**Report on installing and maintaining legacy computer hardware**

Introduction

In computing circles, the idea of installing and maintaining existing computer hardware is widely talked about as it greatly concerns the individuals who would like to optimize the usage of their computer systems, chiefly this is due to reason of a great desire of wanting to cut down cost and reduce chances of software as well as hardware failures on their computer systems, and therein improve their overall customer service and provide a more stable and well defined version of their systems and technologies. The individuals who upgrade and maintain their computer system may also not always derive from a want of increasing their productivity and performance overall, as some do it out of pure necessity, where their hardware components may be critically out of date and subject to a high probability of being susceptible to bugs and crashes. They must then follow industry standards and comply with the regulations that they are subjected to within their respective country such as the ISO 27001 standard. These standards are not in place without good reason, as failure to comply with the most recent standards and old and malfunctional hardware is often a leading factor in security issues and a primary reason for the loss of customers data, or even worse yet, their data being vulnerable to security attacks and malicious persons getting access to their sensitive information. It is then possible, by understanding the basics of installing and maintaining computer hardware, that one can evaluate and draw conclusions regarding the strengths and weaknesses of doing so.

Components from 2013 - 2014

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| Type of computer system | Serial no | Component | Usage |
| PC | Core I3 3220 | Processor | The usage of a processor is to perform the algorithms of the computer system. |
| PC | Intel 80003ES2  Network interface card | Network interface card | To allow networking with other computers and establish communications with others at remote places. |
| PC | Keyboard | IBM 3278 Beam Spring Keyboard | Keyboards allow communication with the computer through an external device. |
| PC | Z77X-UD5H | Motherboard | The motherboard connects all components of a computer system together such that they can communicate with each other properly. |
| Laptop | 5H50S73119 | Hinge | The hinges of a laptop connect the screen to the base of the laptop. They ensure that both will stay in place and that it can be collapsed and carried around, therefore increasing mobility |
| Laptop | PC3-12800 | SO-DIMM | A SO-DIMM or small outline dual inline memory module is the RAM of a laptop and allows relatively fast memory for the computer system. |
| Laptop | MC976 | Main battery | Its usage is to power the laptop and such that it does not need a specific power source so that the laptop can be used whist working at places outside of a building. |
| Laptop | A1466 | Solid State Drive | A solid state drive acts as storage for a laptop and that it contains no moving parts. Being designed as such allows fast and efficient data storage and access of that system and store data to be used later by other processes. |

# Benefits of installing and maintaining hardware

Upgrade in performance of the computer system

By maintaining legacy and old hardware, inspections of the hardware would realize the performance inefficiency of certain components within the system. If prompted to, one could install newer and more efficient hardware and therein improve the productivity of the users of that computer system. Consequently, when productivity of the users are increased, more work can be carried out at once.

Prevention of data loss and compliance with regulations

Data loss is a crucial consideration which companies should be wary of. Improper storage of sensitive data, like that of user details and passwords, will result in it being accessed by malicious actors. By maintaining properly, older components that have these security risks can be removed. Upon newer developments of cyber security, older algorithms thought to be unbreakable previously can now be attacked, and older components using these algorithms can risk data being breached by malicious users of that system. And in doing so the company would fail to comply with regulations and laws protecting the customers data and be subjected to pay a large penalty. When hardware is maintained and checked for compliancy, these security concerns can be partly accounted for.

Less error prone systems

Properly maintained systems are less error prone and therefore more safe and reliable for the users of the computer system. Failures are less likely to occur when using that computer system and in cases where functionality of a system is vitally important, risking errors occurring during employment of that system is not possible. To reduce chance of error, maintenance must be done thoroughly and in intricate detail, such that we can account for areas of failure or fault within the system and fix them, reducing the chance of error and making the system a more reliable and safe system.

Upgraded storage space and memory capacity

Old storage devices often offer very little in terms of storage capacity. This often limits the amount of data to be able stored within a computer system, and its performance as well as the productivity of the user is lessened. By maintaining newer components, the computer system can store and handle more data at one time and increase its capability of handling larger and more complex data. This is an important factor in that of a successful computer system, being that when a systems suffers from lack of storage space it is unable to process any more data when full and would have to rely on cloud storage or other means, both being slower and less efficient when dealing with large amounts of data.

# Impacts of installing and maintaining hardware

Installing and maintaining hardware often results in faults or errors realized within a computer system after inspection, the act of maintaining hardware has an abundant amount of benefits that come with it, as well as it drawbacks. The act of installing and maintaining new systems hardware will be greatly beneficial to the company’s overall income as the performance capabilities of their machines increased is and productivity is therein improved. Notwithstanding, this will also include a multitude of potential negatives as impacted by maintaining the existing hardware and respectively installing new hardware. Through the act of preventative maintenance, we can detect faults and errors of that the computer system may be susceptible to at an ahead of time before its employment in use. As said before, crashes and faults are commonplace in systems that are old – like the ones that are to be replaced, and in performing effective preventative maintenance, we can prevent incurring penalties from failing to comply with the most recent regulations regarding proper maintenance. Security of data within a computer system is most definitely a utmost consideration, especially one who might be handling sensitive user information. Therefore, proper maintenance of a computer system, such as one that might be old and have several faults as a result, is a most critical importance and must be properly upgraded and checked for errors. Under the Data Protection act of 1998, companies can be penalized to up to 8.7 million dollars or 2% of the company’s annual turnover. This amount of this loss is most definitely will result in a disastrous outcome for the company and its reputation will most certainly dwindle. This can be prevented entirely and the chance of user’s sensitive data being loss or falling into malicious person would be subsided. Moreover, legacy devices often require older components that may no longer be manufactured, and therefore pose a great difficulty in finding new parts for it. Conversely, it is also crucial that consideration of the negative impacts of installing and maintaining hardware. These take the form of risks and implications of those risks thereof, and a careful evaluation of these concerns most be done to a proper extent. A simple example of one of those risks is electro-static damage. Most computer components are consists of a vast amount of intricate circuitry, and these often have a high tendency to be damaged through static electricity. Components like the CPU of a computer may be damaged through electro-static discharge and become faulty. The implications of this risk is that the company suffers financial loss and have to pay for new components. Differently, a occasional risk that come from maintaining hardware is that replacing common parts such as hinges of a laptop or a broken monitor. Systematic procedures must be followed to ensure that when fixing certain perhaps delicate parts of a computer system, that these parts are not subjected to damages through careless human error such as being dropped at moderate heights. The implications of these types of risks is that the company will be sustain financial loss and possible damage to the reputation of the company as to the mishandling on computer parts. When these risks are understood, maintenance of the computer system can take on and follow the proper procedures to replace or install components.

# The strengths and weaknesses of hardware components

Laptop

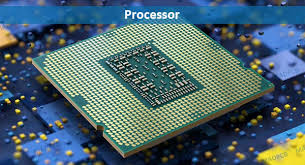
To successfully maintain hardware components one would need to be able to understand the strengths and weaknesses of specific hardware components and why and how the component at interest differs from others and most importantly, the reason as to why it should concern the company’s interest, if at all.

# Motherboard



Whilst motherboards are easy to come by nowadays, they are often designed for personal computers ( desktops and the like ) and they are often subjugated to restrictions due to the being made with larger dimensions than that of laptops and therefore would not be easily compatible with the legacy laptop systems. This poses a challenge when considering installing or maintaining laptops as the constraints of choosing a correct motherboard for certain laptops becomes exponentially harder. One must also consider how most laptop motherboards are proprietary such that if one needs to replace a motherboard, either due to a fault or simply a wish to upgrade, they can only use motherboards produced by the laptop manufacturer and nothing else. This limits the ability to upgrade to a newer and or possibly more efficient motherboard, if the manufacturer no longer produces newer motherboards or design them to be compatible for older systems, and therein upgrading the laptop would be impossible. Yet a great strength that is associated with motherboards that come with laptops is that they are smaller and the general computer system has a smaller form factor, making it a more mobile device overall. Another important consideration is the difficulty when it comes to replacing hardware components within a laptop system. Laptop systems are often designed by manufacturer to be as compact and efficient is use of storage space as possible, so that the components are often small and complex. That being said, to install new motherboards on a given laptop system often involves taking apart the entirety of the whole device and is a comparably more complex process.

# Central Processing Unit



Considering the age of the laptop devices in question, it is without reason that one seeks to upgrade or maintain the existing processor, though they may find themselves faced with certain challenges. CPUs within laptop systems often use system on chip technology, that is they have both CPU and GPU on one chip. This type of design provides benefits to the system such that the CPU and GPU can communicate with each other at quicker rates. One problem with processors within laptop systems is that of the voiding the warranty of the laptop device. If a warranty is established between the consumer ( in this case the company ) and the manufacturer, then attempts to upgrade or fix problems within the computer system can risk nullifying the warranty, and as such the company cannot be paid for damages to the laptop device. This can prove highly undesirable as wishes to perform mandatory inspections of the hardware components done manually would risk financial loss and the consequence is that the device will be unreliable for the end clients. Compatibility issues are also an important consideration, processors are often made by manufacturers to be applicable for certain types of motherboards and architecture of specific bit size. If, and most likely will be, that the computer is using a bit architecture of a smaller size, and the words size of that processor are addressed as 32-bit as opposed to 64-bit as commonly nowadays, then it would be incompatible with components who negotiate at 64-bit and only operating systems of 32-bit sizes can be used. Moreover, to be conscientious of being adequately futureproof, considerations of the sustainability of the processors to be chosen is paramount. Processors can be chosen to ensure that it will last and that will be further compatible and adaptable for other components and devices. Processors that are replaced should not be thrown away entirely and that they are used for older systems that may need that specific component. The choice of processor must be consider the possibility of future inspections and last for a large amount of time such that it wouldn’t be easily displaced by newer components and will reside for long lengths inside the system.

Conclusion

To conclude this report on maintaining and installing hardware for legacy devices, it is observed that there many difficulties and considerations that come with operating on legacy hardware and that the user must take careful precautions when doing the task. Among other things, a great concern when maintaining hardware on computer systems is that of Compatibility. Due care must be taken to ensure that the components used and replaced are sufficiently compatible with other components. There are aspects of specific hardware and certain weaknesses and strengths that they come with. For example, replacing a processor within a given laptop can void its warranty, risking damage and financial loss. Yet once replaced, the laptop can perform tasks at considerable speeds and productivity can be improved. Differently, there are impacts that maintaining hardware can imply, and it is thus one must be careful to consider the risk that come with hardware maintenance, such as reputation or financial loss. These risks underline important factors and complications of hardware maintenance and help enforce proper care when performing hardware maintenance. When the benefits as well as drawbacks of a hardware maintenance is understood, then one can make sound judgement as to what components should be maintained or replaced and that the computer system can benefit from a large improvement.