# Explore PT - Written Response

**Computational Artifact**

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**Prompt 2a.** Provide information on your computing innovation and computational artifact.
- Name the computing innovation that is represented by your computational artifact.
- Describe the computing innovation's intended purpose and function.
- Describe how your computational artifact illustrates, represents, or explains the computing innovation's intended purpose, its function, or its effect.

*(Must not exceed 100 words)*

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The computational artifact conveys the intended function and purpose of the underlying computing innovation, which is the improvement of speech recognition technologies, and the ability to convert that into text a computer can understand to perform useful tasks. This innovation is called a Smart Speaker (such as the Amazon Echo). This artifact works because of its use of explanation and imagery. Captions accompany simplistic drawings, which make for an effective viewing experience. The organization of the artifact is also key to its clarity, with the top of the page explaining the innovation's purpose, and the bottom focusing on technological aspects.

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**2b.** Describe your development process, explicitly identifying the computing tools and techniques you used to create your artifact. Your description must be detailed enough so that a person unfamiliar with the tools and techniques will understand your process
*(Must not exceed 100 words)*

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My development process for creating the computational artifact is as follows. I created a new document in Microsoft Publisher. I then inserted images of the Amazon Echo, my computing innovation, and clip-art of tasks the innovation can complete (such as a pizza for ordering a pizza). After that I added text boxes for the captions explaining how the innovation works and what the images mean. Finally I changed the font, color, and size of the content to increase its visual appeal.

## Computing Innovation

**2c.** Explain at least one beneficial and one harmful effect the computing innovation has had, or has the potential to have, on society, economy, or culture.
*(Must not exceed 250 words)*

The Amazon Echo is a computing innovation known as a smart speaker that came about due to improved speech recognition. Smart speakers are devices containing voice-activated virtual helpers that can perform tasks. The Amazon Echo has a beneficial effect on society in its convenience. It allows us to [2] play music, make hands-free calls, or use internet data to accurately answer questions. However, in doing so, the Amazon Echo infringes on privacy and raises concerns about security. This is because smart speakers are always listening; [4] they record audio after hearing a "wake word." Using an Amazon Echo is like [3] "equipping your bedroom with an internet-connected microphone that can record and send all your conversations to the data-hungry server of a giant tech company." Therefore, a harmful effect of this computing innovation on society is its intrusion on privacy or security.

**2d.** Using specific details, describe:
- The data your innovation uses;
- How the innovation consumes (as input), produces (as output), and/or transforms data; and
- At least one data storage concern, data privacy concern, or data security concern directly related to the computing innovation.

*(Must not exceed 250 words)*

The computing innovation that created the Amazon Echo works via the following process. The first step is signal processing. The device attempts to understand voice input here by cleaning the signal. Next, the speaker must detect a wake word, such as "Hey Alexa." After that, the device must convert the audio it hears to text. The text is then sent to an Amazon server that converts it to a format the device can understand using cloud processing and big data. After that the device can finally carry out the requested function such as reading the weather. A major concern related to the underlying computing innovation is one of security. A device such as the Amazon Echo that listens to everything you say around it is a ripe target for a person with a malicious agenda. As the echo is connected to the cloud and sends data to a server, it can create opportunities for attacks on your privacy. For example, a group of Chinese hackers can [1] "successfully break the Amazon Echo by using multiple vulnerabilities in the Amazon Echo system, and [achieve] remote eavesdropping."

# References

## Bibliography:

[1] *Greenberg, Andy. "Hackers Found a Way to Make the Amazon Echo a Spy Bug." Wired. 11 Aug. 2018. Conde Nast. 21 Apr. 2019 <https://www.wired.com/story/hackers-turn-amazon-echo-into-spy-bug/>.*

[2] *Speakers, Bass Head. "Amazon Echo Review – The Pros, Cons, and How It Works." The World's Best Outdoor Speakers, 4 Jan. 2019, https://www.bassheadspeakers.com/amazon-echo-review/.*

[3] *"Beware the Privacy and Security Risks of Smart Speakers." TechTalks, 5 June 2018, https://www.bdtechtalks.com/2018/06/05/google-home-amazon-echo-privacy-security-risks/.*

[4] *Ovenden, James. "How Amazon Alexa Works | Articles | Big Data." Articles | Innovation | Innovation Enterprise, 1 May 2018, https://www.channels.theinnovationenterprise.com/articles/how-amazon-alexa-works.*

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