

Practice PT - Big Data and Cybersecurity Dilemmas



Background

Technological innovations bring about new dilemmas or tensions that people and society must face. Innovation is usually intended to bring some benefits or positive change, but something interpreted as a benefit for one person or group can negatively impact another person or group. For example, with the rapid growth of “big data” there is a lot of information out there about you which can make your life much more convenient and efficient, but potentially at the cost of losing some control over your privacy or even what information you can easily access. With strong encryption we can enable very secure communications to maintain privacy, but what happens when the data being encrypted is used to hide illegal activity or to enable dangerous activities that threaten the lives and security of others?

For this Practice PT you will pick one of two issues to research more deeply that reveal some of these tensions. This project is an opportunity to practice many of the skills you will use when completing the Explore Performance Task on the AP® Exam at the end of the year. While an open-ended research project might be intimidating, **you have built all the skills you need to complete this task.**

Note for 2017-18 School Year: This Practice PT has NOT been updated to reflect changes to the [Explore PT Scoring Guidelines](#) released in Fall 2017. We recommend you review those guidelines to understand the similarities between this project and the actual Explore PT.

Project: Big Data and Cybersecurity Dilemmas

You will independently select and investigate an issue related to Big Data or Cryptography that poses a societal or personal dilemma. Specifically, you will:

1. **Choose your Dilemma**
2. **Conduct your Research** on a specific issue or event related to the topic that poses a dilemma
 - Understand the different sides of the issue.
 - Explore the “innovation” that caused or spurred this dilemma.
 - Find a visual or audio artifact that highlights, demonstrates, or helps explain some element of the issue.
3. **Write your responses** to prompts that ask you to:
 - Explain both sides of the dilemma
 - Connect your research to things you’ve learned in class
 - Explain what your visual or audio artifact is communicating about your issue.
4. **Submit** your written responses and artifact

1. Choose Your Dilemma

You should choose the category of dilemma - Big Data or Cryptography - based on what you find most relevant or interesting. Once you have a general topic you should go a little bit deeper and find a specific issue or event that pertains to the topic which you’ll report on. See the “conducting your research” section below. Here are the topics:

<p>Topic 1: Big Data</p> <p><i>Dilemma: Should your online experience be tailored to your individual interests?</i></p> <p>Summary: In a world of Big Data, we face an overwhelming amount of information, and need sophisticated tools to help us make decisions and find the information we’re really looking for. Using big data to customize your web experience (in search, social media, shopping,</p>	<p>Topic 2: Cryptography</p> <p><i>Dilemma: Should encryption have a “backdoor?”</i></p> <p>Summary: There has always been a tension between keeping people safe and maintaining a right to privacy, even before cryptography. Most people like to know that they can conduct parts of their life with complete privacy without being observed or spied on. But what if that right to privacy is used to do harm to others, or to conduct illegal activity? Cryptography introduces new wrinkles into this</p>
--	--

<p>etc.) can greatly increase the quality and relevance of what you see. However, this customization can have the effect of removing you as the decision-maker in what information you see, placing you in a “filter bubble” that can prevent you from accessing all the possible information that might be relevant.</p> <p>Starting point for background info: https://en.wikipedia.org/wiki/Personalized_search</p>	<p>dilemma because when information is encrypted (made private) there might not be a physical way to compel someone to give it up or to “break in”. Government agencies and security advocates might call for encryption algorithms to have a “backdoor” that would allow decryption in case of emergencies or serious threats to national security or safety. Of course this raises questions about how true privacy might be maintained, or if privacy is even possible.</p> <p>Starting point for background info: https://en.wikipedia.org/wiki/Crypto_Wars</p>
---	--

2. Conduct Your Research

You already have some practice finding good resources online. You’ll want to find **recently published documents** from **authoritative sources**. There is no need to use overly technical documents, but keep an eye out for **familiar terminology and topics**. In this phase of the process, you will find information about your topic and you will locate an existing computational artifact that demonstrates or helps to explain some part of your issue.

How to start:

- Start at the Wikipedia pages linked above for the general concept and background info.
- The wikipedia page should:
 - Give you terminology, names, or events that you can look up and read about
 - Has links to other pages that go more in depth on specific issues
 - Has a list of sources and reference articles at the end.
- Ultimately you want to end up in some new place - don’t just sit on wikipedia. Once you start, continue to follow links until you arrive at something interesting and manageable.

Key Information to Find:

- A specific issue or instance related to the dilemma you’ve selected.
- What are the two sides of this issue? What are the strongest arguments for each side?
- How is computing involved? What is the “innovation” that caused or spurred this dilemma?
- Any famous incidents or events that stand out (especially recent ones) that highlight the issue?
- A visual or audio artifact that highlights, demonstrates, or helps explain some element of the issue.

Use the table below to keep track of your information. **You’ll need to include at least 3 sources of information** but you can use more.

My Dilemma: _____

<p>Reference Name:</p>	<p>URL:</p>
<p>Year Published:</p>	

Key Information	
------------------------	--

Reference Name: Year Published:	URL:
--	-------------

Key Information	
------------------------	--

Reference Name: Year Published:	URL:
--	-------------

Key Information	
------------------------	--

Reference Name: Year Published:	URL:
--	-------------

Key Information

Submission Guidelines

Overview

The document below has been constructed to mimic the AP Explore Performance Task. In completing this project you write and submit responses to the reflection questions, which are in the style of the AP Explore Performance Task. Some but not all of the language is pulled directly from the AP document. Some of the prompts have been modified slightly or simply omitted for clarity and to better fit this project.

Submission Requirements

1. Research Guide

You will submit your research guide primarily as an indication of the sources of your information. Make sure you have included at least three separate references to information you have collected.

2. Artifact

As part of your research you should have encountered some form of visual or audio artifact (a visualization, graphic, video, audio recording, etc.) that you think does a good job of communicating about the computing innovate behind the dilemma you researched. You do not need to create this artifact yourself but you are more than welcome to. You may also edit or add to an artifact you find if you believe it would add to its clarity. **Video or audio files must not exceed 1 minute in length.**

Selected artifacts should do the following:

- Augment the information supplied in your written responses. The artifact must not simply repeat information supplied in the written responses.
- Convey the computing innovation's intended purpose, its function, or its effect.

3. Written Responses

To help explain your topic you will write responses to the prompts below. Your responses must provide evidence of the extensive knowledge you have developed of your topic and its impacts. Write your responses so they would be understandable to someone who is not familiar with the topic. **Your response to any one prompt must not exceed 300 words.**

- a. Describe the dilemma.
 - What are the details of your specific issue or instance of the dilemma?
 - Explain both sides of the issue and the potential beneficial and harmful effects. Your description

should include:

- i. the populations that are impacted by both the beneficial and harmful effects.
 - ii. the potential consequences of choosing one side of the argument over the other.
- b. Explain the computing “innovation” that gave rise to this dilemma, both how it functions and how it is used.
- o Connect what you researched to terminology and ideas you have learned in this course, and specifically during this unit.
 - o Your description does not need to be overly technical, but should aim to explain elements of the technology that you think the “average” person might not know.
 - o Include details about a data storage, privacy, or security concern related to the underlying computing innovation.
- c. Computational Artifact:
- o How does the visual or audio artifact convey the intended purpose of the underlying computing innovation, its function, or its effect?
 - o What makes the artifact effective? (*NOTE: your description should include the **characteristics** of the visual or audio artifact that help to explain or elaborate on aspects of your selected issue*)

Original Rubric (based on version of explore rubric released in september 2016) C O
D E

Component	1	2	3	Score
Research Guide				
References	Research guide includes references to one or two sources OR the sources listed are not recent and authoritative.	Research guide includes references to three sources but they are not complete, OR the sources are not recent and authoritative.	Research guide includes complete references to at least three recent, authoritative sources.	
Visual or Audio Artifact				
Augments Information in Written Responses	The artifact is <u>primarily non-textual</u> and conveys a minimal, unclear, or otherwise ineffective explanation of the computing innovation’s intended purpose, its function, or its effect. OR The computational artifact is <u>primarily textual</u> .	The artifact is <u>primarily non-textual</u> AND conveys some new information about the computing innovation’s intended purpose, its function, or its effect.	The artifact is <u>primarily non-textual</u> AND conveys a lot of new information about the computing innovation’s intended purpose, its function or its effect.	
Written Responses				
Describe the Dilemma	Topic description does not provide a clear explanation of the specific instance of the dilemma. The response <u>identifies</u> either a beneficial or a harmful effect of the computing innovation.	Topic description provides an adequate explanation of the specific instance of the dilemma, but may lack sufficient detail. The response <u>identifies and describes</u> a beneficial and a harmful effect of the	Description of specific instance of the dilemma is clear, comprehensive, and rich with details. The response <u>identifies and describes</u> a beneficial and a harmful effect of the computing innovation	

	<p style="text-align: center;">AND</p> <p>The impacted population is identified OR provides potential consequences of choosing one side of the argument over the other.</p>	<p style="text-align: center;">computing innovation AND</p> <p>The impacted population is identified OR provides potential consequences of choosing one side of the argument over the other.</p>	<p style="text-align: center;">AND</p> <p>The impacted population is identified AND provides potential consequences of choosing one side of the argument over the other.</p>	
Explain the computing innovation	<p>Description makes limited or inaccurate use of vocabulary and concepts encountered in this unit.</p>	<p>Description makes adequate use of vocabulary/concepts encountered in this unit. OR Includes an explanation of elements of the technology that the “average” person might not know.</p>	<p>Description makes appropriate use of vocabulary/concepts encountered in this unit. AND Includes an explanation of elements of the technology that the “average” person might not know.</p>	
Visual or audio Artifact	<p>An incomplete or inaccurate description of how the visual artifact illustrates the computing innovation’s intended purpose, its function, or its effect.</p>	<p>An adequate description of how the visual artifact illustrates the computing innovation’s intended purpose, its function, or its effect. OR An adequate description of why the artifact effective</p>	<p>A clear description of how the visual artifact illustrates the computing innovation’s intended purpose, its function, or its effect. AND A clear description of why the artifact effective</p>	

Updated Rubric (based on version of explore rubric released in Nov. 2016)



The following rubric and scoring guidelines are to be graded on a binary scale, meaning you either earn the point, or you don't. See the scoring notes section on the right for details about what your response should include in order to receive credit. (note that while each component of this rubric is scored on a binary scale, each item is weighted).

Component	Criteria	Scoring Notes
Research Guide		
References (10%)	Research guide includes complete references to at least three recent, authoritative sources.	There are 2 aspects required to meet this criteria: <ul style="list-style-type: none"> • Sources must be recent; and • Sources must be authoritative;
Visual or Audio Artifact		
Computational Artifact Augments Information in Written Responses (20%)	The computational artifact identifies the computing innovation and provides an illustration, representation, or explanation of the computing innovation's intended purpose, function, or effect.	<ul style="list-style-type: none"> • This score is based on the computational artifact. As needed, the written response can be used to provide additional information required to earn this point. • The name of the computing innovation needs to be explicitly stated either in the written response, computational artifact, OR in sound within the computational artifact.
Written Responses		
Describe the Dilemma (15%)	Describes a specific instance of the dilemma with details of the possible impact of choosing a side in the dilemma.	<p>This score should be based solely on the written responses.</p> <p>The response should include details on the possible negative impact of picking a side in the dilemma.</p>
Describe the Dilemma: Beneficial and Harmful effects (15%)	Identifies a beneficial effect AND a harmful effect of the computing innovation. Explains how ONE of the identified effects impacts society, economy, or culture.	<ul style="list-style-type: none"> • This score should be based solely on the written responses. • The response can include similar words that mean "benefit" and "harmful". • There are 3 aspects required to meet this criteria: <ul style="list-style-type: none"> ○ Identifying a beneficial effect; ○ Identifying a harmful effect; and

		<ul style="list-style-type: none"> ○ Explicitly explaining and connecting ONE of the effects to society, economy or culture. ● “Hacking” can be stated as a valid effect only if the computing innovation is a hacking device or is intended for hacking.
Explain the Computing Innovation <i>(15%)</i>	States a plausible fact about the computing involved in the dilemma (the intended purpose or function of the innovation)	<ul style="list-style-type: none"> ● This score should be based solely on the written responses. The statement should include the intended purpose or function of the computing innovation from a design perspective. ● The response can include this statement with or without an attribution through citation or reference.
Explain the Computing Innovation: <i>data storage, privacy, or security</i> <i>(15%)</i>	Identifies one storage, privacy, OR security concern. Explains how the concern is related to the computing innovation	<ul style="list-style-type: none"> ● This score should be based solely on the written responses. ● There are 2 aspects required to meet this criteria: <ul style="list-style-type: none"> ○ Explicitly stating a storage, privacy, or security concern; and ○ Explaining how the concern is related to the computing innovation.
References <i>(10%)</i>	Provides inline citations of at least 3 attributed sources with the written response. The citations must be used to justify the response.	<ul style="list-style-type: none"> ● Submissions that include only a bibliography (or a list of references) will not receive this point. The submission must also include at least three inline citations. ● Citation styles can include but are not limited to name, superscript, number system. The type of inline citations used does not have to be done correctly. Any format works as long as it is clear