Cheating Better with ChatGPT:
A Framework for Teaching Students When to Use ChatGPT and other Generative AI Bots

David R. Firth
Management Information Systems
david.firth@umontana.edu

Mason Derendinger
mason.derendinger@umontana.edu

Jason Triche
Management Information Systems
jason.triche@umontana.edu

Management Information Systems
University of Montana
Missoula, MT 59812, USA

Abstract

In this paper we describe a framework for teaching students when they should, or should not use generative AI such as ChatGPT. Generative AI has created a fundamental shift in how students can complete their class assignments, and other tasks such as building resumes and creating cover letters, and we believe it is imperative that we teach students when the use of generative AI is appropriate, and when it is not appropriate (i.e., considered cheating). Framework development is based off the 2x2 Product-Market matrix introduced by Ansoff in 1965. Our initial pass at the framework was piloted with colleagues, and then followed with a focus group of students to refine the framework. We then used the framework in an MBA class to test its efficacy and gather qualitative feedback. Using the results, we further refined the framework and then used it to teach two general undergraduate business classes as a rudimentary test of generalizability across students. The qualitative results were positive. The framework helps educators understand when to use, or not use ChatGPT, and provides a way to teach students about the same. We have found that using the framework in class generates interesting discussions about the use of generative AI.

Keywords: Generative AI, ChatGPT, Teaching, Framework, Flowchart

Cheating Better with ChatGPT:
A Framework for Teaching Students When to
Use ChatGPT and other Generative AI Bots

David R. Firth, Mason Derendinger and Jason Triche

1. INTRODUCTION

The introduction of the printing press radically transformed the availability and transfer of knowledge. Rather than being forced to rely on expensive, handwritten manuscripts for the physical dissemination of knowledge, individuals could purchase and consume reasonably-priced, typed knowledge. The introduction of generative artificial intelligence, of which ChatGPT is just an example, presents an opportunity to fundamentally change the process of human learning in a way not observed since Gutenberg developed his printing press (Kissinger et. al, 2023).

When the printing press emerged, the low literacy rate of the European population hampered the true potential of the printing press for hundreds of years. Taking full advantage of a powerful, novel tool at our disposal requires an educated population. The same is true for generative AI like ChatGPT: we must, ourselves, become AI-literate. AI literacy can be defined as a set of skills that enable a solid understanding of AI through three priority axes: learning about AI, learning about how AI works, and learning for life with AI (Casal-Otero et al., 2023). Then, as information systems professionals, we must ensure that this literacy is passed on to students. It is not sufficient and perhaps, not even necessary, to have a technical understanding of AI and its capabilities. But it is necessary to learn when generative AI *should* be used.

Non-generative AI has already become ubiquitous in daily life. Indeed, artificial intelligence has generated a 4th Industrial revolution (French et. al, 2021). We use artificial intelligence when our robots clean our floors while we are away, when our home thermostat automatically sets the temperature to our preference, and when we find the ideal item for our kitchen via an advertisement on a web page. In short, AI powers the tools we use daily (Baidoo-Anu and Ansah, 2023).

The use of generative AI in universities has already generated controversy: "There's an Arms Race on Campus and Professors are Losing" (The Atlantic, 2023), and "Here are the schools and colleges that have banned the use of ChatGPT over plagiarism and misinformation fears" (Business Insider, 2023), as examples. Its ability to successfully evaluate and complete complicated functions has resulted in a variety of reactions among the educational establishment (Baidoo-Anu and Ansah, 2023); several institutions have already banned its use (Lim et. al, 2023), yet it remains a crucial part of business innovations (Chen, 2022). However, we disagree with the approach of restricting or banning its use. Generative AI has a huge potential to disseminate knowledge (Liebrenz et. al, 2023). It has access to a library far beyond the capacity (Kissinger et. al, 2023) that a human possesses. We believe that Generative AI as a technology is much like the calculator when it was first introduced. When introduced, many schools banned its use for mathematics and other science subjects, but soon found that it reduced simple mathematical errors and allowed the instructors and students to work on more important issues.

Generative AI is being utilized in new ways at a rapid pace. *Wired* magazine uses ChatGPT throughout their journalistic process, such as generating headlines or ideas for stories (Lichfield, 2023). It promises advancements in sustainability decision making (Schoormann et. al, 2023) and even in translating sign language into verbal communication (Strobel et. al, 2023). Software developers have used it to greatly increase their efficiency, and many students are already using it to complete assignments. The reality that generative AI is so widely used, even in its relative infancy, is an indicator of how ubiquitous it is becoming. Therefore, we believe that the most relevant questions are, should and if so, how we use generative AI for a given use case. In this paper, we have developed frameworks to address the should, which then leads to better solutions to how.

Our frameworks help to address concerns regarding improper use of generative AI and encourage students to make use of the opportunity to use a new tool to aid their learning. Our overarching goal is to provide a framework by which students can be introduced to the effective use of generative AI chat bots in classroom-related settings. While we absolutely do not approve of cheating, we are well aware that cheating is prevalent in business schools. One comprehensive study of business school cheating showed that 86% of students had cheated at least once (Klein et al., 2007). We do realize that providing a framework to students as to when and when not to use generative AI could increase the level of cheating, or perhaps more importantly given the already high rate of cheating, the efficacy of cheating. In industry, leaders expect IS graduates to be able to align business and technology with the goal of using artificial intelligence to further the needs of the business case (Lyytinen et. al, 2023). Students must also be able to connect the use of IT and AI to how the tools can help the business generate value (Lyytinen et. al, 2023). For students with a general IS undergraduate degree, there is an expectation that they have a basic understanding of artificial intelligence (Lyytinen et. al, 2023). We encourage educators to make use of our frameworks to help their students understand and utilize the powerful new generative AI tool at their disposal. Our frameworks are useful tools but operate in different ways. The first framework is a simple flowchart that provides basic introduction on when to use generative AI like ChatGPT for students. The second framework is a more complex tool, but a more useful tool if one understands the nuances of how to wield the technology properly.

2. FRAMEWORKS

The flowchart and matrix frameworks that we developed and describe here are exploratory. We currently teach the Future of Work sections of our undergrad MIS and MIS for the MBAs using a Latham and Humberd (2018) article wherein they developed a framework to help teachers and students better understand the four ways jobs respond to automation. This article provides a useful framework for students to better understand the Future of Work. Therefore, we wanted to provide a similar framework for when to use generative AI. To that end, we developed a flowchart and matrix frameworks from scratch to help us, the teachers, understand when to use generative AI, or not. The goal was to then be able to use this framework to explain when to use generative AI to students. The process of building
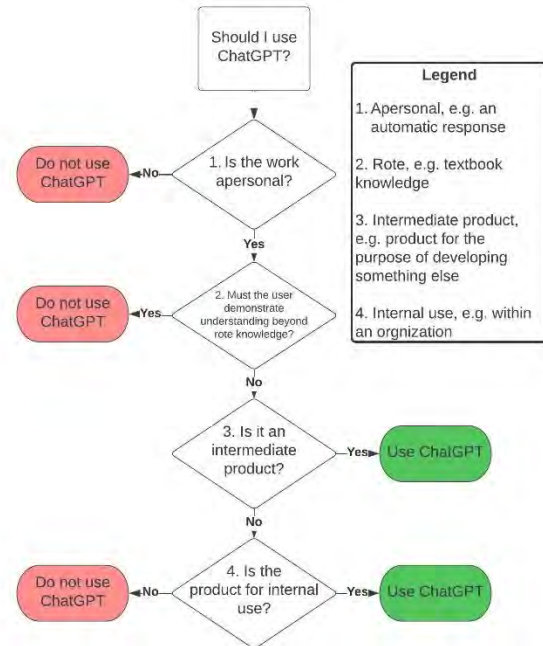
this framework is iterative. We tested the framework with colleagues and a small group of students and modified the framework based on feedback. When we were confident that we had an acceptable and useful flowchart and matrices we engaged an entire class of MBAs. From that qualitative feedback we made minor changes, and then we used the framework in several sections of undergraduate classes to check that the framework was useful.

Figure 1: Flowchart for basic evaluation of generative AI potential use cases. A user can begin at the top and proceed stepwise until a positive (yes) or negative (no) has been determined.

As a starting point, we introduce a simple binary flowchart, see Figure 1. The purpose of this chart is for the preliminary evaluation of the appropriateness of utilizing generative AI for a given use case. This flowchart allows students to apply a series of questions to a task to evaluate on a basic level whether generative AI should be used to complete the task. As such, it can be used to explore different types of information or contexts easily for the purpose of showing students, and others, how large language model generative AI can be used in collegiate settings and beyond. To be clear, the scope of the flowchart is to allow students the ability to determine if generative AI should be used in a collegiate environment (e.g., assignments, group deliverables, projects).

In our flowchart (Figure 1) work is apersonal if the personality of the author does not need to be conveyed in the product. Rote knowledge is knowledge that does not require the synthesis and application of other knowledge into a new product. Rote knowledge is factual knowledge

(e.g., today's date). An intermediate product is a product that is created in a process at any point prior to the absolute end or before the deliverable. Work is considered to be internal if it is not being presented to a client, professor or instructor for an assignment, or submitted to an entity outside the organization or group.

The basic flowchart is useful to the extent that it can be presented in a straightforward way to a large number of students or to students early in their collegiate career. It is simple to use, and in most cases, will return a correct answer that encourages students to use the tool in a way that saves them time in a way that is not detrimental to their learning. To demonstrate, we will walk through the flowchart from the perspective of a busy university student who must give a speech on the importance of communal residence halls. Should the student use ChatGPT to develop an outline for the speech? Let us evaluate:

1. Can the work be apersonal?
   Yes, the outline does not need to reflect the personality of the author.
2. Must the work demonstrate understanding beyond rote knowledge?
   No, the outline can contain rote knowledge without any synthesis.
3. Is the work an intermediate product?
   Yes, the outline is not the final product. Use of ChatGPT makes sense.

In this circumstance, the flowchart framework has determined that because the outline is merely a foundation upon which personality and understanding of the writer can be developed before the final product is complete, using ChatGPT is a wise use of the resources at the student's disposal. The result of the flowchart is to use ChatGPT.

We will evaluate another potential use case. There is a student who must present a nutrition and training plan to an imaginary client for a class assignment. The students want to know if they should use ChatGPT to gather information to write a script that they will read for their presentation.
1. Can the work be apersonal?
   Yes, the script does not need to reflect the personality of the student.
2. Must the work demonstrate understanding beyond rote knowledge?
   No, the script can contain rote knowledge without any real synthesis or addressing a particular context.
3. Is the work an intermediate product?
   No, the script is a final product.

In this circumstance, the flowchart concludes that because the student will be reading from the script, the use of generative AI is not appropriate. This would amount to plagiarism and is a violation of student conduct and would inhibit their learning. The result is not to use ChatGPT.

We will use a non-academic example to demonstrate the shortcomings of this flowchart. There is an individual who wants to use ChatGPT to generate responses to a lab partner that is emailing them excessively with trivial questions and for information that could be easily found using a search engine. Should this individual use ChatGPT to generate responses?

1. Can the work be apersonal?
   No, a 1-to-1 email is, by definition, personal. Use of ChatGPT is not appropriate.

Following the flowchart, the answer would be to not use ChatGPT. However, this seems to be an indistinct area that would benefit from a greater evaluation of circumstances. The answer should not always be no, as what counts as personal has nuance and variation to it that is not accounted for in the flowchart.

Our flowchart is straightforward to use and will prevent students from using generative AI in a way that will inhibit their learning or harm their professional or personal relationships. As a result of this simplicity, this framework has been designed to be conservative in its results. In this particular lab partner circumstance, it is better to return a false negative than a false positive as the risk of not using generative AI is relatively small compared to using it in an inappropriate way. That is, the status quo of manually writing an email is less risky than trying something new and using generative AI. To this end, the flowchart will, in most instances, return false negatives, but not false positives. Therefore, we have developed a second framework to derive a more nuanced answer. This framework, which we are calling the Matrix Framework, can be visualized in Figure 3, below.

3. 2x2 MATRIX FRAMEWORK DEVELOPMENT

Our 2x2 matrix framework inspiration came from Beth Humberd, who co-developed the 2x2 matrix in the "Four Ways Jobs Respond to Automation" paper (Latham and Humberd, 2018). We use the Four Ways Jobs Respond to Automation 2x2 matrix in the Future of Work section of both the undergraduate level Introduction to Management Information Systems class for all business students, as well as the Introduction to Management Information Systems class for MBA students, and it is a very useful way to instruct students.

The 2x2 matrix as it relates to business theory has been around since 1965. The 2x2 product-market matrix has become a basic tool for explaining business to students since then. Figure 3 shows the Product-Market matrix (Ansoff 1965). "The two most essential strategy levers for any business are the product or service it delivers and the markets it sells into." (Ansoff, 1965). The words in each quadrant represent what you should do in that quadrant, with each quadrant being defined by whether it is a current or new product (vertical axis), or a current or new market (horizontal axis).

In developing our 2x2 matrix for the evaluation of generative AI use cases, we used the guidance provided by Lowy and Hood (2004) to create a 2 × 2 matrix that expresses a real and important tension in your life…we ask them to name the ends of the two axes, and the four quadrants contained in the matrix. Further, 2 × 2 modeling is characterized by discovery and unpredictability (Lowy and Hood, 2004).

Figure 2. Product-Market Matrix, Ansoff (1965)

We found that we needed two 2x2 matrices. One focuses on the intrinsic nature of the topic being asked of ChatGPT, the other focuses on how the results of ChatGPT will be used. The intrinsic nature 2X2 matrix has axes defined by apersonal/personal on the horizontal, and rote knowledge/understanding on the vertical. This dichotomy of apersonal/personal reflects how well someone knows the person or topic that is being covered. Personal suggests that someone knows it well and with details that would not be known to others. Apersonal suggests that the personality of the author does not need to be conveyed in the generated product. On the vertical axis, rote knowledge is something that has already been canonicalized, for instance in a textbook. Understanding is something that is well beyond just textbook rote knowledge, and implies a deep understanding of context, history, and such.

The second 2X2 matrix, which focused on how the results from ChatGPT will be used, has Internal/External Use on the horizontal, and Intermediate/End Product on the vertical. This dichotomy of Internal/External Use reflects whether or not the results from ChatGPT will be used internally, by someone or their team who they know well, or will be disseminated to others, who they might not know well, or at all. The Intermediate/End Product dichotomy reflects whether or not the results of ChatGPT are just a stepping stone to a final product, or are the end product themselves.

4. PROSPECT THEORY

Before we continue with an explanation of the Matrix Framework in Figure 3, it is important to introduce a tool to help understand how to deal with the yellow result outcomes – see Figure 3 for yellow results. A yellow result is one in which the outcome is not clear to use generative AI or to not use generative AI. Further analysis is necessary, and for this further analysis we are proposing the use of prospect theory (Kahneman and Tversky, 1979). Simply, prospect theory describes the decision-making process that individuals utilize as they account for potential losses and gains relative to their current circumstances (Barberis, 2013). As there is extensive literature on prospect theory, we will only give a brief overview as it applies to our Matrix Framework. In summary, by evaluating the risks and rewards relative to current circumstances, a user of the Matrix Framework can evaluate if it is appropriate to use ChatGPT for a specific use case if it falls into a yellow quadrant in one of the matrices.

According to prospect theory, a user weighs their decision based on the potential changes to their circumstances. There are several assumptions on which prospect theory is founded, including that individuals are: 1) more attuned to changes than absolute magnitudes, 2) people are more sensitive to gains than losses of the same magnitude, and 3) there is diminishing sensitivity to the magnitude of a gain or loss (Barberis, 2013 see Table 1).

Table 1: Assumption of Individual Behavior in Prospect Theory.

The first assumption is that individuals will value changes more highly than a shift in the absolute standing. For example, let us briefly explore how many students use prospect theory without their conscious intention to do so. A student is more likely to do work to improve a test score when offered the chance to earn points back (Rice, 2020) than they are to complete an optional extra credit assignment (Harrison, et. al, 2011). In this circumstance, the risk is the opportunity cost of taking the time to do the extra credit. Here, the student has prioritized a change (i.e., improved test grade) more than an absolute magnitude (i.e., extra points). Given the choice between a guaranteed $50 or having a 50/50 chance at $100, which has an expected outcome of $50, most people will take the guaranteed $50. For a student, pushing for a regrade produces the opportunity for an increase whilst locking in the current grade, whereas extra credit has a range of uncertain outcomes.

Next, individuals are motivated more by gains **than losses. "What do I gain by using ChatGPT?"** is the silent question underpinning this article. It is weighed against what could be lost by using ChatGPT. As in the first assumption, the loss or risk associated with not using ChatGPT is generally the opportunity cost of taking the time to do something manually rather than using ChatGPT. Using ChatGPT has the gain of both saving time and generating an answer that is better because it is built off more information than that to which the student has access.

Finally, an individual will be happier about becoming $1,000 more wealthy (or less badly off) than they are to hear they will receive an extra $1,000 on top of their $1 million lottery winnings. This is relevant to our framework in that a mediocre student may decide to put more manual effort into an extra credit assignment to achieve a high-quality deliverable and secure their figurative first $1,000. However, an excellent student may decide to use ChatGPT to develop

the deliverable as they have already acquired their figurative academic $1 million and are more concerned with the risk (opportunity cost) of not using ChatGPT. It can be helpful to think of this assumption as a most valuable, first $1,000, and a least valuable, last $1,000.

In summary, by evaluating the risks and rewards relative to current circumstances, with the underpinning of prospect theory to guide the process, a user of the Matrix Framework can

Assumption 1	Assumption 2	Assumption 3
Individuals are **"more attuned** to changes than absolute **magnitudes."**	Individuals are more sensitive to gains than losses of the same magnitude.	There is diminishing sensitivity to the magnitude of a gain or loss.

evaluate if it is appropriate to use ChatGPT for a specific use case if it falls into a yellow quadrant in one of the matrices in Figure 3. As prospect theory is descriptive, not prescriptive, it is helpful to first determine the answer, then critically evaluate how a user arrived at the answer by analyzing which assumption was used.

5. MATRIX FRAMEWORK FOR TEACHING GENERATIVE AI USE CASES

We will now walk through each of the quadrants of the two 2X2 matrices in Figure 3 (*Stranger*, *Acquaintance*, *Coworker*, *Friend*, *Draft*, *Pitch*, *Communication*, and *Solution*) in turn to discuss and explain them.

Stranger: Apersonal/Rote Knowledge
It is helpful to think of this quadrant as containing the kind of information that a stranger may know about you. The stranger may find out basic facts about you, such as where you work, or what kind of car you drive. However, they do not know anything personal about you, like your relationships with your family, or possess any deep understanding of how the facts about you make you who you are. It is appropriate to use ChatGPT for use cases that deal with such basic, personal facts and require no deep understanding or application of those facts.

An example of a use case in this quadrant is creating a syllabus. Creating a syllabus requires knowledge of facts, and applies to the whole class, and not a specific person, and as such is apersonal/rote knowledge. Additionally, it does not require an understanding of who the instructor is as a person. This would make it an
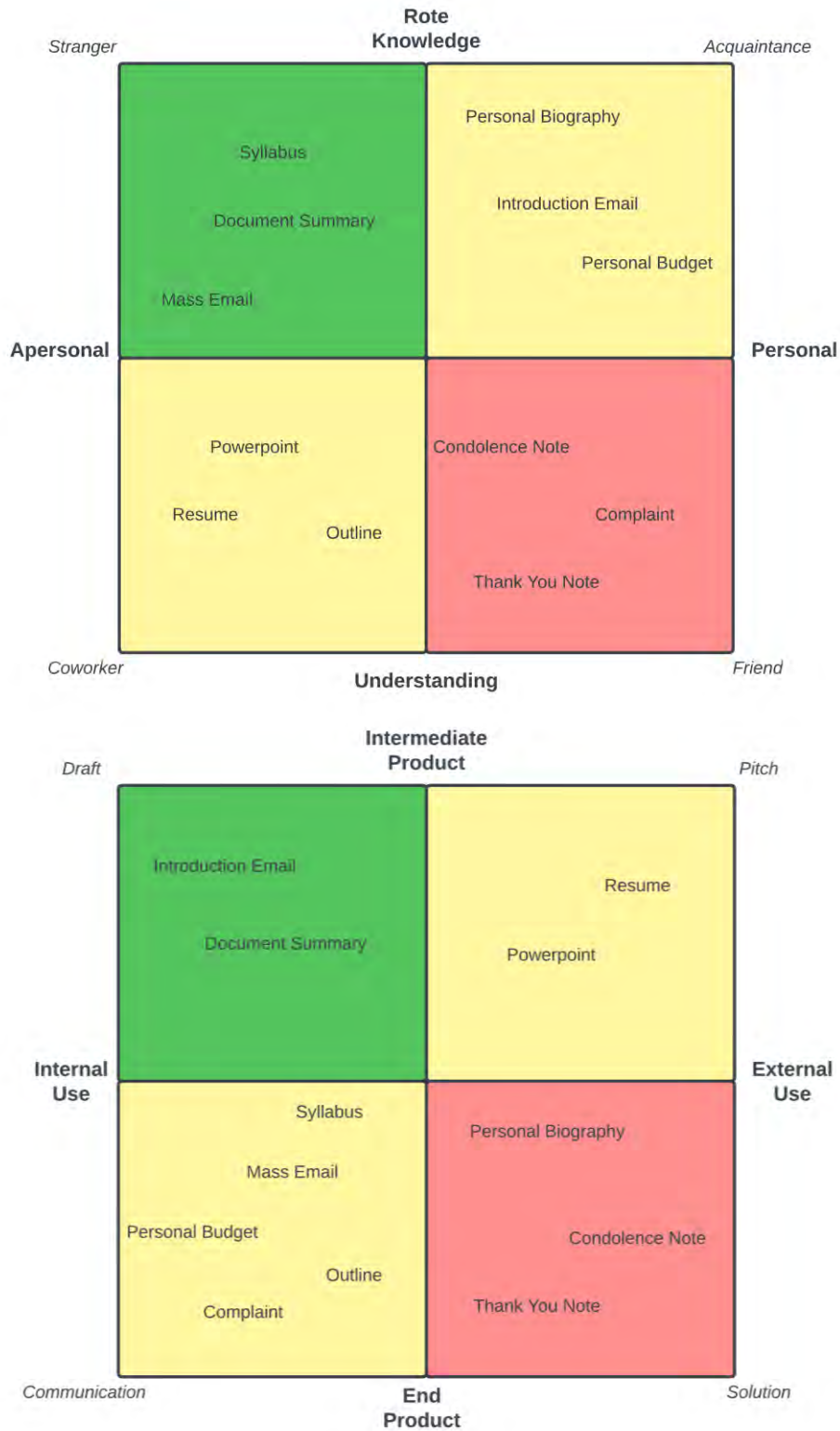
Figure 3. Proposed Matrix Framework for the evaluation of generative AI use cases.

appropriate use case for ChatGPT when evaluated in this part of the Matrix Framework.

Acquaintance: Personal/Rote Knowledge
In this quadrant, there are use cases that require the kind of knowledge that an acquaintance would have which we are taking to mean someone who knows some aspects of your personality. They likely have an idea of what your sense of humor is like or may know the kinds of clothes you wear. However, they still do not have a deep understanding of who you are as a person.

Depending on the situation, it may or may not be helpful to use ChatGPT for use cases that fall into this category. One can utilize prospect theory to evaluate whether a use case that falls into this category can be accomplished using generative AI or not.

For example, take a student who is reaching out by sending an email to a leader at an organization that they desire to be employed by upon graduation and compare their decision-making process to that of an individual in management at the same organization where the leader works. Here, the prospect theory assumption #3 that there is diminishing sensitivity to gains is helpful in evaluating the decision-making process. The student should not use ChatGPT to craft the email, as they have much to gain in the form of employment by making a good impression on the potential leader.

In contrast, the individual in management at the same organization as the leader may choose to use ChatGPT to send the email. The individual in management has much less to gain in the process of making a good first impression, since they have already achieved much of what the student is seeking to achieve. Therefore, the same **assumption underlying the student's decision to** not use ChatGPT underpins the second **individual's decision to use it. This exemplifies the** necessity of prospect theory to underpin the Matrix Framework. Two individuals can come to different conclusions using the same framework based on their personal circumstances.

Coworker: Apersonal/Understanding
Coworkers likely understand the facts surrounding your work. However, they may not understand who you are as a person. If you work for a large firm, they may not have even met you in person. Here, it is again helpful to use prospect theory to evaluate whether a specific use case is appropriate for ChatGPT or not.

A resume lands in this category. For a well-crafted resume, it is necessary to understand how your skills apply to a given prospective job. For example, take someone who currently works in a call-center but is looking to move to more fulfilling work as a consultant in the same field as that in which the call center operates. There is no obvious way working in a call center prepares an individual for work as a consultant. However, there are communication skills and conflict-navigation abilities that are developed in a call center that are very useful to a career in consulting. It is not enough for a prospective consulting employer to merely know that you worked in a call center, it is important for them to understand what that work entailed and how it prepared you for work as a consultant.

However, there is not much space on a resume to directly address who you are as a person. You can include skills and interests, but these do not directly reflect you personally, they are simply facts about you. Using prospect theory here helps determine if the use of ChatGPT is appropriate.

In an example, let's ask ourselves if landing a new job is a choice or a necessity? If it is a necessity, then an individual will likely choose to manually create a resume, as the opportunity cost of creating the resume is outweighed by the potential gain of a job. Assumption #3 in prospect theory is used in the decision-making process. This individual sees a huge potential gain (i.e., their first $1,000). It may initially seem like assumption #2 is the correct prospect theory assumption for this situation, and that the decision using that assumption would lead to a contradictory choice. However, it is important to remember that assumption #2 is only useful for gains and losses of similar magnitude. In this circumstance, the potential gain of a job is significantly larger than the loss, the time spent composing the resume manually. Therefore, assumption #2 does not accurately describe this **individual's choice.**

If moving to a new job is a choice, then the gain (i.e., a new, marginally better job) is closely associated to the loss (i.e., opportunity cost of manually creating a resume) and the individual should use ChatGPT to create the resume. Here, assumption #2 is appropriate as the potential gains and losses like saving time by using ChatGPT and not getting a marginally better job are similar. Therefore, the potential gain will take precedence in the decision-making process.

Friend: Personal/Understanding

Close friends understand what you do and who you are. They know why you love or hate your job. They know your hobbies and your plans for your future. They can give you advice on large life decisions and romantic partners. ChatGPT is not appropriate for use cases that require an understanding of both your personality and the connections between the facts of the use case with which you are presented.

A letter of condolence falls into this category. Given a hypothetical situation where you find out a student missed class due to losing a family member, it is quite inappropriate to formulate a response using ChatGPT. This is because you need to show you understand and care about the situation. Additionally, you want your personality to come through, as you do not want to appear to be unfeeling. For these reasons, this and other use cases in this quadrant are not appropriate to use ChatGPT to fulfill.

Draft: Internal Use/Intermediate Product

This category includes use cases that are not finished products and are used internally. Drafts are generally not presented to any individual outside of an organization, and the point of a draft is that it is not final. Use cases that fall into this quadrant are prime examples of when making use of ChatGPT is appropriate.

A document summary can also be in this quadrant. A document summary, despite the opinions of some educators, is not an external product. Document summaries are meant to be referenced in the future to remind the user what a given piece is about so that they can use it to build a product for external use, like a research paper. This also touches on the other key attribute about a document summary. They are an intermediate product in a process of developing a final product. Therefore, it would be useful and appropriate to use ChatGPT to summarize a document.

Pitch: Intermediate Product/External Use

In this quadrant, good use case examples include a sales or business pitch. In a pitch, the product is external, though not final. An individual presents an idea to a client, but the idea is not a final product yet. ChatGPT may be useful in developing a pitch, as it is not a final product, but it can help develop the presentation. In this quadrant, it is again necessary to use prospect **theory to evaluate how to deal with "yellow result" outcomes in order to evaluate your** specific circumstances and use case to decide if the use of ChatGPT is appropriate.

A PowerPoint deck is a good example of a use **case that falls into the "Pitch" category. In fact, a** PowerPoint deck (or deck developed using similar software) is a crucial part of most pitches. The deck is presented to clients, but it is far from a finished product. If the client likes the deck and the accompanying presentation, they may hire the presenter to build or implement the idea that they presented. In summary, a PowerPoint deck is not a finished product, though it presents the concept of a finished product to an external entity.

In this circumstance, the prospect theory assumption #3 that there is a diminishing value to returns is useful. If an individual has already been contracted to fulfill a need, and the PowerPoint deck is only necessary to sell an additional service, then ChatGPT may be useful. Here, the user already has their proverbial $1 million. They are only risking not being able to sell the add-on (i.e., their last $1,000), as they have already sold the main service.

However, it may not be appropriate to use ChatGPT to gain the client from the start. At the beginning, before the deal has been sold and contracted, the user is striving for their proverbial first $1,000, which is valued more highly in prospect theory than the last $1,000.

Microsoft seems to agree with the assessment that ChatGPT can be helpful in solving the first $1,000 issue here, as they have developed a new tool called Copilot to use in building PowerPoint decks. As in most cases, getting started is the most valuable gain from using ChatGPT.

Communications: End Product/Internal Use

Communications for our purposes are use cases that are an end product for internal use. Here, we consider an organization to be a cohesive unit and as such, communications can be an email or a note to a family member or a member of your educational institution, among other things. We believe that in many of these cases, it could be appropriate and helpful to make use of ChatGPT. However, there may be some instances where it is not, depending on your circumstances.

Imagine a scenario where a professor must respond to a student inquiring about receiving an excused absence for missing class. If it is the beginning of the semester and the professor does not know the student, it could be helpful to use ChatGPT to formulate a response based on the syllabus to save time. However, if this scenario occurred near the end of the semester, the professor might have an established relationship

and knowledge of the student. In this case, the professor should choose to write a response manually that helps elicit the reason for the absence. Students miss class for a variety of reasons, from hobby-type events like concerts to memorial services and professional conferences. Whether a professor declines or accepts the request to excuse the absence, it could be useful to include a personal touch to maintain the positive relationship.

Here, assumption #1 is useful. At the beginning of the semester, the professor is reacting to a potential absolute change in circumstances with a student. Therefore, they use ChatGPT to refer the student to the syllabus. In contrast, at the end of the semester, the professor has an established rapport with the student, and they should take **the time to respond based on the student's** individual needs to preserve the relationship, a relative change instead of an absolute change.

Solution: External Use/ End Product
Use cases that fall into the Solution quadrant should not make use of ChatGPT. These are final products that are meant for external consumption. It is not appropriate to use ChatGPT as the final step in an external process. If there is a deliverable, it is essential that the product is at least reviewed by the user and edited.

Take a personal biography for example. This piece will be representing yourself on behalf of your institution to the public. Indeed, it is important that in situations like these, individuals directly represent themselves. The value in this process is added by the user, and should not be passed off to a bot.

6. PROSPECT THEORY AT WORK IN THE 2X2 MATRIX FRAMEWORK

One powerful way to explain to students how prospect theory works in the 2x2 Matrix framework is to consider a personal budget use case. This use case is in the *Acquaintance* Rote Knowledge / Personal quadrant, and the *Communication* Internal Use / End Product quadrant. Both are yellow quadrants.

If someone is creating a personal budget just to **"take stock"** or just to **"see where they are",** then there is not much to lose, and they can save time by using ChatGPT to create their personal budget.

Since the budget exercise is personal, and just to take stock or see where they are at, the axis has **moved from being "personal" on the horizontal axis, to being "apersonal" on the horizontal axis.**

That is, it is apersonal because the personality of the author does not need to be conveyed in the final product. The personal budget use case has moved to a green quadrant.

Further, this particular budget is an intermediate product on the way to helping the person understand where they are at in any moment of time. As such, the quadrant has moved from the *Communication* quadrant to the *Draft* quadrant, and again from being yellow to green.

Contrast this with when someone is creating a personal budget to make a major decision, such as to purchase a car or house. There is now a lot to lose. As such, the personal budget moves from the *Acquaintance* quadrant to the *Friend* quadrant, as it needs to be highly personal. As such it has moved from a yellow quadrant to a red quadrant, and they should not use ChatGPT.

Since this particular budget could easily be used by the bank or car dealership for financing, this budget has also moved from Internal Use to External Use. That is, the quadrant has moved from *Communication* to *Solution.* Again, it has moved from a yellow quadrant to a red quadrant, and they should not use ChatGPT.

7. PRELIMINARY TESTING OF THE FRAMEWORKS

To refine and test our frameworks, we presented the frameworks and instructions for their use to a class of MBA students and a class of undergraduate students at a public regional university. In order to gain useful feedback on our frameworks, we surveyed the students before and after the class to self-rate their own ability to determine if ChatGPT was appropriate for a given use case. We also asked them to provide written feedback on what they thought was helpful or could be improved.

We collected anonymous survey data from the students (n=18) to test whether the students had become more comfortable evaluating ChatGPT use cases as a result of the frameworks covered in this paper. Prior to starting the discussion of the frameworks in class we administered a pre-test survey using a 7-point Likert scale using the question **"How comfortable do you feel evaluating ChatGPT use cases?".** After the class was complete we administered the same survey to determine if there were any increases in student capabilities. We used a paired t-test to test for significance between the pre/post survey results. The results of the survey are below (see Table 2).

Survey Question	Pre-test mean	Post-test mean	Paired t-stat p-value
How comfortable do you feel evaluating ChatGPT use cases?	4.50	6.72	0.0002

Table 2: Student Survey Results

The student survey results show that the mean score increased for the survey question "How comfortable do you feel evaluating ChatGPT use cases?" The increase was statistically significant, but we acknowledge that the sample size is small.

We also asked for qualitative feedback from the students. First, students who rated themselves as less able to evaluate use cases prior to the lecture had significantly improved their self-rating of evaluating use cases by the end of the lecture. For these students, we received detailed feedback that the framework presentation had changed the way they viewed ChatGPT. One student remarked that they went from "thinking about it as a fun novelty thing to a tool that [they] needed to started engaging with straight away." Another student stated that they "have a better understanding of where and when [they] should use [ChatGPT]." Overall, the students seemed to be appreciative of a deeper understanding of what situations would be appropriate and not appropriate to use ChatGPT. For many, it fundamentally changed the way that they viewed ChatGPT and gave them confidence in knowing how they should apply it to their professional and academic tasks.

We also had students evaluate examples of use cases by using the frameworks. These examples incorporated prospect theory for the yellow result outcomes and required students to evaluate what they should do based on circumstances. For the most part, they were able to arrive at the answer that we were expecting after taking part in the presentation. However, there were some notable exceptions. In one situation, we asked them the following question:

Your 3-year-old niece wants you to tell her a bedtime story. You are not a creative type, but still want to tell her a bedtime story. Should you use ChatGPT to generate a bedtime story?

The answer to this question was nearly unanimously yes. Using our frameworks, this use case is in a yellow quadrant for both squares in the Matrix Framework. In the first matrix, the result is Personal/Rote Knowledge, and in the second matrix, the result is Internal Use/End

Product. Therefore, we would have expected a more even split owing to students being forced into a prospect theory-based analysis of their individual relationships with this family member. A student with a strong relationship with their niece and a student with no pre-existing relationship with their niece would likely answer differently.

A priori we assumed that students would operate under the prospect theory assumption that relative change is a greater motivator than absolute change. A student may not use ChatGPT if they already have a relationship with their niece because they would seek to improve their relationship, where a student with no relationship may use ChatGPT because they had no relationship with their niece in which to invest.

A potential area for future research would be to examine if the relationship between the child in the question to the individual being surveyed affects the answer. For instance, would the child being a daughter as opposed to a niece influence the answer. However, that is beyond the scope of this paper.

Although not specifically related to the when to use ChatGPT of our Matrix Framework, at the end of the presentation, students were tasked with feeding their resumes into ChatGPT for the purposes of writing a draft cover letter. The steps involved were:

1. Sign up for or sign in to a ChatGPT account.
2. Cut and paste their resume into the ChatGPT dialogue box after telling ChatGPT "This is my resume."
3. Tell ChatGPT a very specific position they are applying for, such as "I want to work at Nike in marketing for women's athleisure."
4. Ask ChatGPT for a one-page cover letter that includes a paragraph on "Why me," "Why you," and "Why us."

Upon seeing the result, one generally quiet student exclaimed, "Oh my god, I would totally hire me based on this!" We then referred to the two Matrix Frameworks and emphasized that this cover letter would be in "Coworker: Apersonal/Understanding" and "Pitch: Intermediate Product/External Use," and that it was a draft only, and that it was necessary for them to review it make it their own. This exercise introduced them to the power of ChatGPT but also informed them of how they should evaluate its use.

In our discussions with the undergraduate students, there was a definite thread of thinking that general education courses were more about figuratively just checking the box on the path to getting the degree. The result was that more students leaned towards using ChatGPT. In contrast, the MBA students were much more focused on skill-building. ChatGPT was a productivity tool, rather than a completion tool for them. This difference is in line with what we could expect to see given the application of prospect theory. Undergraduate students are seeking an absolute change to their circumstances, the granting of a first degree, (i.e., the first $1,000). Students in the MBA program are seeking a relative change to their circumstances (e.g., a raise, promotion, or career pivot) and are therefore more motivated.

8. CONCLUSION

As elucidated by numerous papers and individuals, the rise of generative AI represents an issue for the institution of education in its current state. One the one hand, there is significant resistance to its use (Lim et. al, 2023). On the other, students should master AI tools while in school (Rudolph, et. al, 2023). In order to accomplish this goal, it is necessary for students to understand the strengths and shortcomings (Vayena and Morris, 2023) of this technology.

For educational institutions, we feel it is essential that action is taken proactively to introduce and adopt the use of generative AI in curriculums. No-code software implementation courses can be helpful, particularly for business students (Wang and Wang, 2022). This can dovetail easily with ChatGPT to help students think through how and why systems are configured the way they are, rather than becoming burdened with the technical aspects of the code. Whether or not it is banned, ChatGPT will still be used (Liebrenz et. al, 2023). Senior-level students and relatively low academic performers are prone to cheating (Hogan and Jaska, 2000) and institutions must embrace cultural change (Lim et. al, 2023). Rather than trying to avoid technology, universities can leverage AI to enhance creative potential. According to Lichfield (2023), *Wired* magazine is using ChatGPT as a research tool and to generate story ideas. Microsoft has already built a prototype search engine and is working on incorporating ChatGPT into their whole suite of products (Rudolph et. al, 2023). Rather than try to prevent the inevitable, institutions can welcome the chance to have students invest in their own learning and use ChatGPT as a tool to

improve critical and creative thinking (Rudolph, et. al, 2023). *Wired* does not publish stories created by AI (Lichfield, 2023), instead they use it in the creative process to develop a better end product.

How to teach students to use ChatGPT effectively is an area of potential future research. Once students understand the power and risks of the tool, and when they should use it, the next step is teaching them to use the tool effectively. To paraphrase a common statement regarding automation and AI, professionals in a given field will not be replaced by ChatGPT, but professionals who know how to use ChatGPT will replace professionals who do not. A global head of marketing at a global technology firm recently stated that their next hire would be a prompt engineer for tools like ChatGPT. We believe it is essential that students are taught how to wield ChatGPT after they are taught when they should use it.

Students should be empowered to use AI and knowing when to do so is a critical first step. It is essential that they learn about these tools to be competitive in their fields of employment (Lyytinen et. al, 2023). In the words of one of our students, our f**rameworks do "a great job of not** only explaining how someone *could* use ChatGPT but if someone *should* use ChatGPT in certain **academic and professional situations." This kind** of instruction is essential to the success of students in a world where generative AI integration is accelerating. The qualitative feedback from students was very positive, and showed that students had a much better understanding of when to use ChatGPT. We realize that this also means that the framework can enable students to make better choices about when to cheat using ChatGPT. While there is significant research to be done in this area, we believe that our frameworks provide a solid foundation to begin educating students about how to evaluate use cases for ChatGPT.

In the near term, there will continue to be resistance to the widespread integration of generative AI tools in the field of education and beyond. Researchers, like artists, find value in **their work's scarcity, novelty, and creativity** (Loebeckke et al., 2020). Here, we find an unexpected relationship between modern researchers, artists, and a 15th century German monk named Johannes Trithemius. Trithemius vehemently argued against the products of the **printing press, claiming that a work's value lies in** its scarcity (Norman, 2023). Like Trithemius, we lie at a crossroads of innovation and status quo.

We must be cautious to avoid his mistaken thinking.

9. REFERENCES

Ågerfalk, P. J., Conboy, K., Crowston, K., Eriksson Lundström, J. S., Jarvenpaa, S., Ram, S., & Mikalef, P. (2022). Artificial Intelligence in Information Systems: State of the Art and Research Roadmap. Communications of the Association for Information Systems, 50, pp-pp. https://doi.org/10.17705/1CAIS.05017

Baidoo-Anu, D., & Owusu Ansah, L. (2023). Education in the era of Generative Artificial Intelligence (AI): Understanding the potential benefits of CHATGPT in promoting teaching and learning. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4337484

Barberis, N. C. (2013). Thirty Years of Prospect Theory in Economics: A review and assessment. Journal of Economic Perspectives, 27(1), 173–196. https://doi.org/10.1257/jep.27.1.173

Business Insider (2023) Here are the schools and colleges that have banned the use of ChatGPT over plagiarism and misinformation fears. https://www.businessinsider.com/chatgpt-schools-colleges-ban-plagiarism-misinformation-education-2023-1

Casal-Otero, L., Catala, A., Fernández-Morante, C. et al. AI literacy in K-12: a systematic literature review. IJ STEM Ed 10, 29 (2023). https://doi.org/10.1186/s40594-023-00418-7

Chatterjee, J., & Dethlefs, N. (2023). This new conversational AI model can be your friend, philosopher, and guide … and even your worst enemy. Patterns, 4(1), 1–3. https://doi.org/10.1016/j.patter.2022.100676

Chen, L. (2022). Current and Future Artificial Intelligence (AI) Curriculum in Business School: A Text Mining Analysis. Journal of Information Systems Education, 33(4), 416-426.

Driver, Julia, "The History of Utilitarianism", The Stanford Encyclopedia of Philosophy (Winter 2022 Edition), Edward N. Zalta & Uri Nodelman (eds.), plato.stanford.edu/archives/win2022/entries/utilitarianism-history

French, A., Shim, J., Risius, M., Larsen, K. R., & Jain, H. (2021). The 4th Industrial Revolution Powered by the Integration of AI, Blockchain, and 5G. Communications of the Association for Information Systems, 49, pp-pp. https://doi.org/10.17705/1CAIS.04910

Gregor, S. (2018). The Dangers of Dance for the Information Systems Discipline. Communications of the Association for Information Systems, 43, pp-pp. https://doi.org/10.17705/1CAIS.04313

Hacker, P., Engel, A., & Mauer, M. (2023, February 10). Regulating ChatGPT and other Large Generative AI Models. Working Paper.

Harrison, Marissa & Meister, Denise & Lefevre, Amy. (2011). Which students complete extra credit work? College Student Journal, 45, 550-555.. College student journal. 45. 550.

Hogan, P. T. & Jaska, P. V. (2000). Academic Dishonesty: A Study of CIS Student Cheating Behavior. Journal of Information Systems Education, 11(3-4), 169-178.

Houde, S., Liao, V., Martino, J., Muller, M., Piorkowski, D., Richards, J., Weisz, J., & Zhang, Y. (2020). Business (mis)Use Cases of **Generative AI. Proceedings of IUI '20** Workshops.

Kahneman, Daniel; Tversky, Amos (1979). "Prospect Theory: An Analysis of Decision under Risk". Econometrica. 47 (2): 263–291.

Kissinger, H., Schmidt, E., & Huttenlocher, D. (2023, February 24). Opinion | chatgpt heralds an intellectual revolution. The Wall Street Journal. Retrieved March 3, 2023, from https://www.wsj.com/articles/chatgpt-heralds-an-intellectual-revolution-enlightenment-artificial-intelligence-homo-technicus-technology-cognition-morality-philosophy-774331c6?page=1

Klein, Helen & Levenburg, Nancy & McKendall, Marie & Mothersell, William. (2007). Cheating During the College Years: How Do Business Students Compare? Journal of Business Ethics. 72. 197-206. 10.1007/s10551-006-9165-7.

Latham, S. and Humberd, B. (2018). **Four Ways Jobs Will Respond to Automation.** MIT Sloan Management Review; Cambridge Vol. 60 (1): 11-14.

Lichfield, G. (2023, March 2). How Wired will use generative AI Tools. Wired. Retrieved March 3, 2023, from https://www.wired.com/story/how-wired-will-use-generative-ai-tools/

Liebrenz, M., Schleifer, R., Buadze, A., Bhugra, D., & Smith, A. (2023). Generating scholarly content with ChatGPT: Ethical challenges for

medical publishing. The Lancet Digital Health, 5(3), e105–e106. https://doi.org/10.1016/s2589-7500(23)00019-5

Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. The International Journal of Management Education, 21(2), 100790. https://doi.org/10.1016/j.ijme.2023.100790

Loebbecke, C., El Sawy, O. A., Kankanhalli, A., Markus, M., Te'eni, D., Wrobel, S., Rydén, P., & Obeng-Antwi, A. (2020). Artificial Intelligence Meets IS Researchers: Can It Replace Us?. Communications of the Association for Information Systems, 47, pp-pp. https://doi.org/10.17705/1CAIS.04713

Lowy, A., & Hood, P. (2004). The power of the 2x2 Matrix, Jossey-Bass

Lyytinen, K., Topi, H., & Tang, J. (2023). MaCuDE IS Task Force: Final Report and Recommendations. Communications of the Association for Information Systems, 52, 566-586. https://doi.org/10.17705/1CAIS.05224

Mirbabaie, M., Brendel, A. B., & Hofeditz, L. (2022). Ethics and AI in Information Systems Research. Communications of the Association for Information Systems, 50, pp-pp. https://doi.org/10.17705/1CAIS.05034

Norman, J. (2023, February 23). Trithemius favors vellum over paper for long term information storage. Trithemius Favors Vellum over Paper for Long Term Information Storage : History of Information. Retrieved March 13, 2023, from https://www.historyofinformation.com/detail.php?id=337

Rice, B. S. (2020, June), How Extra Credit Quizzes and Test Corrections Improve Student Learning While Reducing Stress Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual On line . 10.18260/1-2--34732

Rudolph, J., Tan, S., & Tan, S. (2023). Chatgpt: Bullshit spewer or the end of traditional assessments in higher education? Journal of Applied Learning and Teaching, 6(1). https://doi.org/10.37074/jalt.2023.6.1.9

Schoormann, T., Strobel, G., Möller, F., Petrik, D., & Zschech, P. (2023). Artificial Intelligence for Sustainability—A Systematic Review of Information Systems Literature. Communications of the Association for Information Systems, 52, pp-pp. https://doi.org/10.17705/1CAIS.05209

Siemon, D., Strohmann, T., & Michalke, S. (2022). Creative potential through Artificial Intelligence: Recommendations for improving corporate and Entrepreneurial Innovation Activities. Communications of the Association for Information Systems, 50, 241–260. https://doi.org/10.17705/1cais.05009

Strobel, G., Schoormann, T., Banh, L., & Möller, F. (in press). Artificial Intelligence for Sign Language Translation – A Design Science Research Study. Communications of the Association for Information Systems, 52, pp-pp. Retrieved from https://aisel.aisnet.org/cais/vol52/iss1/33

Vayena, E., & Morris, A. (2023, February 28). A bioethicist and a professor of medicine on regulating AI in health care. The Economist. Retrieved March 3, 2023, from https://www.economist.com/by-invitation/2023/02/28/a-bioethicist-and-a-professor-of-medicine-on-regulating-ai-in-health-care

The Atlantic (2023). The First Year of AI College Ends in Ruin https://www.theatlantic.com/technology/archive/2023/05/chatbot-cheating-college-campuses/674073/

Wang, H., & Wang, S. (2022). Teaching Tip: Improving Student Performance by Introducing a No-Code Approach: A Course Unit of Decision Support Systems. Journal of Information Systems Education, 33(2), 127-134.