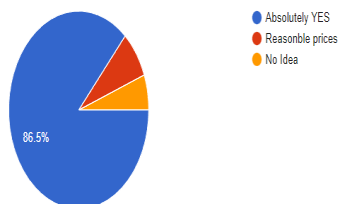
Do you think Laptops are better than PCs?



1.

A lot of people in the survey considered Laptops to be a better option as compared to a PC but that is not necessarily true. The use-case of laptops is a personal computer that can be used at multiple locations and can be carried easily whereas a desktop is a computer fixed at a particular location. Laptops are usually not a match against desktops both in terms of value and performance. Similarly, priced desktops have better thermals and performance capabilities in general.

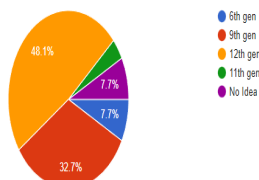
Do you think companies / shopkeepers overcharge you for computers?



2.

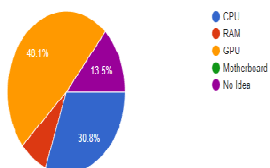
Majority of people in our survey believed that they are overcharged when they go out to buy a computer which stands to true in a lot of situations.

Do you know above which generation of Intel processors you should consider as a minimum requirement while buying a computer today?



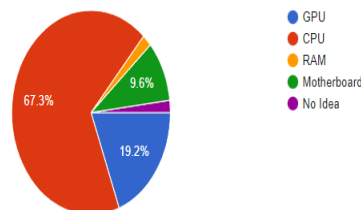
3.

If you want to heavy video editing and photo editing on your PC, what should be of highest priority?



4.

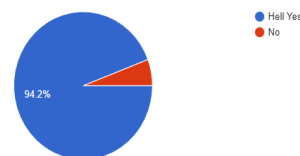
According to you, what is the most expensive component in PCs these days?



5.

If we say, that we are building an app that not only helps you decide what PC components should you choose according to your budget and needs but also lets you order the PC that is optimized for your needs and offers best value for money and convenience. Would you be interested?

52 responses



6.

We also wanted to know how many people have basic idea of one of many things to consider while buying any computer. We found that majority went with options that are certainly not ideal. A lot of people selected generation of processors that hasn't come out yet.

After conducting these surveys, we had even clearer picture of how general audience is not aware about many things in the custom-PC universe and considers that the end consumer is being overcharged because of not being tech-savvy, which everybody can't necessarily be.

People also said, they would really happy if an application can recommend them the components they can actually go for and be satisfied with the product they end up buying.

Lack of right guidance to select right components and mentality to maximize profits at the cost of selling products that are not as optimized as per the needs of the end consumer is the main culprit here.

V. SOLUTION

In order to solve the problems of general audience, it is important to realize that general solutions cannot solve modern day problems. PC builds need to be flexible as per users' requirements and components should be carefully selected keeping in mind that the best value for the money spent is brought into picture. To solve that we came up with few solutions on our project "MakeMyBuild".

A. Handpicked Components

We started by handpicking components that are known for delivering the most optimized performance. The main priority in this regard is to select optimization along with value for money. For eg. 11th gen Tiger Lake processors by Intel do deliver some good performance but they come with some caveats. The biggest one is expensive compatible

motherboards. While one the other hand, AMD’s 5th Ryzen processors are not only based on better fabrication process but have wider range of motherboards in comparison in which budget-tier, mid-tier and premium-tier are all included. This offers users better choices to go with.

B. Price Vs Performance

Suppose a person has a budget of. Rs. 50,000/- and wants a build that is great in terms of productivity. A lot of shopkeepers end up recommending older generation of processors that not only provide them higher margins in terms of profit but also create some potential problems for the end customer. The biggest example right now is – Windows 11 supported processors announced by Microsoft. Suppose a person was soldan AMD Ryzen 5 (2nd gen processor) in 2019 when 3rd gen was also available, that person now is not eligible for installing Windows 11. The importance of choice in selecting components can hit a person back in the years to follow. That is why selection plays a very important role in building a PC. It is not only important to think about generation, architecture and other aspects of the processor but price to performance ratio as well. It is right to say that not everyone can because of being behind.be savvy enough to make these choices on their own. That is why we believe that an application to recommend exactly these aspects of the PC building exercise can help the general customer to get the most optimised experience.

C. Budget Priority

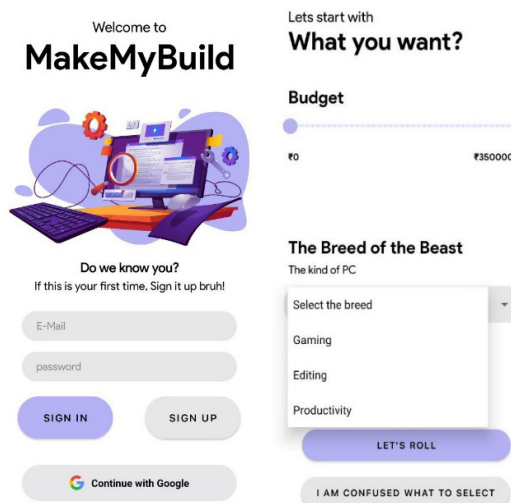
The biggest concern while making a purchase decision with regard to PCs is the budget. The biggest challenge is to understand whether the budget set by us is good enough for our needs or not. A lot of people go ahead in making purchase decisions with huge expectations in mind and when the products don’t stand up to that point, they believe that they have been overcharged. On the opposite end of the spectrum, people sometimes end up paying hefty charges for a particular kind of product and later realize the same. Through the project, we have tried to address that problem by giving the only handpicked options that are rightly priced and consistently deliver when required.

D. Compatibility & Optimisation

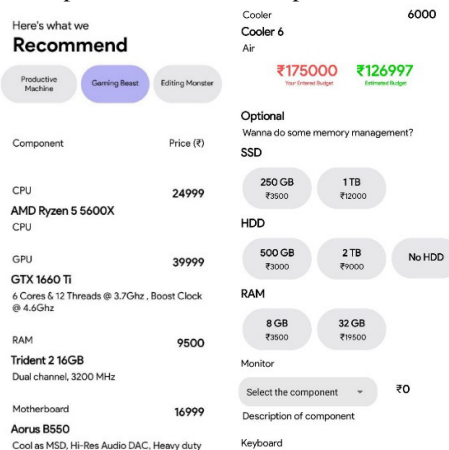
One thing that a lot of people don’t take into consideration is optimization of the performance by selecting the most compatible parts while keeping in mind their own requirements. Let’s say a person wants a PC that is great in terms of gaming i.e. playing games and doing other graphic intensive tasks is the top priority. In that case, the highest percentage of budget allocation (while keeping in mind the requirement and prices of other components) should be on the GPU, then on CPU and motherboard accordingly. The most common parts such as cabinet& power supply must be selected first, then there should be an allocation of percentage of remaining amount to be spent on the essential components such as CPU, GPU & Motherboard. IO devices like Monitor, Keyboard & Mouse must be selected at the

last. Compatibility of motherboards as per the price allocation must also be kept in mind while making such selections.

V. APPLICATION IN ACTION



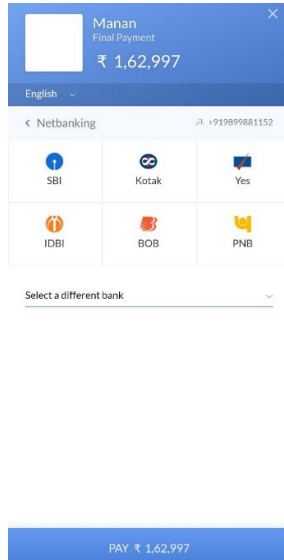
MakeMyBuild lets users enter their budget and the kind of PC they desire. Based on that components are selected from a handpicked list for the best possible results.



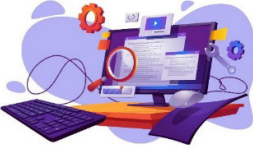
After selecting the components, MakeMyBuild lets user decide how much RAM, Storage he/she wants and further asks for any IO device that may be required by the user. After taking in all the credentials and requirements, the user is asked to make partial payment for the build, which would be sent to their doorstep with all the necessary software installed by the team at the back end.

REFERENCES

- [1] In a general sense, which is better, a desktop or a laptop? (quora.com)
- [2] Laptops Vs Desktops (techradar.com)
- [3] The PC is far from dead (theverge.com)
- [4] Surge in demand for PCs to continue: IDC (windowscentral.com)
- [5] Pandemic spurred PC sector out of hibernation (thehindu.com)
- [6] Chip shortages are starting to hit consumers. (livemint.com)
- [7] CPU & GPU costs could go up following TSMC's reported price increase of chip production (windowscentral.com)
- [8] TSMC to raise quotes for advanced, mature process technologies by 10-20% (digitimes.com)



Your order is **Confirmed**



Expected date of arrival
6-7 days after the date of order.

Current Status
Gathering Components

Delivery Timings
Friday-Sunday(10AM - 6PM)

CONTACT US