

## Explore – Impact of Computing Innovations

### Written Response Submission Template

Please see [Assessment Overview and Performance Task Directions for Student](#) for the task directions and recommended word counts.

#### Computational Artifact

2a)

The computing innovation my artifact represents is the M.2 SSD. The function of the M.2 SSD is to provide large amounts of storage in a small form-factor, and it is intended to be used by consumers to create boot drives large enough for everyday programs but without the drawbacks in terms of read/write speed that some SSDs and hard drives come with. My computational artifact shows how an M.2 SSD can be used to provide a simple storage solution for consumers using images, auditory explanations, and animations, all within a playable video.

2b)

The development process for my computational artifact was simple. I used Google to find images of M.2 SSDs, as well as the types of motherboards that support their installation. I used a built-in screenshot tool to create representative images of the functions that some computers have to erase or otherwise change these devices. I used an audio recorder to record my voice. Finally, I used a screen recorder and a video editor to create and edit the video, as well as to create the animations used in the video using the video editor's built-in animation functions.

## Computing Innovation

2c)

One beneficial effect that M.2 SSDs have had on society is the increased speed that they provide for the average consumer. Hard drives were fast during their prime, however consumers have turned towards SSDs, or solid-state drives, such as M.2 SSDs, for an even faster experience than traditional hard drives. Some M.2 SSDs can provide "15x the speed of the fastest hard drives" (Matthew Lui, 2018), and so many consumers have been willing to take the risk and invest in small form-factor storage in hopes that it will rectify their need for speed. This has led to increased manufacturing by companies that produce M.2 SSDs, and thus a continual loop of production and consumption (which is helping the economy in many ways, some yet to be seen). One potential negative effect of this innovation is the number of features that its implementation in consumer hardware could make useless. For example, motherboards that support M.2 SSDs require an available PCIe lane, and a connector to go with it. This means that motherboard manufacturers have to "take those PCI-Express lanes away from other components on the system" (Mark Kyrnin, 2019), leaving consumers in a situation where they have to choose between a useful innovation and the useful features they'd be losing in the process. This could potentially lead consumers to purchase less M.2 SSDs, and that could lead to manufacturers deciding to cut their production altogether, leaving anyone who wanted them out of luck.

2d)

The types of data M.2 SSDs could potentially handle is an endless list. Because M.2 SSDs are most commonly used for storage of an operating system, and since operating systems have the general capacity to handle or otherwise contain any type of data imaginable, M.2 SSDs are open to an infinite variety of data types. At its core, an M.2 SSD takes all sorts of data, all of which can be reduced to binary as both input and output. One data storage concern related to M.2 SSDs is the common concern that, eventually, all storage devices will fail. In short, there is a guarantee that all storage devices on earth, including hard drives, SSDs, M.2 SSDs, and other data chips, will lose all the data that remains on their storage

blocks. In the case of M.2 SSDs, "each memory bank has a finite life expectancy" (Roderick Bauer, 2018). So, after a long period of time (decades or more), all the data on the drive will be lost. This concerns consumers (as well as manufacturers) because they store their personal data on these drives, and new drives are expensive. So, as one might imagine, the prospect of a drive such as an M.2 SSD dying is worrisome.

## References

2e)

Bauer, Roderick. "Hard Disk Drive (HDD) Vs Solid State Drive (SSD): What'S The Diff? ". Backblaze Blog | Cloud Storage & Cloud Backup, 2019, <https://www.backblaze.com/blog/hdd-versus-ssd-whats-the-diff/>. Accessed 9 Apr 2019.

Kyrnin, Mark. "How The M.2 Interface Is Going To Make Your PC Even Faster". Lifewire, 2019, <https://www.lifewire.com/what-is-m2-833453>. Accessed 9 Apr 2019.

Lui, Matthew. "M.2 SSD Storage Pros And Cons And An M.2 Explanation". Guiding Tech, 2019, <https://www.guidingtech.com/m.2-ssd-pros-and-cons/>. Accessed 9 Apr 2019.