

# Tech Adapt: Emerging Technologies and Canadian Professional Contexts (VLS Library Version)



# **TECH ADAPT: EMERGING TECHNOLOGIES AND CANADIAN PROFESSIONAL CONTEXTS (VLS LIBRARY VERSION)**

An Open Educational Resource for Translating Technical  
Expertise for Canadian Business Contexts

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Acknowledgements

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# INTRODUCTION

Welcome to the Tech Adapt Open Educational Resource

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PART I  
**CHAPTERS**



# CHAPTER 1: ADAPTING TECHNICAL KNOWLEDGE FOR MULTIPLE AUDIENCES

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## Learning Goals

- Describe the challenges of conveying technical content to non-technical audiences.
- Apply the rhetorical situation to written and oral communications.

## Introduction

Adapting technical knowledge needs clarity, precision, and effort. An expert who uses technical words to communicate must be able to translate the information for audiences who may have less knowledge about the technical subject. To be effective in this translation, you should explain information in simplified ways so that non-technical audiences can understand it. Be careful not to mistake *simplified* with *unintelligent*. Avoiding jargon and offering explicit details about technical content improves communication.

An example of using too many technical words to communicate the details of a “Turbo Encabulator” can be seen below [1].



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**Video 1.** A description of the “Turbo Encabulator” that demonstrates how the use of jargon can cause confusion unnecessarily [1].

## The Rhetorical Situation

When you are thinking about how to communicate complex information, it is necessary to recognize that all communication requires awareness of the rhetorical situation. We can imagine the rhetorical situation as a “formula” for good communication. The next video below shows how to use the “formula” [2].



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**Video 2.** A demonstration of the different elements of the rhetorical situation [2].

## Check your Understanding



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## Practice with a Real-Life Scenario

You are the manager of a project team and everyone in the company uses a software that follows a monthly subscription. There are different versions of the software but right now everyone is using the cheapest version. The project your team is working on would be completed more quickly and with better quality if the team could use the more expensive version of the software. **As the manager, you are responsible for deciding how you would convince the finance team that upgrading to the more expensive software is necessary.** Parts A-C, below, will help you organize your ideas to prepare a “pitch” for the software upgrade request.

### *(1) Document the Process Clearly and Professionally*

It might be obvious to you why it is important to get the software upgrade, but as a non-technical receiver

of the request, the finance department may not understand why this upgrade is necessary. The rationale that drives your pitch needs to be said clearly and simply without technical jargon.

It might be a good idea to try to convince yourself before anyone else. You need to analyze this pitch from different points of view so that you can create the most convincing proposal. Think about the points that would be compelling to you as an audience member. These points might positively affect the real audience (the finance team). The finance team are experts in finance but are not experts in the technical workings of the software you're using for the project.

Creating a plan that is supported with evidence is key to ensuring that a project can be reviewed. Taking notes and recording meeting minutes can help keep track of the ideas that come up along the way. Records of meetings can be collectively reviewed by everyone involved to minimize the risk of different points of view being overlooked. It's important to ensure that all voices are heard.

**You need to analyze this pitch from different perspectives so that you can create the most persuasive proposal.**

## *(2) Focus on the Audience*

Even though the benefits of adopting the upgraded software might be obvious to you, that might not be the case for the people on the receiving end of the proposal. It is your responsibility to ensure that they understand what you are trying to do. The audience in this example is the finance team that will be approving or denying the request for the software upgrade. However, your project team is also your audience since that team will be using the software. You will likely find that there are multiple audiences for any report or communication event. It is important that your pitch is inclusive of the different audiences. Focus on empathy and determining what the audience needs. If you are unsure, consider interviewing some of them. Ask what is important to them as they conduct their work. What goals do they have that could be met by the software you're trying to acquire? Try to address audience needs and interests through your preparation, research, and communication.

For example, the finance team will need to understand why the increase of cost for the software upgrade is needed. If the finance team's goal is to reduce overall cost, the team will be focused on minimizing how much is spent. However, the team may recognize that the return on investment, increase in productivity, and more contracts won is worth the up-front expense. As the person communicating, it is your job to ensure that the finance team understands the benefits of upgrading to the new software. Whatever the reasoning, **be clear, be honest, and provide evidence.**

**There will likely be more than one audience for any communication event.**

## Be clear, be honest, and provide evidence.

*Tip: If you are preparing presentation slides, consider making them more engaging by including well-balanced graphics but be sure to use graphics that enhance the argument. “Cute” or “fun” graphics can reduce your credibility. Use examples based on evidence to make your pitch relevant to your audience. Interactive presentations engage the audience and encourages them to become more invested in your pitch.*

### (3) Create an Executive Summary

It is important to remember that not everyone will have the time to read an entire proposal. This is where an executive summary can be useful. For any report that you prepare, create a brief summary of the key pieces of information. The *executive summary* is a summary intended for executives or other decision-makers. They need clear and concise details that will help them make fast decisions. If the readers want further details, they are able to review the entire report.

Keeping this in mind, you should list the specifics that need to be conveyed about your technology. Include information such as the description of the technology, what your technology attempts to solve, how your technology can be expanded further, how much it will cost, and for how long you can expect to use the software. Address these topics in a clear and concise way that is both informative and understandable.

#### Key Points to Remember

- The audience you are speaking to may not understand the information when you use technical language. You must translate the technical concepts and jargon for the non-technical audience.
- The Rhetorical Situation refers to factors that influence a communication event. Being aware of the rhetorical situation helps communicators prepare strong documents and presentations to persuade their audiences.

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# CHAPTER 2: RESEARCH AND FORMATTING – INCREASING PROFESSIONAL CREDIBILITY

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## Learning Goals

- Identify the elements of a literature review
- Conduct a literature review
- Apply IEEE referencing style to various documents and presentations

## Introduction

In almost any professional context, it will be necessary to do research and to prove that your work is influenced by that research. Although we are most often taught that plagiarism is the focus of providing appropriate citations and references, thinking about *ethos* — the credibility and ethics of the author — is also of primary importance. (Review Chapter 1 for more information about *ethos* and the rhetorical situation). As you progress through your career, it is important to demonstrate consistently that you are ethical, productive, and credible. If employers know they can rely on your work and your integrity, they are more likely to support your career development. One way to increase your credibility, and to improve your field-specific knowledge, of course, is to conduct a literature review.

## Conducting a Literature Review

A *literature review* is a process that helps us to understand a field. It's a way to conduct research so that we know of the key studies, scholars, and publications of a particular topic or in a particular field. The phrase “literature review” refers to the process of conducting the research and the document that is prepared through that process.



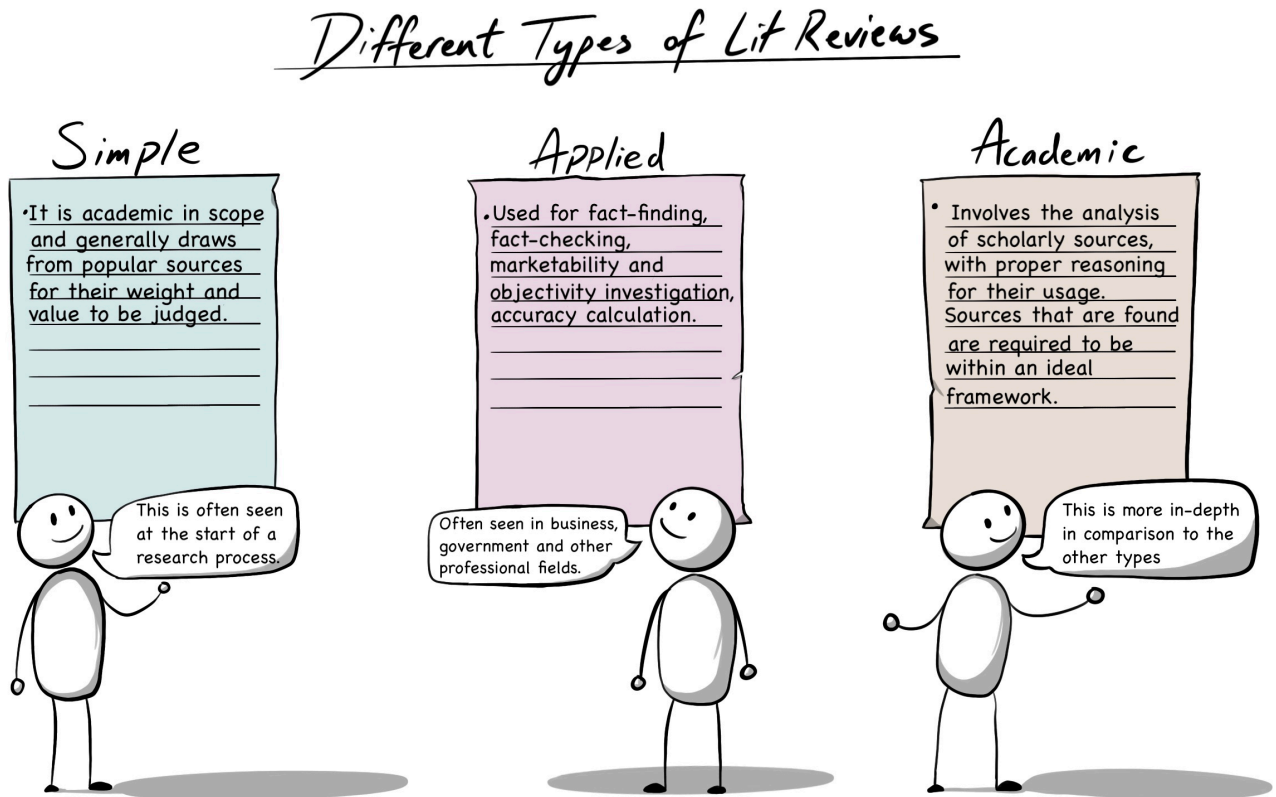




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There are three main types of literature reviews [1] as seen in Figure 1, below.



**Figure 1:** A depiction of the three main types of literature reviews, simple, applied, and academic [1].

The steps involved in conducting a literature review [2] are often as depicted below in **Figure 2:**



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**Figure 2.** Depiction of the process involved in conducting a literature review. Adapted from [1].

## Assessing Resources for Specific Uses

Before using a resource in a literature review document or presentation, it is necessary to assess its usefulness. The selection of credible and relevant resources also supports building *ethos* which is an important component of the rhetorical situation. Every resource used needs to be assessed carefully to understand how it fits into the research and to ensure that it is legitimate and relevant for the review.

The following are some of the key criteria that can help with the analysis of a resource [3]:

**Authority:** Look into the author’s identity, credentials, area of expertise, affiliated university, renowned works.

**Usefulness:** Check if the resource is relevant and related to your topic.

**Reliability:** Determine whether the source of information is trusted and reliable by looking at the date of publication, whether it is peer-reviewed, the publication body, etc.

Once the initial criteria are addressed, it is important to take a deeper look into the resources to confirm whether they will be valuable for the literature review. The following steps can help you with the assessment:

1. Read the title, abstract, and introduction carefully
2. Go through the titles, headings, and sub-headings in the paper
3. Check for mathematical concepts (if applicable) to estimate the number of theoretical foundations
4. Read the conclusions
5. Check the references to see if other exciting papers can be utilized for the research [4].

## IEEE Style and Structure

Articles used as references in documents and presentations are organized according to pre-determined standards to maintain consistency. There are several citation, reference, and formatting styles. Some of the more popular styles include: Chicago, MLA, APA, and Harvard. For many technical fields, especially in Engineering and Computer Science, IEEE is typically the style of choice and it refers to the Institute of Electrical and Electronics Engineering. It’s important to clarify with your organization, professor, or department which style is preferred.

The IEEE style mainly calls for the following:

- Use of numbered citations that are labeled in order of appearance. The number is enclosed within square brackets. E.g. “[1]”
- All the referenced material must be maintained as a list at the end of the document (enlisted using the corresponding citation number).

Citations and references are required when the knowledge presented in the research depends on the work of

others. Citations are used within the document where the derived knowledge is represented and references display the complete publication information used. Both citations and references are required in any documents and presentations.

## IEEE Citations

Citation in IEEE is done using a number within square brackets, e.g. [1], where the number refers to the referenced paper that can be mapped from the references list. Citations are required for direct quotations, paraphrased passages, and summarized passages. Any ideas that come from a source require citations. The citations are numbered in sequence based on where they appear in your document or presentation.



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## IEEE References List

A *reference* corresponds to a citation and includes detailed bibliographic and publication information about a source. A *reference list* is generally provided at the end of a document to list all the works referred to and cited within that document. It details the source, authorship, date, and location of the referenced works. The details of the resources are mentioned in an ordered fashion following the enlisted standards. See Video 1, below, for a demonstration [5].



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**Video 1.** Demonstration of the basics of IEEE referencing [6].

## Referencing Software

There is a lot of software on the internet that can simplify the process of creating reference lists. Zotero is one example. **However, whatever software you use to prepare your references list, it is important to ensure that they were done correctly by checking the results yourself. Learn the referencing style, use resources like this chapter, and double-check the results.** Video 2, below, provides information on Zotero and offers a “quick start” guide if you would like to use it. (Note that use of Zotero or other software is at your own risk. Ensure that you are following all copyright and fair use policies before downloading any software).



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**Video 2.** Introduction to Zotero referencing software [7].

### Key Points

- Literature reviews are used to build a stronger understanding of the studies, scholars, and publications related to a field. The steps to conduct a literature review include (1) choosing a topic, (2) deciding the scope of the review, (3) searching databases and libraries for appropriate resources, (4) reviewing and writing about the selected literature.
- There are three types of literature reviews, each used for different purposes. The *simple review* is often used at the beginning of a research process. The *applied review* can seen

in business, government or other professional fields. The *academic review* is used to analyze scholarly sources and is typically seen in academia.

- Referencing and citing in IEEE style requires numbers enclosed within square brackets. The reference material appears in an ordered list at the end of the document.
- All sources must be identified properly with a citation and full reference. Failure to do so could mean significant penalties for plagiarism and loss of professional credibility.

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# CHAPTER 3: THE ETHICS OF EMERGING TECHNOLOGIES

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## Learning Goals

- Define “emerging technology” (ET)
- Explain the present (and potential future) impact of ETs on society
- Describe ethical challenges related to emerging technology

*Content Warning: Some information in this chapter refers to suicide and suicidal ideation.*

## Introduction

As technology advances, we must think about how the technology we employ can impact ourselves, our communities, and our world. One of the ways we consider “impact” is by questioning the ethics of the technologies we explore. With concerns ranging from privacy breaches to automation to other possible challenges, we must always be mindful of the risks and impacts of the technology. More specifically, we need to question how the technology might impact living and non-living things through using the technology or by producing it. Failure to consider the ethical implications of technology can lead us down a path of negative and destructive consequences.

## The Context of “Emerging” Technology



Image of computer code in different colours by Mitchell Luo on Unsplash [1].

In order to begin exploring the *ethics* of emerging technology, we first must try to understand what is meant by “emerging technology.” *Emerging technologies* are new, innovative, and are still in development. They are expected to create significant impact. These technologies and their creators employ new concepts, methods, and techniques and cannot be categorized with existing technologies. They are innovative in the sense that they promise new and better solutions to the world’s challenges. They are still in development in that none or a limited number of products or services have been created from them. These technologies are expected to generate significant economic value and activity. They promise to affect or transform one or more social or economic domains such as education, healthcare, transportation, or the retail industry [2].

The notion of “emerging” technology does not necessarily mean that all such advances are new or revolutionary by themselves. Some have already been around for years, or in different forms, for decades (for example, fuel-cell vehicles, artificial intelligence, the digital genome, additive manufacturing methods). However, they are now transitioning to a new phase, becoming more widely used in products and consumer goods. In one way or another, all these technologies are expected to gain more attraction in the coming years.

According to Nayef Al-Rodhan, “in the past four decades, technology has fundamentally altered our lives: from the way we work, to how we communicate, to how we fight wars. These technologies have not been without controversy, and many have sparked intense debates, often polarized or embroiled in scientific ambiguities or dishonest demagoguery” [3]. The impact of emerging technologies such as blockchain, 5G, cloud computing, and machine learning has already been staggering. As these technologies continue to be developed and new technologies emerge, it seems that the opportunities are limitless. However, it is important to recognize that technologies are often fraught with issues. Consider privacy concerns and Facebook, or the collection of personal data that can be sold to others with ill intentions. The opportunities and solutions that emerging technologies offer are only one part of the equation. The potential risks and negative consequences are the other.

**Emerging technologies have yet to reach their full potential because they are new, innovative, and still in development.**

## **Ethical Issues of Emerging Technologies**

To explore the ethical challenges of emerging technologies, let’s consider an example. New-generation robotics will have more autonomy and the capacity to react without preprogramming, which complicates current ethical questions about robotics. The trust and reliance invested in a robot will have to be greater, bringing robots closer to the point of being equal with humans. Neuromorphic chip technology further illustrates this. It is among the most revolutionary developments in artificial intelligence (AI) and a radical step in computing power.

However, immediate “red flags” (concerns) emerge. Many people believe that building neuromorphic chips would create machines as smart as humans. These technologies, in theory, could be demonstrations of human excellence, yet computers that “think” could be devastating for our species. If the technology becomes more advanced than a human, as some suggest, the robots could keep humanity as pets [3]. Of course, this is an extreme example, but one that begs the question of how we mitigate risks and pre-plan for the ethical issues involved with technologies that are not yet fully developed.

**Computers that “think” could attain a stage where they keep humanity as pets.**

Medical providers and technology companies, including the United States Department of Veterans Affairs and Facebook, are increasingly applying artificial intelligence to the problem of suicide prediction. Machine learning software, which is good at recognizing patterns, can go through health records and online posts for words and behaviours that are linked to suicide. The software can also alert doctors and police of the possible



impending attempts. The potential positive impact of this use for technology is enormous — even small increases in software accuracy could save thousands of lives each year.

**Facebook is actively using artificial intelligence to analysis signs of suicidal intent. What would happen if this data was being used by those with ill intent?**

Facebook is the largest and most looked-upon company to engage in suicide prediction. After it introduced a live-streaming service in early 2016, dozens of users broadcasted suicide attempts in real-time on the platform. In response, on February 16, 2017, CEO Mark Zuckerberg announced that Facebook was doing experiments with AI-based suicide prediction. Its software analyzes user's posts for signs of suicidal intent. The word "Goodbye"

paired with responses like "Are you OK?" or "Please don't do this" in response to a live stream, assigns the users a risk score. Cases with high scores are forwarded to Facebook's community operations team, which reviews them and notifies police. Facebook also helps to pinpoint users' locations so first responders can find them. Antigone Davis, Facebook's head of global safety, said that in from 2017-18 the company started 3,500 "wellness checks," contacting police about 10 times per day [4].

While this use of data can create positive social impact, what would happen if this data was being used by those with ill intent? What could happen if that same data fell into the hands of marketers or other third parties? [5]

## Ethical Considerations

Understanding the nature of these ethical issues is a pre-condition of conducting research and generating innovations responsibly. Some technologies might progress independently of political support. But good authority, examinations of risks, and ethical considerations must always be weighed for society to ensure equity and appropriate use of technologies. Ultimately, how we approach the rules of emerging technologies, and the policies and laws built to guide them, will have significant implications; not only for security and ethics, but for our definition of human dignity and equality of individuals [3].

**The risks and benefits of new and developing technologies must be analyzed thoroughly to ensure appropriate and equitable use.**

## Key Points

- Emerging technologies are new, innovative, and still in development
- New technology can prove to be very useful as our economies grow and communication systems expand, but there are ethical considerations involved
- The risks and benefits of new and developing technologies must be analyzed thoroughly to ensure appropriate and equitable use

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# CHAPTER 4: VISION DOCUMENTS

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## Learning Goals

- Explain why vision documents are important
- Identify the 11 elements of a vision document

## Introduction

A vision is an idea. A vision document is used to show the final product or software to be created and the progression through the product/software development.

Many organizations hold the vision in a “vision document” that includes all the features of the product from the point of view of a stakeholder or a customer. This document is very helpful when it comes to capturing ideas and ensuring that all parties involved communicate clearly about those ideas. Depending on the size of the project, methodology, and organization, there are different types of templates offered for creating a vision document [1]. In all, a vision document includes clear, detailed information about use-cases, the problems that the technology will solve, the business opportunity for developing the technology, etc. In a business setting, an entrepreneur usually starts with an “idea” that can be developed through the vision and later becomes a product, application, service, etc. With software products, the idea or vision is developed and then the project team continues through its creation [1].

A vision document can also explain the high-level scope and purpose of a program, product, or project. A clear statement of the problem, proposed solution, and the high-level features of a product help set up expectations and lower risks [1].

## Vision Document Outline

In general, the contents of a vision document are discussed and divided into 11 sections [1]:

**(1) Introduction**

This section covers the overview of the entire document. The main purpose of this section is to identify the purpose and scope of the project. It also includes definitions, synonyms, abbreviations, and sometimes references.

**(2) Positioning**

This section describes possible business opportunities for the product or service and identifies the problem the project is trying to solve.

The product position statement gives an overall statement that summarizes the product's intention in the marketplace. The following statements can be used as a model, providing specific project details based on the parenthetical phrases to replace the blanks.

*For the \_\_\_\_\_ (target customer), who \_\_\_\_\_ (statement of the need or opportunity), the \_\_\_\_\_ (product name) is a \_\_\_\_\_ (product category) that \_\_\_\_\_ (statement of key benefit; that is, the compelling reason to buy). Unlike \_\_\_\_\_ (primary competitive alternative), our product \_\_\_\_\_ (statement of primary differentiation).*

A product position statement gives the intent of the application to the concerned stakeholders and users.

**(3) Stakeholder and User Description**

This section identifies the key problems related to the users' and stakeholders' interests. The factors affecting product decisions are market demographics. The size and the growth of the market is considered because it is affected by possible users and the amount of money needed to meet the needs of the customers. A stakeholder summary, a user summary, detailed working user environment, user profile, stakeholder profiles, and key stakeholder or user needs should be included in this section.

**(4) Product Overview**

This section covers a high-level view of the product's capabilities, and interfaces with other applications, systems, and structures. The product needs to be considered from a user viewpoint about other products and the user's environment. The product's roles and general assumptions and needs are discussed. The cost and pricing of the packaging might be useful here, depending on what kind of project it is and whether that level of detail is available at the time of preparing the vision document.

**(5) Product Features**

**A vision document is used to represent the final product or software to be developed. It includes clear and detailed information about use-cases, problems to solve, and business opportunity.**

**Find key problems and factors affecting product decisions to make sure that the issue is addressed properly.**

This section briefly outlines the product features. Features are the high-level abilities of the system that deliver benefits to the users. Each feature is a requested service that usually needs a series of inputs to reach a satisfactory result. For example, a feature of a problem-tracking system might be the ability to offer trending reports. As the use-case model takes shape, this section would be updated to refer to the specific use-cases.

Maintaining clear details for audiences with varied technical expertise is ideal because the vision document is reviewed by a wide variety of involved individuals.

#### **(6) Constraints**

This section identifies the design constraints for the product/service. The constraints can be operational, regulatory requirements, or other needs.

#### **(7) Quality ranges**

This section defines optimum quality range conditions for robust performance.

#### **(8) Priority**

This section lists the priority of the system features. In some cases, the priorities will be determined by the client and production team or others involved in the project.

#### **(9) Other Product Requirements**

This section lists the applicable standards with which the product or service must comply. For example, federal or local legal and regulatory standards. The section also includes the system requirements, performance requirements, and environmental requirements as applicable.

#### **(10) Documentation Installation**

This section provides all the required documents to develop a successful application deployment. Release notes, read me files, links to online help, installation guides, labeling and packaging documentation, etc. would be included in this section.

#### **(11) Appendix**

This section lists all feature attributes.

While this list of 11 elements would help to create a robust vision document, there may be variations on the documents based on stakeholders needs, goals, and requirements. In all situations, it is best to consult your organization or team to determine which elements are necessary for the vision document you're creating. Review the vision document elements specific to a business vision document by watching the video below. Again, be sure to consult your team or manager to determine which type of vision document and which elements are needed for your specific context.

**Remember: The vision document is read by a wide audience with variable technical expertise. Consider what you learned about the rhetorical situation (Chapter 1) to help you prepare this document.**



*One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://ecampusontario.pressbooks.pub/techadaptvls/?p=28#oembed-1>*

**Video 1.** A description of the key elements in a business vision document, including goals, vision statements, processing diagrams, and validation [2].

## Check your Understanding



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## The Necessity of a Clear Vision Document

Documenting the decisions made while conducting project work ensures that all stakeholders have clear, specific, and consistent information about the work. For example, If Team A can represent their core project ideas and high-level decisions in a short document, then other teams and supervisors (and even clients) can quickly understand the intentions of Team A and provide feedback. The more complex and involved a project is, the more important that short document becomes because complex projects have higher chances of miscommunication and heavy, costly mistakes [3].

It is important to adopt a vision statement as it guides the project planning and strategy. To prioritize financial and human resources most appropriately, use a vision document and ensure that all stakeholders have the information and decision-making opportunities they need to progress through the product or service development.

**Writing things down in a short document helps to communicate the intentions of complicated or complex work across a large organization.**

## Key Points

- The vision document is to gather context and to clarify the intentions for product or service development
- The eleven sections of a vision document are: introduction, positioning, stakeholder and user description, product overview, product feature, constraints, quality ranges, priority, other product requirements, documentation installation, and appendix

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## References

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# CHAPTER 5: USE-CASE MODELS

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## Learning Goals

- Describe the importance of a use-case model
- Identify the 3 components of a use-case model
- Create a use-case diagram

## Introduction

A use-case model is a set of typical scenarios for a system that primarily describes functional (behavioural) requirements. Use-cases are text stories that model system-user interactions that can be used to discover and record requirements. The need for use-case diagrams arises during the early stages of a project. These models increase readability and understanding of the system.

A use-case model can benefit parties both on the development side and on the investment side. Developers may lose sight of the actual requirements of a system amidst all the technical difficulties they may face. Use-case models can help focus and track the core requirements needed in the system [1].

## Components of a Use-Case Model

There can be variations in styles and templates used for different purposes and by different organizations. Typically, a use-case diagram contains the following three components:

### (1) Actors

Actors are individuals (human or non-human) involved with the system. To identify the actors, consider the following questions [1]:

- Who uses the system?



- Who are the people involved in the functional maintenance of the system? (E.g., installation, start-up, shut down)
- Who provides information to the system, and who is on the receiving end of that information?

There are three types of actors: Primary, Supporting, and Offstage. *Primary actors* include main actors whose goals will directly be fulfilled by the system. *Supporting actors* can either be a computer system, person, or an organization that supports the system through services. *Offstage actors* are those who are interested in the working of the system. Remember that it is also possible to incorporate “empathy” to address actor needs. This can be accomplished by conducting research to determine how best to approach the need, including interviews with specific actors who can identify clearly how they intend to interact (or what they need from) the system under discussion.

### **(2) Use-Cases**

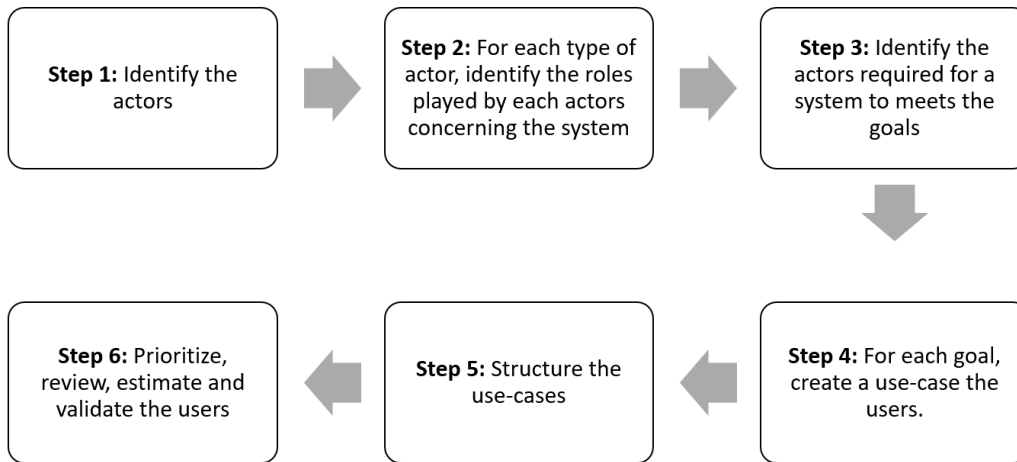
A use-case denotes how the system can be used to accomplish the desired goal. The use-case also needs to include details about the activities and variants involved in the process. It can be thought of as a sequence of actions and interactions between actors and the system. Use-cases often describe related success and failure scenarios with respect to an actor using a system. Note the distinction between this “use-case” (the set of examples that can be created to demonstrate the system) and the use-case model, of which use-cases are one component.

### **(3) Relationships**

There should be a clear indication of how the actors are related to the system by correctly identifying the use-cases in which they participate. This can also include dependencies between the use cases. Identifying relationships accurately and clearly helps to uncover potential issues, backlogs, challenges, and opportunities while the system is under development.

## **Creating a Use-Case Diagram**

Warren Lynch [2] outlines the following steps, Figure 1, below, for developing a use-case diagram.



**Figure 1.** A depiction of the steps required to create a use-case diagram [2].

Now, let's consider how we might apply the use-case diagram steps to an actual example. Review Video 1, below, where Antony Della Porta highlights the process and actors in a use-case [3].



*One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://ecampusontario.pressbooks.pub/techadaptvls/?p=31#oembed-1>*

**Video 1.** An application of the use-case diagram steps with a specific example [3].

## Key Points

- Use-case models describe the functional requirements in a system
- Use-case models increase readability and comprehension of what actions take place in a system
- The components in a use-case model are Actors, Use-Cases, and Relationships

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## References

[1] “Use Case Modeling”, *W3Computing*, <https://www.w3computing.com/systemsanalysis/use-case-modeling/> [Accessed January 1, 2022].

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Instructor Guide

# CHAPTER 6: PREPARING FOR A PRESENTATION

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## Learning Goals

- List the key factors required to prepare an effective presentation
- Identify steps used to create a presentation
- Plan to deliver an effective presentation with confidence

## Introduction

The thought of sharing our ideas publicly can be a great challenge to overcome. Whether we become sweaty or jittery, public speaking can make us forget what we want to say, feel silly in front of our audience, or ruin our chances of securing a desired job. Regardless of your experience with public speaking or verbally pitching an idea, there are ways to manage your emotions and reactions so that, hopefully, you can move forward and feel proud of your performance.

## Preparation

Preparation is key to ensuring a good presentation. Once you have estimated the time it would take for the preparation, segment the remaining days to approach the different sub-topics. Make sure to give yourself an appropriate amount of time to gather the research, prepare any slides/visuals, and practice the delivery.

## Practice

Making flashcards for the presentation can help you practice the delivery. If presentations come easily to you, you can keep this part of the process brief.

But if you're someone who prefers to plan exactly what to say, flashcards might be a good option.

Recording yourself while practicing the presentation

can be beneficial in multiple ways. Watching a

recording can often help you catch errors that you

might have missed while preparing. The recording can also serve to recall all the information that needs to be

presented (in place of the flashcards). Flashcards can be used for quick recalls, and recordings can be used for a

more detailed recalling process [1].

**You can practice by recording yourself delivering the presentation. You can then watch the recording to catch any errors.**

## Energy

Preparation alone cannot pave the path for a good presentation. Make sure you're not skipping meals or compromising sleep to make time for practice and preparation. This advice is often good advice in general, but especially when there's an important presentation coming up. Watching someone full of energy presenting information can contribute to the audience's positive experience thereby increasing their engagement with the information. If you're feeling overwhelmed, try to disconnect a little and give yourself time and space to breathe. Remember to consider what the audience needs (Chapter 1).

## Presentation Day



Created by Gan Khoon Lay  
from Noun Project

Make sure you're fully rested on the day of the presentation. Give yourself plenty of time beforehand so that you can be mentally sharp and ready. If you often find yourself jittery before presentations, try to practice deep breathing, yoga, or meditation at the start of the day of the presentation to help settle your nerves. You might also hold a pen or a small paper clip while presenting (if the audience will not be distracted by it) to help release some of your nervous energy.

**Figure 2.** An image of a successful presentation [2].

## More Ways to Prepare for Presentation Day

There is a lot of information on the internet about preparing for a presentation. From improving oral language and creating interesting slide decks to how to structure your presentation, there are resources for almost any concern you might have. Below, we've provided additional resources to help you plan.

(1) Lucinda Atwood and Christian Westin's e-book, *Business Presentation Skills: Speaking and Presentation Skills for Business*, is hosted by BC Campus (British Columbia, Canada). You can access this e-book using this link [3].

(2) Video 1, below, provides explanations about the “dos and don'ts” of *creating* effective presentations [4]. Remember that part of creating a presentation is ensuring that all of your sources are cited and referenced appropriately. In this e-book, we've been encouraging (and demonstrating) IEEE style, but be sure to confirm which style your organization, team, or professor prefers.



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://ecampusontario.pressbooks.pub/techadaptvls/?p=34#oembed-1>

**Video 1.** The Dos and Don'ts of Creating Effective Presentations [4].

Once your presentation is created, you can practice delivering. Sometimes it's helpful to deliver the presentation to friends or family, or even to your pets. If you do not have anyone who can support your

practice, consider delivering the presentation to a mirror so you can see yourself or record the delivery so you can assess what you'd like to change afterwards. Video 2, below, offers tips on how to *deliver* effective presentations [5].



One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://ecampusontario.pressbooks.pub/techadaptvls/?p=34#oembed-2>

**Video 2.** Tips on How to Deliver an Effective Presentation [5].

## Tips for Virtual Presentations

Presenting virtually is a very different experience from presenting in person in front of an audience that you can see. The following pointers may be useful in ensuring that you communicate successfully during these virtual presentations.

1. **Set up your tech:** It's critical to have the right environment to host and attend virtual meetings. Before you begin your presentation, make sure your microphone and webcam are working and the internet connection is good with sufficient bandwidth.
2. **Set up the background:** Setting up your background with a blank wall or another orderly design will appear more professional than a messy space with personal items behind you. A virtual background is an excellent option if an aesthetically appealing live background isn't possible. In virtual meeting tools, you can choose and set up any background you like.
3. **Be specific and synchronized:** You are not physically connected to the audience during a virtual presentation. Making your point and transitioning from one topic to another is certainly one of the most critical aspects of a virtual presentation. You must relate what you just said to what comes next when you move from point to point. Identifying transitions clearly between subjects and slides is a great way to re-engage your audience in your presentation.

4. **Connect more with the audience:**

The more you interact with your audience, the more they will interact with you, making your presentation more effective.

Keeping the entire audience attentive during a virtual presentation can be difficult. Try to find ways to encourage them to speak up — converse with them and connect with them. Many virtual meeting platforms have engagement tools like raising hands, chat boxes, and breakout rooms for added

interactivity.

Finally, **remember that it is unlikely there will be long-term damage if your presentation is not as successful as you had hoped.** Bad presentations often turn out to be learning experiences that help you improve the quality of your presentations in the long run. Be sure that you've prepared well, you're feeling ready, and you do your best. *Good luck!*

## Key Points

- Create an organized presentation that flows from one point to another
- Create flash cards that have information about the presentation in bullet points to help you remember the talking points while you practice
- Include appropriate citations and references for your presentation in the style required by your organization, team, or professor.
- Record yourself while practicing to observe your tone and the speed at which you speak — it's easiest to make changes \*before\* the actual presentation date!
- Get proper sleep the night before your presentation
- Try to calm your nerves by breathing deeply, taking a walk, or holding a pen (or find a way for you to feel confident that we have not included here)

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## References

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Instructor Guide

# CHAPTER 7: RISK ASSESSMENT AND MITIGATION

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## Learning Goals

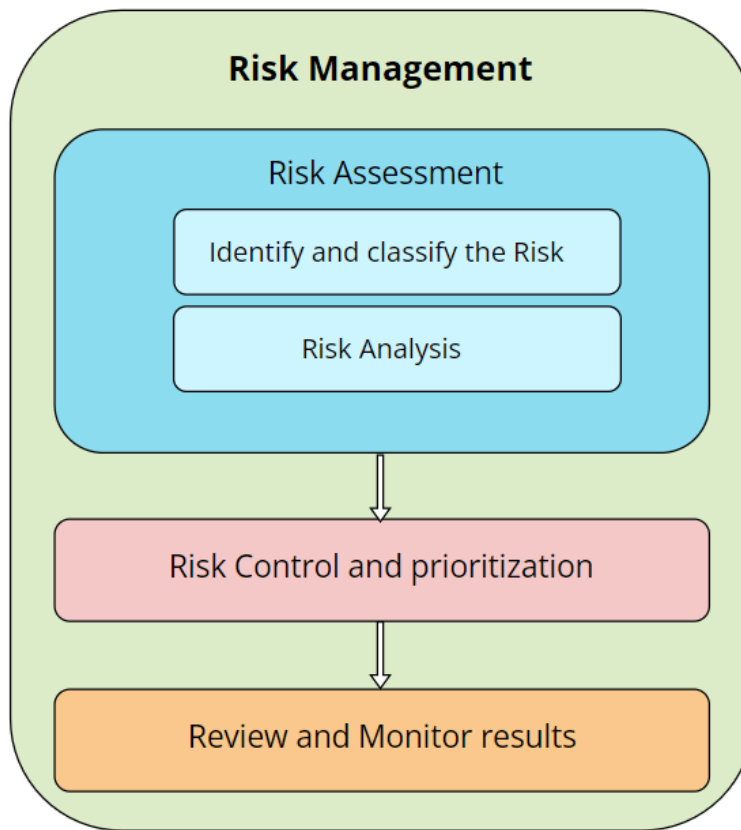
- Identify the 3 components of risk management
- List 7 examples of risk types
- Distinguish between quantitative and qualitative risk management
- Identify the 4 strategies for risk management
- Correlate risk to a business case

*Chapter Author: Sumisha Surendran*

## Introduction

Risk management is the process of detecting, preventing, assessing, and mitigating present and potential risks to an organization's success. These risks can manifest themselves in various ways, including financial risk, strategic risk, reputation risk, liability risk, security and compliance risk, natural risk, and many others.

Broadly, the risk management process, depicted below in Figure 1, comprises three significant blocks: (1) risk assessment, (2) risk control and prioritization, and (3) risk review and monitoring. Each of these blocks can be broken into several sub-processes. Using this three-block approach to risk management (also known as an “aggregated approach”) is sometimes called Enterprise Risk Management (ERM) [1].



**Figure 1.** A depiction of the three components of risk management. Created by S. Surendran, 2022.

## Risk Management Block 1: *Risk Assessment*

Risk assessment is comprised of two components: (1) identifying and classifying the risk(s) and (2) risk analysis.

### (1) Identifying and Classifying Risks

Identifying and tracking risks that might arise in an organization offers significant benefits. Working on a project and detecting potential risks may initially appear to be a setback; on the contrary, anticipating potential risks well before their existence is highly beneficial to the prospective stakeholders. Being able to anticipate risks can help the system’s creators and developers plan for opportunities and difficulties. Identifying risks before implementation can also help reduce the costs of “fixes” that are found after the system is live.

To classify risk, it can be useful to think through the different types of risks that affect an organization. These categories include, but are not limited to [2]:

- Financial risks
- Strategic risks
- Operational risks
- Accidental risks
- Reputation risks
- Technical risks
- Procedural risks

## (2) Risk Analysis

Risk analysis is the process of determining the likelihood of an unfavourable incident occurring. One of the most important parts of risk management is figuring out the likelihood. Risk analysis deals with unforeseen risks and uncertainties and addresses them before they become a liability. There are two types of risk analysis in most organizations: (1) qualitative risk analysis and (2) quantitative risk analysis.

***Qualitative risk analysis is concerned with subjective interpretation of the risk's potential severity.***

The primary goal of *qualitative risk* analysis is to question the severity of what could happen. The Risk Assessment Matrix, Figure 2, is a graphical illustration of this goal.

Risk Evaluation Matrix		Impact of Risk				
		Trivial	Minor	Moderate	Major	Extreme
Probability of Risk	Rare	Low	Low	Low	Medium	Medium
	Unlikely	Low	Low	Medium	Medium	Medium
	Moderate	Low	Medium	Medium	Medium	High
	Likely	Medium	Medium	Medium	High	High
	Very Likely	Medium	Medium	High	High	High

**Figure 2.** The risk evaluation matrix is a graphical representation of qualitative risk analysis. Created by S. Surendran, 2022.

The primary goal of *quantitative risk* analysis is to calculate an objective understanding of the risks, often using data that can be verified and analyzed [3].

*Quantitative risk analysis focuses on objective understanding of the risks.*

Calculating the risk value reveals the exact level of risk and aids in making better-informed decisions. Completing quantitative risk assessments can help organizations illustrate the significance and scale of risk. The formula below can be used to calculate **risk value** [4]:

**Risk Value = Estimated Loss Due to Event x Probability of Event Occurrence**

Let's consider this formula with an example. Assume we're in a circumstance where we must choose between two dangers before continuing to travel along a road. The two dangers are named Event A and Event B. Each event has a probability of occurrence and estimated loss due to the event. See below for the details:

Event A

the probability of occurrence is 1%  
the estimated loss due to event A is \$10,000

Event B

the probability of occurrence is 5%  
the estimated loss due to event B is \$5,000

By using the risk value formula, we can see the following quantitative results for each event:

**Event A risk value:  $0.01 \times 10000 = 100$**

**Event B risk value:  $0.05 \times 5000 = 250$**

Although the estimated loss caused by Event B would be half of that caused by Event A, the *magnitude* of the loss caused by Event B is substantially greater due to the chance of occurrence. In this example, then, we would not want to take the added risk with Event B. We would therefore continue with Event A in this situation.

## **Risk Management Block 2: Risk Control and Prioritization**

Once the risk has been identified and analyzed, the next stage is to prioritize the risk based on its significance and likelihood and then act on that information to manage the risk. Deciding which risks to work on first is

known as risk prioritization. This should be based on the possibility of risk and its impact as determined during the risk analysis step. The risk evaluation matrix, which is calculated using the risk value, is used to prioritize risks.

And, after prioritization, the risks need to be managed. To do this, there are 4 common strategies [1]:

**(1) Risk Acceptance:** Organizations may do this if they believe the risk's likelihood to be low or the potential harm from the risk is insignificant. Organizations manage risk by comprehending the possible repercussions of risk and acknowledging the possibility of such effects without control or mitigation.

**(2) Risk Transfer:** The goal here is to transfer or shift the risk to other business areas or to outside entities accepting the risk, such as insurance firms. The idea is that the other entity that accepts the risk is already an expert in the topic and will handle it better.

**(3) Risk Mitigation:** Risk mitigation entails putting policies and processes in place to decrease the negative consequences of an event. Incident response plans, disaster recovery plans, and business continuity plans are examples of risk mitigation measures.

**(4) Risk Avoidance:** Applying safeguards that eliminate or decrease business risks that can hurt the organization's assets is what risk avoidance is all about. While risk management works to control risks' damages and financial repercussions, risk avoidance seeks to avoid the risks completely.

## Risk Management Block 3: *Review and Monitor Results*

The final but most important element of the risk management cycle is to analyze the actions and regularly monitor the situation for any improvements and corrections. The key beneficial effect of this phase is learning from failed cases in order to improve for similar situations in the future. Another important takeaway: successful cases teach us the best tactics to emulate.

## Importance of Risk Management

Risk management is critical. In an era of evolving technology, where we have numerous opportunities to sculpt new products, features, and services every day, new risks emerge regularly, many of which are related to or caused by the now-ubiquitous usage of digital technology. We must be prepared to confront the consequences and manage any risk. Consider the previous chapter on the ethics of emerging technology. Imagine how "risk assessment and management" become integral parts of ethical technologies.

Risk management is the best strategy to prepare for unforeseen events that impede progress and growth. A competent risk management program identifies the risk and investigates the relationship between risks and the

possibility for cascade effects. Using a risk management strategy, stakeholders may identify potential risks, the likely impact of those risks, and how to eliminate or reduce the impact of those risks. Furthermore, progressive risk management guarantees that high-priority risks are dealt with as aggressively as possible [5].

Risk management is critical in an organization because a company cannot establish its long-term goals without it. If a corporation specifies its objectives without considering the risks, it will likely lose focus whenever any risks become reality. And, as we stated in the previous section, organizations must move quickly to deal with risks as they emerge, which cannot be accomplished if risk management is delegated to the back office.

## Correlating Values to Business Case

As we discussed in the previous section, risk management is vital for an organization and can benefit it in many ways. The most significant source of uncertainty in any organization is risk in its many forms. Risk management is critical, and failing to have a plan can create severe consequences for a company. The consequences of failing to manage risk can vary depending on the risk event. Still, it might include financial loss, employee harm, company interruption, tarnished reputation, or failure to meet corporate objectives. There are several other potential repercussions for failing to manage risk, each one specific to the risk occurrence, and all of them will damage corporate performance. This emphasizes the importance of successful risk management for an organization. As a result, businesses are increasingly focusing on detecting and controlling risks before they impact the business.

The capacity to manage risk will allow businesses to form more confident business decisions within the future. Organizational understanding of the risks they face will provide the organization with many options for coping with future issues.

The organization can significantly reduce or eliminate collateral harm and losses if a plan is in place and the relevant individuals know how to activate it. Knowing which risks are most likely to arise helps paint a more accurate picture of the corporate insurance landscape. A successful risk management plan can save the firm a significant amount of human labour, time, and income loss. In addition, many risk management failures help organizations to create and implement the right policies. So, whether it succeeds or fails, having a risk management plan in place can support organizational goals.

Organizations can gain more leverage from technological breakthroughs if they are prepared to deal with risks ahead of time through a risk management plan. Emerging technologies like machine learning and artificial intelligence hold considerable promise for assisting risk managers in identifying specific threats and developing speedier solutions. Among other advantages, these technologies can help managers focus their efforts on severe dangers to vital sections of the company by reducing lower-risk regions.

In summary, the benefits of creating a risk management plan are as follows:

- Risk management generates financial gains
- Risk management reduces the occurrence of unplanned events and prepares the organization for handling a risk event
- Project success is enabled through risk management
- Risk management allows organizations to save time and effort
- Risk management helps to avoid reputation difficulties
- Decisions are guided by risk management

## Managing the Risks of Risk Management

Organizations must tread cautiously when implementing risk management. Risk management involves complex calculations, making it difficult to handle without automated technologies. Further, such a comprehensive risk management process may not be feasible for all organizations. Its implementation may occasionally be more expensive than the loss caused by the anticipated risks.

There are a few scenarios in which devoting too much time to identifying and controlling an unlikely risk diverts resources that could have been used more efficiently and profitably. And, if the risk is unlikely to occur, it may be preferable to retain the risk and deal with the consequences more simply.

Time spent on development and research must be allocated for training to accomplish proper risk management execution. Furthermore, acquiring information for strategic planning takes a long time in risk management. And if not done correctly, it might result in losses that exceed the risk itself [6].

As we saw in the previous section, risk management demands extensive calculations, which mandate the use of well-designed software. Training is frequently required because risk management software can be challenging to grasp. If this is not done correctly, the risk management plan will not function as intended. To avoid this, businesses should devise a well-structured training program for employees on software and procedures. Employees who have been adequately trained are less likely to misuse it and misinterpret the results.

Another factor that many organizations may find to be a roadblock in implementing a risk management plan is the cost of the software. To effectively manage this, firms can determine which modules are essential and helpful to the organization and select only those software modules that can cut costs to some extent [6].



*An interactive H5P element has been excluded from this version of the text. You can view it*



online here:

<https://ecampusontario.pressbooks.pub/techadaptvls/?p=38#h5p-7>

## A Case Study

“How Evaluating Risk Can Prepare You for the Worst of Climate Change”

Link to read about it: <https://commercialobserver.com/2022/01/how-evaluating-risk-can-prepare-you-for-the-worst-of-climate-change/>

### Key Points

- A risk management plan can be vital and valuable to the organization’s success. It can build a solid foundation well in advance to deal with or prevent losses caused by uninvited events.
- A risk management strategy is made up of numerous submodules, such as detecting and categorizing risks, analyzing risks, and regulating and minimizing risks based on severity.
- Risks can be classified into various business-specific categories and dealt with accordingly. A risk assessment matrix can help any business prioritize and act on risks based on their risk value.
- Businesses can decide how to control or act on the risk and what measures to take based on the nature and category of risk.

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## PART II

# CHAPTER 1 INSTRUCTOR GUIDE: ADAPTING TECHNICAL KNOWLEDGE FOR MULTIPLE AUDIENCES

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- Describe the challenges of conveying technical content to communicate to non-technical audiences.
- Apply the rhetorical situation to written and oral communications.

### Summary of the Chapter

This chapter highlights the importance of communication between technical and non-technical stakeholders. An expert who speaks in technical terms must communicate their knowledge to non-technical audiences. For efficient communication, the materials should be kept as simple as feasible. Avoiding jargon and delivering straightforward facts about technical information might help improve audience understanding. Being aware of the rhetorical situation helps communicators prepare necessary documents and presentations to persuade their audiences. The rhetorical situation can be considered a “formula” for effective communication while conveying detailed information.

The real-life scenario discussed in this chapter illustrates how to document the process clearly and professionally, and to compose and summarise the message while focusing on audience needs and interests.

## Considerations for Lesson Planning

There are several possibilities when creating lessons around The Rhetorical Situation. In the context of this e-resource, it is most common to discuss the elements of the rhetorical situation to ensure that students understand each of the elements by incorporating articles, videos, etc. related to emerging technologies. Suggested approaches for a range of contexts are listed below:

1. Use social media posts to guide students through each of the elements: pathos, ethos, logos. Require learners to identify the purpose of the post and explore the resultant replies to determine whether the author reached his/her/their goal with the post.
2. Guide students to create their own samples of writing for different audiences. For example, learners could investigate a topic related to technology such as the impact of a particular technology on regional economic development. Then, create smaller activities and assignments that require students to develop communications for different stakeholders (e.g., investors, community members, municipal assessors, etc.)
3. Watch TED Talks related to technology with the learners. Use the transcripts of the Talk to have students outline and identify each element of the rhetorical situation and have them critique the success/failure of the speaker’s delivery. Then, incorporate a similar exercise for students to plan for, and practice, their own presentations.
4. Create an activity where learners generate actor maps to begin considering their audience with

“empathy” (many models of design thinking can be useful here). For a particular scenario, invite students to question what each stakeholder group (e.g., government, citizen, user, etc.) is thinking, feeling, saying, and doing. Although a relatively simplistic approach, students often find this activity to be less intimidating and instructors can therefore guide the engagement and analysis to a level that meets the needs of the course and the learners. Learners might also find value in interviewing potential audiences as part of their research.

## Assessment Strategies

Assessments can range from simple, recall quizzes (i.e., asking students to identify each element of the rhetorical situation and define them) to broader projects where students must complete research to prepare a report and then create a meta-analysis of their own work where they outline each of the rhetorical elements within their own work.

The course that inspired this e-resource is graduate-level, so learners are often required to prepare a variety of complex reports and presentations that guide them through the processes of identifying their audiences (including stakeholders), and determining how best to “reach” the audiences with the different forms of communication that we explore (e.g., memo, literature review, business case, debate, pitch presentation, etc.) When the opportunity allows, learners are encouraged to meet with and interview potential stakeholders.

## Suggested Resources

A. Bruzzese, “How to Explain Technical Information to Non-Techies”, 2019, <https://careerlaunch.mays.tamu.edu/blog/2019/03/19/how-to-explain-technical-information-to-non-techies/>

Department of Communication, University of Pittsburgh, “Audience Adaptation”, [n.d.] <https://www.comm.pitt.edu/audience-adaptation>

S. Last. *Technical Writing Essentials: Introduction to Professional Communications in the Technical Fields*, 2019, BC Campus & University of Victoria.

E. Markowitz, "How to Write an Executive Summary", 2021, <https://www.inc.com/guides/2010/09/how-to-write-an-executive-summary.html>

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University of Jamestown Writing Center, *The Rhetorical Situation*, (Aug. 17, 2020). [Online Video]. <https://www.youtube.com/watch?v=QE0thkr6GPA>. [Accessed Nov. 03, 2021].

L. Wahlin, *Fundamentals of Engineering Technical Communications*, (n.d.), <https://ohiostate.pressbooks.pub/feptechcomm/> [Accessed Feb. 22, 2022].

## PART II

# CHAPTER 2 INSTRUCTOR GUIDE: RESEARCH AND FORMATTING – INCREASING PROFESSIONAL CREDIBILITY

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- Identify the elements of a literature review
- Conduct a literature review
- Apply IEEE referencing style to various documents and presentations

## Summary of the Chapter

The chapter demonstrates the value of conducting a literature review, offers effective methods for conducting a literature study, and explains IEEE style and standards when writing a research paper. It is critical to establish consistency in ethics, productivity, and credibility as you proceed through your career. One approach is to refer to various sources and give them proper credit. However, it is crucial to investigate their authority, usefulness, and trustworthiness before using any sources. Failure to give someone credit for their contribution can be detrimental. To ensure uniformity in citations and references in this e-resource, we adhere to the IEEE style and structure. A variety of tools available can help simplify establishing these IEEE-compliant references.

## Considerations for Lesson Planning

In the course that inspired this e-resource, many students will complete a Master's thesis. Part of creating a thesis is conducting a literature review. In some cases, it can be useful to the learners' larger goals (i.e., Master's thesis) to guide them through producing an academically sound literature review.

However, the experience of conducting a scholarly review of literature can be helpful in industry and business environments as well. Consider creating a scenario where learners must provide a report to the CEO of their organization. In this report, the CEO has asked for the learners to provide a broad overview of other companies and studies focused on a particular topic (i.e., one that the instructor chooses for the exercise). As part of the activity, learners will need to engage their understanding of the rhetorical situation to produce effective documentation while also adhering to the conventions of formalized literature reviews and IEEE formatting style.

Note that it can also be useful to invite librarians or other writing support staff from an institution to conduct workshops on research, literature review processes, and formatting. While instructors can certainly lead these sessions, it can be helpful to include additional voices that will underscore the value and necessity of appropriate, academic research pursuits.



## Assessment Strategies

The most common way to assess for learners' understanding of IEEE and formatting is to have them generate documents and communications that require research and create a scoring rubric (or feedback, if scoring is not desirable in a given circumstance) that reflects the learners' application of the IEEE standards.

In some cases, it can be useful to discuss the institutional policies on academic integrity thereby encouraging learners to recognize that incorporating appropriate citations and references is part of the academic community's expectations, not only a requirement for a course.

Consider, also, how appropriate citation and reference style can be used to increase the writers' credibility and make correlations to the rhetorical situation (Chapter 1). One way to build ethos is to ensure that resources are cited and referenced appropriately.

## Suggested Resources

Health Sciences Library JABSOM, *Zotero Quick Start*, (May 15, 2020). [Online Video]. [https://www.youtube.com/watch?v=\\_OvKsCrW4hM](https://www.youtube.com/watch?v=_OvKsCrW4hM). [Accessed Nov. 06, 2021].

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L. Wahlin, *Fundamentals of Engineering Technical Communications*, (n.d.), <https://ohiostate.pressbooks.pub/feptechcomm/> [Accessed 18 February 2022].

## PART II

# CHAPTER 3 INSTRUCTOR GUIDE: THE ETHICS OF EMERGING TECHNOLOGIES

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- Define “emerging technology” (ET)
- Explain the present (and potential future) impact of ET on society
- Describe ethical challenges related to emerging technology

### Summary of the Chapter

This chapter illustrates emerging technologies, their impact on society, and potential ethical

problems associated with them. As technology improves, we must consider that how we use technology affects ourselves, our communities, and the planet. Failure to address the ethical implications of technology can lead to undesirable and catastrophic outcomes. We must consider how technology will affect both living and non-living creatures.

The context of an emerging technology explains that these technologies are novel, innovative, and yet in the early stages of development. The term “emerging” technology does not necessarily imply that all such advancements are novel or innovative in and of themselves. Some have been around for years, or in various versions, for decades.

As these new technologies gain more autonomy, they raise many ethical concerns. We must try to limit risks and plan for the ethical difficulties of emerging technologies. The way we approach the rules of developing technologies and the regulations and laws put in place to govern them will have far-reaching implications for security and ethics. Some innovations may proceed without governmental support, but good authority, risk assessments, and ethical considerations must always be considered.

## Considerations for Lesson Planning

Ethics discussions require that learners recognize the multiple perspectives of potential stakeholders such that they can empathize and identify potential issues. In many cases, beginning the discussion about emerging technologies and ethics can be as simple as asking about learners’ preferences for privacy or as complex as questioning who (or which body) holds rights to data that is willingly shared on social media. When organizing lessons for ethics discussions, consider using real-world headlines about Facebook/Meta or other sharing sources (e.g., downloading music from sharing services or purchasing access to music through Apple or Spotify).

It is usually more effective to begin ethics discussions with contexts that learners are likely to have experienced rather than launching directly into broad-scale questions about implications for emerging technologies.

Consider, for example, asking learners to work in pairs/teams to investigate current or prospective uses of blockchain, augmented/virtual reality, and the like. Have the learners create documentation (tables, lists, etc.) where they identify the potential impacts to stakeholders and ask them to consider the implications if something goes wrong. Most simply, ask learners to identify “what if”

scenarios and then respond to those scenarios by determining how the outcomes would impact the stakeholders.

## Assessment Strategies

One of the more engaging ways to assess students on their understanding of ethics and emerging technologies is to engage them in debate. Divide students into groups of 2 or 4 members and have each “side” argue the ethical implications of the emerging technology under investigation.

Other options for assessment include discussion boards (if using a learning management system such as Blackboard, D2L Brightspace, etc.), argumentative essays, and reflection writing where students consider how their lives might be impacted by unethical uses of a technology.

Inviting a legal expert or ethicist to a discussion would also be an option for those who have the opportunity to engage such professionals.

## Suggested Resources

N. Al-Rodhan, “The Many Ethical Implications of Emerging Technologies,” [March 13, 2015], *Scientific American*, <https://www.weforum.org/> [Accessed January 01, 2022].

Digital Skill Up (sk://up), “How Will Emerging Technologies Impact the Future of Business and Services for Citizens?” (Nov. 03, 2021), <https://www.digitalskillup.eu/articles/how-emerging-technologies-impact/> [Accessed February 22, 2022].

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M. Luo, "Computer Code", [March 23, 2020], Unsplash [online]. Accessed: Nov. 25, 2021.

M. Marks, "Suicide Prevention Technology is Revolutionary. It Badly Needs Oversight", [December 20, 2018], *The Washington Post*, <https://www.washingtonpost.com> [Accessed January 01, 2022].

## PART II

# CHAPTER 4 INSTRUCTOR GUIDE: VISION DOCUMENTS

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- Explain why vision documents are important
- Identify the 11 elements of a vision document

### Summary of the Chapter

There are various templates for developing a vision document, depending on the scale of the project, approach, and organization.

A vision document can also describe the broad scope and goal of a program, product, or initiative. A clear definition of a problem, proposed solution, and high-level features of a product serves to

set expectations and reduce risks. The more complex and involved a project, the more important a short document becomes. Complex projects have higher chances of miscommunication and often costly mistakes.

It is also essential to adopt a vision document to guide the project planning and strategy for its long-term success. A vision document contains eleven elements, including an introduction, positioning, description of stakeholders and users, product features, overview and restrictions, a how-to guide, and other elements. All eleven of these elements are explained in this chapter.

## Considerations for Lesson Planning

Actually *creating* a vision document is one of the more straight-forward ways to engage students in the topic of vision documents. Commonly employed for Unified Modeling Language (UML) projects, vision documents track team progress, project development, and research so that decision-makers, team members, and supervisors are consistently updated on projects.

One way to use the vision document is to give learners a template that provides an example of how to prepare each section, then they would be required to maintain and complete the vision document over several weeks as they complete their projects. Incorporating stakeholder interviews — or interviewing practitioners who customarily produce vision documents — can also be effective strategies to support learners' progress through developing their own vision document.

In any given section of the document, additional work is required. For example, in the stakeholder and market demographic sections, students are required to conduct research, develop actor maps, complete empathy mapping exercises, and articulate their stakeholders' needs. In effect, the vision document serves as a guide for learners to move through the research process in a methodical way. Of course, a template may not be effective for all learners, so it is important to adapt to the needs of the group.

## Assessment Strategies



The vision document assignment can be part of a larger portfolio that requires students to prepare a full business case. As a stand-alone document, team progress can be assessed and formative feedback can be provided at the mid-point in the semester to help guide their work. By the end of the semester, through the portfolio, the vision document can become a full depiction of the work the teams have accomplished throughout the term.

It would also be possible to assess distinct sections of the document rather than waiting for the mid- and end-points of the semester. Essentially, each section can be critiqued based on execution and students could be assigned scores (or qualitative feedback) as deemed appropriate by the instructor.

## Suggested Resources

S. Berkun, “Writing the Good Vision”, *Making Things Happen*, 2008, <https://www.oreilly.com/library/view/making-things-happen/9780596517717/ch04.html> [Accessed January 1, 2022].

IBM, “Vision Document”, *Engineering Lifecycle Management*, 2021, <https://www.ibm.com/docs/en/elm/7.0.0?topic=requirements-vision-document> [Accessed January 1, 2022].

OutSystems, *Business Vision: Vision Document*, (Feb. 08, 2018). [Online Video]. <https://www.youtube.com/watch?v=EVr2f5pyT6w>. [Accessed on Nov. 09, 2021].

“What Makes Vision Statements Ineffective?” *Small Business – Chron.Com*, <https://smallbusiness.chron.com/vision-statements-ineffective-35572.html>. Accessed 19 Feb. 2022.



## PART II

# CHAPTER 5 INSTRUCTOR GUIDE: USE-CASE MODELS

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- Describe the importance of a use-case model
- Identify the 3 components of a use-case model
- Create a use-case diagram

### Summary of the Chapter

A use-case model is a set of typical system scenarios that essentially describe functional requirements. These models improve the readability and comprehension of the system. Use-case

models can benefit parties on both the development and finance sides. This chapter describes a use-case model and how to generate use-case diagrams.

A use-case has three main components: system actors, multiple use-cases for those actors, and relationships between them. This chapter explains how to identify the actors, define the use-cases, and recognize relationships.

## Considerations for Lesson Planning

Generally, use-case models are best explained/taught by demonstrating how to create one. For example, if the class is focused on creating a vision document (Chapter 4) devoted to improvements on a point-of-sale (POS) technology, then the instructor can help learners generate different use-cases to investigate. In all cases, it is useful to provide graphics (even simple hand-drawn representations) to help students visualize the concepts.

As well, it will likely be important to ensure that students are familiar with basic design thinking strategies such as empathy mapping before engaging with use-case modelling. Often, students can better devise potential use-cases by thinking through and analyzing the stakeholders. Interviews of stakeholders can be especially productive in this situation.

## Assessment Strategies

While there are many ways to assess use-case models based on the output itself (e.g., quality of the graphics, complexity of the use-case design), it can be more useful to assess for the depth of analysis that learners undertook to develop the use-case. Of course, assessing on analytical skill will require additional qualitative measures, but often, these qualitative measures can generate stronger formative feedback and support the learners in recognizing the value of their analyses to support the anticipated use-case model outcome.

If the portion of the course devoted to use-case models is focused on producing use-cases and on the quality of the depiction (i.e., for ease of reading, clarity of labels, complexity of components, etc.), then measures related to the production will be important.

## Suggested Resources

A. Della Porta, *Business Modelling – Use Case Diagrams: Tools and Techniques*, (Dec. 12, 2019), The Sustainable PM, [Online Video]. <https://www.youtube.com/watch?v=86v6a5B4WMc>. [Accessed November 12, 2021].

W. Lynch, “All You Need to Know about Use Case Modeling”, [March 22, 2019] <https://warren2lynch.medium.com/all-you-need-to-know-about-use-case-modeling-828756da3215> [Accessed January 1, 2022].

“Use Case Modeling”, *W3Computing*, <https://www.w3computing.com/systemsanalysis/use-case-modeling/> [Accessed January 1, 2022].

*Use Cases: The Pros and Cons*. <https://www.cs.hmc.edu/~mike/courses/mike121/readings/reqsModeling/firesmith.htm>. Accessed 19 Feb. 2022.



## PART II

# CHAPTER 6 INSTRUCTOR GUIDE: PREPARING FOR A PRESENTATION

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- List the key factors required to prepare an effective presentation
- Identify steps used to create a presentation
- Plan to deliver an effective presentation with confidence

### Summary of the Chapter

This chapter describes in-depth some practical and essential aspects for creating and delivering effective presentations. Some critical elements, such as preparation and practice, make it easier to execute. These alone will not be adequate for a decent presentation; a good amount of energy and

physical and mental rest are also required. This chapter offers suggestions like creating flashcards with information about the presentation in bullet points to help remember the talking points while practicing. Because the audience is not physically present if the presentation is virtual, various additional details must be managed. The chapter also discusses some points for an effective virtual presentation.

## Considerations for Lesson Planning

Sessions devoted to effective presentations can be a compilation of activities. When introducing strategies for building and delivering presentations, it can be useful to watch examples of effective and ineffective presentations, and to discuss which elements affect the presentations watched. It can be helpful, also, to invite guest speakers for various course-specific topics and then ask students to reflect upon their experiences with each speaker. Importantly, learners need to recognize that there is not one specific way to deliver a successful presentation — focusing on clarity, delivery, and the rhetorical situation (Chapter 1) guides learners towards strong presentation skills.

Practice! Practice! Practice! It's important to give learners opportunities to experiment with different presentation elements and delivery styles. Consider, also, offering content related to reducing nervousness, deep breathing, and the physiology of stage fright.

## Assessment Strategies

Presentations can be assessed by focusing on different components of the whole. For example, consider assessing for delivery (i.e., clarity of speaking, pacing, eye contact, body language, etc.) separate from the content that is delivered where the instructor would be focused on the research and actual information the learner is delivering. In many cases, students become especially nervous when speaking in public, so reducing the “weight” of a delivery score within the whole grade of the presentation can serve to alleviate some worries.

Other elements to assess can include slide design (if slides are used), organization of the content, use of citations and references, etc.



## Additional Resources

Algonquin College Library, *How to Create an Effective Presentation*, (Jan. 20, 2016). [Online Video]. <https://www.youtube.com/watch?v=AXYxManvI8E>. [Accessed Nov. 12, 2021].

Algonquin College Library, *How to Deliver an Effective Presentation*, (Jan. 20, 2016). [Online Video]. <https://www.youtube.com/watch?v=d4y1009rppA>. [Accessed Nov. 12, 2021].

L. Atwood, C. Westin. *Business Presentation Skills: Speaking and Presentation Skills for Business*. BCCampus. E-book. [Accessed January 1, 2022].

G. Lay, "Standing Ovation", [nd], Noun Project [online]. <https://thenounproject.com/icon/standing-ovation-969109/>

M. Shwantes, "9 Helpful Tips to Calm Your Nerves Before Speaking," 2017, <https://www.inc.com/marcel-schwantes/9-simple-tricks-to-overcome-your-fear-of-speaking.html> [Accessed January 1, 2022].



## PART II

# CHAPTER 7 INSTRUCTOR GUIDE: RISK ASSESSMENT AND MITIGATION

## INSTRUCTOR GUIDE

*Note: The instructor guide provides ideas for how to engage with the chapter. It can be adapted to an instructor's pedagogical context, and is intended only to suggest approaches. There are myriad ways to deliver content depending on student level, delivery mode, and time allotted to a given topic, and users are encouraged to be creative in any way that suits their style and needs. Learners may also use the instructor guide as a tool for a self-guided experience.*

### Learning Goals

- Identify the 3 components of risk management
- List 7 examples of risk types
- Distinguish between quantitative and qualitative risk management
- Identify the 4 strategies for risk management
- Correlate risk to a business case

## Summary of the Chapter

This chapter provides details about risk management. It identifies the various modules of risk management, the different types of risks that may occur, how to analyze and prioritize the risks depending on their impact and magnitude, and how to control or handle the risk scenario. One section explores how vital risk management may be for a company and how it relates to corporate values.

It is not true that risk management will only ever generate dramatic changes within the organization. There are certain disadvantages to incorporating risk management into an organization. The chapter also reveals ways to limit and mitigate the risks involved with the risk management implementation.

## Considerations for Lesson Planning

Risk management can be a broad and deep series of lessons, but the course for which this OER has been created involves only one full class session devoted to risk management and mitigation. Given that learners are graduate-level professionals, they are capable (and often familiar) with assessing risk in different professional environments.

It can be helpful to “ground” the risk management and mitigation discussion in a particular sector and/or with a particular application (in the case of computer science classes). Learners can create their own risk management plan based on the projects they are investigating and then the rubric can be applied to other models/applications in order to identify whether the rubric can be used universally or if it is specific. In addition, instructors can supply various scenarios where risk calculations can be completed to assess the quantitative risks of a scenario.

In general, one of the most effective ways to explore risk management and mitigation is to do the work. Apply the concepts to particular examples and invite students to generate their own qualitative and quantitative assessments of the risk followed by generating a fulsome risk management/mitigation plan.

## Assessment Strategies

For risk management and mitigation plans, it can be useful to assess learners' work based on breadth of coverage; i.e., determine whether the learners' investigation is comprehensive and appropriately articulates the levels of risk. Learners could offer mitigation plans for each identified risk and demonstrate the levels at which risk would be deemed too great for what can be tolerated in a particular context.

In general, assessments could include the creation of the risk matrices and management documents themselves (e.g., readability, comprehensiveness, clarity, etc.) and the qualitative explanations that learners provide to articulate the mitigation plans and the "no-go" triggers.

## Suggested Resources

I. Horvath, "Difference between Qualitative and Quantitative Risk Analysis," *Invensis Learning Blog*, July 16, 2021. [Online]. Available: <https://www.invensislearning.com/blog/qualitative-vs-quantitative-risk-analysis/>. [Accessed: 01-Jan-2022]. R. S. Kaplan, H. B. Leonard, and A. Mikes, "The Risks You Can't See," *Harvard Business Review*, (Nov-Dec 2020). [Online]. <https://hbr.org/2020/11/the-risks-you-cant-foresee>. [Accessed Jan. 1, 2022].

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C. Larmore, "The Disadvantages of Risk Management Software," *Bizfluent*, February 11, 2019. [Online]. Available: <https://bizfluent.com/>. [Accessed: January 1, 2022]. "Risk Management," *Corporate Finance Institute*, April 27, 2021. [Online]. Available: <https://corporatefinanceinstitute.com/resources/knowledge/strategy/risk-management/>. [Accessed: January 1, 2022].

T. Six, "15 Categories for Project Risks," *Ten Six Consulting*, February 18, 2019. [Online]. Available: <https://tensix.com/15-categories-for-project-risks/>. [Accessed: 02-Jan-2022].

L. Tucci, "What is Risk Management and Why is It Important?" *SearchCompliance*, October 12, 2021. [Online]. Available: <https://searchcompliance.techtarget.com/definition/risk-management>. [Accessed: January 1, 2022].

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