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**SCENARIO-BASED ASSESSMENT OF INFORMATION TECHNOLOGY
ALIGNMENT AND MISALIGNMENT: INCORPORATING USER PERSPECTIVES**

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Informatics

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ABSTRACT

Information technology (IT) alignment refers to the relationship between an organization's goals and the impact of its IT systems on performance towards these goals. Managing IT alignment and misalignment requires an ability to assess this relationship. Most previous research has focused on assessing alignment at the strategic and operational levels of the organization without considering the individual user-IT interaction level. Recent research has recognized the importance of including users' perspectives in IT alignment models and frameworks, but assessment methods are slow to include the individual level. Scenario-based methods are effective for collecting, organizing, and analyzing user-IT interactions, particularly in human-computer interaction. This study explores a scenario-based method called *SUMMIT-Align* to assess IT alignment and misalignment from the perspective of individual users. The aim is to provide value to IT practitioners at the strategic and operational levels by providing a method for assessment. *SUMMIT-Align* was applied in a university case study to assess alignment and misalignment between user perspectives of IT use and the organization's strategic IT objectives. The assessment results provide a detailed account of the *SUMMIT-Align* method, the advantages and challenges of using scenario-based methods this way, and insights into alignment and misalignment issues. This work contributes to human computer interaction and information technology alignment disciplines by providing a method to explicitly link strategic IT objectives and the perspectives of people who use technologies. [OB]

Table of Contents

LIST OF FIGURES	vii
LIST OF TABLES.....	ix
ACKNOWLEDGEMENTS.....	x
Chapter 1 Introduction.....	1
Chapter 2 Literature Review.....	5
2.1 Introduction.....	5
2.2 Defining Alignment	5
2.3 The Value of Alignment.....	6
2.4 Levels of Alignment.....	7
2.5 Assessing Alignment.....	10
2.5.1 The Foundations of IT Alignment and Assessment	10
2.5.3 Multi-discipline Alignment Assessment	12
2.5.4 Assessment at lower levels of organizations.....	12
2.5.5 Assessment Methods.....	13
2.5.5 Challenges with Assessing Alignment.....	14
2.6 Synthesis of the Literature	15
Chapter 3 Study Methods.....	16
3.1 Introduction.....	16
3.2 Case Study.....	17
3.2.1 Case Study Context: The Pennsylvania State University.....	17
3.3 Scenario-Based Methods.....	19
3.4 The <i>SUMMIT</i> Method.....	20
3.4.1 Stage 1: Building <i>a priori</i> contextual appreciation.	23
3.4.2 Stage 2: Scenario elicitation.....	24
3.4.3 Stage 3: Scenario validation.....	27
3.4.4 Stage 4: Analysis.....	28
3.5 Feedback from IT Practitioners.....	30
3.6 Summary	30
Chapter 4 Study Procedures.....	32
4.1 Introduction.....	32
4.2 Stage 1 - Building a priori contextual appreciation.....	32
4.3 Stage 2 - Scenario elicitation.....	34
4.4 Stage 3 - Scenario validation.....	37
4.5 Stage 4 – Analysis.....	41
4.6 Feedback from IT Practitioners.....	42
4.6 Summary	43

Chapter 5 IT Alignment and Misalignment Assessment: General Findings.....	44
5.1 Introduction.....	44
5.2 Alignment is associated with local IT support interactions.	44
5.2.1 Senior IT Practitioner Feedback.....	49
5.3 Perceptions of alignment and misalignment derive from participants’ prior experiences.	51
5.3.1 Senior IT Practitioner Feedback.....	55
5.4 Examining shifts in alignment and misalignment highlights its dynamic nature.....	56
5.4. Senior IT Practitioner Feedback.....	63
5.5 Misalignment can be a source of strong negative emotions for participants.	63
5.5.1 Senior IT Practitioner Feedback.....	67
5.6 Summary	68
Chapter 6 IT Alignment and Misalignment Assessment: Insights related to IT Objectives....	69
6.1 Introduction.....	69
6.2 Objective 3.1: Expand faculty engagement.....	70
6.3 Objective 3.2: Increase digital fluency.....	75
6.4 Objective 3.3: Improve access and affordability.....	83
6.5 Objective 3.4: Invest in state-of-the-art classroom and learning spaces.	90
6.6 Objective 3.5: Provide IT Training to students, faculty and staff	99
6.7 Summary	104
Chapter 7 Discussion	106
7.1 Introduction.....	106
7.2 RQ1: How can scenario-based methods enable user and use-centric assessments of IT alignment and misalignment?.....	106
7.3 RQ2: What are the advantages and challenges associated with using scenario- based methods, and how can these challenges be addressed?.....	108
7.3.1 Advantage: Scenarios help capture the dynamic nature of alignment and misalignment.	109
7.3.2 Advantage: <i>SUMMIT-Align</i> enables multi-perspective analysis of alignment and misalignment.....	111
7.3.3 Challenge: Manual analysis of data.....	112
7.4 RQ3: What insights about IT alignment and misalignment can be gained from the use of scenario-based methods?	114
7.4.1 User perspectives can inform IT objectives and strategic IT decisions.	114
7.4.2 Assessing alignment and misalignment can identify actionable information for IT managers.	116
7.5 Study Limitations.....	117
7.6 Future Research.....	119
Chapter 8 Conclusion.....	121
References.....	123

Appendix A Codebook	132
Appendix B Interview Guide	140
Appendix C Scenario Narratives.....	142
Appendix D IRB Information	187

LIST OF FIGURES

Figure 2-1: Coevolutionary IT Alignment Framework (Benbya & McKelvey, 2006).....	8
Figure 3-1: The <i>SUMMIT</i> Modeling Concept. (Haynes et al., 2013)	22
Figure 3-2: Conceptual use of Meaningful Use to assess alignment and misalignment.....	25
Figure 3-3: Analysis perspectives of Meaningful Use applied in <i>SUMMIT-Align</i>	29
Figure 4-1: The IT Service Catalog Model (Adizes et al., 2019).	33
Figure 4-2: Sample of a coded scenario.....	38
Figure 4-3: A sample scenario as it appears in the SUMMIT database.....	40
Figure 5-1: Scenario Elements related to IT support actors.....	45
Figure 5-2: Scenario Elements of benefits and costs related to prior experiences.....	51
Figure 5-3: Scenario Elements related to a shift from alignment to misalignment.....	56
Figure 5-4: Example scenarios of a shift from alignment to misalignment.....	57
Figure 5-5: Scenario elements related to a shift from misalignment to alignment.	58
Figure 5-6: Example scenarios of a shift from misalignment to alignment.....	59
Figure 5-7: Alignment scenario of the nursing simulation lab.	59
Figure 5-8: Misalignment scenarios of the nursing simulation lab.....	60
Figure 5-9: Multiple shifts in alignment over time with the nursing simulation lab.	62
Figure 5-10: Scenario elements of costs: negative personal emotions linked to misalignment scenarios.	63
Figure 6-1: Objective 3.1 relevant scenario elements.....	70
Figure 6-2: Objective 3.2 scenario elements related to objective 3.3.	76
Figure 6-3: Objective 3.2 scenario elements related to objective 3.5.	78
Figure 6-4: Scenario element task: IT use linked to alignment and misalignment scenarios.....	79
Figure 6-5: Scenario element actor related to digital fluency.....	82

Figure 6-6: Objective 3.3 relevant scenario elements.....	84
Figure 6-7: Objective 3.3 alignment and misalignment relevant scenario elements.	85
Figure 6-8: Objective 3.4 as identified by scenario elements method.	91
Figure 6-9: Objective 3.5 alignment scenario elements.....	99
Figure 6-10: Objective 3.5 misalignment scenario elements.....	102
Figure 6-11: Objective 3.5 misalignment scenario elements.....	103

LIST OF TABLES

Table 3-1: Semi-structured interview guide to elicit scenarios.....	26
Table 4-1: Study Participants.....	35
Table 4-2: Objectives for IT Plan Goal #3: Enable teaching and learning.	36
Table 4-3: Elements and sub-element examples.....	39
Table 4-4: Alignment and misalignment scenarios by objective.....	40

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Chapter 1

Introduction

Business and information technology (IT) executives face the persistent challenge of aligning IT investments with business objectives despite years of research and practical experience (Kappelman et al., 2019). Empirical evidence suggests that proper alignment between the two can lead to positive outcomes, such as IT effectiveness (Chan et al., 1997; Lee et al., 2008) and competitive advantage (Kearns & Lederer, 2000). However, one explanation for the persistent IT alignment challenge is the need for more collaboration between the IT and business disciplines (Munoz & Avila, 2019). These two disciplines focus on their independent frameworks instead of seeking solutions that leverage both fields. The business discipline traditionally concentrates on managing IT for strategic outcomes without incorporating IT user perspectives in assessment methods. On the other hand, the field of human-computer interaction (HCI) often focuses on how users interact with technology without considering organizational strategies. To address this challenge, this dissertation proposes a method that leverages both disciplines by incorporating user perspectives of IT use in the context of strategic IT goals to assess alignment and misalignment.

This study adopts the definition of alignment from Benbya and McKelvey (2006) for this work. According to their analysis,

“Alignment is a continuous co-evolutionary process that reconciles top-down 'rational designs' and bottom-up 'emergent processes.' It aims to consciously and coherently interrelate all components of the Business/IS relationship at three levels of analysis (strategic, operational and individual), in order to contribute to an organization's performance over time.” (p. 287)

This definition of alignment recognizes a more contemporary characterization of the concept, which includes its dynamic nature around multi-level perspective. Additionally, Benbya and McKelvey (2006) recognize the individual dimension of alignment as part of the alignment process. The inclusion of the individual level, where users' needs align with information technology capabilities, is a rare acknowledgment that individual users within an organization have a role to play in alignment. One of the challenges in accounting for individuals in alignment assessment is understanding how individual-level factors contribute to organization-level outcomes (Coltman et al., 2015, p. 95). This challenge presents an opportunity to explore methods that consider individual users and their use of IT to assess alignment.

A useful concept from IT research is the idea of *meaningful use*. This concept is derived from attempts to measure how technology interactions support organizational goals, specifically in healthcare IT research (Haynes et al., 2013). The HITECH Act mandated the term *meaningful use* to measure the effectiveness of certified electronic health records (EHR) in terms of technology (HITECH Act, 2009). For this study, the definition of *meaningful use* from Haynes et al. (2013) is used. They define *meaningful use* as "a measure of an organization's real use of technology within their stated mission and subject to all of the contextual forces that impact their ability to realize this mission." This definition is relevant as it considers the organization's IT goals and contextual factors that may impact their ability to achieve them when assessing IT use.

IT alignment and misalignment assessment methods usually rely on survey questionnaires and quantitative analysis of perceived use, but these methods often fall short in capturing the actual use of IT (Hussin et al., 2002; Teo and Ang, 1999). Other methods focus on how IT is designed to be used. For instance, Bleistein et al. (2006) measure alignment by validating requirements of a specific information technology against organizational goals. The requirements are often static, and though detailed, do not account for actual IT use.

Quantitative methods are limited in their ability to capture the complex contextual factors that influence actual interactions between users and information technology. When assessing IT alignment, researchers tend to rely on methods that use easily quantifiable metrics (Aversano et al., 2012). To complement these quantitative measurements, some researchers have used qualitative methods such as interviews to triangulate questionnaire data (Gutierrez & Serrano, 2008). However, these combined methods have often only targeted executives and managers in IT alignment assessments (Campbell, 2005; Fardal, 2007). Although Benbya and McKelvey's (2006) IT alignment model includes an individual level, there is still a need to develop assessment methods that consider user-IT interactions. Scenario-based methods focused on the lens of *meaningful use* hold potential.

Scenario-based methods have proved to be highly adaptable and useful in various IT research contexts. In software design, scenarios enable more effective interactions between system designers and users (Carroll, 2000). Scenario-based methods have been used to evaluate collaborative systems to provide a summative assessment of organizational contributions (Haynes et al., 2009). Collaborative systems have been evaluated using scenario-based methods to provide a summative assessment of organizational contributions (Haynes et al., 2009). One case study, for example, evaluated the usability of large-scale integrated systems by using scenarios as the primary unit of analysis (Haynes, 2009). In supporting emergency medical services, a specific scenario-based method and tool, *SUMMIT*, has been used to model *meaningful use* as utility, i.e., the benefits, costs, and risks of IT use in context (Haynes et al., 2013). In another case study, researchers collected representative scenarios from stakeholders across an organization to identify where IT influences organizational objectives (Haynes et al., 2004). Overall, scenario-based methods facilitate the gathering and organization of individual perspectives for analysis and assessment of organizational goals and outcomes.

Given the state of research into IT alignment assessment, this study aims to explore the following research questions:

RQ1: *How can scenario-based methods enable user and use-centric assessments of IT alignment and misalignment?*

RQ2: *What are the advantages and challenges associated with using scenario-based methods, and how can these challenges be addressed?*

RQ3: *What insights about IT alignment and misalignment can be gained from the use of scenario-based methods?*

This study provides three main contributions to the field. First, it fills a gap between business and IT disciplines by providing a method to explicitly link strategic IT objectives and the perspectives of people who use technologies. Second, it identifies the advantages and challenges of applying scenario-based methods to assess alignment and misalignment and recommends potential mitigations to these challenges. Finally, it shows that incorporating the user perspective in alignment and misalignment within an organization offers valuable insights for practitioners to consider.

The dissertation has the following structure. In Chapter 2, the literature on alignment and the methods used to assess alignment are reviewed. The chapter also highlights the need for IT users' perspectives in alignment research. Chapter 3 describes the four stages of the scenario-based method and the modifications that led to the creation of the *SUMMIT-Align* method. Chapter 4 discusses the procedures employed to evaluate alignment in a case study of a major university. Chapters 5 and 6 present the findings and insights on alignment and misalignment. Chapter 7 relates the method procedures, findings and insights to the research questions, discusses the study's limitations, and suggests potential future work. Finally, Chapter 8 discusses the study's contributions to research.

Chapter 2

Literature Review

2.1 Introduction

Academics and professionals widely recognize that the concept of aligning information technology (IT) with business objectives originated from the work of Henderson and Venkatraman (1993). The idea that IT plays a strategic role in organizations was first introduced and termed "strategic alignment" in the *IBM Systems Journal*. Since then, numerous researchers have explored and expanded upon the concept, attempting to define it, measure it, and categorize the value in aligning IT with the strategic levels of an organization. This body of research spans over 30 years and is extensive in terms of depth and breadth, but there remain some aspects of assessing IT alignment that remain unexplored. This chapter seeks to make sense of this literature by examining the definitions of alignment, its value to organizations, the levels of alignment, and different approaches and challenges to assessing alignment.

2.2 Defining Alignment

Alignment is a concept that is often mentioned in various ways, which can make it difficult to understand what it means and how to maintain it (Aversano et al., 2012). It can be referred to as "alignment," "strategic alignment," "strategic IT alignment," "IT alignment," "business/IT alignment," "business/IT alignment strategies," and "strategic information systems alignment." The terms "fit" and "integration" are also sometimes used interchangeably. The term

"misalignment" is usually used to describe the opposite of alignment. For the rest of this dissertation, I will use the terms "alignment" and "misalignment."

Different perspectives exist on how to approach alignment in the field. Some researchers view alignment as a static state or an outcome. For instance, Trendowicz et al. (2011) analyzed the alignment between the business goals of an organization and its IT project goals. Kearns and Lederer (2000), on the other hand, concentrated on aligning the business and IT plans. Reich and Benbasat (2000) defined alignment as shared domain knowledge and communication frequency between IT and business executives. These studies considered alignment as a "snapshot" in time.

Others view alignment as a process or a continuously evolving idea. Henderson and Venkatraman (1999) defined alignment as a continuous process that leverages technology to differentiate operations for a competitive advantage. Luftman and Brier (1999) see effective alignment as a continuum of "applying appropriate information technology in given situations in a timely manner and that these actions stay congruent with the business strategy, goals and needs" (p. 109). Some researchers categorize alignment as bidirectional, with IT and strategy working together to achieve common organizational goals (Campbell, 2005; Hirschheim & Sabherwal, 2001; Ullah & Lai, 2013;). Aversano et al. (2016) focused on identifying misalignments between business processes and the supporting software, recognizing that both can change and evolve. The perspective that alignment is a dynamic process has gained wider acceptance.

2.3 The Value of Alignment

Achieving and maintaining alignment between information technology investments and business goals is a persistent challenge for professionals in the industry. Surveys of executives and IT departments have highlighted IT alignment as a top priority (Luftman et al., 2013; Thevent, 2008). Despite IT practitioners understanding the importance of aligning technology and

business goals, industry surveys still identify maintaining alignment as a constant challenge (Accenture, 2004; Avison et al., 2004).

Executives continue to prioritize alignment because empirical evidence shows that it improves organizational performance (Bergeron et al., 2004; Luftman et al., 2017; Papp, 1999). Typically, higher levels of alignment are associated with financial indicators such as growth and profitability. Alignment also helps firms maximize their return on IT investments, giving them a competitive edge (Kearns & Lederer, 2000; Avison et al., 2004). Even the *perception* of increased performance, such as sales growth and profitability, is positively related to alignment (Croteau & Bergeron, 2001; Oh & Pinsonneault, 2007). Given the high cost and necessity of IT, it is understandable that organizations aim to maximize their return on an investment relative to firm performance.

Studies have shown that the alignment of information technology (IT) with business objectives can positively impact firm performance. However, some experts doubt its overall benefit. According to Palmer and Markus (2000), alignment may have become so widely used in organizations that it no longer provides a competitive advantage. Tallon and Pinsonneault (2011) argue that *firm agility* and alignment are essential for gaining a competitive advantage. While many studies indicate that aligned IT investments lead to better firm performance, Devaraj and Kohli (2003) found that increased *IT usage* improves organizational performance, as measured in revenue. These examples do not diminish the importance of alignment but suggest that there is more to understand about the role of actual IT use and alignment.

2.4 Levels of Alignment

Previous research recognizes that alignment is a complex concept that involves multiple levels. However, there is a need for more consistency in terms of the number of levels and

naming conventions used in the field. For instance, Gutierrez and Serrano (2008) identified three levels of alignment: strategic, tactical, and operational, while Chan and Reich (2007) referred to upper levels and front lines. In contrast, Coltman et al. (2015) used corporate, strategic business unit, and functional-level activities as their labels. In enterprise architecture (EA), Pulkkinen (2006) describes the enterprise, domain, and systems levels. Benbya and McKelvey (2006) identified strategic, operational, and individual levels, with IT end-users acknowledged at the lowest level (Figure 2-1). The strategic level involves ensuring that the IT strategy and the business strategy remain aligned. At the operational level, stakeholders from both IT and business departments work together to achieve a shared understanding and maintain communication to sustain alignment. Finally, the individual level refers to the alignment between IT and the needs of the end-users. Each level must keep evolving within itself and with the other levels (Benbya & McKelvey, 2006).

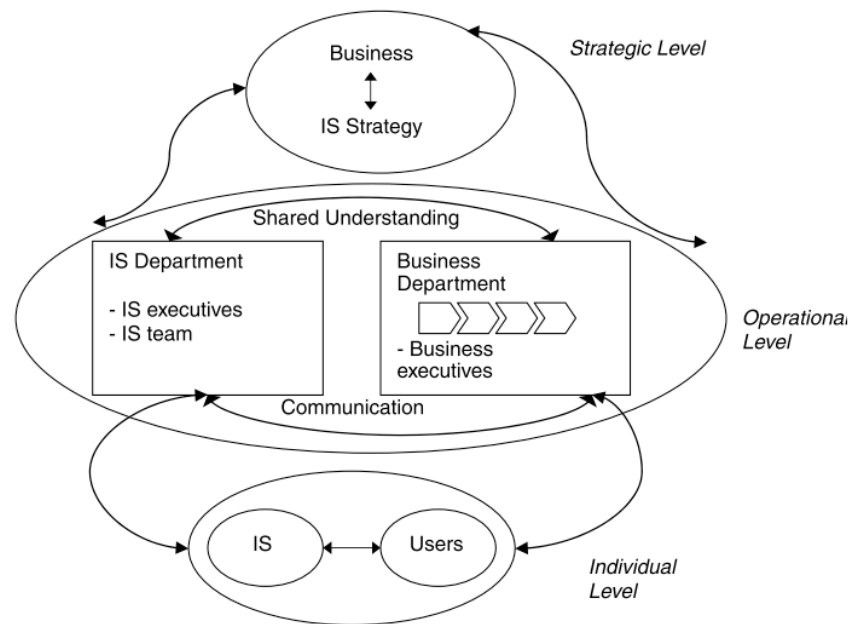


Figure 2-1: Coevolutionary IT Alignment Framework (Benbya & McKelvey, 2006)

Although different research studies categorize alignment levels differently, the top level is consistently called the strategic level. Most alignment measurements tend to focus on the strategic level (Chan and Reich, 2007; Gutierrez and Lycett, 2011). In contrast, definitions of the bottom two levels vary among researchers but generally follow the idea that granularity increases from the top to the bottom.

Measuring multi-level alignment has both benefits and challenges, despite differences in level naming conventions. Researchers may gain new and valuable insights through micro-foundation analysis, which aggregates micro- or individual-level factors to higher levels of an organization (Coltman et al., 2015). In a related study of micro- and macro-levels of alignment, Shen et al. (2013) found that the total value of IT requires alignment at both levels. Some researchers find benefits in focusing on multiple levels. Campbell (2005) even questions the usefulness of alignment research that does not include all levels.

One possible obstacle in analyzing different levels of a company is the varying language and terminology used at each level (Kincaid, 1996, as cited in Coltman et al., 2015). For example, when discussing strategic alignment, the focus may be on financial performance metrics (Bergeron et al., 2004), whereas at an operational level, the focus may be on IT support for supplier relations (Tallon, 2008) or business processes (Thevenet, 2014). The difficulty lies in finding a method of analysis that can accommodate data on multiple levels, using a common language.

2.5 Assessing Alignment

The measurement or assessment of alignment is essential to both researchers and practitioners. Researchers seek to investigate business-IT alignment based on reliable and valid measures (Ullah & Lai, 2013). Practitioners seek to measure alignment since that equates to easier management (Chan & Reich, 2007;). According to Gutierrez & Serrano (2008), there must be a means to measure alignment in order to achieve it. Practitioners need alignment assessment tools to enable their management goals; thus, measuring or assessing alignment is a valuable research endeavor (Chan & Reich, 2007; Ullah & Lai, 2013).

To have a thorough understanding of the evaluation or measurement of alignment, it is important to consider literature that goes beyond just *measuring* alignment. Research that *identifies* or *assesses* alignment can provide valuable insights into the different tools, models, and methods used. Focusing only on measuring alignment can be limiting as it tends to rely on mainly quantitative methods. In this study, the term "assessment" is used as an umbrella term that includes identification, assessment, and alignment measurement. The following section will discuss various aspects of assessing alignment.

2.5.1 The Foundations of IT Alignment and Assessment

Many assessment tools are based on operationalizing aspects of the Strategic Alignment Model (SAM) developed by Henderson and Venkatraman (1993). SAM describes two concepts, functional integration, and strategic alignment, that link four domains in an organization. The four domains are: business strategy and IS strategy, and business structure and IS structure. Luftman has extended this model to include the consideration of alignment maturity by developing the

Strategic Alignment Maturity Model (SAMM) (Luftman, 2003). SAMM is often the basis for alignment assessments using six criteria or maturity categories:

1. Communications Maturity
2. Competency/Value Measurements Maturity
3. Governance Maturity
4. Partnership Maturity
5. Technology Scope Maturity
6. Skills Maturity

Each maturity category is evaluated on one of five maturity levels representing defined best practices.

1. Level 1: With Process (No Alignment)
2. Level 2: Beginning Process
3. Level 3: Establishing Process
4. Level 4: Improved Process
5. Level 5: Optimal Process (Complete Alignment)

Researchers usually administer these assessment tools via a survey, primarily to business and IT managers or executives, to produce an alignment maturity assessment of an organization. Modifications to how the SAMM is evaluated is the differentiator among studies (Gutierrez & Lycett, 2011; Khaiata & Zualkernan, 2009; Luftman et al., 2017). For example, one survey instrument was customized for a rapidly growing company to identify insights into alignment issues (Khaiata & Zualkernan, 2009). Gutierrez and Lycett (2011) modified a SAMM evaluation instrument to measure the maturity of alignment at the tactical and operational levels in a large insurance and finance sector company. Despite identifying lower levels of alignment (tactical and operational) in the organization to measure, the unit of analysis was IT projects, and the

participants were business and IT managers. The traditional frameworks and models that assessments of IT alignment are based on tend to disregard the user-IT interaction.

2.5.3 Multi-discipline Alignment Assessment

Various models have been used to evaluate alignment stemming from other disciplines. Bleistein et al. (2006) used requirement engineering models to break down business strategies into goals and link them to system requirements. However, this approach does not consider changes to either strategy or alignment and assumes that both are static. Elhari et al. (2011) used enterprise architecture (EA) layers to measure the consistency between business strategies and information technology using the maturity levels of SAMM. This approach does not account for actual human activities, such as how they use IT. Aversano et al. (2016) adopted a business process perspective and developed two attributes (Technological Adequacy and Technological Coverage) to evaluate alignment as the extent to which software systems support business processes. Although these attributes determine the adequacy of software systems, Aversano et al. (2016) acknowledged that user opinions should also be considered. These multidisciplinary studies provide value in assessing alignment with strategies and IT. However, the perspectives of IT users are not included.

2.5.4 Assessment at lower levels of organizations

Recent studies have suggested assessing alignment to include the lower levels of an organization. These studies include IT projects, project goals and project stakeholders as the lowest levels of organization. For example, Gutierrez and Serrano (2008) used a multi-level approach to understand IT alignment. They collected data from various IT project stakeholders,

such as IT managers and staff. Trendowicz et al. (2011) assessed the "extent to which a project implements the business strategy" by focusing on software project-level goals and business objectives from the higher-level strategy (pg. 143). Vatharkar et al. (2018) identified alignment factors at the operational level, including the perspectives of IT and business managers, project coordinators, and business analysts. While some alignment frameworks (Benbya & McKelvey, 2006) acknowledge actual IT users and their interactions with IT, user perspectives are limited to the project manager level for alignment assessments.

2.5.5 Assessment Methods

An important consideration in assessing alignment is the specific research methods used. The most commonly used methods for alignment assessments in case studies are quantitative methods that occur in three phases. The first phase is the development of surveys that aim to measure alignment based on an alignment model or framework (Gutierrez & Serrano, 2008; Luftman, 2003; Luftman et al., 2017; Wong et al., 2012). In the second phase, surveys are refined as instruments through pretesting and pilot testing (Cragg et al., 2002; Gerow et al., 2015; Luftman et al., 2017). The final step is to apply the developed survey instrument in a single case study (Miller, 1993; Ravishankar et al., 2011; Zhang et al. et al., 2020). The results of these approaches are usually a factor or attribute statistically correlated with higher or lower alignment in the organization under study. For example, Cragg et al. (2002) measured the alignment of business and IT strategy via surveys of managing directors. Analysis of variance demonstrated a relationship between higher IT alignment and better performance in profitability and sales growth. The stakeholders commonly surveyed in these case studies are business and IT executives and managers.

Some researchers assess alignment by mixing quantitative and qualitative methods to triangulate the data. Researchers often use a combination of quantitative and qualitative methods to assess alignment. For instance, Khaiata and Zualkernan (2009) conducted a survey for various subgroups within an organization and later interviewed select IT and business leaders to review the survey. This approach allowed them to clarify some of the survey results and gain a deeper understanding of the assessment. Gutierrez and Serrano (2008) developed a three-step process to evaluate strategic, tactical, and operational alignment factors in small and medium-sized companies in a case study. In Step 1, they administered a questionnaire and used the results in Step 2 to determine the maturity alignment of a company. Step 3 involved presenting the results from Step 2 in a semi-structured interview with the CEO. Any inconsistencies in the results from Step 2 were explained during the interview with the CEO. By using multiple methods to triangulate data and results, researchers can gain valuable insights and clarify survey results for a more comprehensive assessment.

2.5.5 Challenges with Assessing Alignment

Assessing alignment can be a difficult task due to various factors, such as the absence of a widely accepted definition of alignment, different approaches to assessing it, and challenges in applying alignment assessment techniques for practitioners. There are divergent views on whether alignment is an outcome, a static state, or a process (Luftman et al., 2017; Reich & Benbasat, 2000). Moreover, there is a wide disparity in which indicators or “points of alignment” best measure alignment (Chan & Reich, 2007, p. 297). These indicators range from tangible and intangible factors (Alghamdi & Sun, 2017), IT and business plans (Kearns & Lederer, 2000), and business value or customer satisfaction (Preston, 2014). The diversity of alignment measures also complicates comparisons between approaches (Avison et al., 2004). Finally, practitioners want to

identify the reasons for misalignment to address them (Ullah & Laie, 2013). While maturity levels and IT alignment correlations to increased profits or performance may be helpful at the strategic level, IT practitioners need actionable information.

2.6 Synthesis of the Literature

The value of IT alignment to an organization has made identifying and assessing alignment an enduring pursuit among academics and practitioners. However, understanding the domain can be challenging due to varying perspectives and definitions of alignment. Benbya and McKelvey's (2006) coevolutionary IT alignment framework assists in evaluating different levels of alignment that the literature focuses on and identifies areas for further research. Past assessment methods have primarily concentrated on strategic and operational levels, while the individual level remains relatively unexplored in the context of alignment and misalignment. This study proposes using scenario-based techniques to include the IT user's perspective in assessing alignment and misalignment within an organization.

Chapter 3

Study Methods

3.1 Introduction

This study aims to investigate the use of scenario-based methods to assess IT alignment and misalignment from the perspective of IT users. Scenario-based methods provide “a structured approach to understanding human activity” (Haynes et al., 2013, p. 455). These methods have been used to evaluate individual and group interactions with information technology (Haynes et al., 2009) and to design and develop information technology (Carroll, 1995; Carroll, 2003). The first research question seeks to explore how a modified scenario-based method, called *SUMMIT* (Haynes et al., 2013), can facilitate user and use-centric assessments of IT alignment and misalignment: RQ1: How can scenario-based methods enable user and use-centric assessments of IT alignment and misalignment? In assessing the feasibility of using a method in a new way, it is essential to identify the advantages and challenges associated with its use, and how these challenges can be addressed. Therefore, the second research question is RQ2: What are the challenges associated with using scenario-based methods, and how can these challenges be addressed?" Finally, it is crucial to identify specific findings related to the phenomenon under investigation. Hence, the third research question is RQ3: What insights about IT alignment and misalignment can be gained from the use of scenario-based methods?

This chapter is structured as follows. First, the research design and structure are explained in detail. Second, a rationale for applying the scenario-based method to assess alignment is presented, followed by an overview of the *SUMMIT* method and tool. The four stages of the *SUMMIT* method are then described, along with the modifications made to support

the assessment of IT alignment and misalignment. Finally, there is a description of how this study aims to gather practitioner feedback regarding the method and the assessment.

3.2 Case Study

Assessing alignment is often done through a single case study as it offers several advantages for exploring methods in a particular context (Lee, 1989; Yin, 2011). Focusing on a single organization provides a clear boundary for an in-depth examination of alignment phenomenon in a real-life context (Crowe et al., 2011). Also, scenario-based methods are commonly applied in a single case study to demonstrate their application in the field (Carroll, 1998; Haynes et al., 2004; Hayes et al., 2009; Simonsson, 2005).

3.2.1 Case Study Context: The Pennsylvania State University

Penn State University is the focus of this case study primarily due to convenience and accessibility. Building upon Benbya and McKelvey's (2006) coevolutionary IS alignment framework (Figure 2-1), an IT strategy is a component of the *strategic level*. While Benbya and McKelvey (2006) do not explicitly define what they mean by IT “strategy,” they refer to the IT “mission, objectives and plans” of an organization. For this study, the written objectives in the University’s IT plan encapsulate the IT strategy. The written *Strategic Plan - University IT* (Penn State University, 2020-2025) has a clear structure with the following main goals:

1. Advance digital transformation.
2. Enable research.
3. Enable teaching and learning.
4. Optimize IT resources.

5. Improve IT operational excellence.

To further scope the case, the assessment is focused on the third goal (*Enable teaching and learning*) and its associated five objectives:

1. Expand faculty engagement.
2. Increase digital fluency.
3. Improve access and affordability.
4. Invest in state-of-the-art classrooms and learning spaces.
5. Provide IT training to students, faculty, and staff.

In a meeting at the start of the study, the University's CIO argued that assessing the IT goal focused on teaching and learning would be of great interest to the IT management team (CIO personnel communication, November 10, 2020). The strategic goal and its objectives, the focus of this study, aim to improve the IT experience for three user groups at the university: students, faculty, and staff. The user groups and their interactions with the IT at the University represent the *individual level* of Benbya and McKelvey's (2006) coevolutionary IS alignment framework.

Research related to IT alignment in higher education institutions is sparse, which is surprising considering that universities are the main source of IT managers and executives in the business sector (Ullah & Lai, 2013). Moreover, information technology plays a significant role in how students learn, so it should be a top priority for educational institutions to enhance teaching with technology (Newman & Scurry, 2002). Therefore, development of methods for assessing alignment to improve and manage IT alignment is essential for IT practitioners in these institutions. Finally, the University context is unique, with an annual influx of students who bring new perspectives and different technical frames of reference (Orlikowski & Gash, 1994). The continuous incorporation of new and varied individual perspectives makes it challenging but appropriate to assess alignment, particularly from an individual perspective. These factors make a higher education institution a unique context for assessing alignment (Yin, 2011).

Finally, as a current graduate student at Penn State University, I am an insider researcher with five years of experience from a student user perspective. As a graduate student, I am familiar with the University structure and IT resources, and I can access Penn State's websites and global email address book. One of the advantages of being an insider researcher is that I have access to identify and recruit participants for research purposes (Brannick & Coghlan, 2007). However, there are certain risks associated with insider research that need to be mitigated. For example, a researcher should be aware of the strengths and weaknesses of their prior knowledge to avoid being biased (Brannick & Coghlan, 2007). As a graduate student, I acknowledge my perspective is biased toward that of a student user. To minimize this potential bias, I have incorporated self-reflexivity through memos and researcher notes during data collection and analysis (Cunliffe, 2003).

3.3 Scenario-Based Methods

Scenario-based methods originated with Herman Kahn's work on military strategy in 1962 (Kahn, 1962). Kahn introduced scenarios to deal with the complex and uncertain subject matter of modern technology and international relations, with a specific focus on thermonuclear war. According to Kahn (1962), one of the advantages of this analytical method is that scenarios "force the analyst to deal with details and dynamics which he might more easily avoid treating if he restricted himself to abstract considerations" (p. 144). This analytical method gained popularity in other fields as well. After the 1960s, scenario-based planning became an analysis tool in the corporate world (Fotr et al., 2015). Since then, scenario-based methods have also helped analyze, design, and evaluate information technology (Carroll, 2000; Haynes et al., 2013; Rosson & Carroll, 2002).

Scenario-based methods have become increasingly popular in software design and evaluation research. According to Rosson and Carroll (2009), scenarios are narrative descriptions of people's activities when using IT. In their simplest form, "scenarios are stories about people and their activities" (Carroll, 2000, p. 46). These stories include actors, settings, sequences of events, and individual perspectives. As individuals express their interpretations of what is essential from their experiences, scenarios become accessible to multiple stakeholders in plain language. Story-like narration has served as a communication mechanism between users and system designers in software design (Carroll, 2000). Potentially, scenarios can bridge the gap between business and IT stakeholders as a simple story can be the middle ground between technical jargon and business language.

In addition, scenario-based methods are effective in evaluating software. As a unit of analysis, a scenario analyzes detailed activity while accounting for the broad context of the activity (Haynes, 2009). By using scenarios, one can also identify technology requirements that have the "highest potential utility relative to the goals of an organization" (Haynes et al., 2013, p. 457). The adaptability and diverse application of scenario-based methods demonstrate their potential to help solve problems in various fields.

3.4 The *SUMMIT* Method

This study extends a unique, scenario-based approach and related tool called *SUMMIT* to assess alignment and misalignment. *SUMMIT* was initially developed to evaluate a large-scale integrated system, *Sense & Respond*, used by the U.S. Marine Corps Light Armored Vehicle stakeholders (Haynes, 2009). The purpose of the evaluation was to identify the system's usability and potential benefits for the users. To ground the assessment in actual stakeholder activities while avoiding abstract considerations, scenarios served as the focal unit of analysis. *SUMMIT*, as

a tool and method, further facilitated structured management of observed data by breaking each user interaction with the *Sense & Respond* system into common parts, such as user roles and components. This approach allowed interactions to be aggregated and analyzed in a comparable format, which was essential in evaluating such a complex system.

The *SUMMIT* method and tool were used in a field evaluation of the Integrated Digital Environment (IDE) collaborative system, which was being used in a federal government program office (Haynes et al., 2009). The study demonstrated that *SUMMIT* achieves a "middle ground for evaluation" between specific system features and broad investigations of system use in context (Haynes et al., 2009, p 351). The method involved capturing, aggregating, and analyzing users' experiences with the IDE system from multiple perspectives, enabling multi-level evaluation within the organization. This evaluation helped identify the system's contributions to the organization.

SUMMIT was also used to identify and model tasks as examples of *meaningful use* that support emergency medical services (EMS) technologies (Haynes et al., 2013). This study shows how *SUMMIT* can be used to understand how technology supports human activity within the goals of an organization. These examples show this method's potential to provide a structured analysis across an organization involving multiple technologies.

The *SUMMIT* method is a four-stage process aimed at gathering user experiences, analyzing their consequences using claims analysis, and integrating these consequences across various scenarios and user roles for system design improvements (Haynes et al., 2009). The four stages are as follows:

1. Building *a priori* contextual appreciation
2. Scenario elicitation
3. Scenario validation
4. Claims analysis

The main unit of analysis in *SUMMIT* is a scenario, which is managed by the software as a set of interconnected elements (Figure 3-1). A utility-based interaction model divides scenarios into structured elements for thorough analysis. Eliciting scenarios from a stratified sample of user groups within an organization enables multi-level and multi-perspective analysis (Haynes et al., 2009).

SUMMIT is also the name of the software tool that enables scenario construction and analysis. The tool was initially “designed to model how people, activities, technologies, and information work together within a domain” (Haynes et al., 2013, p. 457). Each scenario is a structured narrative that consistently captures the primary *actor* (user telling the story), the *task* (activity), the *component* (information technology), the *method* (way of doing something), and the *data* involved in each scenario. Each scenario may also contain *benefit* elements, which are the positive aspects of the user's scenario, *cost* elements, which are the negative aspects, and *risk* elements, which refer to potentially adverse outcomes of a given event. Figure 3-1 depicts the elements and their relationships of the *SUMMIT* model.

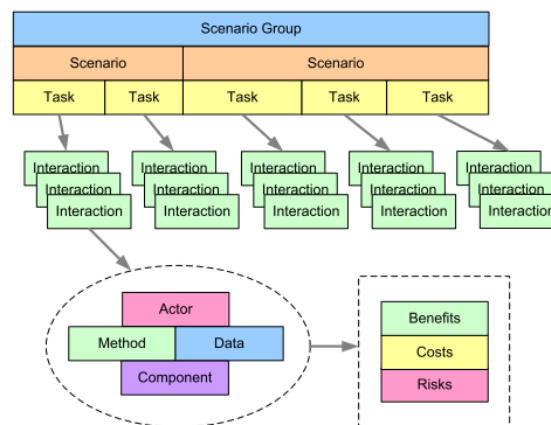


Figure 3-1: The *SUMMIT* Modeling Concept. (Haynes et al., 2013)

Previous applications of the *SUMMIT* method and tool were mainly focused on the interaction between users and a system (Haynes et al., 2009). The alignment framework developed by Benbya and McKelvey (2006) identifies the individual level in an organization as the interaction between the user and the information technology and the strategic level as the alignment between the IT and business strategy. This study focuses on user interactions and experiences with IT in the context of strategic-level goals. To assess information technology alignment and misalignment within an organization, this study made some modifications to the *SUMMIT* method. The following procedures describe the four stages of this modified *SUMMIT* method, called *SUMMIT-Align*.

3.4.1 Stage 1: Building *a priori* contextual appreciation.

The first stage of the *SUMMIT* method is to develop *a priori* understanding of the organizational context before entering the field (Haynes et al., 2009). The scope of this understanding includes the organizational structure, the user groups, and the information technology used in the organization. By developing a baseline understanding of the organization, researchers can better interpret and relate to user scenarios and ask follow-up questions to elicit more comprehensive scenario descriptions. Additionally, identifying relevant information sources in this stage can help ensure scenario comprehensiveness and data accuracy for analysis in later stages.

The *SUMMIT-Align* modification to this stage of *SUMMIT* is to shift the focus from an IT level to an organizational level. This means that the scope of the analysis expands from a single information technology to all the IT in the organization. This understanding guides the participant sampling decisions and the extent of the assessment regarding the number of organizations and IT involved. Assessing the “continuous coevolutionary process that reconciles

top-down ‘rational designs and bottom-up ‘emergent processes’” also requires an understanding of the strategic-level goals of the organization (Benbya & McKelvey, 2006, p. 284). Therefore, the goals that involve information technology and users are relevant to this "reconciliation." The information and the sources identified during stage 1 lay the foundation for methodological decisions in the following three stages.

3.4.2 Stage 2: Scenario elicitation.

In the second stage of the *SUMMIT* method, the researcher uses the contextual understanding obtained in the first stage to determine appropriate sampling strategies and creates an interview guide to gather user scenarios (Haynes et al., 2009). Once the user groups are identified, the researcher needs to decide if equal representation is necessary across all user groups. Depending on the organizational structures, the researcher may need to sample only select sub-organizations instead of the entire organization. Purposeful sampling is a qualitative study technique that helps select appropriate participants (Rossman & Rallis, 2017). However, sometimes a blend of sampling strategies may be needed to achieve the desired representation of user groups and sub-organizations (Cresswell & Clark, 2018). The *SUMMIT* method recommends a stratified sampling approach to attain representation across stakeholder groups (Haynes et al., 2009). This method involves obtaining a population sample by dividing it into groups and then randomly sampling each group to represent the entire population.

The *SUMMIT* method typically uses semi-structured interviews to operationalize scenario elicitation because they offer consistency of scenario topics and the flexibility to capture contextual details (Haynes et al., 2009). To ensure consistency across interviews, each participant is asked the same fixed, open-ended questions using an interview guide with fixed and potential follow-up and probe questions for the interview (Rossman & Rallis, 2017). This standardization

allows the aggregation of scenarios across users while capturing individual input in each scenario (Jarke et al., 1998). Moreover, with the contextual appreciation from Stage 1, the interviewer can also probe for details during the interview to fully comprehend the user's perspective.

To apply the *SUMMIT* method for assessing alignment and misalignment, there are two modifications required for this stage. First, all scenarios will focus on the participants *meaningful use* of IT. This refers to IT user's "real use of technology within their stated mission" (Haynes et al, 2013, pg. 459). Figure 3-2 depicts how *meaningful use* conceptually focuses participant scenarios to assess alignment and misalignment in an organization.

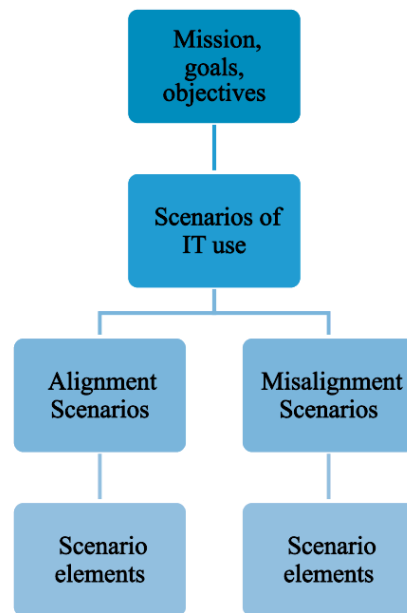


Figure 3-2: Conceptual use of *Meaningful Use* to assess alignment and misalignment.

IT-related objectives selected during Stage 1 will set the context for scenario elicitation. The scenario elicitation process will focus on identifying positive and negative scenarios of IT experiences related to the given IT objective. Positive experiences are indicative of IT alignment

from the user's perspective, while negative experiences represent IT misalignment. Table 3-1 presents a general form of the semi-structured interview.

Table 3-1: Semi-structured interview guide to elicit scenarios.

<p>Background Information Questions</p> <ol style="list-style-type: none"> 1. What is your position at the organization? 2. Which department do you work in or are a part of? 3. How long have you been a member of this organization? 4. Please describe your comfort level in using information technology. <p>Questions related to IT use scenarios</p> <ol style="list-style-type: none"> 1. Please describe a positive and a negative experience of IT use in the organization related to the stated IT goal as you understand it. (Repeat for each goal presented in random order.) 2. For each experience, please describe the general time frame, individuals involved, the task being performed, the IT(s) used, and location. 3. Positive experiences mean you were able to complete a task with ease or to your satisfaction. 4. Negative experiences mean you were unable to complete a task with ease or to your satisfaction. <p>Ask additional questions to ensure all elements of the scenario are identified.</p>
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The second modification to the *SUMMIT* method involves determining a suitable sample size for assessing alignment across an organization rather than evaluating a single IT. Since the unit of analysis for *SUMMIT* is the individual scenario, the following factors should be considered when deciding on the participant sample size:

- The total number of scenarios.
- The number of scenarios for each strategic goal.
- Representation of each user group.
- Representation across organizational sub-units.

The minimum number of scenarios starts with the number of scenarios desired per strategic goal with representation from each user group. For instance, for three strategic goals and two types of user groups, each participant would ideally provide one alignment and one misalignment scenario

per goal. Therefore, aiming for ten participants in each user group should lead to 40 scenarios for each goal (ten alignment and ten misalignment scenarios).

This approach to selecting sample size seeks to balance the breadth and depth of data (Rossman & Rallis, 2017). However, the number of relevant scenarios may not be known until after Stage 3 (scenario validation) and Stage 4 (data analysis). Therefore, using estimates for potential scenarios per participant, per goal, and organization can help determine an initial sample size. The *SUMMIT* modeling concept is employed in the next stage to ensure that individual scenarios are systematically classified and constructed to enable an organizational-level analysis (Haynes et al., 2013).

3.4.3 Stage 3: Scenario validation

Stage 3 of *SUMMIT* aims to ensure the scenario catalog is validated and relatively complete before the analysis stage (Haynes et al., 2009). This is achieved through two steps: the first step is the construction of scenarios using the elements of the *SUMMIT* modeling concept, while the second step involves the validation of these scenarios through member-check with user groups or triangulation of scenario details. The next section will provide a detailed explanation of scenario construction and validation.

The purpose of scenario construction is to turn interview data into structured scenario data for analysis. The *SUMMIT* method and tool assists with scenario construction by allowing for a top-down, bottom-up, and middle-first characterization that accommodates the fragmented way scenario data collection can occur (Haynes et al., 2013). The coding process involves transcribing interviews into text documents and coding data into scenario elements. Initially, a codebook is created that includes the elements of the *SUMMIT* model (Figure 3-1) and continually evolves through the coding process, only being finalized after the last text is coded

(Guest et al., 2012). Coding can be done manually or using qualitative data analysis software such as NVivo (lumivero.com) or Atlas.ti (atlasti.com). Intercoder agreement is the preferred technique to ensure coding reliability (Guest et al., 2012). As data is input and linked as elements in the *SUMMIT* database, scenario data is validated.

It is important to ensure scenario data accuracy to derive value from it during analysis. Therefore, it is necessary to ensure that details such as software system names, event dates, and policies are verifiable with other data sources like organization websites, newsletters, and interviews to maintain the credibility of scenarios. Triangulating these details from multiple sources enhances the rigor and quality of scenarios (Rossman & Rallis, 2016). In the final stage of the *SUMMIT* method, it is essential to construct scenarios and ensure coding reliability and validity to have a complete and accurate scenario catalog for analysis. There are no modifications to the *SUMMIT* method at this stage.

3.4.4 Stage 4: Analysis

SUMMIT's development derives from linking IT use outcomes to higher-level organizational goals via scenarios (Haynes et al., 2009). The analysis stage of this method uses a claims taxonomy to reflect the consequences of the scenarios. Claims analysis then involves aggregating and interpreting the claims to assess the organizational contributions of an implemented system and identify opportunities for future system enhancements (Carroll, 2000; Carroll & Rosson, 1992). In *SUMMIT*, claims are expressed as utility elements: benefits, costs, and risks (Haynes et al., 2009).

The most extensive modification of the *SUMMIT* method occurs in Stage 4, focusing on the participants' *meaningful use* of IT elicited in Stage 2. The analysis is conducted from two different perspectives. The first perspective aims to identify patterns related to alignment and

misalignment scenarios across the organization. All the scenarios of alignment and misalignment are analyzed to identify recurring themes, and the findings are discussed in Chapter 5 (Figure 3-3).

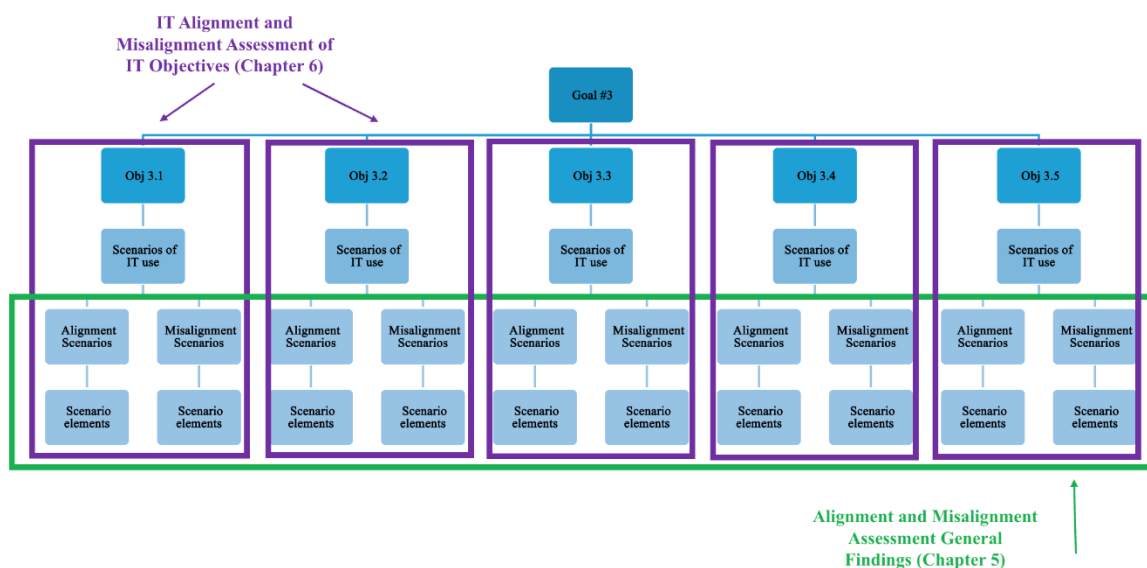


Figure 3-3: Analysis perspectives of Meaningful Use applied in *SUMMIT-Align*.

The second perspective identifies patterns related to alignment and misalignment scenarios within each objective. Since scenarios are the unit of analysis, they are also explicitly linked to a specific *goal* (objective) element in *SUMMIT*, allowing for a systemic examination of alignment and misalignment in the context of each objective. All scenarios of alignment and misalignment are analyzed to identify recurring themes, and insights are discussed in Chapter 6. Both perspectives will be analyzed using inductive analysis, like applied thematic analysis, often used to solve practical problems (Guest et al., 2014).

Both perspectives leverage the same benefits of the method and tool. The elements of the *SUMMIT* model form the building blocks of data analysis codes, with sub-elements developed

during the scenario validation stage—the elements and respective sub-elements link to the alignment and misalignment scenarios in the database. For instance, the component element can be sub-categorized based on the types of information technology, such as Zoom, Microsoft Word, or phones. The *SUMMIT* tool explicitly displays these relationships and allows easy navigation through them. Thus, analyzing each model element helps explore patterns of alignment and misalignment associated with that element or sub-element.

3.5 Feedback from IT Practitioners

It is important to gather feedback from senior IT practitioners in the case study organization to inform the effectiveness of scenario-based methods in assessing alignment and misalignment. Since the senior IT practitioners are the direct beneficiaries of the assessment, they are the most appropriate stakeholders to determine the value of the assessment and the practicality of the method. The senior IT practitioners will be presented with the assessment of alignment and misalignment in a focus group interview, where they will be encouraged to discuss and provide feedback (Rossman & Rallis, 2017). Open-ended questions will be asked to understand how informative the assessment is for IT leadership. Any feedback received from the IT practitioners will be considered and reflected in this dissertation where appropriate.

3.6 Summary

In this chapter, the reasoning behind the research design and study methods are explained. The suitability of scenario-based methods for assessing alignment and misalignment is discussed. The four stages of the *SUMMIT* method and the modifications required for the *SUMMIT-Align* method are described. Finally, the logic behind seeking feedback from senior IT

practitioners is explained. Next, Chapter 4 describes the application of *SUMMIT-Align* to assess alignment and misalignment at Penn State University.

Chapter 4

Study Procedures

4.1 Introduction

This chapter explains how the study methods described in the previous chapter were applied in the case study at Penn State University. IT alignment and misalignment at the University were assessed between March 2021 and April 2022. The assessment involved collecting IT use scenarios from University faculty, staff, and students, focusing on the third goal, *Enable teaching and learning*, from the *Strategic Plan – University IT Plan*. The four stages of the *SUMMIT-Align* method, as described in Chapter 3, were applied to conduct the assessment. Method procedures are described here at a level of detail to enable method replication for future research (Haynes et al., 2009). Additionally, feedback on the assessment and the method was collected from senior IT practitioners at the University. Procedures for the four stages of *SUMMIT-Align* are described in the following sections.

4.2 Stage 1 - Building a priori contextual appreciation.

In Stage 1 of the *SUMMIT-Align* method, the primary focus was to understand the relevant IT user groups in the University, the University's strategy and IT plan, and how its IT organization functions. The University is spread across 24 campuses in Pennsylvania, with 18 academic colleges and schools, and it has a global online presence through the World Campus. The primary IT users at the University are students, faculty, and staff members. During the case

study, the total enrollment of students across the University was approximately 88,000, with 17,000 faculty and staff.

In 2019, the University updated its strategic plan for the five calendar years of 2020-2025. The plan also required individual strategic plans to be developed for each of the 24 administrative organizations, including the IT organization. Additionally, all 20 campuses and 16 colleges created separate strategic plans. The administrative organizations, campuses, and colleges initially submitted their strategic plan assessments in February 2023 and then annually. In November 2020, the Penn State CIO confirmed that the University's IT plan was in its final draft and ready for review (Welch, personal communication, November 10, 2020). The University's IT plan aims to provide general strategic guidance for IT services and support for the University.

The University IT department manages IT using the Educause Higher Education IT Service Catalog Model in Figure 4-1 (Adizes et al., 2019). A four-tiered model in which the bottom tier describes each discrete "technology-focused activity or product used to deliver a service."



Figure 4-1: The IT Service Catalog Model (Adizes et al., 2019).

The University catalog has the following service categories:

1. Administrative and Business
2. Communication and Collaboration

3. Desktop and Mobile Computing
4. Information Security
5. Infrastructure
6. IT Professional Services
7. Teaching and Learning

In the last decade, many services have been brought under central IT management and consolidation of IT departments has been carried out across the commonwealth. This has allowed for the central IT unit to focus on standardizing general-purpose classrooms and University-wide IT initiatives by eliminating local college and campus IT units. However, many college and campus IT departments still exist at the University.

4.3 Stage 2 - Scenario elicitation

A contextual understanding of the organization derived from Stage 1 drove multiple decisions for scenario elicitation. First, the University's strategic IT plan linked the organization's strategic level with goal #3, "Enable teaching and learning," and its five objectives.

Objective 3.1: Expand faculty engagement

Objective 3.2: Increase digital fluency

Objective 3.3: Improve access and affordability

Objective 3.4: Invest in state-of-the-art classrooms and learning spaces

Objective 3.5: Provide IT training to students, faculty, and staff

The elicitation of scenarios focused on the participant's *meaningful use* of IT, i.e., the actual use of technology in the context of the five IT objectives.

Second, understanding the University structure guided the breadth of organizations from which to identify participants. Finally, identifying three user groups, namely students, staff, and

faculty, helped in driving the purposeful sampling strategy. A representative assessment would contain scenarios from these user groups since the IT goal focused on teaching and learning. The purposeful sampling strategy was to identify an equal number of participants from each user group and academic college. Snowball sampling was used to obtain recommendations for potential staff, faculty, and student participants. Approximately 500 individuals, equally divided among the user groups and from nine academic colleges, were invited to participate in this study. Participants were contacted individually via email and provided with consent information and a brief paragraph explaining the study's purpose. A total of 27 participants from different user groups were interviewed for this study. Table 4-1 summarizes their roles, organizations, and years at the University.

Table 4-1: Study Participants.

Participant	User Role	Organization	Years with University
#1	Staff*	College of Arts and Architecture	13
#2	Student	College of Arts and Architecture	4
#3	Staff*	Center for Health Care and Policy Research	16
#4	Faculty	College of Arts and Architecture	5.5
#5	Faculty	College of Arts and Architecture	10
#6	Student	College of Information Sciences and Technology	4
#7	Student	College of Earth and Mineral Sciences	3
#8	Staff	College of Agricultural Sciences	20
#9	Staff*	College of Engineering College of Education	8
#10	Staff	College of Engineering	4
#11	Faculty*	Ross and Carol Nese College of Nursing	7.5
#12	Faculty	College of Education	7
#13	Student	Ross and Carol Nese College of Nursing	.5
#14	Faculty*	College of Engineering	8
#15	Faculty	College of Earth and Mineral Sciences	2
#16	Student	Ross and Carol Nese College of Nursing	3
#17	Staff	Ross and Carol Nese College of Nursing	7
#18	Staff	Ross and Carol Nese College of Nursing	34
#19	Staff	College of Earth and Mineral Sciences	7
#20	Staff	School of Labor and Employee Relations	13.5
#21	Staff*	College of Health and Human Development	4
#22	Staff	College of Health and Human Development	4
#23	Staff*	College of Health and Human Development	11
#24	Staff	College of Liberal Arts	16
#25	Staff	College of Health and Human Development	19
#26	Faculty	College of Health and Human Development	11
#27	Student	College of Liberal Arts	4

*Indicates that the participant has experience in more than one user role at the University.

Among the participants, six were current students, while five staff and two faculty members had been University students in the past. Many of these participants also shared their experiences as

students. On average, the participants have spent nine years at the University and therefore commented on recent IT changes before, during, and after COVID-19. Due to the pandemic's virtual work and learning mode, participants expressed moderate to high comfort levels in using IT.

All interviews were conducted using the Zoom platform and were recorded after obtaining the participants' consent for the study procedures. Each participant was requested to confirm their major (in case of students) or job title (in case of staff and faculty), the number of years they have been associated with the University, and their proficiency level in using information technology before proceeding to the scenario elicitation part of the interview. The scenario elicitation followed a standardized open-ended format (Appendix B), which included brief titles and descriptions of the selected objectives from the draft *Strategic Plan - University IT* (Table 4-2).

Table 4-2: Objectives for IT Plan *Goal #3: Enable teaching and learning*.

<p>Objective 3.1: Expand faculty engagement Description: Provide multiple avenues for faculty engagement with Teaching and Learning Technology (TLT) to transform education at Penn State.</p>
<p>Objective 3.2: Increase digital fluency Description: Enable digital fluency to allow our students to be 21st century digital citizens.</p>
<p>Objective 3.3: Improve access and affordability Description: Develop, grow, and support initiatives that improve access and affordability.</p>
<p>Objective 3.4: Invest in state-of-the-art classroom and learning spaces Description: Invest in state-of-the-art classroom technology and learning spaces for General Purpose Classrooms and computer labs <u>in order to</u> provide a consistent and reliable experience for faculty and students across the Commonwealth.</p>
<p>Objective 3.5: Provide IT training to students, faculty, and staff Description: Provide IT training to Penn State students, faculty, and staff on University-supported IT platforms <u>in order to</u> support collaboration, communication, and enabling teaching and learning.</p>

The objectives were randomly presented to the participants during the study to prevent any order-effect bias (Perreault, 1975). Participants were asked to describe a positive and negative scenario of IT use related to each objective. If participants did not understand the objective or asked questions, they were directed to use their best judgment as the objectives and the descriptions were directly from the draft *Strategic Plan - University IT*. Each participant could provide one or multiple scenarios (positive or negative) or none, depending on their understanding of each objective. The interviews were scheduled for an hour; the shortest interview took approximately 20 minutes, while the longest lasted for one hour and three minutes.

4.4 Stage 3 - Scenario validation

During Stage 3, the process involves organizing and verifying scenario information. Scenario construction decomposes qualitative interview data into structured scenarios using the *SUMMIT-Align* method and *SUMMIT* tool for analysis. To prepare for coding, the 27 interviews were transcribed, which resulted in approximately 390 pages of text. Manual coding was then performed on all transcripts using the *a priori* codebook (Appendix A), which started with eight primary element codes from the *SUMMIT* model. Coding reliability was checked twice in the coding process with another researcher familiar with scenario-based methods. Passages of different participant transcripts were reviewed to ensure agreement between coders on the eight primary element codes from the codebook (Miles et al., 2020). Any disagreement between the researchers was discussed and resolved prior to additional coding, achieving at least an 80% agreement on 95% of the codes (Miles & Huberman, 1994). Figure 4-2 provides a sample of the coding process indicating the primary elements of the *SUMMIT-Align* model beneath each highlighted word or phrase.

Participant #14: So, I'll give a positive. When I was a grad student, I had to create a video using a green screen and edit it. They had One Button Studio in various buildings. Then so I was able to just go in. I probably had to reserve the room and then I think I edited maybe in Adobe, whatever, Premiere. That was available maybe on a lab computer. I would say that was a positive where that increased, as a student, my digital fluency in terms of video capture and video editing.

Figure 4-2: Sample of a coded scenario.

The *SUMMIT* tool was used to construct scenarios from the coded transcripts, by writing a scenario narrative and then building and linking sub-elements. Participants' words and phrases were used as much as possible to accurately reflect their perspectives. Sub-element names were created from the primary coded elements in the transcripts, input to *SUMMIT*, and linked to the respective scenarios in the database. For example, in Figure 4-2, a video is coded as a *data* element, then input as a sub-element (*video*) and linked to the scenario in *SUMMIT*. Field notes and quotations were input into the text boxes of each sub-element to provide explanations and examples to support the linking decision. Once a sub-element was created in *SUMMIT*, it was available to link to any scenario within the current project file. This linking enabled analysis in stage 4. Table 4-3 shows the number and examples of sub-elements created with *SUMMIT* for this study.

Table 4-3: Elements and sub-element examples.

Elements	Number of Sub-elements	Sub-element Examples
Actors	10	student, staff, faculty, external actors, IT help desk-local, IT help desk-university
Components	121	Zoom, Wifi, Box, Microsoft Office 365, phones, SIMBA
Tasks	72	share files, give presentation, learn to use IT, schedule classrooms for courses, grade assignments, post jobs, conduct degree audit
Data	40	Course assignment, research data, video recordings, help desk contact information, software licenses
Methods	20	online, remote, in-person, hybrid, hands-on, self-taught
Benefits	36	access to IT training, affordable, save time, capacity, exceeded expectations, build skills
Costs	31	failed expectations, negative personal emotions, technical issue, wasted time, extra work, broken process
Risks	9	loss of data, termination from work, fail course

Scenario and element validation was accomplished using University websites and software vendor websites like Microsoft (Microsoft.com). The University IT department's online resources were valuable in identifying the correct software names and describing how the University uses the software. Three attempts were made to obtain a comprehensive IT list from the IT department to compare the 121 information technologies (*component (IT)* elements) identified by the participants. Unfortunately, a comprehensive list was never acquired; therefore, the validation of IT managed by the University was partially completed by using the University's online services catalog. Finally, the searchable Penn State University News site was instrumental in verifying details of university events that participants could not recall. For example, verifying the transition date to remote learning due to COVID and various IT implementation milestones.

Scenarios that participants identified as positive are considered examples of alignment from an individual's perspective. Conversely, scenarios that participants identified as negative experiences are considered misalignment. Table 4-4 shows the type of scenario for each objective, along with the total number of alignment and misalignment scenarios after the

completion of scenario validation. Each participant generated an average of ten scenarios (minimum: 6 and maximum: 16).

Table 4-4: Alignment and misalignment scenarios by objective.

Objective	Alignment	Misalignment
3.1 Expand faculty engagement	14	18
3.2 Increase digital fluency	35	22
3.3 Improve access and affordability	29	26
3.4 Invest in state-of-the-art classroom and learning spaces	28	35
3.5 Provide IT training to students, faculty and staff	37	29
Total	143	130

Each scenario consists of a brief title, a descriptive narrative, and linked sub-elements. Figure 4-3 in the *SUMMIT* database shows an example of one such scenario.

The screenshot displays a user interface for a scenario in the SUMMIT database. On the left, a vertical list of sub-elements is shown, each with an icon and a plus sign. The selected scenario is titled "P14.2.P2 One Button Studio experience example of improving digital fluency for student". The main content area on the right shows the scenario's details under the "Properties" tab. It includes a "Name" field with the scenario title, a "Source" field, and a "Description" field containing a narrative about a faculty member's experience with One Button Studio. There are also "Delete", "Edit", and "Save" buttons, and a "Tags" field with a plus sign.

Figure 4-3: A sample scenario as it appears in the *SUMMIT* database.

In Figure 4-3 above, the list on the left under the scenario title contains the sub-elements linked with this scenario. The icons represent the primary element of the *SUMMIT-Align* model.

For instance, the lightbulb icon represents the *component (IT)* element (information technology) with a specific sub-element name. The linked sub-elements in *SUMMIT* enable the two analysis perspectives conducted in stage 4.

The descriptive narrative on the right recounts the scenario in plain language. Each scenario has a unique three-section code for information management purposes. The first section of the code is a "P" followed by a number representing the participant number (refer to Table 4-1 for participant data). The second section is the IT objective (one through five) under which the scenario was elicited. The third section identifies the scenario type as positive ("P") or negative ("N") and a number, as some participants gave multiple scenarios for the same objective and type. For instance, the scenario displayed in Figure 4-3 has the code "P14.2.P2", indicating that this is the second positive scenario from Participant #14 discussing objective #2 (Table 4-2). In Chapters 5 and 6, the unique scenario codes demonstrate the breadth of scenarios provided by participants.

4.5 Stage 4 – Analysis

The assessment of alignment and misalignment scenarios involved two analysis perspectives. The first perspective aims to identify patterns related to alignment and misalignment scenarios across the organization, while the second perspective identifies patterns related to alignment and misalignment scenarios within each objective. Memoing during scenario construction helped identify initial patterns for further analysis. Those patterns were explored through the explicit linkages of sub-elements to scenarios using *SUMMIT*.

The number of alignment and misalignment scenarios varied per objective as participants did not provide a scenario if they could not think of an experience or provided more than one (Table 4-4). The *SUMMIT* tool facilitated examining the data in multiple ways due to the structure and linking of scenarios and sub-elements. To examine the scenarios associated with

each objective, the analytics feature of *SUMMIT* was used to locate all the scenarios linked with a selected sub-element. Figure 4-4 shows the scenarios linked to objective 3.4, *Invest in state-of-the-art classrooms and learning spaces*, on the right side of the screen.

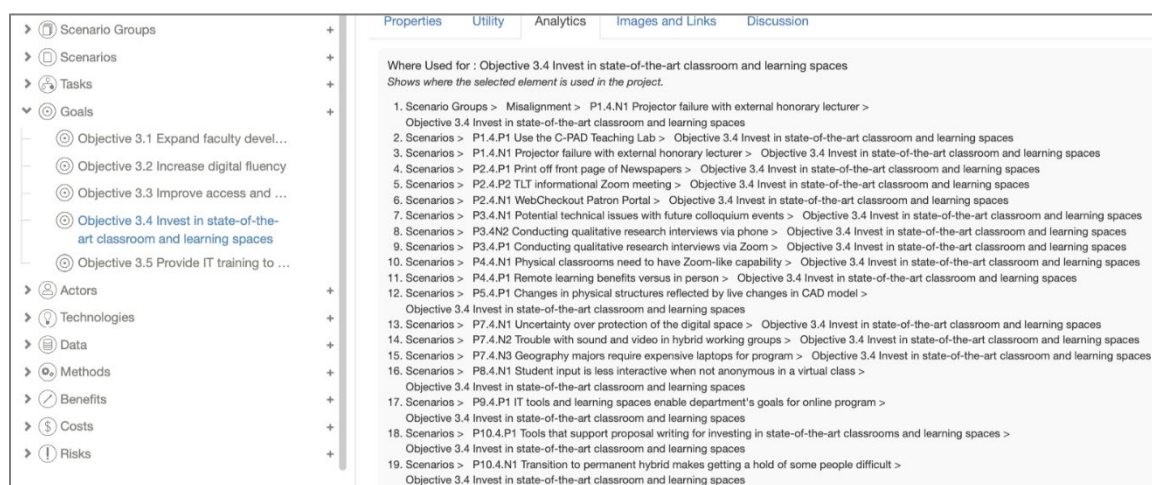


Figure 4-1: Example of the analytics feature in the *SUMMIT* software showing all the scenarios linked to a specific sub-element.

4.6 Feedback from IT Practitioners

All nine members of the Penn State IT Senior Leadership Team were invited to provide feedback on the assessment and the method. However, only two senior-level IT practitioners accepted the invitation. These two practitioners attended two separate focus group sessions. In the first session, the senior IT managers discussed their roles and responsibilities and shared background information on significant IT-related events at the University. In the second session, the IT practitioners were presented with the results of an alignment assessment and were given a brief overview of the *SUMMIT-Align* method. They were then asked to provide feedback, which they did anonymously. The feedback was obtained via two recorded Zoom sessions, each lasting about 70 minutes. The two senior IT practitioners provided their perspectives on some of the

alignment assessment findings and the use of the method in general. The feedback received has been incorporated into Chapters 5 and 6 and is also part of the discussion in Chapter 7.

4.6 Summary

In this chapter, the study procedures for each stage of the *SUMMIT-Align* method are explained in detail. The next two chapters, i.e., Chapters 5 and 6, present the assessment of alignment and misalignment. Chapter 5 outlines four general findings related to alignment and misalignment, while Chapter 6 provides insights into alignment and misalignment for the five IT objectives assessed. Chapter 7 answers three research questions, discusses the study's limitations, and identifies potential future work. Finally, Chapter 8 concludes the study by discussing the research contributions of this study.

Chapter 5

IT Alignment and Misalignment Assessment: General Findings

5.1 Introduction

This chapter presents the results of the assessment of IT alignment and misalignment at the University. The assessment was conducted using all 273 scenarios collected, which led to four primary findings. First, alignment is associated with local IT support interactions. Second, perceptions of alignment and misalignment derive from participants' prior experiences. Third, examining shifts in alignment and misalignment highlights its dynamic nature. Finally, misalignment can be a source of strong negative emotions for participants. These findings were shared with senior IT practitioners to gather feedback on the assessment and scenario-based methods. The quotes related to each finding are examples of how scenario-based methods, such as *SUMMIT-Align*, can help reveal critical contextual details in the assessment. This will be explored further in the discussion chapter. Additionally, any relevant feedback from the practitioners is included in each finding. It is important to note that these findings are not mutually exclusive, and there is some overlap between them.

5.2 Alignment is associated with local IT support interactions.

Participants associated positive (i.e., aligned) IT experiences with interactions with their local IT organization. Local usually means a person or group from the college or campus IT organization charged with helpdesk functions or an 'IT smart' person in their department.

Participants distinguished between local and University-level IT help or support in describing their scenarios. In stage 3, scenario validation, the scenario elements of *actor: local IT support* and *actor: university IT support* identified the different levels of IT support (Figure 5-1). Alignment scenarios were more often associated with participants' relationships with local IT support than with University-level help desk or support. Misalignment scenarios also reinforced participants' preference for IT support at the local level.

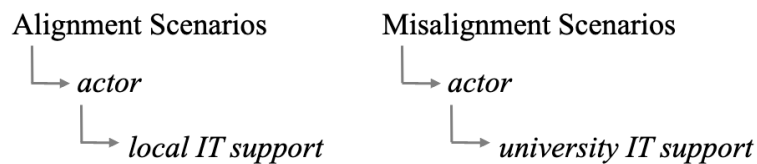


Figure 5-1: Scenario Elements related to IT support actors.

Participants used favorable terms to describe interactions with these individuals. A staff member describes her experience with local IT support.

“Our campus IT, I think they're amazing! They are very approachable. I can just go- they're right down the hallway, I can just go down and say, ‘hey, I need help.’ They come right down, or even if you put in a work order, they're very responsive.” [P17.3.P1]

The positive aspect of this experience from the participant’s perspective was focused more on the personal interaction with the IT individual than their technical assistance.

Another staff member appreciated her college IT team's understanding of her work demands. They were able to accommodate her unique situation by prioritizing her needs, rather than sticking to a rigid help ticket submission process.

“My . . . IT team has been stupendous! They're just absolutely wonderful . . . sometimes it's like, I have a student coming in two minutes and my Zoom isn't working. I just call

them. If it's something like that, they will come up right away and then they do their own ticket so that I can move on with what I need to do. They have to keep a record of what all they're doing, but they've been very accommodating. They'll recognize when something's urgent and when it's not and they will address it if it's urgent. They're very kind about explaining things without making you feel stupid.” [P25.5.P3]

This participant focuses on how the IT team interactions make her feel. It is her perception that the college IT help desk people understand her work requirements and adjust their processes to accommodate her priorities.

These positive interactions continued with remote IT support during the virtual work and learning due to the pandemic. A staff member relied on her close relationship with the local IT team through the transition to remote work.

“Our IT team, who I'm exceptionally close to. . . their office suite is right beside me so that is certainly helpful. I know them well. They had a regular Zoom link that you could go into throughout COVID when we were all remote . . . and talk to the IT team directly about any issues that we were having, or any concerns.” [P18.5.P1]

The staff member's relationship with the local IT team extended into the virtual environment due in part to their previous working relationship. She feels comfortable enough to bring "issues" and "concerns" to them based on her familiarity with them.

A faculty member also recalls the difficulty of transitioning to remote teaching due to COVID. He was pleased and somewhat surprised by the remote assistance his local IT provided.

“Our . . . IT people, you can actually . . . connect them and they can work on your computer even remotely, so they can install software. Yeah, so it actually works. . . So, it was a very positive experience.” [P4.5.P1]

Members of staff and faculty are an integral part of work organizations and have regular opportunities to interact with their local IT support teams. Similarly, students who work with

University organizations appreciate the importance of local IT assistance. For instance, a student who frequently collaborates with a scientific institute at the University shares his experience with the institute's IT support.

“They host IT office hours weekly so it's like a Zoom drop-in. Anything you need, just show up. So that was really helpful because [I] will just drop in with my phone, with somebody on Zoom and be like, hey, new phone, I'm not sure what's going on. My Duo is not working.’ They walked me through it pretty well.” [P7.5.P2]

In this example, Duo is the University's two-factor authentication application for secure access to IT services. The student finds the IT office hours via Zoom convenient and helpful.

These examples of alignment related to local IT support span across University organizations and are repeated in each participant group. Misalignment scenarios also reinforce a preference for local IT assistance. Participants were aware of the University's effort to consolidate local IT help desks into centralized support and explained their negative experiences due to this effort.

A faculty member who has been with the University describes his experience with IT centralization in a misalignment scenario.

“We used to have people within our department. They had an office inside the building, and you would walk down, and they would help you. This has been removed long ago. . . I have to try to find people. . . So, I would appreciate much more one-to-one person, on-demand and training. . . That would cut down on a lot of wasted time on the part of faculty and for sure students as well.” [P5.5.N1]

There is a clear preference for a return to local IT support relationships. The faculty member identifies the cost of wasted time for faculty and students with the shift away from the department's IT support.

A staff member with over a decade of experience at the University also recalls the negative aspect of consolidating IT help desks in a misalignment scenario.

“Our college IT used to be housed right in our departments, which was nice way back when, if you need them, they came. Now it's just you put in a ticket, you got to wait. I don't know if that will ever change. I think they are moving towards decentralizing our department, so I don't think they're ever going to come back.” [P24.3.N1]

This staff member also prefers the local IT help desk relationship and the in-person assistance of the past. She also expresses a lack of hope that things will return to the more personable and responsive IT support she prefers.

A faculty member shared his thoughts on what may be driving the changes in the University's IT management.

“There is a whole push for digitalizing or digitalization of even help, which sounds very economical, very effective but I can tell you, I get the same thing from all my different day-to-day things. For most part, we quit trying in the middle of the whole thing because it's too much text to read and document to open, and all that. I wonder if that's not true for our own people at Penn State. That is not against IT, it's in favor of increasing IT resources, so we can provide these trainings and also the help in a more effective way.” [P12.4.N1]

"Digitalization" in this scenario refers to the AI-enabled virtual agent that provides the University's IT Service Desk chat feature to answer frequently asked questions. The virtual agent is available 24 hours daily to answer technical questions, fill out a ticket, or connect a user to a live agent. The faculty member sees this digitalization effort as intended to be more effective, but his experience is different from the intended goal. As a user, he wants to avoid reading multiple documents to fix an issue independently. In his interview, he explained his preference for resolving IT issues:

"I don't have the time to go searching. I would like to have someone that can say, 'Oh, you need to do this and that.' 'Thank you, sir.'"

In this finding, participants described alignment scenarios associated with local IT help or support, primarily from within their college or departments. These scenarios express a desire to interact with IT people who understand their work, are responsive, and do not expect them, as users, to solve IT problems on their own. Additionally, participants reinforced their preference for local IT help with misalignment scenarios that highlight the negative aspects of the University's IT help desk consolidation away from local IT support.

5.2.1 Senior IT Practitioner Feedback

The two IT senior practitioners (Practitioners #1 and #2) provided feedback after being presented with an overview of this study and the assessment. In regards to this finding, Practitioner #1 remarked, *"One thing that really jumped out to me was on . . . [how] decisions regarding a decentralized or centralized IT organization can impact alignment and the value of your local IT."* He admitted that they have struggled to decide at the strategic level what shared services to create, knowing the value the local IT teams bring to their respective organizations. Practitioner #2 understood the idea that participants prefer their local IT organizations.

"One thing that we know is that faculty in particular really value those relationships with their local IT staff. . . they are very protective of those local IT staff because nine times out of ten, they're [local IT staff] going above and beyond to do whatever they can to support those needs." [Practitioner #2]

A challenge Practitioner #1 sees with decisions related to centralized or decentralized IT support often comes to budget considerations. Since organizations, such as colleges or campuses, manage their IT budgets for local support, they can reduce IT spending by transitioning services

and support to the University level. As a result, when a user has a problem, the call goes to the Enterprise Service Desk rather than the local support team. Practitioner #1 feels that problems with this change often come down to managing the users' expectations.

Practitioner #2 explained the problem with college-level IT support provided in the past. He often hears the service "touted" by deans and faculty regarding their local IT staff.

Practitioner #2 explains his opinion on how college leaders perceive their local IT support.

"It's their perception that it's white glove service. What is really meant is they could pick up the phone, or they could yell down the hallway, or something. . . That's the whole basis for the evaluation. [It] doesn't matter if the person's technical or can solve their problems. . . So, we have this ongoing challenge, a perception problem of deans and faculty members who say, 'Oh, I get this great white glove service from the team I have.' Now, whether that's true or not, it's really open for debate. Yeah, they might be getting terrible service, but the person is very nice to them, you know. And in some regards, that's important. . . to some people."

Both practitioners agreed that this type of IT service has two problems. The first problem is that participants hold this level of IT support in high regard regardless of IT management metrics, such as the cost of this support. The second problem is that only some college or campus-level executives making IT support decisions understand the cost of such a service.

Practitioner #1 explained that the cost model for IT support is calculated and assessed at a per-ticket rate. A few years ago, a college IT organization within the University completed an analysis and realized they were paying about \$48 per ticket, mainly due to overstaffing.

"Because they wanted, basically, like a three-minute turnaround time from the time they submitted a ticket, to [when] somebody was in the office. Um, that's fine. I mean, if you want to pay for that. But I don't even think that the executive leader in that unit realized

that's actually what they were paying per ticket that was being submitted across the academic unit."

The deans of academic units are responsible for making management decisions regarding local IT support. However, they may not always be aware of the actual or reasonable costs of IT support. On the other hand, practitioners evaluate these costs based on industry standards rather than the value of relationships formed within the units. Both participant groups preferred local IT support through alignment and misalignment scenarios. This finding emerged by examining the scenario elements of the *actor: local IT support* and the *actor: university IT support*.

5.3 Perceptions of alignment and misalignment derive from participants' prior experiences.

Participants identified scenarios as either positive (alignment) or negative (misalignment) based on comparisons with prior experiences. The comparisons varied between points in time, places, and expectations established from similar prior experiences. This pattern occurred across all three participant groups: students, faculty, and staff.

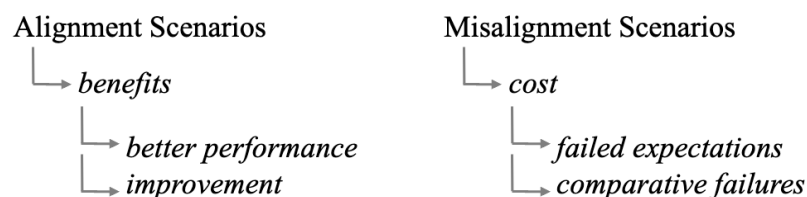


Figure 5-2: Scenario Elements of *benefits* and *costs* related to prior experiences.

During stage 3: scenario analysis, the scenario element of *cost* was associated with misalignment scenarios linked to a sub-element of *failed expectations / comparative failure*. In

contrast, the scenario element of *benefit* was associated with alignment scenarios linked to the sub-element of *better performance / improvement* (Figure 5-2).

A staff member described a misalignment scenario after a new IT was implemented. His assessment was based on his prior experience of how things worked before the new IT was implemented.

“On the negative side, I think the one that really jumps to mind is using Workday. . . The decision was made when we brought Workday here to the university, that in order for the software to fit the way Penn State is structured, we would have the faculty members be the manager. Unfortunately, I think they expected the faculty to do too much in that manager role, posting their job decisions, the historical HR functions. . . . I get their frustration of ‘I need to focus on teaching, I don’t have time for this minutia.’ Especially in the old systems, where we had . . . staff who had roles in those systems - IBIS, at the time. The staff would process everything for the faculty member. They [faculty] came and said, ‘This is what I need.’ The staff member took care of that within the system, and it flowed, and everything happened.” [P19.1.N1]

The negative aspect of this staff member's scenario is the decision to assign faculty members the manager role in the new Workday system. The staff member's prior experience in the manager role helping faculty with human resourcing tasks in the IBIS system has influenced his perspective. He feels that his prior experience was more productive than the current experience, and as a result, views the recent experience as negative or misaligned. The opposite effect is also evident when the participant's prior experience in time can anchor their perspective, leading them to judge the recent experience as positive or negative.

The same staff member describes an alignment scenario based on his experience as a student at the University several years ago.

“I think Penn State has been doing a good job of at least allowing students to be familiar

with the technology, offering them Wi-Fi in the dorm rooms, and all that good stuff.

Where that was something that I didn't have when I was a Penn State student."

[P19.2.P1]

When comparing students' current access to Wi-Fi to his prior experience as a student, this participant views the current situation as positive.

Participants tend to derive their perspectives based on their past experiences in various places or organizations. Their first encounter sets the benchmark for comparison in their future experiences. For instance, a faculty member describes a scenario of misalignment by comparing a particular classroom with others they have used at the University.

"You have other classrooms who are, maybe not as equipped, and then it's harder to do certain things. For example, I'm in a class that's supposed to be observed, but it doesn't have . . . where you can Zoom while you're teaching. I'm supposed to be observed by someone who doesn't want to come in physically. We have to make accommodation for that, putting a computer with a camera and all things like that." [P15.4.N1]

A faculty member's view of a classroom that lacked modern IT was influenced by his prior experiences with classrooms that had more advanced IT. This prior experience shaped his perspective on how technologies like Zoom can allow for remote observation in a classroom. Therefore, the faculty member's most recent experience is considered a negative experience (a misalignment) due to his prior experience.

During the interviews, participants shared their prior experiences with IT at other organizations and compared them to experiences at the University. One faculty member shared how he noticed a significant improvement in IT services when he compared his undergraduate IT experience at a different University to his IT experience as a master's student at Penn State. He described how everything seemed to be more emphasis on IT at Penn State in an alignment scenario.

“I will say, overall, our IT [Penn State] is amazing. My undergrad was [at a different university]. When I came here many, many years ago, I noticed from the get-go that IT was more for ed-tech or TLT. It was just a bigger deal. There’s investment, there’s people, there’s support.” [P4.4.P1]

The faculty member assesses Penn State's emphasis on IT as positive (aligned) because of his prior experience at a different University. In contrast, a current Ph.D. student in nursing at Penn State compares prior educational experiences at a different institution in this misalignment scenario.

“I can say that just my experience in general, with the teaching style of my professors, hasn’t caught up to the level of technology that I know is available. The reason that I feel like I can say that is because I have my master’s degree in nursing education, specifically, and my program focused a lot on how to integrate technology and technologically based teaching and learning into the classroom. Some of those very basic technology-leveraged strategies that I know are becoming very common in other disciplines aren’t being adopted in nursing.” [P13.1.N1]

Since the student has learned about integrating technology into classroom learning from prior educational experience, she views the lack of those "technology-leveraged strategies" negatively in her experience at Penn State.

Expectations established by prior experiences can be related to non-technical factors associated with IT, such as IT training and policies. A faculty member describes a misalignment scenario related to her expectation of IT training.

“IT training to me means that someone has taught them how to use Canvas. Someone has taught them how to use Clickers. That does not happen. It’s not something that is organized. Everything is, for us anyway, learned on the fly and then we teach the students on the fly.” [P11.5.N1]

In this scenario, a faculty member expresses her frustration with the IT training she has received at the University, as it does not meet her expectations. Although she does not specify the source of her initial expectations, she is comparing her current experience with some prior training that set the standard for her expectations.

Participants' perspectives and their perception of alignment or misalignment are often anchored by their prior experiences. Prior IT experiences can serve as a reference point for determining alignment, including comparisons over time or between different places or organizations. On the other hand, misalignment scenarios occur when participants' expectations were not met, and their anchor point was the comparison between their expectations and the actual experience. The study found that participants rarely mentioned positive scenarios that exceeded their expectations. This finding emerged by examining the scenario elements of costs: failed expectations/comparative failure and benefits: better performance/improvement.

5.3.1 Senior IT Practitioner Feedback

The two senior IT practitioners who have been managing IT at the University for decades shared their differing perspectives from those of the participants. Practitioner #1 finds the "*long institutional memories*" of participants "*very fascinating*," recalling that he heard about IT events that took place eight years ago. Practitioner #2 commented on the narrow perspective that participants, particularly faculty members, tend to have when it comes to negative IT experiences.

"Some of these things are very . . . small, self-serving comments. 'You know I had a problem doing XYZ', instead of looking at the big picture of things like, you know, overall. . . and faculty tend to get like that. They tend to focus on their own little worlds, and, um, their opinions reflect that. And as [Practitioner #1] mentioned earlier, that might have happened seventeen years ago, or something like that."

The IT practitioners focus on strategic issues and thus, in comparison, see the individual experiences remembered for years as irrelevant to the management of IT at the strategic level.

5.4 Examining shifts in alignment and misalignment highlights its dynamic nature.

The study participants provided scenarios that demonstrate shifts in and out of alignment highlighting its dynamic nature. The first section of this finding provides two examples of single alignment shifts. That is, from alignment to misalignment and vice versa. The second section follows four scenarios over 11 years with the same IT and participant, providing an example of shifts in and out of alignment over time. The reasons participants identify as the source of the alignment and misalignment shifts may be informative to practitioners.

In the first example, the shift is from alignment to misalignment. The scenario elements involved are depicted in Figure 5-3. The *actor* and *component* scenario elements remain the same in both the alignment and misalignment scenarios. However, the *cost* element is the notable difference in the misalignment scenario.

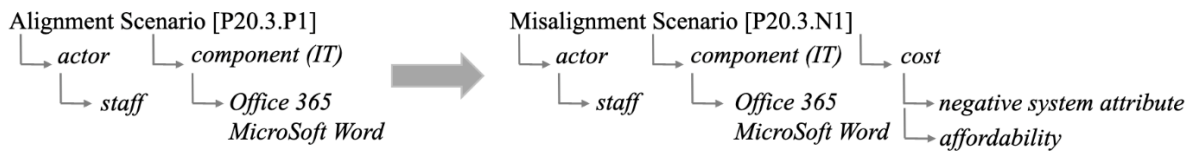


Figure 5-3: Scenario Elements related to a shift from alignment to misalignment.

A staff member recalled two scenarios about her perspective of Office 365. She first described the alignment scenario that gave students free access to the web version of Office 365 [P20.3.P1]. Previously, this was available only to faculty and staff, while students had to pay. She

felt that this change “*positively impact[ed] students, that they don’t have to pay and that’s obviously a resource that they need in terms of Word and Excel and those functions.*”

This same staff member then described how this positive situation became negative from her perspective in a misalignment scenario.

“I was just talking to a student the other day and was trying to show him how to use Word to incorporate APA citations into a paper he was writing. And I realized that the web version of 365 doesn’t offer that functionality which sucked. He had to actually purchase . . . the desktop version which was \$40. Which I mean, it was still discounted, I think, through Penn State, but it was creating a disadvantage for him to not have it and then obviously he had to pay to get that.” [P20.3.N1]

The two scenarios described by this staff member demonstrate that factors of *negative system attributes* and *affordability* captured as the scenario element of *cost* caused the shift in alignment in her perspective (Figure 5-4).

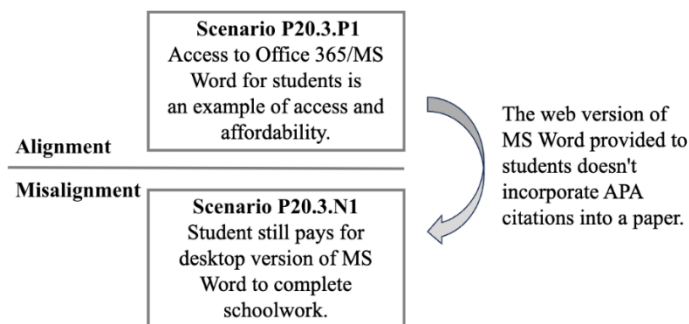


Figure 5-4: Example scenarios of a shift from alignment to misalignment.

Initially, the staff member felt that giving students free access to Office 365 software was

a positive example of access and affordability. However, when she realized that MS Word had limited features and required a student to pay for additional features, she identified it as a negative scenario (misalignment). The shift in alignment resulted from using the software for a student-related task and identifying that the University's free access did not help the student with the task.

In contrast, another staff member described two scenarios demonstrating a shift from misalignment to alignment. The scenario elements involved are depicted in Figure 5-5. The *actor* scenario element remains the same in both the alignment and misalignment scenarios. However, the *component (IT)* and *benefit* element are the notable difference in the misalignment scenario.

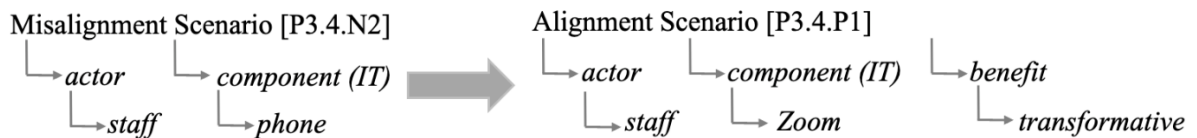


Figure 5-5: Scenario elements related to a shift from misalignment to alignment.

The staff member described a scenario from the past whereby research interviews were conducted via phone if she could not meet with the subject in person. Due to the remote learning restrictions caused by COVID, she learned to use Zoom. The staff member found Zoom to be "*transformative*" in her work. She mentioned that Zoom is much better than the phone and now perceives conducting interviews over the phone as a negative scenario after learning to use Zoom for interviews, which she provided as a positive scenario (Figure 5-6).

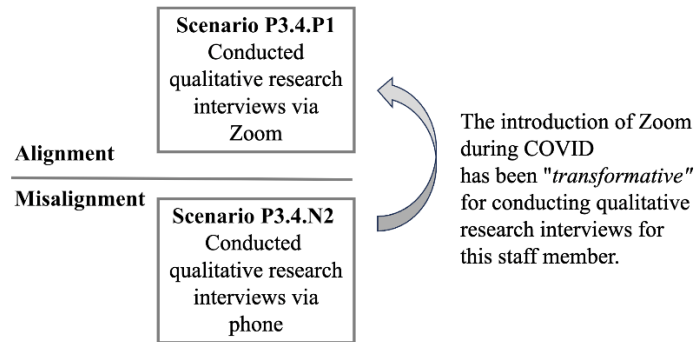


Figure 5-6: Example scenarios of a shift from misalignment to alignment.

These two examples demonstrate single shifts between alignment and misalignment. These scenarios identified two factors that account for the shift that could provide value to IT practitioners.

In the second section of this finding, a staff member shared some unique examples of multiple shifts in alignment that happened over approximately 11 years. She identified some factors that caused her to see these scenarios as either alignment or misalignment. This example demonstrates, in just a few scenarios, how contextual factors can cause constant change around the use of IT.

The application of the *SUMMIT-Align* method captured this unique set of scenarios based initially on the scenario elements of *actor: staff member* and *component (IT): nursing simulation lab*. The scenarios include the same participant and center around the same IT.

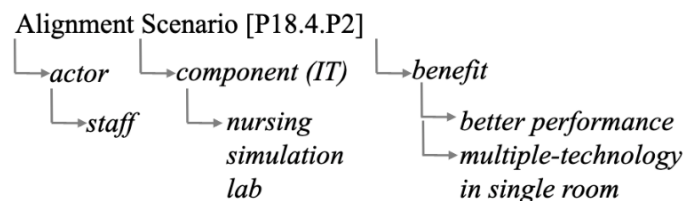


Figure 5-7: Alignment scenario of the nursing simulation lab.

The elements of *benefit* (Figure 5-7) and *costs* (Figure 5-8) captured the factors that reflected the changes between alignment and misalignment over time.

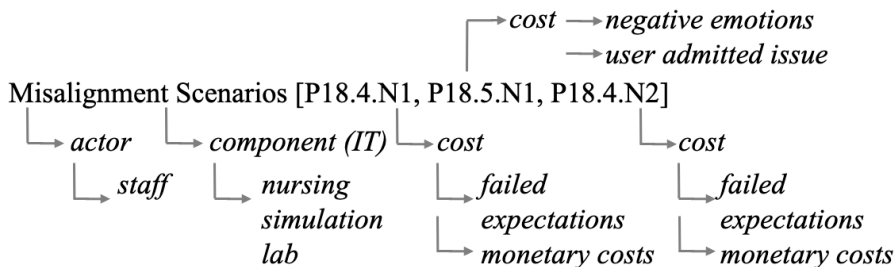


Figure 5-8: Misalignment scenarios of the nursing simulation lab.

The scenarios are related to a nursing simulation lab, which aims to provide nursing students with a realistic environment for simulation-based training. The nursing department initially developed the simulation lab in 2011, but the staff member recalled having a negative experience interacting with the technology in the lab.

“There were many negative issues in the early days where we thought one piece of technology talked to another and it didn’t. Or we thought that we had full access to videoing of all of our simulations, that then we could use for debriefing. But it turned out that was only possible in part of the room or in one of the rooms . . . We had the money to purchase part of what we needed for certain scenarios that we wanted, but not enough money to purchase the technology to do every piece of what we wanted. Maybe a mannequin . . . could . . . take the blood pressure or some function like that, but it didn’t put out the readings. You could simulate it, but you weren’t getting a real-time reading. There were lots of different pieces to that, that have taken years for us to get that

simulation lab to where we want it.” [P18.4.N1]

The staff member had expectations of what she could do with the technology. She mentions tasks that are only partially supported by IT, and incompatibility issue between different IT. Additionally, *monetary costs* are contributing to the misalignment.

In 2019, she felt that the technology in the nursing simulation lab was sufficient for the department's needs. However, new challenges arose when COVID-19 forced the University to move to a fully remote mode in March 2020. The staff member recalls in a misalignment scenario the challenges of transitioning to remote learning while striving to provide simulations for nursing students over Zoom.

“We were going to do an anthrax simulation and I was going to be exposed to anthrax and how I was then going to be able to show online how . . . each symptom was occurring? I had to have my skin changing . . . The negative scenario was we couldn't do it. We had no idea. We didn't know how to share screens. We didn't know how to do that whole thing with the students, so we had to work with IT.” [P18.5.N1]

The changes in technology and having to complete a simulation remotely forced the staff member and her colleagues to adapt and learn. She recalled this in an alignment scenario, recognizing that initially, it was a hurdle, but they learned to do things remotely they had never done before.

“We learned over COVID . . . when we had more time to think about these things. And we also started doing these online simulations . . . where we can have 10 rooms up for the students and we can set a code situation in multiple rooms.” [P18.4.P2]

The online environment allowed the staff to create a simulation that more closely mimicked situations that nurses face in a real hospital.

In August 2021, the nursing staff, faculty, and students resumed in-person instruction in the nursing simulation lab after the COVID-19 pandemic. During the pandemic, the lab underwent significant IT updates, such as introducing advanced mannequins and new classroom

technology. The IT team trained the nursing coordinator and staff on these new features. Although the updates brought about positive changes, a staff member recalls a scenario where what they had learned during COVID changed their expectations for what was possible to simulate in the lab. Their expectations for what could be done using IT in the lab also changed. The online environment allowed the staff to create a simulation that more closely mimicked situations that nurses face in a real hospital.

“We want students to have the real scenarios the way they would happen in an actual hospital setting or the way we can do it online where they have to quickly prioritize. . . We can do that now on the computer for them and we’ve learned that that’s a really great thing. But we can’t do it actually in our simulation lab. That is our future goal.”

[P18.4.N2]

The final scenario provided by the staff member described a misalignment of the expectations and reality of the nursing simulation lab.

These multiple scenarios flowed between alignment and misalignment (Figure 5-9) due to environmental factors, learning experiences, and expectations.

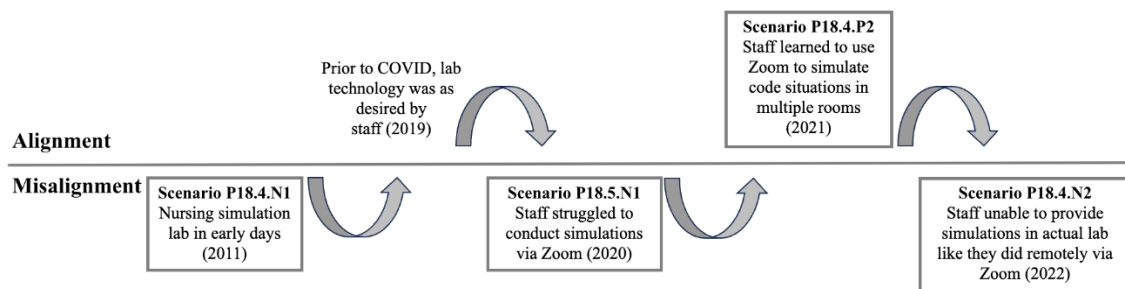


Figure 5-9: Multiple shifts in alignment over time with the nursing simulation lab.

The dynamic nature of alignment was apparent in single and multiple shifts of IT use scenarios during this study. The COVID-19 pandemic and the subsequent reactions accelerated change, helping to highlight rapid changes in IT use at the University. The application of the *SUMMIT-Align* method captured the factors contributing to the dynamic process of alignment and misalignment.

5.4. Senior IT Practitioner Feedback

The senior IT practitioners did not provide any specific feedback or discussion regarding this finding.

5.5 Misalignment can be a source of strong negative emotions for participants.

Strong negative emotions were noted during interviews and codified using the *SUMMIT-Align* method. The emotions were linked as scenario element: *costs* to numerous misalignment scenarios (Figure 5-10). There was no complementary effect of positive emotions captured as scenario element *benefits* in alignment scenarios.

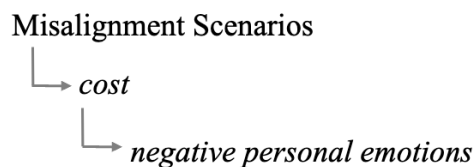


Figure 5-10: Scenario elements of *costs: negative personal emotions* linked to misalignment scenarios.

The previous three findings focus on causes and origins of alignment and misalignment. In contrast, this finding describes how misalignment causes strong negative emotions in participants. The intensity of the negativity expressed in various scenarios went beyond mere irritation and left an indelible impression on the participant. Participants used words and phrases such as “*completely confused,*” “*horrified and felt terrible,*” “*pretty stressed out,*” “*nerve wracking,*” and “*overwhelmed.*” Participants sometimes could recall detailed scenarios years beyond their original occurrence.

The following scenarios exemplify how the *SUMMIT-Align* method identified misalignment scenarios at the individual level that resulted in substantial negative emotions for participants. A staff member describes her interaction with the new Web Single Sign on (SSO) service to access DocFinity to see information about candidates for the accelerated second-degree nursing program. Global Protect was the old SSO replaced by Azure.

"The negative scenario from yesterday was I was frustrated. I was still trying to figure out how to access that system at 9:30 at night. That was irritating, because it was taking a lot of extra time yesterday that I didn't really have. I had put in a lot of hours already and I couldn't figure it out. What was happening was it kept spinning. I would get a message and I actually thinking I just deleted that, because I had taken a picture of the message, but essentially it was saying that you couldn't access the site. . . I then, of course, later discovered that the reason I couldn't access it was I still needed to go into Global Protect." [P18.2.N1]

The staff member requires access to certain information for her job duties. To fix the issue, she had to take screenshots and send them to an IT individual. The individual sent her a bullet checklist on using the SSO service to access another IT (DocFinity) to get the needed information. This multi-step process frustrated her, and she felt it wasted her time.

Multiple participants also identified a particular IT that evoked negative emotions in

misalignment scenarios. For example, interactions with the University System for Integrated Management, Budgeting, and Accounting (SIMBA) were very frustrating. A staff member describes her experiences with SIMBA.

“I did SIMBA training from hell. The system itself is extremely non-user friendly and everybody has to use it to see what their grant funding is like. It’s just a nightmare. I sat through an IT training on that system. Everyone was lost. . . .I avoid it like the plague, but I do have to use it.” [P8.5.N]

This staff member uses words such as *“hell”* and *“nightmare”* to describe her interactions with SIMBA. Since the University mandates using SIMBA, participants acknowledged that future negative interactions are unavoidable. Another staff member from different college also describes similar negative interactions with the SIMBA system.

“You have to go into all these different screens. If I had to do any travel or anything new, . . . I would be lost. I just don’t do it enough. It’s not very user-friendly. Just to go in and be able to do it without calling somebody. I hate it. I really hate it. I don’t think I’m alone in that.” [P17.5.N2]

While this staff member is from a different college in the University, her misalignment scenario reflects some of the same intense emotions as the previous staff member. Her feelings towards using SIMBA are beyond disdain, as she expresses hatred towards a particular IT. A feeling she thinks other users share.

Negative experiences left such a lasting mark on some participants that they were able to give a detailed account of the interaction months and even years later. One staff member described how a visiting professor’s lecture went awry three years prior. The staff member described the presentation as *“a visual lecture that needs to be color accurate,”* which was problematic when the projector had issues. As a reasonably savvy IT person, she was asked to help troubleshoot the issues with the computer and projector. When she could not resolve the

problem, she contacted the IT help desk number for after-hour help. The staff member's primary frustration stemmed from the interaction with the help desk person who came to address the issue.

“By the time this person gets over to us, it’s 15-20 minutes in and he had no idea what he was doing. . . And I tell him, don’t do that, please don’t turn it off, because if you turn off the projector, it takes two minutes to shut down, two minutes to turn it on and we had already done it. And I said, ‘Please don’t do that.’ He pushes the button. I could have physically like just attacked the projector at that point and ripped it out of the wall, right? Because at this point it’s just you know, I was so frustrated at it, and he couldn’t do anything.” [P1.4.N1]

The staff member expressed her emotions by describing physical actions she wanted to take in frustration. She further explained that the guest lecturer expressed her frustration about the situation later in her presentation, referencing the *"ugly screen"* in her slides. The staff member *"lost faith"* in the IT help desk number, and to her, *"it felt like, because I was a woman, the tech person didn't believe that I knew what I was talking about."*

A single negative interaction with an IT help desk person had a lasting impact on a staff member at the University. The experience was remembered in detail for years and has influenced the way she views IT support. As a result, she now tests all presentations in advance to ensure that the projectors and computers work during regular work hours. This way, she can mitigate any potential negative experiences in the future. The source for the emotional experience, the incident caused a shift in the staff member's attitude towards IT.

A final example is two misalignment scenarios about the same event. The experience happened over two years ago and evoked negative emotions in two participants. The participants are faculty members from the same college who distinctly and without hesitation recalled the same scenario in their separate interviews. For both faculty members, the source of the misalignment revolved around software licenses that expired during a significant academic

competition. One of the faculty members recalls the situation in detail.

“So there is software that requires a lock to function and each computer needs a different lock. It’s always a nightmare to match the locks with computers and they need to be renewed every year. . . We were participating in a competition . . . and everything was going well until you know, two hours before the deadline, the license ran out and so that was very . . . negative situation. So I guess, we should have some system to warn us that the license are expiring, because obviously we are focused on working.” [P4.3.N1]

The other faculty member put the same scenario in context, recalling that they were *“3D printing, live, in front of really, a world audience, [national level] judges, and all the TV cameras focused on our results and work, and . . . our license ran out!”* [P5.3.N1]. The unfortunate timing of the computer licenses expiring at an academic competition in front of a world audience caused both faculty members to experience stressful emotions. IT practitioners may be able to adjust the timing of computer license expirations to avoid future misalignment situations.

Different participants expressed these strong emotions and the personal costs they bear due to their negative interactions with IT as identified by the scenario element of *costs*. These *costs* include *wasting time, significant frustration, and task failure*. Unfortunately, when the University mandates using a particular IT for work duties that has been the source of a misalignment scenario, the participants also express their anxiety about future experiences.

5.5.1 Senior IT Practitioner Feedback

The two senior IT practitioners briefed on the assessment agreed on two aspects of this finding. First, the fact that participants can recall these misalignment scenarios in detail despite many years passing is consistent with their experience. Practitioner #2 agreed that *“there's long institutional memories here.”* While neither of the participants addressed the negative emotions

associated with the misalignment scenarios, they did recognize that these institutional memories affect future IT initiatives. For example, Practitioner #1 described a recent user reaction to an Enterprise Constituent Relationship Management (ECRM) initiative. In his perspective, this new IT initiative would be a significant game changer for the organization that manages alumni relations. However, he recalled that as soon as the topic of the new ECRM was raised in a user group discussion, "*they [users] immediately just threw up a bit of a wall.*" Practitioner #2 responded by adding that "*it's just this is the nature of the beast,*" signaling that at the strategic level, practitioners acknowledge there is a change-resistant user perspective.

5.6 Summary

This chapter presented four primary findings from assessing IT alignment and misalignment by examining 273 participant scenarios. These findings demonstrate how scenario elements help identify alignment and misalignment patterns from the IT users' perspective. At this University, participants prefer local IT support over consolidated university-level IT support. Participants' perceptions of alignment and misalignment are also anchored by their prior experiences. Additionally, alignment and misalignment scenarios demonstrate single shifts in pairs and shifts over time. Examining these shifts uncovers why participants perceive the shifts and reflect how dynamic alignment and misalignment can be at the individual level. Finally, perceptions of misalignment are a source of strong negative emotions for participants, perpetuating future perceptions of misalignment when faced with similar experiences. IT practitioners provided feedback on some of these findings, indicating their perspective and confirming consistencies between some of the findings and their experiences.

Chapter 6

IT Alignment and Misalignment Assessment: Insights related to IT

Objectives

6.1 Introduction

This chapter presents insights derived from assessing alignment and misalignment in relation to the five objectives of the University's IT third goal, "Enable teaching and learning." The goal aims to "Enable and advance the transformation of teaching and learning through exploration, dissemination, and support of learning technologies, faculty development, and research." The five objectives of the goal are:

Objective 3.1: Expand faculty engagement

Objective 3.2: Increase digital fluency

Objective 3.3: Improve access and affordability

Objective 3.4: Invest in state-of-the-art classrooms and learning spaces

Objective 3.5: Provide IT training to students, faculty, and staff

This chapter is organized by objective, with each objective description following the objective title. The participants were provided with the title and descriptions just before they provided scenarios of IT use. The quotes in this chapter related to each insight are examples of how scenario-based methods, such as *SUMMIT-Align*, can help reveal critical contextual details in the assessment.

6.2 Objective 3.1: Expand faculty engagement.

“Description: Provide multiple avenues for faculty engagement with Teaching and Learning Technology (TLT) to transform education at Penn State.”

The primary insights related to objective 3.1 identify that participants have a broader understanding of the idea of “*faculty engagement*” than the written definition and that challenges with IT are a primary source of misalignment in achieving this objective. The first finding emerged by looking at the scenario elements of *actors: students, faculty, and staff* and *task: collaborate with TLT* (Figure 6-1).

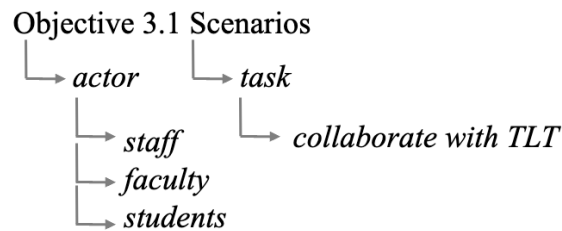


Figure 6-1: Objective 3.1 relevant scenario elements.

The following section will explain how participants view the scope of “*faculty engagement*” with quotes from scenarios. The second section will discuss how challenges with IT impede achievement of this objective in misalignment scenarios.

The description above is taken from the IT strategic plan and aims to offer faculty members various ways to engage with the Teaching and Learning Technology (TLT) organization. The purpose of the TLT organization is to “*collaborate with faculty to enhance teaching and learning through cutting-edge technology*” (Penn State Teaching and Learning with

Technology, 2024). Out of 32 total scenarios, three scenarios reflected the specified aims of objective 3.1. Among these, two were alignment scenarios, where both staff members reported experiences where faculty members engaged with the TLT organization as indicated by the scenario element *task: collaborate with TLT*.

“We have all participated in teaching and learning programs, they have increased. . . There was certainly the simulation at Penn State Hershey, that all faculty in the College of Nursing were invited to participate.” [P18.1.P1]

“I think that all of the resources and opportunities that TLT provided remotely did help with, you know, bringing the level of faculty engagement up.” [P1.1.P1]

The remaining scenario was a misalignment scenario in which one of the staff members reflects the faculty-TLT relationship that, in her opinion, needs to also include staff members. The staff member had submitted a proposal for an innovative use of technology to the TLT Symposium, but it was rejected because she was not a faculty member. She feels faculty engagement should be expanded due to the staff's role in helping faculty learn and use technology.

“The reason I'm using this as a negative scenario . . . is the way that faculty learn. Most of the technology is from staff and that gets overlooked every day because somehow there is this assumption that staff, you know, push a bunch of papers around and make coffee and unlock doors. And that's part of the reason why I've really worked so hard to get faculty status because I don't get the level of respect that I should as a technology person who uses and trains people, including faculty in technology stuff, whether it's cameras or online or whatever. And so If you want to expand faculty engagement, you have to get the buy in from the staff because we're the ones at the last minute getting yelled at by the faculty in order to show them why the thing-a-ma-jig is not working, because they don't even know what it's called.” [P1.1.N1]

This scenario provides a detailed perspective from a staff member on teaching faculty to learn to

use technology. She feels staff members are "overlooked" daily in their essential role related to this objective and suggests that faculty engagement can expand by acknowledging the staff.

The scenarios of the faculty and student participants also reflected the undervalued role of staff. Out of the 32 scenarios shared under objective 3.1, none were about staff, except for those provided by staff themselves. This pattern suggests that neither faculty members nor students are fully aware of the significant contributions of using IT by staff members. The scenario elements of *actor: student, staff, and faculty* revealed this pattern.

In support of this objective, participants identified ten alignment scenarios that reflected positive IT-related interactions. For instance, an advisor staff member describes how technology has enhanced the educational experience for students when they interact with their advisors.

"We used to have students come to our office . . . students come in during certain times and see our advisors. They would just get assistance with their curriculum while they're here and anything that goes along with that. We have transitioned to all Zoom sessions. . . It has actually benefited some of the students. I think they could see us more often because they can just be where they are and sign in and wait. Where they didn't have to . . . come to our office. I would say that's all been a positive thing to come out of this terrible time." [P24.1.P1]

This scenario describes an interaction between an advisor and a student using Zoom. Since she described this scenario in the context of objective 3.1, she believes that activities such as advising are associated with "transforming education."

Senior IT Practitioner #2 reflected the inclusion of staff in the idea of "faculty engagement" with the TLT organization.

"[TLT is] located over in the Shields building in the lower level there. . . We have some applications that are being used by advisors that's called Elevate and Course Sightings which helps an advisor [staff member] or a faculty member, track their students to see

how they're doing in the course relative to their peers."

The University IT department develops the goals and objectives of the *Strategic Plan - University IT*. However, since Practitioner #2 is a senior department member and holds a broader perspective on "faculty engagement," there may be an inconsistency between the reality of the objective and the written description.

Misalignment scenarios highlighted a barrier to "transforming education" associated with difficulty in using IT. One faculty member described the following misalignment scenario in response to objective 3.1. He sees faculty engagement hampered by the basics of using IT and getting help when he has issues. A faculty member explained some of the challenges in resolving issues with his computer.

"Well, you have a pretty engaged person [referring to himself], but by now I'm going to be brutally honest with you. If I have an issue with something, I spend usually anywhere between 30 minutes to 2 hours trying to figure it out. That doesn't work, then I call IT, especially my university IT, which is wonderful. They always answer. Then more often than not, they say, 'Oh, but that's a computer issued by the college . . . You need to contact IT in the college . . .'" [P12.1.N1]

Transforming the educational experience starts with understanding how to use the technology before an individual can leverage it to enhance their teaching.

There were other activities aimed at supporting education that faced difficulties due to the lack of understanding about how to use IT. For instance, a student who previously worked as a Research Assistant (RA) required assistance in comprehending the usage of Canvas when shifting to Teaching Assistant (TA) duties.

"When I first came in, I was an RA. I never dealt with Canvas stuff. My view is always a student view. When I started [as a] TA, I was in the Canvas course. I would be the administrator or the teacher role, so you can add stuff. That's confusing in the beginning."

You can have help or something where they guide you through how you upload and that kind of stuff. There's a lot of information. I don't look through them individually unless I can't figure out how I can upload the stuff or grade or that kind of problem. I guess it's a lot to get familiar with in the beginning. That's a negative part, but after a while, you'll get used to it and it's not that hard.” [P16.1.N1]

Despite being in Canvas training and having access to help documents, this student still felt that learning the teacher role in Canvas was challenging. Her task of uploading documents or grading in Canvas is a task that she feels supports the educational experience for faculty and other students.

Similarly, a staff member described a misalignment scenario of assisting faculty in learning to use Zoom during the transition to remote learning.

“There was just a lot of frustration with our faculty and especially with our older faculty that weren't as familiar with Zoom or recording. And it just took some time to collect all the information and great tutorials . . . Specifically with Zoom and our more senior professors. They didn't understand what Zoom was or how to record and I literally sat in a classroom with some of our more senior faculty and just went through it, step by step from creating an account.” [P9.1.N1]

This staff-and-faculty engagement was aimed at teaching faculty how to use Zoom to enable teaching, which was an essential task required by the pandemic's restrictions. The staff member highlighted the IT-related challenges that she observed in her engagement with faculty. IT enables multiple tasks that support the improvement of education. However, the inability or challenges in using IT ultimately impact the ability to improve education.

The scenarios related to alignment and misalignment, which were explored under objective 3.1, demonstrate a wider understanding of faculty engagement than what is defined in the IT Plan. Engagement takes place not only between the faculty and TLT organization, but also

involves the staff members who play a crucial role in facilitating faculty training and the use of IT. The efforts of staff members should be recognized by both faculty and students. Additionally, individual challenges with IT can cause misalignment, which can hinder faculty engagement. These insights regarding objective 3.1 were discovered by analyzing the *actor* and *task* scenario elements.

6.3 Objective 3.2: Increase digital fluency.

"Description: Enable digital fluency to allow our students to be 21st century digital citizens."

The scenarios for objective 3.2 revealed four insights by examining the scenario elements of *actors*, *tasks*, and *benefits* and *costs*. The first two insights show that this objective has linkages to two other IT objectives examined in this assessment. The third insight identified the significance of IT use to digital fluency while the final insight highlighted the participants' perspective that the objective scope may need to expand beyond just students. Fifty-three scenarios were provided by the participants, of which 32 were aligned with the objective, while 21 were misaligned.

The first insight is that 14 of the scenarios elicited under objective 3.2 linked to objective 3.3, *Improve access and affordability*. Some participants expressed the need for access to information technology as a prerequisite for building digital fluency and barriers to accessing IT negatively impacted digital fluency. This was identified by looking at the alignment and misalignment scenarios linked to the scenario elements of *benefit: access to IT* and *cost: no/limited access to IT* (Figure 6-2).

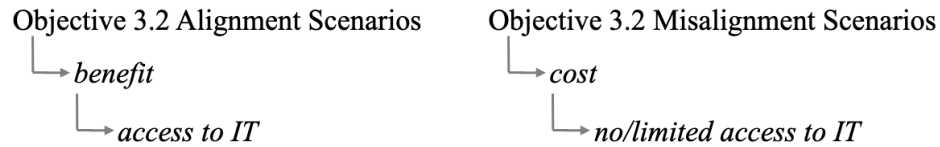


Figure 6-2: Objective 3.2 scenario elements related to objective 3.3.

A staff member spoke in general about access to IT.

“I think just having the exposure to a lot of these things helps with that fluency. I think where you get into this e negative side of things is those areas where students don't have access to broadband or don't have a cell phone or don't have a computer at home. I think that they are falling behind their peers in getting that access, and getting that fluency, and building their confidence around the systems and around computers, in general.”

[P19]

This staff member sees a direct link between having access to IT and students' ability to increase their confidence with computer systems and, therefore, their digital fluency.

The scenario element of *benefit: access to IT* was common in nine of the 32 alignment scenarios. Objective 3.3 aims at improving access and affordability to IT. This link to objective 3.3 indicates that having access to IT is a complementary objective for increasing digital fluency. One faculty member articulated this supporting relationship in an alignment scenario.

“I think that positively, there's a lot of access for the students. They can pretty much go on . . . the technology website. They can talk to anybody there, and they have how-tos. The how-tos are very easy, very easy to follow. I think digital fluency is great . . . I can actually tell the students where to go and how to get there. When it comes to even programs that we have . . . available for the students, Office 365 and such, I think that that's really great for the students.” [P11.2.P1]

From this faculty member's perspective, the University provides easy access to IT in many forms,

which he associates with increasing digital fluency. Another faculty member echoed the same sentiment, focusing on the available IT variety and access via virtual private networks.

“I think what enables digital fluency . . . [is] IT that's available or the ed-tech that's available to students. Zoom, Canvas, Yammer, Kaltura - is all good. I also know that we have software on virtual private networks that students can access maybe college by college or department by department. I think that this is really positive.” [P14.2.P1]

Five misalignment scenarios also reinforced the linkage between access to IT and digital fluency identified by the scenario element *cost: no/limited access to IT*. From a staff member’s perspective, the lack of student access to courses on Canvas before starting a course is problematic for digital fluency for online courses.

“I would though say that probably something we don't do too well is - I work specifically with more off-campus students, and I think that some of them are just not prepared in terms of understanding how the systems operate. You can't even get into your course until the first day of the semester so there's no time to orient yourself to your online class and understand like what do all these buttons, where do these links take you, or how do I go to my library resources . . . Now, I think a lot of that probably has to do with the instructor doesn't want to have to teach a class before the semester starts because students are going to be in there, they're going to be asking questions, they might even start submitting things, so I get that. Maybe a solution to that would be to have some sort of test run, trying out a course. Obviously, it's a free thing, but understanding how to navigate Canvas just to become comfortable with the technology.” [P20.2.N1]

This staff member suggests that students should have access to Canvas prior to class to become familiar with the software. She provides a recommendation that could be implemented to increase digital fluency.

The second insight also reflects a link between five scenarios of objective 3.2 to objective

3.5, which aims at providing IT training. Specifically, participants mentioned positive digital fluency experiences enabled by IT training as identified by the scenario element *benefit: access to IT training* (Figure 6-3).

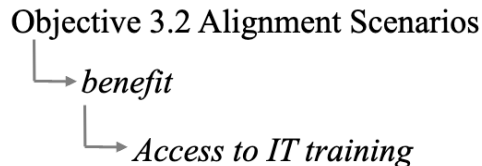


Figure 6-3: Objective 3.2 scenario elements related to objective 3.5.

A staff member describes the development of micro-credential workshops to train students on relevant software as one way to increase digital fluency.

“Increased digital fluency. I know we talk about this as a department all the time. . . On the positive note we created . . . like micro-credential workshops that provide some of this unique software for students that are interested. . . I am not in charge of this but to answer the need or the suggestion from our industry partners, and students too, we created these mini credential workshops for them to attend. It's great.” [P9.2.P2]

The other four alignment scenarios also link IT training experiences with digital fluency. Participants did not identify any misalignment scenarios related to negative experiences in IT training and digital fluency.

A third insight resulted from analyzing scenarios under this objective relates to IT use and digital fluency. Over half of the scenarios focused on using IT to accomplish work or academic-related tasks. The generic scenario *task: IT use* captured multiple specific tasks that were identified during scenario analysis.

Objective 3.2 Alignment and Misalignment Scenarios

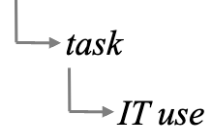


Figure 6-4: Scenario element *task*: *IT use* linked to alignment and misalignment scenarios.

Twenty-six alignment scenarios gave examples of participants' perspectives on how IT use and digital fluency are connected. Students, staff, and faculty all provided scenarios related to using a specific IT or using IT to accomplish a specific task that, in their perspective, was a positive experience related to digital fluency. For example, a student recalled that the University has opportunities to use social media to increase digital fluency.

“I think that there's been many strides to help students really interact with the online space. Not necessarily maybe in my may major but definitely, I think if you look at anyone in Comms or anyone in advertising or really anything related to business like marketing arts, there's definitely a strong push to be involved in social media and social media engagement. I think it is just going to be a really important tool going forward for a lot of different areas and spaces. I know that there's plenty of opportunities not only to get involved with administrative departments in that aspect but just organizations, clubs, Greek Life.” [P27.2.P1].

This student recognizes the value of social media in an academic sense as part of digital fluency. He sees these as opportunities to use IT in ways students may need to become more familiar to increase their digital fluency.

Other participants identified their use of IT as an example of digital fluency. One staff member described how she uses LionPATH to accomplish a work task.

“Yes. I'd say another positive scenario as a staff person is it's really easy to look up

people's contact information on LionPATH. If you need to find someone, you can go to the directory on LionPATH, and there's their ID number, their phone number. Obviously, I don't do that to be a creep, but if I needed to get hold of a student who's not showing up for an exam they signed up to proctor, yes, I'm going to find your phone number."

[P23.2.P2]

It is unclear if LionPATH was intended for this purpose, but this staff member has found a unique way to use the software to support her work tasks.

Additionally, a faculty member provided an alignment scenario of tools he used 12 years ago as a graduate student. In retrospect, he sees this as a positive example of how he increased his digital fluency.

"When I was a grad student, I had to create a video using a green screen and edit it. They had One Button Studio in various buildings. Then so I was able to just go in - I probably had to reserve the room and then . . . I edited maybe in Adobe, whatever Premiere. That was available maybe on a lab computer. All of that, that was a positive example, and I would say that was in 2010. It was quite a while ago. Being ahead of the curve and setting those things up so that students are able to take advantage of them whether for classes or personal. I would say that was a positive where that increased as a student my digital fluency in terms of video capture and video editing." [P14.2.P2]

This faculty member sees using IT that was "ahead of the curve" as a way to increase his digital fluency. He thinks personal or academic use of IT is part of this relevant experience, and the University's offering of the One Button Studio exemplifies this objective.

Twelve misalignment scenarios reinforced the same sentiments about IT use and digital fluency. Like the alignment scenarios, these scenarios are linked to the element of *task: IT use*. Whenever the participants came across IT-related problems, it became an obstacle in enhancing

their digital literacy. For example, in a misalignment scenario, a staff member discusses the challenges faced by her and students while using Starfish, the software tool required to manage and document academic advising.

“Well, on Starfish, which is another one students use to schedule appointments and stuff, I don't know that they use it that much, because it is incredibly slow. When I go to type a note, because after I meet with a student, I have to do a note with them, I have to write a note of what we talked about. Sometimes it's three seconds. Sometimes it's been 18, 20 seconds until the screen comes up that I can actually type the notes. When you have 10 appointments a day, that really slows you down.” [P25.2.N2]

The staff member reasons that since students find the system so slow to use, they often avoid it. She explains in her interview that such avoidance causes students to miss out on faculty messages. Students will also call staff members for appointments instead of using the system to schedule them. Misalignment scenarios, such as this one, indicate that when participants encounter issues while using IT that hinder them from completing a task, they avoid using them.

One of the final insights is that around 30% of the participants interviewed did not agree with objective 3.2, which aims to improve digital fluency specifically for students. According to two faculty members and four staff members, students at the University are more digitally fluent than themselves. These perspectives were identified through memos during interviews and confirmed during scenario analysis involving the *actors: students, staff, and faculty*. By examining the *actor* element for this objective, alignment scenarios provided by the staff and faculty described examples of student digital fluency that exceeded theirs.

Objective 3.2 Alignment and Misalignment Scenarios

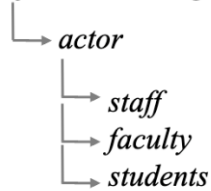


Figure 6-5: Scenario element *actor* related to digital fluency.

A faculty member provided his perspective on student digital fluency at the University.

“Well, the COVID came [and] all the faculty came together and figured out a way to transition from face-to-face to remote counseling services. In a month, we were able to open up our clinic virtually again. That means all our students in practice and internship were forced to get into this new platform. We provided training for them, et cetera, et cetera. Well, what did you know? None of them fail to make that transition. When you ask me, enable digital fluency to allow our students to be 21st-century digital citizens, I work with master’s and doctoral students who are heavily invested on being 21st-century digital citizens. In fact, I think they teach me more than what I teach them about becoming a 21st-century digital citizen.” [P12.2.P2]

This faculty member is learning digital fluency skills from students, indicating that the objective should focus on more than just students. A staff member had a slightly different perspective on students and digital fluency. As an advisor, she meets with students often and observes that they tend to be “*selectively fluent*” in their chosen IT.

“I think they are much more fluent for sure than I am. They call them digital natives and I’m a digital immigrant, so I don’t always speak the language very well. I think our students have access to some pretty good materials and software and all that stuff. I don’t think they’re always using it. Like the rest of us, they may grumble when it’s something new. . . They really know their TikTok and social media ones, but I’m surprised that they

don't really use the internet for searching for answers about the university. 'Where do I go for this or is this available?' It's really been troubling. It's like, 'Did you look?' 'No, I thought I'd just ask you.' 'Well, that's great, but you waited a week for an appointment!' Things that are at the registrar's website that could answer most of their questions, they never do that." [P25.2.N1]

This staff member's misalignment scenario reinforces the alignment scenarios reflecting the idea that students are sufficiently and more digitally fluent than some staff and faculty. However, she feels that students' digital fluency is more about personal preferences than skills. These scenarios provide two avenues of actionable information for IT practitioners. First, they should consider widening this objective's scope to include increasing the digital fluency of faculty and staff.

The alignment and misalignment scenarios of objective 3.2 link digital fluency to other objectives such as access to IT (objective 3.3) and IT training (objective 3.5). The scenarios also indicate a connection between increased IT use and improved digital fluency. Finally, participant experiences codified in scenarios are inconsistent with the narrow objective focus on just students. The digital fluency of faculty and staff members is also important to achieving digital fluency at the University. These insights were obtained by examining the scenario elements of *benefits, costs, tasks, and actors*.

6.4 Objective 3.3: Improve access and affordability.

"Description: Develop, grow, and support initiatives that improve access and affordability."

There are three insights related to objective 3.3. The first insight relates to the stated

objective as written. Although the objective definition does not specify a target audience, most participants assumed that the focus was on *student* access and affordability. Second, examining both alignment and misalignment scenarios highlights the factors that cause the same IT to be viewed as aligned and misaligned by participants. Finally, examining misalignment scenarios reveals how perceptions about the University-provided services, specifically related to hardware, are influenced by environmental factors such as the COVID-19 pandemic. This section will discuss each of these findings in detail.

While the definition of objective 3.3 does not identify the subject audience, scenario analysis reveals that participants generally related this objective to *student* access and affordability. This insight resulted from an examination of the scenario element of *actors*. Of the 55 scenarios provided under objective 3.3., over half were linked to the element of *actor: student* (See Figure 6-6).

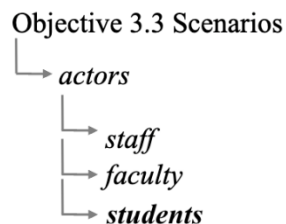


Figure 6-6: Objective 3.3 relevant scenario elements.

Considering that students only comprised approximately 22% of the participants, even faculty and staff assumed this objective targeted access and affordability to IT resources for students.

The second insight arose by analyzing alignment and misalignment scenarios and their respective linkages to IT. The scenarios were categorized into groups based on alignment or misalignment and linked to element *components (IT)* within the scenario. Specifically, the sub-

elements of *components (IT)*, such as *Canvas* or *Wi-Fi*, were identified and linked. Furthermore, during the analysis, they were classified into software or hardware categories (refer to Figure 6-7).

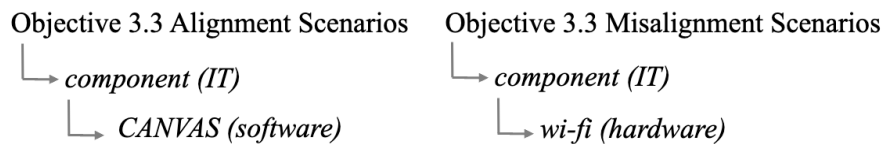


Figure 6-7: Objective 3.3 alignment and misalignment relevant scenario elements.

In alignment scenarios, participants identified positive experiences of access and affordability related to *software*. More informatively, participants identified shortcomings in browser versions of software in misalignment scenarios, nullifying some of the positive aspects of access to free software.

The following quotes from participants provide examples of the alignment scenarios related to access and affordability to University-provided IT. A recent major software initiative at the University was the implementation of Office 365, which finished in early 2019. This staff member noticed this initiative's positive impact in an alignment scenario.

“I will say . . . probably the biggest positive I've seen in this area is that now all students, faculty, and staff have access to Office 365. That is probably the biggest improvement that I've seen. I think in years past, students had to pay for, they'd get a discount or whatever, but they'd have to pay for that. Obviously, faculty and staff already have access to those things, but I have seen that positively impact students that they don't have to pay and that's obviously a resource that they need in terms of Word and Excel and those functions.” [P20.3.P1]

She highlights that adding student access to Office 365 is an affordable benefit for students since

they are provided access to the online software suite at no additional cost.

A faculty member noted how access to free software has also helped students.

“Okay. Well, the positive scenario for improving access is certainly the use of Canvas with the students, and it has given me an opportunity to make things more accessible, and that leads into the affordability and that I've been able to do a lot of the readings in connection with the library system. It saves cost for students on reading or just accessing different types of things, be it lectures or certainly readings, surveys, things like that.”

[P26.3.P1]

The faculty member highlighted the indirect benefits students get from Canvas and the library. He can post readings that do not require students to purchase books and enable access to other media types.

Students also recognized that Penn State provides access to costly software via online applications. The following student understands that the IT resources provided would be “unaffordable” if he had to purchase an individual license.

“I would say that the positive scenario here is the broad licensing that the university provides . . . I think every semester here I've used it in a class having access online to their web resources. . . Otherwise, like it is unaffordable . . . it's really cost-prohibitive to use all this software as a single user.” [P7.3.P1]

Unfortunately, not all the IT solutions provided by the University met the objective of access and affordability for specific software. Participants discussed issues accessing the browser versions of the software provided by the University. These were misalignment scenarios linked to the element *components (IT)* and classified as software. A staff member commented about shortcomings with online versions of Office 365.

“In . . . office 365, some format file formats don't lend themselves very well to editing online. So, if you're trying to do something more creative like a recruitment poster or

flyer or PowerPoint, you need to go through the steps of downloading them onto your desktop and then uploading them again. . . You don't want to mess up version control so if multiple people are working on it that can pose a problem. Seems like word and excel work pretty well on the online version of 365 but, again, I run into these issues with them trying to be more creative.” [P3.3.N1]

Providing access to web browser versions of software can help achieve the objective of affordability. However, in certain cases, the browser version may not offer enough functionality, which could either lead to additional work or extra expenses. Both of these outcomes are in contrast to the providing access and affordability.

During the COVID-19 pandemic, the move from on-campus learning to remote learning highlighted issues with University-provided services, particularly related to hardware. Although Penn State offers multiple computer labs and access to the wireless network on campus, the shift to remote learning in the spring of 2020 caused problems for students, faculty, and staff who were no longer on campus. The resources and programs intended to address access and affordability were not designed for fully remote learning. As a result, many students struggled to access computers and the internet to participate in remote classrooms or complete their coursework. An advisor shared one of her students' challenges during the pandemic.

“The issue is when you're on that audit on a smartphone or even looking at the schedule on a smartphone, it's just so tediously detailed. I did have a student who actually took an entire physiology course on his phone during the pandemic. You're looking at cells and I just can't even imagine doing that. He did all his coursework on his phone because that's all he had.” [P25.3.N2]

This staff member highlights hardware assumptions made at the University. Accessing specific information, such as a degree audit or class schedule, is assumed to be accomplished on certain hardware, such as a computer or tablet. Additionally, it is not likely that faculty members design

their courses, assuming that students would take the entire course remotely via a smartphone.

The IT services provided by Penn State are designed to work with multiple types of devices. However, realistically, there are challenges in accommodating every possible device used by faculty, staff, and students. According to Practitioner #2, seventy-five percent of the service desk work at the Harrisburg campus involved helping students get University IT services to function on their personal devices such as phones, iPads, or Chromebooks. However, the University does not have a "Bring Your Own Device" policy, which leaves users with nebulous expectations. The pandemic has added to the complexity of the IT department's service offerings since those services were originally based on on-campus access to a free wireless network and computer labs. When students had to attend class via Zoom off-campus, they had to rely on non-University provided access to the Internet.

Misalignment scenarios indicate a disparity between the assumptions regarding hardware used to access services and the reality participants experienced. A staff member discusses the challenges students faced during the pandemic.

“A negative scenario would be off campus and again especially through the pandemic. Students did not always have great Wi-Fi. For advising appointments we could definitely make it work. If a student couldn't hear me, we could use the chat, or if they were breaking up during the meeting, we could do what we needed to do, and then supplement that by emailing each other back and forth. But it was definitely an issue for classes. Hearing from students that they couldn't be on during their class, or they would be on, but couldn't hear or their Wi-Fi would freeze, or the screen would freeze. That was definitely a challenge.” [P22.3.N1]

This scenario demonstrates that the staff and students leveraged multiple types of IT to work around the issues generated by an entirely remote and virtual education environment. Lack of access to the Internet due to the change in educational mode resulted in inequitable access to

education for some students. One student identified that even though he had minor issues with his Wi-Fi connection, other students could not afford adequate Internet access.

“Everyone has a different plan with an Internet provider and some people don’t have enough bandwidth to be able to really stream a Zoom call or stream a lecture. That’s a lot of resources it takes up. Not everybody has that same opportunity.” [P27.3.N1]

When the shift was made from on-campus to off-campus learning, the availability of campus-wide free Wi-Fi and computer labs was reduced for participants.

Another misalignment scenario came from a staff member who teaches multiple classes and talked about the impact of access hardware on students and herself.

“So, for me, this access and affordability issue is infuriating on some level because I grew up in an underserved situation. And so, I know that a lot of my students who are from multi-ethnic backgrounds and lower classes are underserved and not able to have the same quality experience. Whether it’s because they have five children, and their parents are home trying to fight over one computer, or the internet is going out because they can’t do it. Or they are embarrassed to turn on their camera screen, right? So, they can’t interact in the same way because of either the bandwidth is too low and so their screens are not able to work, but they can still kind of hear it if they Zoom in on their phones. . . the things that we have asked our students, especially our underserved students, to do to come up to the same level of the students who have it easier have been so apparent, especially during this remote period.” [P1.3.N2]

The University made assumptions regarding the hardware that IT users would use to access IT services. As a result, changes in the learning mode, from in-person to remote, due to the pandemic exposed these assumptions.

Analyzing the scenarios elicited under objective 3.3 using the elements of *actors* and *components (IT)* highlights several informative factors for IT practitioners. Individuals make

assumptions about a written objective's target audience if not identified, which can result in an unclear objective scope. Additionally, looking at the alignment and misalignment scenarios centered around software can identify factors of IT use that can lead to misalignment. For example, while access to free browser versions of software can be favorable, it can also reverse alignment when it lacks necessary features. Finally, scenarios can identify how environmental factors, such as a pandemic, can misalign previously aligned IT services.

6.5 Objective 3.4: Invest in state-of-the-art classroom and learning spaces.

“Description: Invest in state-of-the-art classroom technology and learning spaces for General Purpose Classrooms and computer labs in order to provide a consistent and reliable experience for faculty and students across the Commonwealth.”

Participant experiences with state-of-the-art classrooms and learning spaces varied across time during this study due to the impact of COVID-19. The classroom and learning spaces identified in the scenarios included virtual and hybrid classrooms in addition to physical spaces. By examining the element of *methods* in the scenarios for this objective, it is discernable that participants experienced three distinct types of *methods* over time (Figure 6-8) spread across 27 alignment scenarios and 33 misalignment scenarios. The scenario elements of *benefits* and *costs*, also indicate the reasons why participants view their experiences as aligned or misaligned.

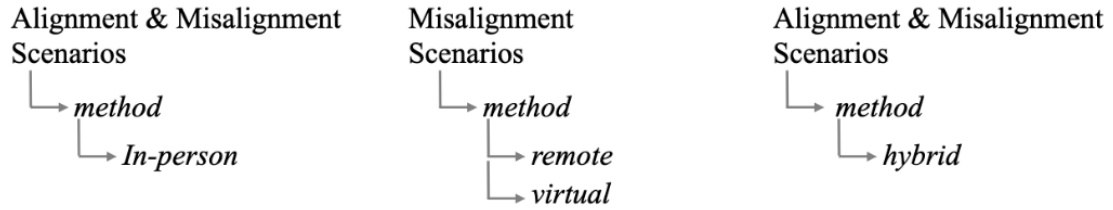


Figure 6-8: Objective 3.4 as identified by scenario elements *method*.

The initial learning space discussed was the traditional classroom experience, where staff and faculty interacted with students face-to-face before COVID-19. The scenario element of *method: in-person* identified this IT interaction. Due to the pandemic, the entire University shifted to a fully remote working and learning environment facilitated by technology. This interaction was identified with the scenario element of *method: virtual* or *method: remote*. A final learning mode identified was when the University tried to return to face-to-face learning and used technology to maintain social distancing or accommodate individuals unable to participate in classes or work in person. This interaction was identified with the scenario element of *method: hybrid*. In the following section, alignment and misalignment scenarios exemplify how IT use did or did not meet objective 3.4

Initially *in-person* learning (*method*) was the norm before the pandemic and thus drove the physical and technical characteristics of each classroom and learning space. The physical upgrades to achieve "state-of-the-art" has been a multi-year effort for the University. The aim of having a consistent and standardized user experience was emphasized by Practitioner #1.

“One of the other things in particular what you're thinking about the student side of the academics that also our labs are standardized. All the computer labs have a basic image that is the same across the entire uh, Commonwealth. Uh. So that what the University Park does and what the New Kensington does, and what Harrisburg does, the core is the

same, and what the individual units do is they add or subtract things based on their local needs. So, there is a consistency for the students in that regard and for the faculty that it kind of looks the same at University Park that looks at any other campus. So we do have that consistency, and that's been around for a while."

The IT department strives to make the user experience consistent in the computer labs and across all campuses. Participants' experiences reflected this achievement in alignment scenarios identified by the scenario element of *method: in-person*. A teaching staff member describes how the standard user interface across classrooms makes setting up presentations easy.

"The positive scenario is, as I would walk into whatever classroom they gave me that day, it was nice that the setup was uniform across the classroom. If I went in, logged in with my Penn State credentials, I was able to bring up my own OneDrive, share drive, get my PowerPoint, all that stuff. . . It was nice having that consistent platform and software and user interface so that no matter what classroom I was in, I was able to do what I was trying to do." [P19.4.P1]

This alignment scenario supports Practitioner #1's desire to ensure IT consistency from campus to campus. The scenario element *benefit: consistency* was linked to this scenario.

The description provided for objective 3.4 does not explicitly describe what it meant by "state-of-the-art." However, participants like this staff member articulated their perception of this term.

"I believe that the classrooms in the BBH building really are state-of-the-art classrooms. They have computers and projectors so that a professor or an advisor, like if we're doing some sort of classroom presentation, we can stand in front of the classroom and have access to anything that we would typically have access to in our offices. All sorts of online accessibility. Doing that in the classroom is so beneficial because you can project it onto a wall so that it is large and everybody can see it and everybody can follow along

and they can see what you're seeing, and they can also have it on their own laptop at their desk so they can be looking at the slide and taking notes.” [P22.4.P1]

The staff member’s description combines physical and technical characteristics. She needs to project a presentation on the wall so everyone can see the same thing and have the presentation on laptops so students can follow along and take notes. The staff member can access the same files from her office and the classrooms. She articulates how the IT in the classroom is “*state-of-the-art*” since it enables her teaching approach. The scenario element *benefit: access to specific data* was linked to this scenario.

The IT department's initiative to update the thousands of general-purpose classrooms across the University has been a multi-year effort. Therefore, it is understandable that participants may have positive experiences in the updated space and perceive the dated spaces negatively. Misalignment scenarios reflected participant experiences with older, legacy spaces at the University.

“The bottom floor of unrenovated Willard [building]. Some of the computer labs look clunky, they look bulky. Much of the hardware is pretty outdated. You're talking about PCs that were probably made in the early 2010s. It doesn't look clean. When I think of integrated technology space, it's open, but there's connection to those devices that still allows both the human connection and the technological connection. Whereas in those [older] spaces, you have a central . . . clump of all desks and computers. It just is very clunky and doesn't allow every student to have an equitable . . . view.” [P27.4.N1]

This student identifies the computer labs in the Willard building that need to be updated. Additionally, he expresses the need for a connection in these spaces that integrates humans and technology. His description describes a physical layout that enables all students to have “equitable views” which was captured as scenario element *cost: inequities*. While upgrading classrooms and learning spaces is a technical task for the IT department, the outcomes for the

participants can include human costs and benefits. In the *SUMMIT* database, this information is identified as elements of *cost* and *benefits* across all applicable scenarios.

One cost is turmoil between staff and faculty due to the meta-data on the University classrooms in the 25Live system. Staff members use 25Live to schedule spaces and classrooms for faculty. Unfortunately, the meta-data about each classroom is not always accurate, forcing this staff member to often physically confirm what is in the room since the accuracy of the information is in doubt in 25Live.

"I've had to go [physically confirm the spaces] because people have told me that there aren't the number of seats there are in the rooms. I had to go literally count seats and take pictures of the room and be like, "there are this many seats. I don't understand. Why are you lying to me?" [laughter]. Sometimes the equipment isn't listed on 25Live. I need to know if it's an iTech room, which just means that the computer is in the room and it has the ability to hook up. You can sign into the computer and project off of [it]. . . versus having to bring a laptop with you and connecting it." [P23.4.N1]

As identified by the *cost: wasted time* and *cost: negative personal emotions*, this scenario identifies that not updating meta-data about learning spaces creates tension between faculty and staff and causes unnecessary work. However, such scenarios also identify information for IT practitioners. For example, upgrading the descriptions of the upgraded classrooms and learning spaces can be just as important as the technical upgrades themselves.

When participants had to quickly adapt to a *virtual* learning and working environment (*method*), facilitated by various information technologies. The IT department had to offer resources and support in new ways to help the University cope with this change. Practitioner #1 has described the process of transition.

"One of the things that we had to pivot very quickly on was the fact that we had to pair all of our classrooms for virtual learning and hybrid learning. . . we were able to outfit,

uh, every single classroom at Penn State, which is in the thousands, with appropriate technology, you know, to create these rooms zoomable. . . So, every single classroom at Penn State had a core level of technology that would work for Zooming.”

The IT department had to prepare classrooms to support an eventual return to face-to-face learning while supporting the virtual environment. Under objective 3.4, participants provided 18 related scenarios using the scenario elements of *method: remote* or *method: virtual*. During this time, the participants did not articulate any alignment scenarios under this objective related to the virtual or remote environment during or due to the pandemic. However, they did articulate their challenges in misalignment scenarios.

The participants’ negative experiences in virtual classrooms were described in misalignment scenarios. The challenges were not technical but were caused by the behaviors of others. The expected behavior norms of in-person learning did not always translate to virtual learning. A staff member mentioned the lack of student interaction during Zoom lectures. Cameras were off, and students did not participate in discussions as much as in face-to-face lectures. At the beginning of remote learning, the University policy did not mandate students to turn on their cameras during classes. One faculty member found student behavior in the virtual environment unacceptable and mandated that students turn their cameras on during Zoom lectures.

“I had a lot of complaints made against my position, which of course, I knew that I was doing something anti-university policy, but what I found was that I was talking to a blank screen. People were not engaged. They were not asking questions. In fact, when they did turn their cameras on, they were still in bed. God knows where they were. They were holding their dogs. Their dog was going crazy. It was just mayhem. ... I don't want to make blanket statements across the board that everyone was like that, but the vast majority were like that. It disrupted people also who were not like that, also trying to

learn.” [P26.4.N3]

This faculty member struggled with student behavior in the virtual learning environment. She found the University policy regarding cameras as a barrier for her to create a better learning environment for her students.

The shift from in-person to entirely virtual classrooms and learning spaces highlighted new challenges under this objective. Misalignment scenarios identify policy issues that impact learning in the virtual environment. These are different than the technical and monetary challenges of upgrading physical spaces. They also identified unanticipated behavior issues associated with virtual versus physical classrooms.

In the fall of 2022 when the University began returning to campus for classes and work. Due to the ongoing pandemic, the mode of instruction (*method*) was *hybrid*. Hybrid learning involves having some individuals face-to-face in a classroom and some attending the same class via Zoom. IT Practitioner #1 talks about the transition from virtual to hybrid.

“Since we’re back to face to face, we’ve left the technology in place because it’s usable for other things. The zoom technology is great for faculty members to bring in guest speakers and things like that into the classroom. It’s also great, for if they want to record the lecture they can use uh, they can record it in Zoom, and then put it into Kaltura and then into Canvas. . . So there are some very, very useful benefits of this, uh, of this pandemic about how the faculty members can help with the outcomes, particularly with our international students, who have difficulty, sometimes understanding a lecture. If they can go back and watch the lecture two or three times it helps them, and any student if they didn’t get the first time, they, if they could watch it two or three times, or something like that. It’s beneficial for them.”

He points out the unintentional benefits of the virtual learning mode they leveraged, such as improved educational outcomes. Recording lectures for students who missed class or needed to

watch the lecture more than once was helpful to students and faculty.

The alignment and misalignment scenarios during this time were identified with the scenario elements of *method: hybrid*. A staff member echoed Practitioner #1's sentiment about the educational benefits of recording lectures in an alignment scenario.

"I think also because of the pandemic, professors have utilized both in-person and online options to help students not miss class for whatever the reason. Whether they're not feeling well or just missed class that day because they didn't go to class or whatever the reason. Being able to have those kinds of things recorded, and even for the students who are in class. If you're studying for a test and you're reviewing something and you can go back to the lecture and rewatch it, that's a wonderful resource to have." [P22.4.P2]

The scenario element *benefit: helping students* was linked to this scenario.

Unfortunately, there were more misalignment than alignment scenarios regarding the experiences of a hybrid learning mode. Negative experiences occurred as students, faculty, and staff moved back to in-person classes but still accommodated those who needed to be remote. This faculty member describes a scenario of the challenges of hybrid teaching.

"We're on campus . . . Every other student and faculty are getting COVID. Right now, the general-purpose classrooms are very minimally set up to do any quality recording unless you have a tablet. . . I just had a colleague who half his class is out with COVID so he needs to be recording but he also wants to be walking around to be facilitating any kind of group interactions. The solution isn't great. He can . . . get a tripod, prop up his computer to capture. He can capture through the desktop but it's not seamless and it takes a bit. . . We have some awesome rooms but I think just generally, they're not set up for hybrid learning." [P14.4.N1]

The challenges of in-person pedagogy techniques, such as walking around, are amplified in a hybrid teaching environment. Participants work to mitigate these issues and maintain an effective

learning environment. The scenario element *cost: workaround* was linked to this scenario.

Adding Zoom capabilities to classrooms was helpful; however, it highlighted the lack of appropriate sound capabilities for effective hybrid learning modes. A Ph.D. student describes the sound issues his working group encountered.

“The working groups meeting is a hybrid. There's some people . . . go to a room on campus and some people who come in via Zoom, and we're trying to get the department to get a microphone just so we can hear people, but what ends up happening is that somebody uses their cell phone and they passes around like a talking stick because that's the only way we can hear people in a room. . . They were still having trouble figuring out hybrid in terms of sound and video.” [P7.4.N2]

Despite the sound issues experienced in the classrooms, individuals make different attempts to mitigate the problems, even using personal IT devices. Again, the scenario element *cost: workaround* was linked to this scenario.

By examining the scenario element of *methods* in the 60 scenarios participants provided under objective 3.4, three prominent types of IT interactions occurred over time. They started with traditional face-to-face learning, then moved to virtual, and finally to hybrid. The pandemic restrictions forced the methods used for learning and work environments enabled by IT.

Examining alignment and misalignment scenarios within each *method* identified some ways that IT use did or did not meet this objective, as indicated by the *benefits* and *costs*. Participants' perceptions conveyed that the IT department successfully met this objective during face-to-face instruction, with challenges arising during virtual and hybrid interaction. Those challenges were not necessarily related to IT, as participants identified other factors, such as University policy or individual behaviors, as factors in misalignment scenarios. The explicit linking of the scenario elements *method*, *benefits*, and *cost* for this objective in *SUMMIT* helped identify why participants viewed some methods as aligned and others as misaligned.

6.6 Objective 3.5: Provide IT Training to students, faculty and staff

“Description: Provide IT training to Penn State students, faculty, and staff on university-supported IT platforms in order to support collaboration, communication, and enabling teaching and learning.”

Among the five objectives examined, objective 3.5 has the largest number of scenarios (65), which are related to IT training for staff, faculty, and students in the University.. Among these scenarios, 37 alignment scenarios highlight factors that make IT training experiences positive, while 28 scenarios identify factors that cause misalignment. These scenarios emphasize the importance of *actors* and *methods* in achieving alignment or misalignment in IT training experiences. The *methods* element is common to both alignment and misalignment scenarios, while the *actor* element identifies local IT organizations and people with alignment. Additionally, the *cost* element is unique to misalignment scenarios.

Alignment scenarios identified factors that made IT training positive for participants. The scenario elements of *actors* and *methods* identified these factors (Figure 6-9). For *actors*, college or college IT department personnel were instrumental in providing positive IT training for participants. The scenario element *actor: IT local*, was linked to a third of the alignment scenarios for this objective.

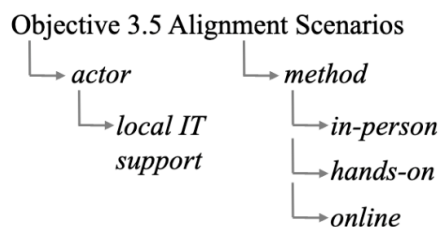


Figure 6-9: Objective 3.5 alignment scenario elements.

A staff member describes how her college provides IT training.

“I think . . . [my college] does a great job of providing IT training to everyone. The training center . . . offer[s] sessions monthly that you can sign up for. Then the Leonard center . . . they also do a great job of providing training to . . . [college] faculty, and staff or teaching and course improvement. Then . . . [two individuals] . . . within our department offers special summer workshops, more [for] faculty. I think Penn State just knocks [it] out of the park and IT knocks out of the park, in these areas to help our faculty really get to know what platforms are out there.” [P9.5.P1]

IT training can be specialized or tailored when individuals from colleges or college IT departments provide it. Participants also have preferred methods for the delivery of IT training.

The scenario element of *method* identified multiple preferred mediums of IT training in alignment scenarios. Participants appreciated the flexibility and variety of the options provided.

This staff member shares her varied preference for IT training.

“I have liked most of the in-person [training] when you're like six people and you'll have your own computer and you're doing it together and there's somebody there you can ask. For me, those have been very helpful, but it's also nice to just be able to say, ‘Oh, I have a half an hour today or an hour. . . Here it is online. You can go do it at your own convenience.’ I'm like, ‘well, that's great.’” [P25.5.P1]

The staff member likes small *in-person* training sessions where she can be on her computer. This format allows her to follow along and ask the training instructor questions. She also likes the *online* training method, as she can fit it into her schedule when it works for her. Another staff member describes his preferences for other methods of IT training.

Informal documents that were available for me to learn about that, it was a very positive experience. . . I would say it was easy to access, all the information was laid out in terms

that someone that doesn't understand fully IT was able to learn. I think an everyday student that's in a master's program could understand what's going on within the platform as well as multiple mediums for learning. There were videos. There were words that you could just read off the sheet instead of having to worry about watching the video as well as diagrams and different things like that. The multiple mediums came . . . into play for that.” [P21.5.P1]

In this scenario, the participant identified “documents,” “videos,” and “diagrams” as helpful. In addition to these different mediums, the staff member explains that he likes the training documents to be “easy to access” and understandable by an IT novice or “everyday student.” While some participants like the multiple methods available for IT training, others identified a preference for a single method.

In four alignment scenarios, participants indicated a specific preference for a single method, *hands-on* IT training. This staff member describes why this is her preferred method.

“I would say that the college . . . did do a . . . workshop on SharePoint and the differences between SharePoint and One Drive. That was . . . training by request, so it was just for our department. But I'd say that was helpful because it was pretty specific. We could talk through different scenarios. It was much more just direct; I had my computer in front of me. This was via Zoom. . . we could drill down into the specific ways in which we were using those technologies. I would say that's definitely something that's necessary for collaboration for sure.” [P20.5.P1]

This staff member recounts her experience of hands-on IT training, where she had her computer in front of her and was able to “drill down” when using the technology. She mentions that the training was specific and conducted by her college (*actor: IT local support*), indicating her preference for who conducts IT training. The participant also considers this IT training on SharePoint and One Drive essential for collaboration, aligning with the description and aims of

objective 3.5.

Misalignment scenarios were associated with the specific methods and costs identified by scenario elements and sub-elements. For example, *method: hands-off* identifies one scenario that reinforces the preference for conducting IT training by using a computer during the training (Figure 6-10).

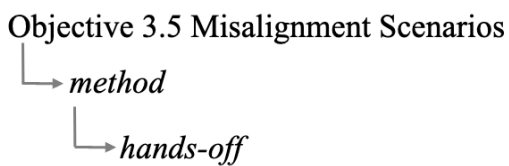


Figure 6-10: Objective 3.5 misalignment scenario elements.

The following staff member describes his challenges with initial training on the University human resources software, Workday.

“I know everybody learns differently, some of us are visual, some are tactile, some are auditory. When Workday was first coming online . . . we were all in a big classroom. We all had a computer in front of us but only the instructor was able to get into the system and they just broadcast it up on the big screen. They said, ‘Oh well, and if you click here, it will do this. If you click here, it’ll do that.’ I’m sitting here in front of a computer, and I’m like, ‘Why can’t I get in and tinker?’ ‘Oh, well, we find that people learn, this the best this way.’ It’s like, ‘Well, no, I don’t. I need to be in it. I need to make mistakes and learn from my mistakes.’ I was very disappointed, and I understand that the way the contract was written drove how the training would be done, and yadda, yadda, yadda.”

[P19.5.N1]

The staff member expressed his disappointment with how the Workday training was conducted.

While he understands that everyone has their way of learning, he prefers a more hands-on approach. This misalignment scenario reinforces a general preference for *hands-on* IT training in the alignment scenarios. Such a preference can be informative for IT practitioners when deciding on IT training methods.

The scenario element of *cost* also identified a factor that contributed to misalignment. Four misalignment scenarios were linked to the element of *cost*: *failure to develop needed skills* under objective 3.5 (Figure 6-11). The cost of this misalignment was due to the IT training not meeting the work skill needs of the participants as they had expected.

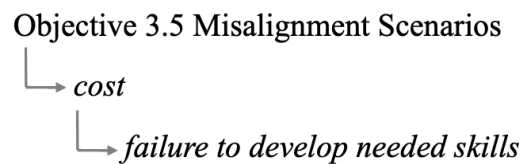


Figure 6-11: Objective 3.5 misalignment scenario elements.

One faculty member describes his perspective.

“My experience with IT training at Penn State has always been not helpful because I’m finding that it’s not specific to my needs. It’s not that it’s not helpful for somebody, they’ve all been very, very well done. It’s just that they’re not specific to what I may need specifically. I tend not to participate in them after that initial training, because I would like to-- maybe this is just how I learn too, but I’d like to figure out my specific need and then play with it.” [P26.5.N1]

The faculty member acknowledges the high quality of the IT training. However, it does not cover the specific areas he needs to learn. A staff member also echoes the same sentiment.

“It would be helpful if trainings were just a bit more specific, specific in terms of, if you work with students and these are the things that you would be using - iTwo for headcount

or how many credits students take each semester or how many people are dropping or withdrawing courses - those kinds of things. I think it would've been certainly more helpful.” [P20.5.N1]

Both participants identify that specific job-related IT training is what they feel they need but that it has yet to be their general experience at the University.

Factors positively and negatively influencing IT training were identified by examining scenario elements across 65 alignment and misalignment scenarios. Participants felt that training from their college or college IT department fulfilled their specific needs, as identified by the scenario element of *actors* in alignment scenarios. The scenario element of *methods* highlighted that *hands-on* training that allowed participants to use a computer during the training was preferred. This method was prevalent in alignment scenarios and confirmed by one misalignment scenario. Some participants preferred multiple training methods, such as videos, documents, and diagrams. Finally, the element of *cost: failure to develop skills* was highlighted as a negative outcome in misalignment scenarios when IT training was not specific to the needs of the participants. These identified factors can inform practitioners when developing initiatives and making decisions to meet this objective.

6.7 Summary

This chapter presented insights derived from assessing alignment and misalignment in relation to the five objectives of the University's IT third goal, "Enable teaching and learning." The scenario elements in *SUMMIT* and the *SUMMIT-Align* method helped identify contextual details that explain why participants viewed their IT experiences as aligned and misaligned. These details can be helpful for IT practitioners in scoping and writing IT objectives by

considering the needs of IT users in their organization. Additionally, the insights gained from this analysis can help practitioners understand how IT users perceive alignment and misalignment within each IT objective. Chapter 7 will discuss how these findings and insights are relevant to the research questions of this study.

Chapter 7

Discussion

7.1 Introduction

This chapter discusses the findings and insights from the previous two chapters as they relate to the thesis research questions. The first section of this chapter addresses the two research questions related to the methodology. The first question focuses on the procedures required to apply scenario-based methods to assess alignment and misalignment. The second question focuses on the advantages and disadvantages of applying the method in this manner. The third research question addresses the key insights about alignment and misalignment that emerged from this use of scenario-based methods. Finally, the limitations of the *SUMMIT-Align* method are discussed, and directions for future work are proposed.

7.2 RQ1: How can scenario-based methods enable user and use-centric assessments of IT alignment and misalignment?

Collecting and analyzing the perspectives of individuals can be a challenging task. This is due to the large volume of data, the unstructured nature of the data, and the inherent subjectivity involved. As a qualitative method, scenarios help capture participants' real-life experiences in a natural setting. As part of a method, scenarios make the use of IT explicit by capturing stories about people and their activities from their perspective (Carroll, 2000). In this case study, participant IT experiences were captured and analyzed with respect to five objectives of the *Strategic Plan - University IT*. While this method produces a significant amount of textual data,

the four stages of the *SUMMIT-Align* method make data collection and analysis manageable and repeatable.

In stage 1 of the *SUMMIT-Align* method, building *a priori* contextual appreciation of the subject organization leveraged my status as an inside researcher. Experience as a student for two years before the start of the study shortened the time required to understand the organizational context of the University. While an outside researcher could build a similar understanding of an organization, inside research can be “more useful in exploring organizational phenomena” (Evered & Louis, 1981, p. 392).

In stage 2, scenario elicitation, participants recalled IT-related experiences with relative ease, confirming the accessibility of scenarios (Carroll, 2000). The anonymity of the interviews also contributed to the participant's willingness to share their experiences. Participants were asked to recall positive (alignment) and negative (misalignment) scenarios to gain insight into the factors contributing to each type of experience. IT practitioners in discussion remarked that getting quality feedback on IT, especially from students, is a challenge. However, despite conducting the research virtually due to the COVID-19 pandemic, the participants were interested in the study and readily shared their IT experiences in interviews.

In the scenario validation stage (stage 3), participant scenarios were coded using the scenario elements as per the codebook (Appendix A) and then constructed into scenario narratives in the *SUMMIT* database. Scenario elements (*actors, components (IT), tasks, data, methods, benefits, costs, and risks*) were linked to the respective scenario narratives. For example, if the participants used Zoom for IT training in an alignment scenario, the scenario element *component (IT): Zoom*, was linked to that scenario. During this phase, patterns and paths of inquiry regarding IT use, alignment, and misalignment were captured via memoing for future analysis.

Stage 4 of the method enabled analysis of scenarios across all the scenarios and within

the five IT objectives. A strength of the *SUMMIT* method is that the approach and software make IT use explicit and the scenarios and elements navigable (Haynes et al., 2013). This strength remained true for the *SUMMIT-Align* method and the *SUMMIT* software. The software structure enabled queries that could answer questions such as “Which IT is associated with alignment scenarios?” or “Are staff involved in scenarios related to *objective 3.1: Expand faculty engagement?*” The analysis identified elements of scenarios associated with alignment or misalignment, which led to findings and insights in the assessment.

A desired outcome of assessing alignment is identifying information that helps IT practitioners manage alignment. For example, practitioners need to understand the reasons for misalignment to address them (Ullah & Laie, 2013). Multiple choice surveys have been an effective method to statistically correlate a level of alignment with one or more specific factors (Cragg et al., 2002; Gerow et al., 2015; Luftman et al., 2017). Conversely, multi-discipline methods represent the user as a generic actor in their assessment approaches (Aversano et al., 2016; Bleistein et al., 2006; Elhari et al., 2011). These methods are effective in their specific assessment aims. However, they do not incorporate individual users and their perceptions. Nor do they identify the reasons those users perceive an alignment or misalignment. The *SUMMIT-Align* method effectively provides a strategic understanding of alignment and misalignment by aggregating the scenarios and their elements. It also effectively captures why individuals perceive alignment and misalignment, which can be informative for IT practitioners.

7.3 RQ2: What are the advantages and challenges associated with using scenario-based methods, and how can these challenges be addressed?

Using scenario-based methods to assess alignment and misalignment is exploratory research that highlighted both advantages and challenges. The *SUMMIT-Align* method has two significant advantages: it captures the dynamic nature of alignment and enables multi-perspective analysis. However, the primary challenge was a considerable amount of manual analysis due to using the *SUMMIT* software, which was not specifically designed or modified for this type of analysis. Some software enhancements are recommended to address this challenge in the future.

7.3.1 Advantage: Scenarios help capture the dynamic nature of alignment and misalignment.

During the study, *SUMMIT-Align* was found to be effective in capturing the dynamic nature of alignment and misalignment, as evident in changes over time and unexpected events that impacted IT use. Participants were given the freedom to provide scenarios without any time constraints, resulting in a diverse range of scenarios that spanned several years. This flexibility allowed for a more comprehensive understanding of user perspectives regarding significant events over time.

For example, Practitioner #1 explained that consolidating IT units from the local to the enterprise level took almost a decade. From the participants' perspective, this was captured as before and after experiences of the two service levels. The analysis of the scenarios highlighted the participants' preference for local IT support as indicated in alignment scenarios and codified as *benefit* scenario elements.

SUMMIT-Align also demonstrated its adaptability to significant and rapid changes caused by environmental factors. In the time period of this study, the COVID-19 pandemic occurred, forcing the University to quickly move from face-to-face to virtual learning and work

environment. However, this change did not affect the use of scenarios to capture user-centric activity. For instance, the scenario element *method* identified different learning modes associated with scenarios participants described. From the participants' perspective, misalignment scenarios were linked to the *hybrid learning method*, while alignment scenarios were linked to *in-person* or *virtual/remote learning methods*. Despite temporal and unforeseen environmental changes, *SUMMIT-Align* demonstrated flexibility and adaptability as an assessment method.

The versatility of *SUMMIT-Align* is partly due to the scenario elements, which remain constant aspects of each scenario (i.e. *actor, data, task*). The content of the scenarios determines the sub-elements under each of these elements. For example, participants differentiated between Penn State University and other organizations when describing IT experiences. As a result, the sub-elements of *actors: PSU* and *actors: external* identified the two organizations. Sub-elements can be developed for different contexts to capture unique aspects of the scenarios without changes to the method or the supporting software. Additional considerations must be taken into account for an organization that does not have documented IT objectives.

Additionally, the *SUMMIT* software and the *SUMMIT-Align* method are advantageous for capturing the dynamic nature of alignment and misalignment because they are a "living repository" of user perspectives. This means that scenarios can be continuously added to the database and analyzed to understand the organization's current state of alignment and misalignment. Regardless of the amount of time assessed or the different environmental factors and contexts, the essential elements of the scenarios remain consistent, and the process is repeatable. The data for this study was collected over approximately one year but could have easily continued for longer, enabling longitudinal assessments.

Alignment is acknowledged to be a continuous and dynamic process (Gutierrez & Lycett, 2011; Yeow et al., 2018) that reconciles top-down plans with emergent processes (Benbya & McKelvey, 2006). Such fluidity requires a compatible method for assessing alignment that

incorporates the everyday activities of IT users and accounts for the contextual factors and their potential to change. The incidental occurrence of the COVID-19 pandemic during this study accelerated change, particularly related to IT, showing the adaptability of *SUMMIT-Align* to reflect the dynamic nature of alignment and misalignment.

Another advantage of scenario-based methods in the field of alignment is their ability to situate scenarios within a specific *context*. When it comes to IT practitioners, it is essential for managers to understand the context in which they are trying to make sense of their complex environments and the specific business and IT challenges they face (Thomas & Venkatraman, 1992). The significance of context is evident when considering participant misalignment scenarios regarding general classrooms that still need to be upgraded, for example. The University has a multi-year plan to upgrade the classrooms, and in this context, these misalignment scenarios are already being addressed. Therefore, in context, these misalignment scenarios are actually a recognition of alignment due to classroom upgrades.

7.3.2 Advantage: *SUMMIT-Align* enables multi-perspective analysis of alignment and misalignment.

This study captured and analyzed the multiple perspectives of the University's staff, students, and faculty. In doing so, several areas of the alignment and misalignment assessment were informed by these perspectives. Specifically, staff members believed that *objective 3.1: Expand faculty engagement*, should also include staff members since they commonly assist faculty in learning how to use IT. Additionally, both staff and faculty members felt that *objective 3.2: Increase digital fluency* - should include them, as they believed that students were already digitally fluent. The insights gained from this study could be valuable for IT practitioners as they

work to develop IT goals and objectives and measure progress.

The *SUMMIT-Align* method enabled the analysis of multiple perspectives using the scenario element of *actors*. Each scenario was linked to the *actor* who provided the scenario and other *actors* in the scenario. This linkage allows scenarios to be grouped by *actor*, so that alignment and misalignment can be identified within each group and across different scenario elements. It is also possible to create multiple *actor* sub-elements, such as staff, faculty, and students, which provides flexibility to add perspectives for different contexts.

Considering multiple perspectives in IT assessments is necessary and informative. Orlikowski and Gash (1994, p. 174) recognized that people hold unique "underlying assumptions, expectations, and knowledge" about technology, known as technological frames. Failure to understand these frames can result in "misaligned expectations" and "unexpected organizational consequences." In evaluations of collaborative systems, scenario-based assessments require multiple perspectives to comprehend the technological, psychological, and social-contextual aspects (Haynes et al., 2004). Additionally, in scenario-based design, multiple points of view are necessary to understand the "human impacts and inherent trade-off in design" (Carroll, 2000, p. 15). Finally, in alignment literature, Benbya and McKelvey (2006) suggest that individual and group perspectives result in tension that leads to "organized emergent behavior and structure" (p. 285). The ability of *SUMMIT-Align* to capture, organize, and analyze multiple perspectives is needed to enhance alignment and misalignment assessments.

7.3.3 Challenge: Manual analysis of data.

A significant challenge of using the *SUMMIT* software to conduct alignment analysis is that it was not explicitly designed for this application. As a result, some analyses had to be

performed manually outside the *SUMMIT* software, using spreadsheets and presentation software. Three manual techniques were implemented to aid the analysis in this study.

The first technique involved developing and using a unique identification code to label each scenario. This code included the participant number, objective, and alignment or misalignment scenario and played a vital role in the analysis. It made identifying and tracking specific scenarios easier and saved time by providing relevant data without referring to other charts.

The second technique, facilitated by spreadsheet software, allowed me to examine each scenario element against alignment and misalignment scenarios and within the five IT objectives. This technique enabled analysis similar to exploratory studies when researchers look for trends or themes in the data (Guest et al., 2012). For instance, by creating a grid of actors and alignment and misalignment scenarios for each objective, I could identify similar perceptions by some actor groups. The risk of inconsistencies and reproducibility of the manual analysis was partially mitigated by the consistency of scenario elements across all scenarios. Identification of prominent themes was primarily via the arrangement of the scenario elements in the spreadsheets.

The third technique, made possible by presentation software, involved visually arranging some of the scenarios based on the time they occurred. For example, Participant #18 provided several scenarios regarding a nursing simulation lab that spanned 11 years. By arranging the scenarios chronologically, it became apparent that Participant #18 perceived the nursing simulation lab as shifting in and out of alignment over the years.

As this study was an exploration, a considerable amount of time was dedicated to finding the best analysis techniques to evaluate alignment and misalignment. In the future, software upgrades to *SUMMIT* could help streamline this process by providing more automated analysis methods. For example, the ability to sort and visualize scenarios by date would make it visually easier to investigate when alignment and misalignment shifts occurred. Another software

enhancement that would save time is a more robust query and filter feature built into the *SUMMIT* software. These enhancements could significantly improve the efficiency of the *SUMMIT-Align* method when analyzing alignment and misalignment.

One specific change to the *SUMMIT* software involves adding a time-based scenario element. By recording dates as a separate element, it would be easier to analyze scenarios with a focus on temporal occurrences. For instance, understanding user perspectives before and after the implementation of new information technologies could provide valuable insights to IT practitioners. When combined with visual capabilities, scenarios could be mapped across time, incorporating relevant information technology milestones to enable analysis.

7.4 RQ3: What insights about IT alignment and misalignment can be gained from the use of scenario-based methods?

The primary purpose of this study was to explore scenario-based methods to assess alignment and misalignment in a case study. The assessment revealed two insights about alignment and misalignment at the University. The first insight discusses the value that IT user perspectives and IT use can provide for IT objectives and strategic IT decisions. The second insight is that IT practitioners can glean actionable information from the use of scenario-based methods. The following section will describe these insights in more detail.

7.4.1 User perspectives can inform IT objectives and strategic IT decisions.

The organization's IT objectives in this case study directly involve IT users. Therefore, user perspectives on the alignment and misalignment of those aims can be informative. For example, participants indicated that access to IT and IT training are necessary in alignment scenarios for *objective 3.2: Increase digital fluency*. Those tasks are the focus of *objective 3.3:*

Improve access and affordability and *objective 3.5: Provide IT training to students, faculty, and staff*. This observation indicates that the goals are interconnected in subtle ways. In this example, digital fluency may not increase if there are challenges in accessing IT or IT training is not effective. The advancement in one objective may be hindered by setbacks in another objective.

The participants acknowledged the efforts of the University IT department towards achieving *objective 3.4: Invest in state-of-the-art classrooms and learning spaces*. Their insights were codified as *benefit* elements in alignment scenarios praising the updates made to general classrooms. On the contrary, a staff member also highlighted in a misalignment scenario that if the meta-data about the updated classrooms is not updated, it creates problems between faculty and staff. This misalignment could be addressed by ensuring that the meta-data in the classroom scheduling system is correct. Examining multiple scenarios focused on the same IT objective provided detailed insights that would be difficult to gather from other methods like surveys.

User perspectives can also inform strategic IT decisions. For example, the finding that misalignment can be a source of strong negative emotions from the participants. Several misalignment scenarios revolved around the University mandating specific IT tools for staff and faculty to use for work tasks. The participants had terrible experiences with IT, and the descriptions included words like "hate" and "confusion." The compulsory use of this IT, which is a source of such negative emotions and shared among a group, can significantly impact an organization's culture. When an organization routinely subjects its IT users to negative IT experiences, that negative experience becomes a norm and, therefore, part of the culture (Chan & Reich, 2007). Since culture can impact alignment (Chan, 2002; Watson et al., 1997), practitioners should consider that not addressing misalignments in their organization from a strategic level can create more misalignments or even a culture of misalignment.

Another example of how user perspectives can inform strategic IT decisions involved the decisions to centralize IT support at the University. The senior IT practitioners evaluated IT

support based upon cost per ticket and the reduction of local IT units from 120 to approximately 65 over the past decade. These quantitative measures are in tension with the things that user's value. The IT users assessed IT support based upon relationships they had developed with their local IT personnel. Their responsiveness and how the IT person from their department made them feel was highlighted in their alignment scenarios. There is clearly a tension between the two perspectives, making IT decisions at the strategic level complex.

Frameworks and models used in research often overlook the IT user and their perspective as part of the alignment concept. Although Benbya and McKelvey (2006) recognized the user-IT interaction at the individual level of their co-evolutionary alignment framework, research still lacks methods that assess this level. Furthermore, research must articulate how the user perspective relates to the operational and strategic levels. The *SUMMIT-Align* method assists in capturing and representing the *meaningful use* of technology from a user perspective (Haynes et al., 2013). The interconnected scenario elements of this method enable analysis that can identify factors related to alignment and misalignment associated with specific IT objectives and across the organization.

7.4.2 Assessing alignment and misalignment can identify actionable information for IT managers.

An important aspect of this study is that it evaluated both alignment *and* misalignment. This approach provides a more comprehensive understanding for IT practitioners than examining just one aspect. Throughout the assessment, evaluating both types of scenarios helped to identify the factors that influenced the participants' perception of alignment or misalignment. To pinpoint the contributing factors, it is crucial to analyze both scenarios and determine if these factors are reinforced in opposite scenarios.

For example, in scenarios provided for *objective 3.5: Provide IT training to students, faculty, and staff*, participants identified preferences for IT training by method. The analysis revealed that hands-on training, where participants had their computers in front of them and could follow the instructor, was preferred in alignment scenarios. In addition, misalignment scenarios reinforced that hands-off training, where participants only watched the instructor, was not favored. Based on this information, IT practitioners can incorporate hands-on training methods to potentially improve the effectiveness of their IT training programs.

According to Luftman et al. (2017), practitioners need actionable information to manage alignment. Previous research tends to focus on assessing either alignment (Cragg et al., 2002; Gerow et al., 2015; Luftman, 2003) or misalignment (Carvalho & Sousa, 2014; Ori, 2014; Weeger & Ulrich, 2016). However, this study followed the lead of researchers who assessed both alignment and misalignment (Aversano et al., 2016; Yeow et al., 2018). As a result, comparing the two types of scenarios provided actionable information for practitioners.

7.5 Study Limitations

It is important to acknowledge some limitations of this study. As an exploratory case study to understand how scenario-based methods can assess alignment and misalignment, the primary focus was on the novel application of the method. The alignment assessment is specific to Penn State University; however, the method is intended to be replicable at other organizations. Three limitations were identified in this study.

The first limitation concerns the anonymity of the method and its ability to provide actionable data to practitioners. During the interviews conducted with the participants, it was made clear that their personal information would remain confidential, and only the researcher

would have access to it. As a result, the participants were openly willing to share their experiences. The study did identify actionable information that practitioners could use to address misalignments or maintain alignment. However, practitioners may need more precise details on where or when scenarios occurred, and the individuals involved to address misalignments effectively. This is necessary due to the large size of the University and the multiple IT units across the colleges and campuses. Implementing this method to assess alignment in an organization needs to balance the anonymity of data collection with the value of actionable information for practitioners.

The second limitation is the focus on the perspective of individual IT users to assess alignment and misalignment within a single organization. From this perspective, the *SUMMIT-Align* method has effectively captured human interactions with information technology to identify factors contributing to alignment and misalignment. This approach was adopted to address the need for more research at the individual level while acknowledging that this level is only one of the three levels identified in the coevolutionary alignment framework (Benbya & McKelvey, 2006). The assessment does not represent the operational level since scenarios were not collected from individuals in the IT or business departments. Additionally, although senior IT practitioners at the strategic level provided feedback on the method and assessment results, they were not asked to provide scenarios. This study can serve as a basis for future multi-level assessments of alignment and misalignment, including perspectives from all three levels.

The third limitation acknowledges that higher institutions have a different structure, performance metrics, and strategic objectives as compared to other profit and production-driven organizations. Consequently, the assessment findings from other organizations would most likely differ from this study. However, the *SUMMIT-Align* method was modified to maintain the adaptability and flexibility of scenario-based methods to assess alignment and misalignment in any type of organization. Additionally, a detailed explanation of the method's four stages was

provided to facilitate the replication of the method.

7.6 Future Research

This study's exploration of scenario-based methods has led to three potential directions for future work. First, research can build on this study by using other methods to validate the findings. Second, action research can enable a better understanding of IT practitioners and their day-to-day operations for a broader application of the *SUMMIT-Align* method. Lastly, further work can expand beyond the individual level to a multi-level analysis of the coevolution of alignment (Benbya & McKelvey, 2006).

One recommendation for further study is to triangulate the findings of this assessment using other methods. For example, creating a survey based on the results of this assessment can help confirm the general applicability of how a larger group of university users perceive alignment and misalignment. This study can clarify whether *objective 3.2: Increase digital fluency*, should focus only on students or whether faculty and staff should also be included. Another potential research is to combine quantitative measures of the same objectives with this study's findings. At the beginning of this research, the IT department had developed quantitative Key Performance Indicators (KPIs) for the five objectives used in this study. Since the KPIs were still in draft form, data had yet to be collected to compare, combine, or contrast them with this assessment's findings. A combination of quantitative and scenario-based methods may result in a more comprehensive alignment and misalignment assessment.

One suggestion for future research involves conducting an action research study within an IT department to gain insight into the perspectives of IT practitioners on alignment assessments. *Action research* is an iterative process that involves the collaboration and learning of

both the researchers and the subjects within their social system (Baskerville & Myers, 2004). This approach ensures that the IT department actively shapes the research outcomes rather than just being the subject of the study. Future research could focus on how specific scenarios can better inform alignment decisions in day-to-day IT operations. Continuously assessing alignment across an organization using the SUMMIT-Align method could also help manage alignment's coevolutionary and emergent nature (Benbya & McKelvey, 2006). In this way, action research could explore how to reconcile the perspectives of users and IT practitioners to improve the organization.

Finally, the *SUMMIT-Align* method could assess the multi-level phenomenon of alignment as described by Benbya & McKelvey (2006). Although this study mainly focused on the individual level, future research could explore assessment within operational and strategic levels, and between all levels. To identify similarities and differences, the perspectives of IT and business managers could be captured in scenarios that involve the same IT objectives as users. Furthermore, IT and business executives could select scenarios that best exemplify IT objectives and goals from their unique perspectives. Scenarios can serve as a common unit of analysis, enabling a within-level and multi-level analysis. Additionally, scenario-based methods could bridge the communication gap between business and IT managers and executives (Reich & Benbasat, 2000).

Chapter 8

Conclusion

This study has explored using a scenario-based method to incorporate IT user perspectives in assessing alignment and misalignment in a major university. By eliciting IT users' *meaningful use* of IT in the context of five University IT objectives, scenarios were focused on IT use relevant to the study organization. The study utilized the four stages of the *SUMMIT-Align* method to capture, code, and analyze IT user experiences and assess alignment and misalignment based on IT user perspectives. As a result, this study offers three contributions to the field.

First, the *SUMMIT-Align* method demonstrates how to explicitly relate strategic IT objectives to the perspectives of individuals using technology. The method codifies the contextual elements of user-IT experiences into common scenario elements, which help capture insights into how participants view alignment and misalignment. These insights may derive from a single scenario, an alignment and misalignment pair of scenarios, or across multiple scenarios. The analysis assesses alignment and misalignment across an organization as perceived by IT users. The *SUMMIT-Align* method helps identify how IT users perceive the written IT objectives.

Second, this study demonstrates the advantages and challenges of implementing scenario-based methods in assessing alignment and misalignment and suggests potential mitigations. The *SUMMIT-Align* method provides two main advantages: it is adaptable in capturing the dynamic nature of alignment and enables multi-perspective analysis. The scenario elements are the basic building blocks of scenarios, regardless of context or time, making them adaptable. Additionally, *SUMMIT-Align* captures multiple perspectives, providing feedback to help senior IT practitioners understand group behavior. However, the primary challenge of using the *SUMMIT* software to

conduct alignment analysis is that it was not specifically designed for this application. As a result, some analyses had to be performed manually outside the *SUMMIT* software, using spreadsheets and presentation software. Future software enhancements to *SUMMIT* may facilitate more automated analysis to address this issue.

Finally, this study has demonstrated that considering IT users' perspectives of alignment and misalignment within an organization can be informative. First, the participants' IT use scenarios revealed how they perceived the written objectives of IT. Second, participants' prior IT experiences can impact how they perceive the alignment or misalignment of subsequent IT experiences. Finally, examining shifts in alignment and misalignment from the user perspective reflects the dynamic nature of the concept at the individual level.

Overall, this study highlights the ability and importance of incorporating IT users' perspectives in assessing alignment and misalignment within an organization. Using the scenario-based method *SUMMIT-Align*, it is possible to capture and analyze IT user experiences and gain valuable insights into how their users perceive the alignment and misalignment of IT to organizational objectives. These insights can help senior IT practitioners better understand user group behavior and make informed decisions to improve IT alignment and achieve strategic organizational IT objectives.

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Appendix A

Codebook

Code: STU

Element/Sub-Element: Actor / Student

Definition: A current student at any level of learning enrolled at any Penn State University campus or college. Referred to as a “scenario originating actor” in codebook.

When to use this code: Use this code once per scenario to identify the originating actor as a student. Often the actor only identifies themselves at the beginning of the interview. In each scenario, use this code to label the pronouns “I” or “me” one time in the scenario. Also code any additional actors in an originating actor's scenario.

When not to use this code: When a faculty or staff member was previously a student, but their current position is as a faculty or staff member.

Example of quote illustrating the code:

Interviewer: *“Ok, I just want to verify that you are a political science student?”*
Participant: *“Yes.”*

Below is part of a scenario with the same student.

“Yes, I can definitely attest to one thing that I actually experienced a couple of days ago. I was trying to access our SharePoint site on my organization.”

Code: FAC

Element/Sub-Element: Actor / Faculty

Definition: A current faculty at any Penn State University campus or college. Referred to as a “scenario originating actor” in codebook.

When to use this code: Use this code once per scenario to identify the originating actor as a faculty member. Often the actor only identifies themselves at the beginning of the interview. Therefore, in each scenario, use this code to label the pronouns “I” or “me” one time in the scenario. Also code any additional actors in an originating actor's scenario.

When not to use this code: When a student has served as a faculty assistant, or when a staff member has taught a course.

Example of quote illustrating the code:

“Yes, and it actually has changed. I am Assistant Teaching Professor.”

Below is part of a scenario with the same faculty member.

“This is something I wish we actually did more of.”

Code: STA

Element/Sub-Element: Actor / Staff

Definition: A current staff member at any Penn State University campus or college. Referred to as a “scenario originating actor” in codebook.

When to use this code: This code is needed once per scenario to identify the scenario perspective originating from a faculty member. Often the actor only identifies themselves at the beginning of the interview. Therefore, in individual scenarios, use this code on to label the pronouns “I” or “me” one time in the scenario. Also code any additional actors in an originating actor's scenario.

When not to use this code: When a student has a job at Penn State University.

Example of quote illustrating the code:

“I’m staff, yes.”

Below is part of a scenario with the same staff member.

“I think engineering does a great job of providing IT training to everyone.”

Code: EXT

Element/Sub-Element: Actor / External to Penn State University

Definition: Individual who is not affiliated with Penn State University.

When to use this code: Code any actor that is clearly identified as not being affiliated with Penn State University.

When not to use this code: Do not code any actor that falls under one of the other Penn State University actor codes in the codebook.

Example of quote illustrating the code:

“So, there was a guest lecturer coming in one evening to a classroom in Borland.”

Code: UNK

Element/Sub-Element: Actor / unknown

Definition: Individual or a group who is not clearly identified by the participant or unidentifiable by the context of the interview.

When to use this code: Use this code when it is unclear who the participant is referring to in the interview. Often a pronoun.

When not to use this code: Do not use this code if you are able to determine who the participant is referring to by the context of the interview.

Example of quote illustrating the code:

“There’s a lot of different things in there, but people don’t really know it exists.”

“I used Yammer and reached out to the ID community and was able to connect with people to figure out what I needed to figure out about the Kaltura integration with Canvas.”

Code: ITL

Element/Sub-Element: Actor / Local IT help

Definition: Individual or group that provides local IT help. Local referring to specific college or campus.

When to use this code: Use this code when the scenario originating actor identifies an actor providing IT help at the college or campus level.

When not to use this code: Do not use this code when the scenario originating actor is not clear about level of IT help.

Example of quote illustrating the code:

“Oh, our campus IT I think they're amazing.”

“Now, I have to say this, I think the world of IT both at the college level and at the university level.”

Code: ITU

Element/Sub-Element: Actor / University IT help

Definition: Individuals or groups that provide university-wide IT help.

When to use this code: Use this code when the scenario originating actor identifies an actor providing IT help at the university level.

When not to use this code: Do not use this code when the scenario originating actor is not clear about level of IT help.

Example of quote illustrating the code:

“I’ve had some computer problems I’ve had to call like, there’s a college one and then there’s the university one sometimes I’ve had to call the university one for some of my issues, but they told me exactly who to call and everybody’s been very friendly and helpful.”

Code: LIB

Element/Sub-Element: Actor / Penn State University libraries

Definition: Individual or group associated with Penn State University libraries.

When to use this code: Use this code to identify any actors that are associated with any Penn State University library.

When not to use this code: Do not use this code if it is not clear that the actor is associated with a Penn State University library.

Example of quote illustrating the code:

“I just want to throw this out there that our nursing library and, I felt at Penn State library as a whole, did a fantastic job.”

Code: PSU

Element/Sub-Element: Actor / Penn State University

Definition: Any organization, person or group of people that are part of the university and not specifically identified by other actor codes.

When to use this code: Use to identify any actors that are associated with the university. Use this category for departments, alumni, colleges, and pronouns that are conveying Penn State University.

When not to use this code: Do not use this code if the actor meets the criteria for any of the other Penn State University actors.

Example of quote illustrating the code:

“Now, of course, after being in the system for years, I can help folks that are new to the university.”

“I was trying to access our SharePoint site on my organization, the Penn State Singing Lions.”

Code: IT

Element/Sub-Element: Component / Information Technology (IT)

Definition: Information Technology definition is any computer used to store, send, receive, and manipulate data or information.

When to use this code: Use to identify any IT within the scenario. One or multiple IT can be identified for any scenario. Code any reference to IT, including pronouns or slang terms.

When not to use this code: Do not code any items that do not meet the definition of IT presented in this codebook.

Example of quote illustrating the code:

“So, just even walking them through in that way, whether it's through phone, email or on Zoom has been a very successful way of training, students and helping them learn, um, you know the photo archive.”

Code: TA

Element/Sub-Element: Tasks

Definition: The specific activity that the actor was trying to complete using information technology in the scenario.

When to use this code: Use this code to identify the specific activity that is being done with IT. This includes activities such as learning to use IT, IT training, or purchasing IT for example.

When not to use this code: Do not include tasks that don't involve the use of IT.

Example of quote illustrating the code:

“So I spent 30 minutes the other day, having to create a document version of my midterm exam because Canvas wasn't able, to um, you know, deliver it. “

Code: DA

Element/Sub-Element: Data

Definition: The data or information that is being stored, sent, received or manipulated by information technology.

When to use this code: Use this to identify the different data elements that are involved in the scenario. Some examples include personal information, course material, briefings, videos, photos, and voice communication.

When not to use this code: Do not use this code to identify data that is not involved with the task or IT in the scenario. Do not code pronouns or generic terms that are by implication referring to data

Example of quote illustrating the code:

“They're required in order to complete their assignments, to be able to access photoshop or create something in adobe spark.”

“It's an amazing space. I'm sure that we can probably find photos and images and stuff I know we took some for their press release.”

Code: MD

Element/Sub-Element: Methods

Definition: An approach or technique for accomplishing a task.

When to use this code: Use this code to identify a specific approach or technique for accomplishing a task with IT. For example, “in person”, “hybrid”, “screen share”, or “remote” to describe how educational material is delivered or communication is accomplished.

When not to use this code: Do not use this code when the task does not use IT or is not related to the use of IT.

Example of quote illustrating the code:

“I've had other students do it, and we were in person. Which that worked in a similar way, um, but if we were virtual and didn't have the opportunity to like do screen share and stuff like that it may have been much more complicated because I wouldn't have been able to point them in the right direction.”

Code: BEN

Element/Sub-Element: Benefits

Definition: A positive aspect or outcome of a scenario as identified by the scenario originating actor.

When to use this code: Use this code to label any positive aspect or outcome that is expressed directly by the originating actor of the scenario. This can often be expressed using emotional terms such as “happy”, “relieved”, “pleased”. Also, in terms of productivity and ease of use such as “time saved”, “easy to use”, or “simple.” Code phrases that help identify the full benefit.

When not to use this code: Do not use this code when the benefit is not related to the use of IT.

Example of quote illustrating the code:

“Yes, being able to deliver class, being able to teach off of Canvas. Having the students access that. I love the integration with Zoom when we were all virtual, so that was really good. It's just easy to navigate.”

“I think this is pretty convenient and saves time and a lot of inconvenience for students that doesn't live or go to school in UP campus or Hershey.”

Code: COST

Element/Sub-Element: Cost

Definition: A negative aspect or outcome of a scenario as identified by the scenario originating actor.

When to use this code: Use this code to label any negative aspect or outcome that is expressed directly by the originating actor of the scenario. This can be expressed using emotional terms such as “frustrated”, “angry”, or “upset.” Also, in terms of productivity and ease of use such as “wasted time”, “work around”, and “confusing.” Code phrases that help identify the full cost.

When not to use this code: Do not use this code when the cost is not related to the use of IT.

Example of quote illustrating the code:

“They have to be equipped with the tools and the access in order to do that, and especially during this remote period I know that most students are not on a level playing field. And that makes me very upset.”

“I would really appreciate much more one-to-one person on demand and training . . . That would cut down on a lot of wasted time on the part of faculty and for sure students as well.”

Code: RISK

Element/Sub-Element: Risk

Definition: A potential negative aspect or outcome of a scenario as identified by the scenario originating actor.

When to use this code: Use this code to identify a potentially negative aspect or outcome as identified by the originating actor of the scenario. A risk is often expressed by “if x happens then y will happen,” where y is the negative outcome.

When not to use this code: Do not use this code when the risk is not related to the use of IT.

Example of quote illustrating the code:

“And I tell him, don't do that, please don't turn it off, because if you turn off your projector it takes two minutes to shut down two minutes to turn it on and we had already done it and I said, please don't do that.”

“I finally have gotten to a place where I have Internet in order to tell you that I can't do this because I don't have Internet and I don't want to fail.”

Appendix B

Interview Guide

Thank you for being part of this study.

If we happen to be disconnected from Zoom during this interview, I will attempt to reconnect via Zoom.

Please confirm the screening criteria:

- Are you 18 years or older?
- Are you a student, employee, or faculty of Penn State University?
- Do you use Penn State's Information Technology?

For this study, the definition of information technology (IT) is any computer used to store, send, receive, and manipulate data or information.

Consent:

- Do you receive the one-page consent information that I emailed you?
- Do you have questions about the consent form?

Answer questions
OR

Since there are no questions, I am going to start recording this session.

This interview is broken into 2 parts:

- I will ask you questions about you and your position at Penn State.
- I will then share a presentation with IT objectives of the university and then ask you for scenarios of IT use that you feel are aligned with each objective.

I would like to ask you some questions about you:

- What is your position / title at Penn State University?
- Which College / Department?
- What degree are you seeking? (if applicable)
- How long have you been a student/faculty at Penn State?
 - Please describe your comfort level in using information technology.

Scenario solicitation:

I am going to present you with five objectives of a goal from the Penn State University En in random order. Please read the objective and the description provided. I will ask you to provide a positive or negative scenario of IT use that is related to the stated objective. It does not matter which scenario you provide first, negative or positive.

Ensure participant covers each element of the scenario:

- *Information technology*
- *Task*
- *Method*
- *Approximate time by semester. For example, spring 2020.*
- *Benefits, costs, and risks*
- *Confirm negative or positive scenario if not clear.*

Do you want to go back to any objective and add any scenarios?

Thank you so much for your time today, I greatly appreciate it.

Can you think of one or two people who would be willing to be a participant in this research?

Appendix C

Scenario Narratives

Objective 3.1: Expand Faculty Engagement - Alignment Scenarios (14)

P1.1.P1 TLT provided resources and opportunities to faculty during remote teaching

A staff member values the TLT workshops and TLT symposiums during the remote teaching semesters. She feels that TLT has done a good job of supporting the faculty, especially during the remote teaching time with tips on how to navigate Zoom and keep students engaged. More faculty know about TLT now than they did before having to teach remotely. Sometimes it's hard to get faculty to take the initiative to invest in their technology and skills but with the resources and opportunities provided by TLT, faculty engagement has been brought up.

P4.1.P1 Live streaming of course during COVID

A faculty member taught a class on additive manufacturing of concrete structures remotely during COVID. The university sent a person to videotape the class and live stream it to students and record it for later viewing, which actually worked very well. The students were able to see the entire additive manufacturing process as if they were there. Additionally, they could watch the video of the class later.

P5.1.P1 Media team documented series of 3D printing events

A faculty member describes a series of 3D printing events with a working relationship that she feels is an example of positive faculty engagement. A media team came to every event, documented everything, brought a photographer, and the person in charge of overseeing the linking of information was on time and there every time. The communication with the faculty was seamless and perfect. These events enabled the faculty member to educate two groups.

P9.1.P1 Positive experience with transition to online learning due to COVID

A staff member recalls the positive experience the Department of Mechanical Engineering faculty had in the transition to online learning due to COVID. Initially, it was "very stressful", but a key member of the department worked closely with the Design Learning Team to make the transition. The result was a positive response and a lot of communication.

P13.1.P1 Student excited to use TriNetX for research

A graduate student has gone through orientation for using TriNetX as an investigator for a clinical trial and is excited about the capabilities to engage with professors or anyone else on the research team. The software has the ability to give members of the same research team access to files of the same format type and the ability to communicate. The use of this software is in response to government legislation that ties Medicare and Medicaid reimbursements to ensuring health information is more easily available across different systems.

P14.1.P1 Faculty engagement enabled by colleagues on Yammer

A faculty member describes learning about how Kaltura worked with Canvas as part of his job to collaborate with faculty to set up their online course. He used Yammer to reach out to the instructional design (ID) community. Yammer creates easy-to-access help since he can post any question and connect with ID colleagues. He feels that this is a way to expand faculty engagement.

P16.1.P1 Helpful features on Canvas for grading

A student described the positive aspects of using Canvas as a Teaching Assistant when grading assignments. There's a function called rapid grading on Canvas that helps you grade student forums but shows you all the initial posts and responses, so you don't have to dig into the discussion forum. She really liked this function because it also allowed you to put your comments in for the students to read although she doubts the students read the comments.

P18.1.P1 Teaching and learning programs expanding with simulation labs

A staff member feels that the teaching and learning programs are a positive example of faculty engagement that she has participated in that have increased. Prior to COVID, there was simulation training at Penn State Hershey that the faculty in the College of Nursing were invited to participate. She also recalls that they brought other faculty outside of nursing in to see the nursing simulation lab to learn how to use it and to potentially build it into their course curricula. For example, faculty from HDFS, Psych, SCT, engineering, and kinesiology. The kinesiology faculty were preparing to build their own simulation lab.

P19.1.P1 MS Teams provides shared space for faculty and staff to accomplish the mission

A staff member describes the use of MS Teams as positive as it provides a shared space to accomplish the mission. As a staff member, he interacts frequently with faculty members on promotion and tenure committees within the College of Earth Mineral and Sciences. He mentioned this as a positive in reference to having to go through Box and all of that to get use to using Teams. MS Teams provides the committees with a one-stop-shop for access to the information they need (STRE scores for example) to do their job. It provides both the faculty and the staff a shared space where they can operation and both accomplish the mission they are trying to accomplish.

P20.1.P1 Faculty engagement internationally due to Zoom

A staff member describes the ability to accomplish faculty engagement internationally due to Zoom. Due to COVID, they have not been able to travel to international locations. Fortunately, due to Zoom, they are connecting with Australian company hosts, company HR representatives are connecting with students, and they are doing presentations. The engagement has been faculty with faculty and faculty with students. She described the engagement as a really nice collaborative effort.

P24.1.P1 Student drop-ins with advisors has transitioned to all virtual via Zoom and has remained virtual

A staff member describes the transition that has been made to virtual due to the "present work situation" [assuming COVID]. Students used to meet with advisors in-person to get assistance with their curriculum in the political science undergraduate advising office. For two years now, the meetings have been virtual and continue to be all virtual via Zoom. The staff member feels this has actually benefited the students since they can see the advisors more often because they can stay where they are. The student signs in to Zoom on a form and then waits to meet with an

advisor. This staff member now enjoys using Zoom and has gotten much better at using it. Initially, he was a little skeptical but after multiple sessions, meetings, workshops, and training, he has gotten better. The organization continues to use Zoom and drop-in sessions with students have remained virtual. In his opinion, this is because he doesn't think people are comfortable with in-person and it is working well.

P25.1.P1 Advisors created CANVAS course to help inform students

A staff member describes a CANVAS page for advisors where they can put postings about academic deadlines, professional talks, and other newsletter-worthy events. It actually replaced the weekly newsletters and is updated continually. Students can sign up for the "course" in CANVAS so they can see everything that goes on. Other data that is there: deadlines for majors or minors, a company is coming to speak about what it takes to work in a hospital, how to get into med school, emergency contact information if you've been assaulted, drop-in hours for advisors, registration dates and deadlines, and research, job, grad school, and internship opportunities. An expert in CANVAS actually came and taught the four advisors on tips and how to set up the CANVAS page.

P25.1.P2 IT teams are friendly and helpful

A staff member describes her overall experience with IT. There is her college IT team and a university IT team. She admits that she doesn't know the distinctions so that is sometimes frustrating. She usually reaches out to her college IT team, and they show her where things are and who to call. When she had to call the university IT help desk, they told her exactly who to call and she felt everyone was very friendly and helpful.

P26.1.P1 World Campus course designers create consistency for students

A faculty member describes the positive experience that has resulted from his time with the World Campus classes. The design experts (staff) that work with the teams help determine the best way to deliver content. They have developed a uniform look to World Campus courses so that whenever students matriculate through their degree, they can find information in the same spot in every class. Since the World Campus is exclusively online, it helps that it is consistent and uniform.

Objective 3.1: Expand Faculty Engagement - Misalignment Scenarios (18)

P1.1.N1 TLT Symposium proposal rejected for staff member

A staff member submitted a proposal to the TLT Symposium on how to create a virtual remote internship using the Adobe Creative Suite. Her proposal was returned because the TLT "is for faculty by faculty" so they required the staff member to have a faculty co-sponsor in order for her to present at the symposium.

P2.1.N1 Advertisements of IT that is not effective with students

A student points out that Penn State tends to advertise IT in a way that is not effective with students. Some examples include Professors telling students that you are paying for IT in your tuition so if you don't use it, you spent your money on nothing. During student tours as a freshman, the student recalls that when he toured the 3d printers in the library or visited the One Button Studio during coursework, those spaces would be empty. It caused the student to wonder

if there are so many students at PSU, why isn't anyone using these spaces? He also commented that even free workshops offered on Friday evenings in the library are not "enticing" to students.

P4.1.N1 Approving hiring actions and work hours for people not under direct supervision

A faculty member in charge of a Center has multiple hiring actions and work hours that he must approve. Many of the people do not work under his direct supervision so it is problematic. He feels it would be nice if Workday (approval system) could list all the people who are working under his Center, so he doesn't have to exchange emails with multiple people before approving the action.

P5.1.N1 Lack of skill and time to make work known on social media

A faculty member struggles with the time available and the skills to keep social media updated to make her work known. When she worked at Cornell last year, they had staff members that did this for them. Her research life and teaching are complex, demanding, and time-consuming. This faculty member meets people incidentally at conferences that want to collaborate with her. If IT services could help update social media accounts to show what faculty and students are achieving that would be "fabulous."

P6.1.N1 Faculty engagement expectations from a student's perspective

A World Campus student doesn't feel that the leaders of the faculty don't engage with the students. In his three years as a student, he still doesn't know if there is a dean and who it is, or what the faculty is about. While he gets a number of emails in his Outlook email, he may have missed important ones from such people due to the bombardment of emails from places like the bookstore. He hopes when he comes for his graduation, there will be more faculty engagements at that time.

P9.1.N1: Transition to online learning due to COVID difficult for older faculty

A staff member recalls the frustration that older faculty had in transitioning to online learning due to COVID. Many of them were not familiar with Zoom or recording as they were more comfortable with the in-person classroom environment. She had to sit in a conference room and walk them step by step in setting up an account and using Zoom.

P11.1.N Faculty who is a Ph.D. student without access to needed research IT tool

A faculty member in the College of Nursing who was also a student working on her Ph.D. needed access to SPSS for her research but had to ask for access and then explain why. Neither her faculty nor Ph.D. student status gave her access because she was in nursing. She eventually got access to the software but still feels she has no idea what all "we" have a license to.

P12.1.N1 IT help depends upon where you got your computer

A faculty member describes a negative scenario of spending 30 min to 2 hours trying to figure out how to fix an IT issue he may have. When that doesn't work, he calls the university IT help number, which they always answer, but then they tell him to call the IT help desk in the College of Education since he has a computer issued by his college.

P12.1.N2 IT Help desk responses not timely

A faculty member describes his experience with the IT help desk a generally not timely. When he doesn't get an immediate answer, the help desk sets up a ticket, but this faculty member feels that the answer to the ticket can take much longer than what he has time to wait. While he has "cheat sheets" he finds it time-consuming to go back and review several documents to find a simple

thing. He even speculates "if this idea of creating these forced online text-based responses really help as more to aggravate faculty." He feels that there aren't enough IT people to respond to all the different issues. He suspects that it is more costly to have every member at Penn State spending time trying to fix IT issues than to have a large number of IT people who can quickly answer questions.

P12.1.N3 Faculty member has cheat sheet to get to chat to get help

A faculty member describes how he has to have notes in his cheat sheet to get to chat to get the help he needs. When he clicks on the chat function, he gets online frequently asked questions. Someone told him that if he scrolls down past that information he can get to the direct chat and click on there to get his questions answered.

P13.1.N1 Student not seeing professors integrate available technology into classrooms

A graduate student who has a master's degree in nursing education which focused a lot on integrating technology into the classroom doesn't see her current Ph.D. professors integrating available technology into the classrooms. Generally speaking, the teaching style of her professors hasn't caught up to the level of technology that she knows is available in the teaching realm. For example, live polling systems help maintain engagement during a lecture by having students use their cell phones to answer a poll that displays anonymous results to the entire class. The benefit is the teacher is able to assess learning and let the students see their peer responses to the poll.

P14.1.N1 Kaltura capability shortfalls limit use

A faculty member describes the capability shortfalls of Kaltura that limit his use of the software. Generally speaking, he does not find the UX of Kaltura immediately intuitive. He gives the example of the channel versus the default versus your media playlist. He is unable to find a way to have subfolders. Another issue he has is that when you record a session on Zoom, only the person who recorded it has immediate access. They have to go into Kaltura and move it to a channel for others to see. He feels he would use his videos and Kaltura more if the UX were a little easier.

P16.1.N1 Switching from student to faculty view in CANVAS a challenge

A student describes her experience moving from the student to the faculty view of CANVAS when she was a TA. She was confused in the beginning since there was so much information. She didn't look through all the information available until she had problems. She eventually got used to it and now it's not that hard.

P18.1.N1 Need more in-person IT training

A staff member describes the challenge it is to learn technology over Zoom. She felt that the in-person training for faculty on technology and open computer labs used to be more common. She felt the decrease in in-person training even before COVID. Over Zoom, she recalls you could take Box training but that for people of her generation (mid 50s) she feels that it hard to learn new technology and even harder online. She noted that many people in senior positions at Penn State, Harrisburg, and Penn State Health are older than her and she thinks they would like more in-person training.

P19.1.N1 Transition to Workday problematic due to shift in manager role from staff to faculty

A staff member recalls the problems that have occurred during the transition to Workday. One change that was made during the transition was to make faculty members the manager role in the

system. As a result, only faculty members could post job positions, and review and hire a candidate which cut HR out of the process. Additionally, the faculty had to learn how to use Workday and at the same time had to learn LionPath and Simba. This convergence of a new role in Workday and learning new systems simultaneously was overwhelming and frustrating for faculty who felt their focus should be on teaching. Using the previous system, IBIS, the staff member could assist the faculty with their roles in the system and "everything happened." One workaround to the issues is a new role was created in Workday called the Manager Recruiting Support (MRS). The staff member said that it works well in EMS but not so much in the College of IST where there is a different structure.

P23.1.N1 Hybrid faculty meetings are difficult

A staff member describes the difficulty with hybrid faculty meetings. Right now (Spring 2022), faculty meetings are done in person and via Zoom. The auditorium in which the meeting is held is hard to hear and the meetings are long and dry. It's also hard to engage the faculty as a scheduler since there's more interest in faculty doing research than teaching. He heard that the meetings were much better when they were remote. He did not go since he didn't have to go. He feels some people are in denial that remote can be better sometimes. He is also stressing about this meeting because he is in charge of the next one and doesn't want to hear complaints about the meeting.

P24.1.N1 Transition to Qualtrics to gather information not working out well

A staff member learned to use Qualtrics and decided to use the tool to gather information from faculty at the beginning of the semester. Usually, she asks for information and gets an email. She tried to use the Qualtrics tool to ask for information, but it wasn't going the way she wanted it to go. Only three people responded to the survey, the rest just sent her emails. She admits that she is an old hat at all the new technologies and some of the younger girls in the office thought she should try Qualtrics. They said it would be easier. She is in the process of developing one for students as well. So far, she doesn't feel like it is working in her favor.

P26.1.N1 Technology should supplement not replace in educational process

A faculty member describes his viewpoint on information technology in the educational process. He feels it should supplement but not replace education. He thinks the basics are missing where an individual must go to the blackboard and demonstrate they understand the concepts. He feels this is missing from the educational process. Not just in the graded assignments but also an opportunity to learn it and practice it prior to getting a graded assignment. While it is great that we have all these wonderful technological tools, he is more of a hands-on person.

Objective 3.2: Increase digital fluency - Alignment Scenarios (32)

P1.2.P1 Teaching students how to locate, download and use Penn State provided applications.

A staff member of the university used Zoom to teach students how to locate, download and use applications to help them complete their assignments during workshop meetings. The staff member shared her screen via Zoom to show students how to locate the Adobe web apps on the university website. She showed the students how to navigate the Penn State sign-in and download applications from the Adobe Creative cloud. She was also able to demonstrate to students via Zoom how to use the application. The applications mentioned were Adobe Photoshop and Adobe Spark.

P2.2.P1 Resume review via Brazen

A student saw his roommate using Brazen for job interviews but had not used the software himself. When forced to learn to use Brazen in order to get his resume reviewed, he found it a very useful tool and he felt it increased his digital fluency.

P2.2.P2 Assignment submission options for CANVAS

A student found it a positive experience that CANVAS allows different file formats for submitting an assignment. He was unable to figure out how to save a word document and upload it from his iPad but felt the ability to submit a photo, PDF, word document, or Google drive link helped save him on assignment submissions.

P3.2.P1 Online access to project documents for distributed work

A staff member who works on multiple projects has team members across several states that are able to update and check common tracking documents for recruitment and scheduling in SharePoint, Office 365, and Excel spreadsheets. She felt that it was wonderful and helped make it work better since it's accessible to everyone on the team.

P5.2.P1 Collaborate on same document

A faculty member appreciates the ability to collaborate with other people on the same MS Word document, anytime and anywhere in the world. She likes the ability to write comments right in the common document instead of having to explain the location of something in a document.

P6.2.P1 Current industry software equal digital fluency

A World Campus student feels that Penn State courses that use applications that are already current in the industry are a positive example of digital currency. For instance, Prezi was used in multiple online courses he took with Penn State. As a student who is also currently working as a researcher in industry, he would research software and see if it was currently used and who was using it.

P8.2.P1 Using Mentimeter during presentation as an easy way to get input

A staff member recalls using Mentimeter during a "Women in Ag" presentation as an easy way to get input from the audience. You give the audience a link, they put in a code, you ask a question, the audience puts in three responses and the tool builds a word cloud where themes and similar threads are visually displayed.

P9.2.P1 Micro-credential workshops on software

A staff member of the mechanical engineering department describes the micro-credential workshops that they provide to answer the need or suggestions of industry partners and students. It is offered outside the curriculum and managed by a faculty member. The workshops were conducted in person before COVID. Prior to COVID, alumni or someone from one of the industry partners would teach them in person. This involved scheduling hotels and meetings for the instructors, but it was also an opportunity for networking.

P9.2.P2 Virtual micro-credential workshop benefits

A staff member discusses the advantage of conducting the micro-credential workshops over Zoom instead of in-person. She felt it was actually easier to get the talented alumni and industry instructors and also more cost-effective than flying them in and getting them a hotel room.

P11.2.P1 Technology website enables digital fluency

A faculty member in the College of Nursing feels that the technology website provides a lot of access for students and enables digital fluency. The website contains "how-tos" which are very easy to follow. She also likes this site because she can tell the students how to get there. The availability of programs such as Office 365 is another example of a positive for students.

P12.2.P1 Student push faculty member to produce videos

A faculty member describes how his student pushed him to produce a set of videos prior to spring break (2020). He joked that you could see how exhausted he was in these videos as he was almost falling from his chair. This was fortunate since, during spring break, Penn State transitioned to remote learning due to COVID-19. Since production was already complete on the first 166 videos, they were able to continue their work and recorded the next batch of videos during Zoom. The faculty member credits his students for pushing him to produce the videos.

P12.2.P2 Students teach faculty more about becoming 21st century digital citizens

A faculty member describes that when the university made the transition to remote learning, none of his students failed to make the transition. He feels that the master's and doctoral students he works with are heavily invested in being 21st-century digital citizens. He feels they teach him more than he teaches them about being a 21st-century digital citizen especially since many of them were born in the middle of the digital world, they come with much better training.

P12.2.P3 Students ahead of faculty in using technology

A faculty member describes a situation where he was a Professor-in-Charge and his colleagues wanted to censor and limit ways of communication among students. He felt that they were threatened that students could share information faster than they could. His response was "good luck" since he felt the students were 20 steps ahead of the faculty in using platforms such as WhatsApp, WeMeet or Google Groups. He felt it would be better to focus on educating the students about confidentiality, the security of conversations, and "what can and cannot" be discussed on these platforms. He also felt that continuing to open platforms, use novel platforms, and improve platforms will allow students to take advantage of the technology and "make the world better." Teach them how to use these platforms from an ethical professional point of view. He definitely felt that the students are way ahead of the faculty in regard to becoming digital citizens.

P13.2.P1 Great virtual IT onboarding in the Nursing Department

A student describes a positive experience when she virtually onboarded the nursing department during COVID. The department sent a "cheat sheet" to each student with specifics on what IT-related things they were going to need to be successful in the nursing program. The cheat sheet on the Office 365 suite described all the programs available in the suite, the purpose and how to access information about each program. There was either a direct tutorial or a link to a tutorial to be able to use specific software.

P13.2.P2 Prerecorded orientation of library resources was positive

A student of the nursing department describes the positive experience she had with the nursing department and Penn State libraries, making sure that students understood all the technology available at the library. A set of library modules specific to nursing students was prerecorded and included the contact information for the nursing-specific librarian.

P14.2.P1 Digital fluency increased by access to IT

A faculty member describes the enabling of digital fluency by the access to different IT systems the university provides to students. For example, he mentioned Zoom, CANVAS, Yammer, and Kaltura. He specifically called out IT used by the College of Engineering such as Virtual Desktop Interface (VDI), MATLAB, and Qualtrics. He didn't know who supported these college-specific tools; University IT or college IT. He was also thinking of the example of recording things in CANVAS but felt that most students were doing that with Instagram and their phones. Overall, he felt that PSU was pretty good with the educational technology available and the support for IT for students.

P14.2.P2 One Button Studio experience example of improving digital fluency for students

A faculty member remembers that when he was a graduate student, he used the One Button Studio to create a video using a green screen and edit it. He recalls editing it in Adobe Premiere and a lab computer that was available. He felt that this was an example of PSU being ahead of the curve and available for the students to take advantage of for classes or personal use. He felt that as a student it increased his digital fluency in terms of video capture and video editing.

P15.2.P1 Faculty finds the PSU IT platforms an overarching positive experience

A faculty member describes the IT platforms that he uses at Penn State as user-friendly and a positive experience. For instance, Zoom and CANVAS, are very user-friendly and he didn't have to be taught how to use them, which he feels is a big plus. He mentioned MS Teams but admitted that he doesn't use it that much. He feels his email system "is fine."

P15.2.P2 CANVAS can be user-friendly in making exams once you know how

A faculty member describes the ability to do exams in CANVAS as very user-friendly. He mentioned multiple-choice exams, open-ended comment tutorial exams, hybrid exams online, and interfacing in-person. He felt that the tool was not transparent and obvious at first, he searched around and asked folks in IT, but he never got "a real answer from IT." He eventually got an answer to his question from a student who got a different answer from someone else at IT. He felt it was a "net positive" experience since he doesn't have any issues making exams anymore.

P16.2.P1 Student uses OneDrive to share research videos with the team

A student describes the change from Box to OneDrive and how she regularly uses OneDrive to upload videos and research data that her and her research team share with each other. She feels that sometimes OneDrive has glitches. For instance, the other day (Jan 2022), she was uploading five videos and one of them would not upload. It just stopped in the middle of loading. She canceled and tried uploading multiple times, but the same video would not finish loading. She finally converted the video into a zip file and then it loaded successfully. She feels these tools are pretty quick, easy to use, and usually pretty good.

P16.2.P2 Student appreciates convenience of using OneDrive

A student describes some of the conveniences that she gets from using OneDrive. She appreciates the unlimited amount of storage that she thinks she has. She also works from home on a MacBook which is a different system from the University. However, she just uploads her assignments or files on OneDrive, and then she doesn't have to take her personal computer with her since she can access the files in her office.

P17.2.P1 Digital fluency for students not an issue

A staff member feels that digital fluency is not an issue at all, especially for students who are provided "everything possible." For staff and faculty, Office 365, with Word and PowerPoint, can

be accessed at home. She loves the fact that she can get to everything on Office 365. She has only heard complaints from students about programs that are not Penn State's.

P18.2.P1 Successful use of new web access authentication (Azure SSO)

A staff member reflects on her ability to successfully navigate the new web access authentication software, Azure SSO, and look up information on select students on DocFinity. She describes the steps to accomplish this. She was trying to go in and get to the permissions access screen. However, she needed full access to DocFinity, which typically only admissions have access to. She needs access to information related to admissions so she can see the candidates for the accelerated second-degree nursing program. She successfully completed that task today (Feb 2, 2022) after having been frustrated by the task the previous day (see P18.2.N1).

P19.2.P1 Wi-fi in dorm rooms, use of CANVAS, and the world itself helps with digital fluency

A staff member describes activities he feels are contributing to digital fluency. Penn State providing Wi-fi in the dorm rooms helps students become familiar with the technology. That is something that he did not have when he was a Penn State student. The school using CANVAS as a tool for students to keep tabs on their academics and submit homework assignments helps them become more comfortable with "the digital workspace" that will be a big part of their future. He also felt that "the world itself is helping with digital fluency."

P20.2.P1 Flipped classroom example of using technology in unique and different ways

A staff member describes one instructor who uses a flipped classroom. Instead of meeting three days a week in person, his class only meets for two days, and the third day is virtually over Zoom. He also has readings and videos for students on CANVAS so they can prepare for their next in-person class the next week. Students still submit their assignments on CANVAS as well. She feels he is doing a really nice job of incorporating technology into his classroom to create efficiencies and avoid some of the cumbersome in-classroom things.

P22.2.P1 Starfish is helpful for academic advising for students, faculty and staff

A staff member describes how Starfish helps students, faculty, and staff navigate Penn State academic advising. Students can make an academic advisor appointment in Starfish which can be in-person or virtually over Zoom. Students can put specific notes in the appointment so that staff members can tailor the appointment to what is important for the student. Staff members often notify students to let them know what is available through Starfish. If a professor has a concern or sends out a Starfish flag, it also notifies the staff member so they both can reach out to the student.

P22.2.P2 LionPATH is an example of positive use of technology with students

A staff member describes how LionPath is an example of a positive use of technology with students. LionPath houses all students' academic information, so she helps students walk through the software to see where they are in the degree progression. Sometimes when they need additional credits, such as electives, they have to choose specific courses which meet the requirements. She feels that teaching them how to use LionPath helps them be responsible for their own degree by fulfilling the requirements but also ensuring that they're taking classes that they would find beneficial.

P23.2.P1 Anatomy.TV is a great tool

A staff member recalls as a student using the library databases a lot. One example is Anatomy.TV tool that he learned about taking anatomy and physiology for his schoolwork. He said he used it recently because someone told him they hurt their knee, and he was trying to figure out what they did. The tool allows you to pinpoint an area on the human body and just peel back layers of skin and muscle striations. He said you can learn about many things about the human body with this tool and it is still available in the library database.

P23.2.P2 LionPATH is helpful in looking up people's contact information

A staff member describes how easy it is to look up people's contact information. The directory in LionPATH has ID numbers, phone numbers, and names. Often a faculty member will ask him to sign up a student for a course of credit, but they will have spelled their name wrong. The staff member is able to use the Add/Update person function in LionPATH to see the plan and narrow it down to the correct person. He doesn't like waiting for responses from faculty because he will end up waiting forever to get a misspelled name.

P24.2.P1 Students are more digitally fluent than some of the staff and faculty

A staff member describes how the students have demonstrated that they are more digitally fluent than some of the staff and faculty. She gave a specific example of students creating posters from all the data the student collects. In her department, they are political science majors, and they collect a lot of data, use numbers and game theories and use programs that she doesn't know how to use. She feels the older faculty are set in their ways, but the younger faculty are coming in and helping students learn what they need to be learning.

P26.2.P1 Digital fluency is the integration of platforms

A faculty member sees digital fluency as the variety of options available and the ability to incorporate different types of platforms within. For instance, the ability to embed a link into CANVAS. You can easily show Ted Talks, YouTube, and other videos inside of CANVAS courses.

P27.2.P1 Some digital fluency efforts regarding social media

A student explains the numerous efforts around campus that he feels are examples of increasing digital fluency for students. He sees this in students making strides with the online space such as business-like marketing arts for communication or advertising majors. He feels there is a strong push to be involved in social media, social media engagement, and social media skills. He feels there is also opportunities to get involved with administrative departments in that aspect with also organizations, clubs, and Greek life. He recalls one experience which demonstrates that perhaps PSU isn't doing as much as it could. He took a business writing course where he learned how to format a resume and write up a research report. What he didn't learn was how to set up a LinkedIn page or the best way to market yourself online. He thinks it is important to interact online in the business space and that PSU is making efforts but that there is more that can be done.

Objective 3.2: Increase digital fluency - Misalignment Scenarios (21)

P1.2.N1 Onboarding student to work at Penn State

A staff member described a negative experience of hiring a student to fill a wage payroll position and onboarding the student using the Workday system during remote work. She had the student fill out all of the paperwork required in the Workday system but it was very confusing to the student, and the staff member had never used the system before. The staff member and student

thought they had filled everything out until an email was sent warning the student that she would be terminated since everything was not completed in the system. Some of the regular onboarding and registration activities were not fully accounted for in a remote environment. The student had signed up for the needed onboarding session but never received confirmation that she was registered. After calling the help desk and talking to other colleagues, the staff member learned this situation had happened to other students. Both of them were very frustrated by the situation.

P3.2.N1 Unable to access files located in PASS

A staff member recalls issues accessing files when Penn State was using the Penn State Access Account Storage Space (PASS) for file storage. PASS provides universally accessible disk space/file storage space for use by anyone at Penn State. Unfortunately, this staff member remembers that if you couldn't access files from a project task space in PASS and didn't have a local copy on your desktop, you could be at a stop work situation.

P3.2.N2 Unable to access files located on SharePoint

A staff member recalls a negative experience of not being able to access her files on SharePoint because of temporary server issues. She categorized these as "short-lived" issues that usually would be fixed "pretty quickly."

P5.2.N1 Log in requirement disrupts work

A faculty member is collaborating on an MS Word document in One Drive and in the middle of the collaboration, she is asked to log in again or the system identifies her as a guest user. She has the expectation that the log in should be automated and work consistently.

P5.2.N2 Multiple IT issues are frustrating

A faculty member cannot locate her files after the university has migrated away from Box. Even though she has them backed up, she has also had two computers in the past six years or so. The compounding IT issues require time to organize and interconnect everything in order to keep pace with her research projects and teaching. She expressed a significant amount of frustration with the situation.

P6.2.N1 Course didn't use software that is current with industry

A World Campus student took Web Fundamentals, IST 816 and felt that the course could have used more recent applications that industry is using. As a web designer for a hobby, he is familiar with current applications and while the course used Dropbox and HubSpot, he felt they could have used more recent applications.

P8.2.N1 Hybrid meeting frustrating due to issues hearing people

A staff member expresses her frustration with "volume issues" during hybrid meetings. In a particular example, she was hosting an advisory meeting for one of her projects. Some people were in person, some were in a hotel on GoToMeeting. The two different groups of people had a hard time hearing each other. The hotel group worked with their local IT department and the hotel with no success. The staff member felt it was hard to get the flow of the meeting with the volume issues. (Oct 2021)

P9.2.N1 Faculty and industry view digital fluency different

A staff member recalls multiple discussions about what digital fluency means in the mechanical engineering department. The industry prefers ("I don't want to say pressure because it's not pressure") that students are fluent in specific software, such as MATLAB. The faculty wants

students to be able to solve problems and use any software. They don't feel that teaching a particular software is what they are here for.

P9.2.N2 Hard time connecting with students who have graduated

A staff member remarks about the low response rate on a survey with alumni students due to a lack of contact information. Her department sends out surveys to three class years of alumni about five years after graduation to ask questions about how their education at Penn State has served them. She understands that with Office 365 students get to keep their email addresses for life and that will help with contacting them after they graduate.

P11.2.N1 Using IT when English is second language is difficult

A faculty member describes the difficulty students, whose second language is English, encounter when using information technology. As these students struggle with learning a language, they also have to learn where and when to click and the difference between clicking and hovering. She feels this adds to the difficulty of using IT.

P13.2.N1 Institutional onboarding at Penn State during COVID was rather clunky

A student describes her experience with onboarding Penn State (negative) versus the nursing department onboarding experience (positive). She conducted onboarding in a virtual environment due to COVID, mainly via email and asynchronously. She had to communicate with several different people in several different departments. She felt that it was supposed to be streamlined and centralized in one location, but it wasn't an effective way to navigate through all the different components. She thinks it was called "the people software" where everything was supposed to be in one location.

P15.2.N1 SIMBA is a counterintuitive system

A faculty member describes his negative experience of trying to navigate through SIMBA, the system that handles grants since it is very counterintuitive. A decision was made that administrators have to deal with the system and not faculty, which is a plus for him. He tried the system out once or twice but not again. He understands that the system is written in German originally and the translations have caused a lot of issues with backend and frontend software components.

P17.2.N1 ExamSoft not a Penn State IT issue but an IT issue

A staff member describes the ExamSoft software as software that gets a lot of complaints but it's not Penn State's fault, it's the program. The nursing program uses it to take tests and quizzes. Complaints include not being able to get on the software at very important times such as when the students are supposed to be taking a test. Another student complained that the software is not compatible with her computer, and she has spent hours on the phone with the third-party software IT support.

P18.2.N1 Frustration with access to system and instructions to access the system

A staff member recalls her frustration with trying to access DocFinity with the Azure SSO. She followed the bulleted instructions she was given repeatedly but it wouldn't work. She was perplexed by the missing step on the checklist to open access to the GlobalProtect system first but assumed that since it was a new system, that wasn't needed anymore. However, the system kept "spinning" and she would get messages that she took pictures/snapshots of and then emailed to the person who gave her the directions. He emailed her back the next day and told her to make sure she was in GlobalProtect first. She was frustrated and irritated because she was still figuring

out how to access the system at 9:30 pm at night, had a deadline she was under with a student acceptance to the program, and had put in a lot of hours trying to figure out the problem.

P20.2.N1 CANVAS not available until the first day of the semester

A staff member points to the non-availability of CANVAS for students prior to the start of the semester. She feels that many of the off-campus students are not prepared in terms of understanding how the systems that PSU uses for online courses. They cannot orient themselves to the buttons and links or use the library resources which she describes as "a whole another rabbit hole of confusion." She thinks this has to do with instructors not wanting to teach a class or answer questions from students prior to the semester starting. One solution she thinks would fix this would be to have some sort of test run trying out a course. One benefit is that it would be free and would help students understand how to navigate CANVAS and be comfortable with the technology.

P21.2.N1 Transition to remote difficult with little information available about face-to-face online media

A staff member recalls the lack of information available about face-to-face online media when the school transitioned to remote due to COVID (March 2020). It would have been better if there were more access to videos or training materials that could have helped.

P22.2.N1 Making changes to LionPATH or Starfish is an arduous task

A staff member describes the long and difficult process of adding or deleting any of the data in LionPATH. A change must go through the faculty senate and the registrar's office and many other stakeholders for review and/or approval. She estimates it takes approximately a year to get such changes through the process. Part of the problem is that the forms for changes are online and not intuitive. Even the four advisors and the professor in charge weren't sure the forms were being submitted correctly. As a staff member, one workaround is to go into the system and make substitutions. She doesn't feel that this would hold up anyone's graduation. She does find it contradictory that as a staff member she is encouraging students to use LionPATH to manage their own degrees but then she has to say, "By the way, LionPATH is wrong."

P23.2.N1 Staff member doesn't have access to certain student information that he needs

A staff member describes the issues he has in accessing certain student information that he needs to do his job. When he worked in the records department, he had access to everything. When he moved to BBH, he lost that access but has worked at BBH for four years and still has issues getting access to the things he needs to do his job. He has asked people for access, and it still hasn't happened. For example, he does TA assignments but cannot pull up the Student Support Center in LionPATH because he doesn't have access. His workaround is to go into QuickEnroll and get access to a student's current schedule. For undergraduates, he has access to the Student Support Center but not for graduate students. He can still complete his work tasks but has to do them in a roundabout way.

P25.2.N1 Students are "selectively fluent"

A staff member describes her perspective regarding digital fluency and students. She feels that students are much more fluent than she is. She explains that students are even called "digital natives" while she is a "digital immigrant." To her, this means that she doesn't speak the language very well. She thinks they are certainly very comfortable with computers as most of them have laptops. Some of them bring their laptops to her advising appointments to take notes and look at the degree audit. She feels they really know some social media apps, like TikTok and others.

However, she feels this is a "selective fluency" as she has seen situations where they don't use technology. For example, a student waited for a week to get an appointment with her to ask a question that could have been answered by an internet search or looking on the registrar's website. Another example is student resistance to learning SPSS. They kick and scream about it and only learn because they have to. She also finds that students are resistant to looking at their degree audit (My Academic Requirement) in LionPATH because it's "old style" and long. It does provide them with all of the information they need for their degree.

P25.2.N2 Slowness of Starfish creates resistance to student use

A staff member attributed the slowness of Starfish to the resistance of students to use it. Starfish is used for students to schedule appointments. After she meets with students, she has to type a note in Starfish about what they talked about. Sometimes it takes 3 seconds and sometimes it takes 18 or 20 seconds for the screen to come up for her to be able to type the note. She explains that when she has 10 appointments in a day, this delay really slows you down. The students are not instigators of learning the system, but her approach is to send them right back to Starfish. The faculty puts flags in the system for students related to their performance on exams or notes to come to see them. The school needs the students in the system.

P26.2.N1 CANVAS communication has limitations

A faculty member describes the limitations of communication abilities in CANVAS. The limitations are primarily described in relation to the robust communication that is provided in Outlook. For instance, in CANVAS, the faculty member can respond directly to a student, but he can't add additional students to that email or sent it beyond CANVAS. If he is having an exchange with a student in a course in CANVAS and wants to elevate that exchange to the department level, the director, he cannot do that in CANVAS. He has to copy and paste the exchange into Outlook since the director is not enrolled in the CANVAS course. He feels that messes with the integrity of the communication exchange. This is a constraint of the communication capabilities of CANVAS.

Objective 3.3: Improve access and affordability - Alignment Scenarios (29)

P1.3.P1 Staff member encourages students to use media resources on campus.

A staff member encourages students to leverage the rental opportunities of the media resources on campus as a way to help them and get them access to equipment and technology. She establishes relationships with other members of those resources to help her students get better service and support

P2.3.P1 Ability to Google Penn State software and find download page

A student feels that a positive scenario is an ability to Google software that he can download from Penn State and the link is at the top of the search results. He forgets the name of the Penn State website to go to otherwise find the software.

P2.3.P2 Affordability of the print lab

A student identified the print lab for photography students in graphic design as a positive scenario related to affordability. The paper is free there but the ink costs. As they advance in their studies, the requirement to print larger and larger prints increases and so does the cost. The student doesn't see the bill because his mom takes care of it, but he is appreciative of the low costs and the software in the print laboratory.

P4.3.P1 Computer purchase enables access and affordability

A faculty member recalls that during COVID, their center was able to maintain productivity with research center graduate students by purchasing new computers for the students.

P5.3.P1 Interdisciplinary aspects enabled by IT

A faculty member appreciates the support that PSU provides for interdisciplinary research and relationships using IT. For example, she feels that Box, and now OneDrive enables and facilitates that kind of research by putting different people and partners in touch through these systems.

P6.3.P1 Access to Penn State applications online is positive experience

A World Campus student feels that the access he has had during his coursework online with Penn State has been "impressive" and there have been no issues with access. He specifically called out "the learning platform" which is assumed to be CANVAS since he is graduating in Dec 2022.

P7.3.P1 Student grateful for access to Penn State Maps

A Ph.D. student is grateful for the access to Penn State Maps. She includes not just the "arc map" but also having "Pro" on her desktop to work offline. She feels that trying to use all this software as a single user versus through the Penn State enterprise and student licenses is unaffordable and really cost-prohibitive. She gave the example of the student license she could have purchased for NVIVO through the university for \$60. She couldn't recall a situation "where things were unattainable due to cost."

P8.3.P1 College IT support liaison great help in grant IT purchases

A staff member has good things to say about her college's IT support liaison. Whenever she needs help ordering IT for grant work, she contacts him, and he tells her what she needs and what to order. That way it's very smooth and seamless.

P9.3.P1 Free software available for student use

A staff member feels that the free software, SolidWorks, which is available for Mechanical Engineering students to use over the web is a positive scenario.

P10.3.P1 Tools that support the pursuit of gifts also improves access and affordability

A staff member who works as a Senior Director of Major Gifts appreciates the AWA system that Penn State uses to identify, assess, and track the solicitation of alumni and friends for gifts. The system keeps records of contact, records what they do, helps them communicate with their colleagues, identify the right people, and figure out how to reach/engage them. He considers this tool central to what he does, identifying the right people to engage for gifts for the university which improve access and affordability through scholarships.

P10.3.P2 Remote solicitation of gifts for PSU raises most money in career

A staff member recalls that since they were forbidden to travel during COVID, his job as a major gift officer required him to use virtual tools to solicit alumni and friends of the university for gifts. He used tools like Skype, Zoom and MS Teams to work with people during COVID. He remarked that in the academic year 2021, he raised more money than at any other point in his career.

P10.3.P3 Cisco Jabber enabled "friendlier" phone number to call people

A staff member described the success he had using Cisco Jabber during COVID to solicit gifts for the University. His cell phone number is a 702-area code which is Las Vegas and associated with

the call centers there. People tend to block numbers with that area code. However, he was able to make calls using Cisco Jabber using his desk phone number with an 814-area code. He found more people would pick up with that number.

P11.3.P1 CANVAS is easy to use

A faculty member thinks of the ease of use of CANVAS to deliver course material. She is dedicated to using CANVAS since she can teach off it, students have access, and it integrated well with Zoom when the school was virtual. It is also easy to navigate and create. She likes the ability to put stuff in CANVAS herself without using an instructional designer. She speaks from the perspective of having used the previous system before the school moved to CANVAS. She doesn't really use any of the other apps such as Kaltura, as she doesn't find them useful in her courses.

P12.3.P1 Use of Zoom with multiple users and no logo requirement

A faculty member describes the benefits of using Zoom. He also had experience at an organization/university where access to Zoom was free, but he was required to have the university logo on the screen which was pretty much in the middle of the screen. He appreciated that Penn State let him host an international conference and did not have a logo requirement and was able to provide access to people worldwide for training. Since he came here in 2015, he has found only positives related to the use of Zoom at Penn State.

P13.3.P1 Library orientation/onboarding cheat sheet enables access and affordability

A graduate student describes the library orientation and the onboarding cheat sheet as examples of access and affordability. The library did a good job explaining the database system that is available through Penn State's library and also the partnerships with outside companies for discounted software. Examples of software were Adobe Suite and Office 365 suite which she feels are sufficient to meet the majority of her academic needs.

P14.3.P1 PSU provided loaner laptops for students during COVID

A faculty member describes a positive example of access and affordability when PSU provided loaner laptops for students when COVID forced academic instruction to go remote. He thought the Keep Learning website for PSU provided this information for students. The laptops were for students who didn't have their own or their current computer didn't have the necessary specifications to work with Zoom. The faculty member didn't think the program provided any resources for wireless or broadband, but he thought that would have probably been a bigger deal than the computers.

P15.3.P1 Faculty access and affordability is great

A faculty member describes access and affordability to the technology platforms of the university as great. He has never had to pay for any as a professor and they are easily accessible.

P15.3.P2 Problem with GRADS is about communication, not the tool

A faculty member describes a scenario about the GRADS portal. The portal is where he puts in ratings for prospective students, but he had problems seeing the rating options. He received a screenshot from the head administrator in his department and the problem was that he (the faculty member describing the scenario) did have access to rate the students. He felt the problem was not due to the portal, which he felt is very user-friendly, but due to the communication problem about access to specific capabilities in the portal. He felt this was a positive scenario since it is relative. He feels these things happen and it was a communication gap.

P17.3.P1 Local IT is amazing

A staff member describes her positive experience with her local campus IT office. She finds the team very approachable, especially since she can just walk down the hallway and ask them for help. They come right down to her office, or they put a work order in. She felt they were very responsive. She feels that she has no problem accessing them and if there is anything that she needs, they will get it for her.

P18.3.P1 Nursing program receives donations due to new appreciation for nurses during COVID

A staff member describes the positive aspects that came from COVID. People began to appreciate nurses more and therefore donations and fundraising for the nursing program greatly increased. The program has been able to purchase technology to support the students such as new mannequins and other technology-related items.

P19.3.P1 Computers for students at discounted rate or free is a good program

A staff member describes a program in IST that is a test pilot for computers for students who can't afford them. He believes the program helps students get a discounted rate or for free. He pointed out that you would think students that could afford tuition could afford a computer but often the students are attending Penn State on grants or scholarships and money isn't set aside for computers in those mechanisms. His understanding of the program is an example of addressing some of the access and affordability issues for students.

P20.3.P1 Access for staff, faculty and students to Office 365

A staff member feels that access to Office 365 for staff, faculty, and now students is a rare positive example of meeting the goals of access and affordability. Previously only staff and faculty had access to Office 365, but a new improvement has been that students also have access. She has seen this positive impact on students in that they don't have to pay, and that Office 365 is a resource that they need in terms of Word and Excel.

P21.3.P1 Shift from Angel to CANVAS was positive

A staff member recalls the shift from Angel to CANVAS around 2016/2017 timeframe. He felt this transition was a very positive opportunity for the university to develop and grow the systems. The initial shift was confusing but now he views it as a positive opportunity to streamline different things and allow for more positive interactions with professors. Additionally, he highlighted the internal messaging system in CANVAS is better and tracking week-to-week classwork is also easier.

P22.3.P1 Students have access to affordable IT on campus

A staff member feels that students on campus have access to everything that they need. She feels that has been the case since she has been at Penn State (4 years). Students can connect to Wi-Fi, they have access to printers on campus, and access to computers is easy and affordable. She has not heard any complaints from students that anything is pricey. She hasn't heard students saying that if they need to print out a paper, the paper is not affordable.

P23.3.P1 New changes in LionPath saves time

A staff member describes the coming improvements to the prerequisite overrides process using LionPath as a positive scenario. Students transfer into PSU with prerequisites and don't want to take the course again because they took an honors version of the course. LionPath used to not

recognize that so the students would need to have an override of the course. The process was the student would submit a form to the staff member and the professor in charge and the professor would decide if the student's prerequisite met the requirement. Then the professor would send the staff member a note and say yes or no. The staff member would enroll the student in the course if the prerequisite was accepted. Now the student applies in LionPATH and the professor in charge approves it in the system and they are enrolled. This saves a step. The new changes in LionPATH also prevent time conflicts with courses and keep students from enrolling in too many credits. The staff member doesn't have to oversee that communication anymore. The staff member has not seen this functionality in action yet.

P24.3.P1 Local IT help responsive during COVID

A staff member recalls that her local IT help desk was responsive during COVID. The local IT guy learned Zoom quickly and then helped her learn. During COVID, IT was available just as much as it is now. She didn't experience any more lag with them during COVID.

P25.3.P1 Providing students access to computers during COVID

A staff member describes the impressive action of the IT team during COVID. They were reaching out to students and getting them computers, computer loans, or hot spots for internet access. Many of the students went on spring break and when they didn't come back due to COVID, they didn't have access to the computers they used around the university. Students also did not have internet access where they lived. The IT team was very proactive and on top of the situation. She felt this was very positive for lower-income and rural students. She also understands that this costs a lot of money.

P26.3.P1 CANVAS enables access and affordability for students

A faculty member describes how the use of CANVAS has given him the opportunity to make things more accessible for students. He feels that then leads to affordability. For example, he has been able to provide a lot of the readings in connection with the library system where the students have access to entire books or portions of the book at no charge. He has also done this with lectures, other types of readings, and surveys.

P27.3.P1 Access to laptops helps people continue education during pandemic

A student recalls how PSU provided laptops, free of charge, to allow students to continue their online learning during the pandemic. He feels this was a positive outcome despite when students might not have the Wi-Fi or affordability to continue online in their own homes. He feels there isn't much marketing about these types of programs to allow students to be able to use these resources.

Objective 3.3: Improve access and affordability - Misalignment Scenarios (26)

P1.3.N1 Underserved students disadvantaged during remote learning

A staff member explains the impact that moving to a remote mode has had on her underserved students as well as herself. She identifies underserved students as those whose internet access, computer hardware, or technology skills are deficient enough to make remote participation in class a disadvantage. For the students that she knows are underserved, she makes accommodations. For those that she does know if they are underserved, they fall through the cracks.

P1.3.N2 Training students on inferior digital camera equipment

A staff member is frustrated during hybrid teaching mode due to the pandemic since students have to use their own camera equipment which is often inferior. The students are professional photography majors but do not personally own the type of camera equipment or computers they need to develop the portfolios they need. For instance, taking photos in low light or editing photos using Adobe, which requires a minimum level of computer to use. If the school was not in a hybrid mode, the students could check out some of this equipment to help them develop their skills appropriately.

P3.3.N1 Issues editing some file formats with online software versions (browser version)

A staff member experienced issues doing creative project recruitment posters or flyers. She had issues trying to edit them with online software versions, so she had to go through the extra steps of downloading them to her desktop, and then upload them again. This can mess up version control if multiple people are working on the same file. She specifically called out MS PowerPoint as a problem, but MS Word and Excel are ok for editing using the online software versions.

P4.3.N1 Software license expired during NASA competition

A faculty member recalls a situation where his team was competing in a competition organized by NASA when the software license that ran the robotics involved in his project expired two hours before the competition deadline. Each computer requires a different license to function, which is a nightmare to match the correct license to the correct computer. Since the licenses expire each year, this is a recurring problem. During the competition, the robotics were moving a large concrete structure and to rectify the license situation, the team had to work to get the new licenses in time. The situation was solved by "someone who had the same software" and presumably shared their license numbers.

P5.3.N1 Software license expire at NASA competition

A faculty member was leading a team in the NASA Centennial Challenge when licenses for critical software expired during the competition. The team had requested the removal of the license a month prior to the competition without success. To participate, the team had to move their entire lab and robotic arms in huge trucks to Peoria, Illinois to print in front of NASA judges and TV cameras. A former Penn State grad student helped coordinate getting new licenses.

P8.3.N1 Access to technology negatively impacted by grant policies

A staff member explains the frustration of the policies at Penn State University and how they make it "tricky" to get access to information technology. The Grants and Contract Office has specific guidance that is problematic. One example is that if you are working on six different grants, you have to split the cost of the technology among the six different grants. The problem with dividing amongst grants is that some grants won't allow you to buy technology unless the grantor retains ownership of the technology for three years.

P9.3.N1 Free access to software over the web is suboptimal

A staff member recalls the problem the department had when COVID restrictions were implemented and students couldn't access software in the computer labs. Software is provided for use over the web but with limited licenses. When the labs closed and the online demand for access increased, the department bought more licenses. Unfortunately, more students wanted access than licenses were available and the software was sluggish and slow. Students preferred to have the software put directly on their computers but that was expensive for the department.

P10.3.N1 Access issues to endowments data in the eSteward database

A staff member in the Department of Engineering describes the difficulty in accessing data about a "prospect" who has a joint scholarship between the college of liberal arts and engineering in the eSteward database. Since there is a "stovepipe" issue between the colleges, he has to reach out to someone else who has access and ask them for the information. He would prefer to just get privileges to the information as this manual process "takes a great deal more time than it would be if [he] could just look it up."

P10.3.N2 Non-user's perspective of the transition to SIMBA not positive

A staff member who does not use SIMBA directly has a very negative perspective of the system. The transition from IBIS to SIMBA has been ongoing for years now. However, he has not heard a single person tell him a single positive thing about the way that SIMBA works. The system has taken away from the work that his group has done, eats up staff time like crazy, and even required a fellow staff member to work on SIMBA and no other duties.

P11.3.N1 Extra software costs for students not helpful

A faculty member feels that some of the extra software costs that students have to pay for each semester are not helpful. One program, ExamSoft, is used only for students to take exams. The faculty member understands that it is used to protect the exam process, but the students must pay \$25 for this software every semester. She finds it tedious and difficult to upload the tests. It does not integrate with CANVAS so test grades must be manually entered from ExamSoft into CANVAS. When you have above 50 students, this is really tedious. The other software that students need to purchase at \$1,300 a year is ATI. While this software can administer exams, the "higher-ups" in nursing decided not to use this function. The advantage of ATI is it helps students when "it comes to sitting for their board exam for their license. These costs are not part of the school technology fee so students can't use loans or whatever to pay for them - it's an extra cost."

P12.3.N1 Glitches with Zoom

A faculty member recalls a couple of glitches with Zoom. The first one is when you use a fake background and parts of you disappear into the background. The second one is when you are in one Zoom meeting and switch to another, and someone's sound gets blocked. He sometimes must restart his computer to fix it and has already updated the sound system in his Dell computer to try to fix the issue. He feels it's a weird situation and doesn't understand why this happens.

P12.3.N2 Google Docs not saving changes

A faculty member recalls working on book chapter information in PowerPoint slides saved in Google Docs. He was collaborating on the document with his co-authors and publishing company. Despite the auto-saving feature of Google Docs, his responses and changes to questions were not saved. Therefore, he and his coauthors decided to email PowerPoint slides in small numbers to ensure that comments and changes were saved as a work-around.

P12.3.N3 Email file size limitations

A faculty member describes the limitation of attaching large files to his email. He feels it makes his life easier to share files, chapters, books, pictures, and videos with colleagues for review or editing. Penn State University is the first place he has worked where he was not granted additional uploading capacity for his emails. When he did complain, the limit was raised but since then he has turned to different platforms (WeFile and WeTransfer) in order to send files outside of Penn State in particular.

P12.3.N4 User lacks ability to change duration of sleep lock on laptop screen

A faculty member describes a "silly" story related to sleep time on his university computer. Because he doesn't have administrative privileges, he cannot lengthen the sleep time on his laptop screen lock. When he gets up to get a cup of coffee or takes a phone call while working, he has to log back in again. IT wouldn't lengthen the timeout period for him or give him the privileges to do so. His comment on the situation was, "I thought I was an adult."

P13.3.N1 Student wishes she had access to a subscription to a reference manager

A graduate student wishes she had access to a subscription to a reference manager in the past, such as EndNote, Mendeley, and RefWorks. She knows that Penn State's library has links for discounted subscriptions to some of this software.

P16.3.N1 Online only software is problematic

A student describes the difficulty of using university software that is available online only. For a multilevel modeling class, she used Software as a Service (SaaS) to do coding, but the software can't be downloaded. The student had to use her ID and password to access the software for daily use, which she found inconvenient and difficult to use. Something changed in the system, and she was not able to log in to use the software one day. She tried for a couple of days to fix the issue on her own and then contacted the University IT help desk. They responded the next day and walked her through how to fix the issue. Her assignment was late, but the instructor didn't care about the assignment due dates.

P16.3.N2 Student shares her log-in credentials with research classmate

A student shared her log-in credentials (ID & password) with a fellow research team classmate. The classmate was unable to log on to use a computer from the university with the same credentials as her university Outlook email for some reason. Since she was graduating soon, her classmate did not reach out to anyone to fix the issue.

P18.3.N1 Changes in environment mean changes in simulation that require more money

A staff member describes that changes in the way medicine is done due to COVID require changes in the way the nursing simulation lab needs to be set up. For example, the simulation lab before COVID was mainly focused on a hospital environment but now there is a need for a second simulation that mimics a real home. Nurses need to be trained in nursing in home environments where there could be challenges for an elderly person or someone with special medical needs. She felt that these are not things they would have thought of prior to COVID but since the medical provider environment has changed, the learning environment needs to account for the change.

P20.3.N1 Access to the specific digital resources needed

A staff member recalls two examples of where access to the right things matters. In her first example, she was helping a student how to use Word to incorporate APA citations into a paper he was writing but realized that the web version of Microsoft word does have that feature. The student then had to pay the discounted student rate of \$40 for the desktop version. She felt that it was still a disadvantage for the student to not have access to the full version. The second example was access to digital books or free digital resources through the library as opposed to having to purchase a \$100 book.

P21.3.N1 Lose work data due to VPN connection issues

A staff member recalls the frustrations of having to use "cross-over" systems between the hospital and the university which require VPN at all times to access emails for staff and students. He explained that once he is on VPN, he has to log into all these different systems. If there is an issue with the VPN, he has to worry about not losing his work. In a specific example, he was on an "advanced system" within the development and alumni relations, and he hit save, then the VPN started to reconnect, and he lost all of his work. He finds that very frustrating.

P22.3.N1 Students do not always have great Wi-Fi off campus

A staff member describes the challenges students had, especially through the pandemic with Wi-Fi that wasn't great. For academic advising, her department uses Zoom as the university made a push for the tool. Amongst the department, they use MS Teams, and she knows that there are other tools out there such as Google Hangouts. For academic advising appointments, she always starts out with Zoom and if there are issues such as the screen freezing or students couldn't hear her, they would use chat, email each other back and forth or use the phone. She would always start with Zoom and then use what was needed to make it work. She heard from her students that sometimes they couldn't be in their classes virtually because of Wi-Fi issues or if they were on, they couldn't hear, or screens would freeze up.

P24.3.N1 Central location of IT help means longer wait for help

A staff member recalls when her college IT organization used to be housed in their department. She felt this was nice because if you needed help, they came instantly. Now the college IT organization has moved to a central location, some on-campus and some off-campus. Now when you put a ticket in, you must wait for a day or two for someone to get back to you or IT tries to resolve your issue remotely through your computer. She doesn't think the IT organization is ever going to move back to her department.

P25.3.N1 Staff doesn't understand student monetary choice related to IT

A staff member describes a situation with one of the students that she advises. The fifth-year student has the same computer she used throughout high school. Since it is so old, they can rarely have a video advising session without the computer shutting down. The staff member thinks that it is interesting that students can live in \$1,200/month apartments but don't have the resources to buy a newer computer for their schoolwork.

P25.3.N2 The difficulty of students using only Smartphone for their academics

A staff member describes the difficulties of students using only Smartphones for academics. She explains that the student schedule and academic audit are tediously detailed so viewing them on a Smartphone is difficult. She had one student who took an entire physiology course on his phone during the pandemic. He did all his coursework on his phone because that is all that he had.

P26.3.N1 Access to films is a systemic problem

A faculty member describes his difficulty in gaining access to entire films or portions of films for inclusion in his CANVAS courses. He has two films that he likes to use in his course, but it takes a lot of difficulty and work on behalf of the university to achieve success. Penn State has developed a system to be able to get a yearly permit for films but sometimes it expires halfway through the semester he is using the film. The process used to take a month or so to get permission and now it takes about two weeks, so the length of time is improving. This has to be repeated yearly however and sometimes he resorts to just using YouTube to show a snippet of a film.

P27.3.N1 Internet access limits opportunity in remote learning

A student describes the struggles that other students had regarding internet access during the pandemic. Since there are different internet providers and plans, not everyone had enough bandwidth to stream a Zoom call or a lecture. He heard other students discuss their struggle with their mics cutting out during calls due to "bad Wi-Fi." This means that not everyone had the same opportunity to interact in the same ways as in-person learning.

Objective 3.4: Invest in state-of-the-art classroom and learning spaces - Alignment Scenarios (27)

P1.4.P1 Use the C-PAD Teaching Lab

A staff member teaching a course on multi-media makes every effort to use this room in order to give her students access to the highest level of technology. She is willing to reduce her course enrollment numbers in order to teach in the classroom. The classroom has digital technologies of all kinds including sound equipment, desks that can be written on, projector screens, and a softboard. She feels it is an ideal room for a multimedia internship since it gives students access to the highest level of technology.

P2.4.P1 Print off front page of Newspapers

A student working in the library's Dr. Keiko Miwa Ross Global News Center would use PressReader to look up and capture the front page of different newspapers. He would print off the front page of a variety of newspapers on 11" x 17" newspaper-sized paper for display. He would print off and display the front pages of approximately 10 American newspapers and 10 international papers in plastic holders weekly. He felt this was a positive scenario since it gave people access to news sources they normally wouldn't see such as a Japanese or Egyptian newspaper.

P2.4.P2 TLT informational Zoom meeting

A student attended an informational Zoom meeting where TLT demonstrated the use of technology including 3D printers and Cricket machines. The student felt the interaction was positive and informative, mainly due to the lack of "scary" tech people making him feel like he didn't know what he was doing.

P3.4.P1 Conducting qualitative research interviews via Zoom

A staff member (research analyst) explains that since COVID, research interviews are now being done via Zoom which has been much better than over the phone. She is excited and happy to "do something a little bit more efficiently and effectively."

P4.4.P1 Remote education teaching benefits

A faculty member is able to teach his design studio course better online versus in person. In person, he sits next to his students as they sit in front of their drafting desks or computers. When he talks to them, he must look back and forth between the computer and the student, which is uncomfortable. When teaching the course over Zoom, he is able to see the student's screen and the student at the same time. He is also able to access the Internet, grab images or information that he can quickly share with the student. The faculty member expressed concern that this improved approach will make it hard for him to transition back to the in-person teaching methods he used prior to COVID.

P5.4.P1 Changes in physical structures reflected by live changes in CAD model

A faculty member who teaches an architecture course that uses AUTOCAD likes the fact that students can see how "live" changes in their CAD model can result in physical structures that they build. She feels this is the result when things are all set up well and that at the edge of technology everyone is learning at the same time.

P9.4.P1 IT tools and learning spaces enable department's goals for online program

A staff member explains that the use of Zoom and One Touch Studios both help enable the achievement of the goals of the online portion of the department's goals. Zoom will send all of your recordings into Opera which has a great editing ability to start and stop. She sets up modules in Canvas and have many small recordings in one module. For example, a six-minute video on fluid flow. They encourage the faculty not to record a 60 min lesson because students will "zoom out" if it's that long. The One Touch Studio will record and have a live class at the same time. Both of these approaches support the synchronous and asynchronous courses of the department.

P10.4.P1 Tools that support proposal writing for investing in state-of-the-art classrooms and learning spaces

A staff member describes his work in writing proposals for new buildings and the tools that he uses to create the proposals. He uses Photoshop, Adobe Acrobat and Word to construct the actual proposals. He also corresponds (assume via email) with the Office of Physical plant for virtual and artist renderings, and floor plans to incorporate into the proposals. This is a positive scenario for this staff member since he is able to email out these "persuasive documents" to prospects who he has spoken to in order to make things happen and move things forward for raising funds.

P12.4.P1 Opportunities for technology training definitely exist

A faculty member recognizes that there are many opportunities for training on technology. He mentioned that he gets a lot of announcements for training but 70% of the time cannot go due to something else that came up that he had to spend his time on. He also knows several students that take the technology training and get certified to use the technology.

P12.4.P2 IT support provides direct training on specific software

A faculty member explains why he thinks the world of IT both at the college and at the university level when they couldn't answer a question on SPSS (statistical software) so they offered to provide training directly to his students and him. He specifically remembered this training opportunity because it was on a Friday morning and his daughter was getting married on Saturday in Ohio so he finished the training and drove to help with wedding preparations.

P13.4.P1 Remote attendance capability to satellite campus makes attendance possible

A Ph.D. student in the nursing program is able to attend her classes via a smart classroom receiving the broadcast from University Park. This capability is a significant increase in access to go back to school and get her Ph.D. She frankly admits that if she couldn't attend classes in Hershey she wouldn't be at Penn State.

P14.4.P1 PSU emphasis on IT is positive

A faculty member frames his appreciation of the PSU emphasis on IT from the perspective of his undergrad experience from Northwestern. He noticed from the beginning that IT was more for ed-tech/TLT. He feels that at PSU it's a bigger deal based on investment, people and support. He feels that everyone is really intelligent, and supportive, and the "person on the phone is really nice." There is documentation and they(?) are the "MVP" in terms of being able to do recordings

and do Zoom. He has also worked with TLT many times in the last 20 years including working on all the Learning Management Systems (LMS) pilots.

P15.4.P1 Streamline log-in for Zoom is great

A faculty member describes the streamlined log-in to Zoom as a positive experience. You just click on one or two things and your Zoom account pops up, which he thinks is great.

P16.4.P1 Zoom enables one class on multiple campuses synchronously

A student describes the ability to take a class that reaches multiple campuses because of Zoom. For example, prior to COVID, nursing students at UP would go to a specific classroom and sit in on a class that had students at five campuses and the instructor would be at Hershey or UP to teach the class. She feels this is very convenient for students.

P18.4.P1 Very good training on new IT in nursing simulation lab

A staff member recalls the great training that her and other staff and faculty members received on the new IT (ex: advanced mannequins) technologies in the nursing simulation classroom. Several updates had been made during the COVID break and the staff member felt the training that got her up to speed was very good.

P18.4.P2 COVID changed the idea of the optimal nursing simulation lab

A staff member recalls that due to COVID, the idea of the optimal nursing simulation lab. She felt that over COVID they learned things from doing online simulations via Zoom and having time to think about the simulation lab. Online they were able to do up to 10 rooms for the students to handle code situations in multiple rooms. The physical simulation lab currently doesn't have that ability. They would like the simulation facility to look like you are in an actual nursing ward with a main nursing desk with the same technology as a hospital. The students could use the technology from the main desk to operate different technology in different rooms. This would force the students to quickly prioritize among multiple crisis scenarios like in a hospital.

P19.4.P1 Standard interface in classrooms is nice

A staff member recalls his experience teaching lessons to the ROTC at PSU. No matter which classroom he was assigned the was able to log in with his PSU credentials, bring up his OneDrive, and get to his Powerpoint presentation. He contrasts this with his experience in the military where you had to carry your stuff on a thumb drive until thumb drives were not allowed. Then he would have to email stuff to himself or use personal email so you can access it. He enjoys the consistent platform, software, and user interface across the classrooms. No matter where he was at PSU, he was able to do what he was trying to do. Even now, when he helps to get presentations set up for his Dean, he appreciates the standard interface.

P20.4.P1 Classrooms for conference meetings work well

A staff member recalls that classrooms that were used for conference rooms worked well. Specifically, she recalls having no problems connecting on Zoom, being able to share screens, and being able to hear the people.

P21.4.P1 PSU World Campus does a good job at creating a digital classroom online

A staff member recalls that as a graduate student of the World Campus program, he feels that Penn State World Campus does a really good job of creating a digital classroom online as far as the discussion posts and using the CANVAS platform to the full ability.

P22.4.P1 BBH building classrooms are state-of-the-art

A staff member describes all the benefits of the state-of-the-art classrooms in the BBH building. The computers and projectors help staff and faculty stand in front of the classroom and give presentations on a very large wall that everyone can see. The computer has access to anything that they have access to in their offices. The audience members can sit at their desks with laptops and look at the slides and take notes. She feels all of these things are very beneficial.

P22.4.P2 Due to pandemic, professors using classroom technology to help students

A staff member describes the benefits she sees from the professors using classroom technology to help students. The professors use both online and in-person options to help students not miss class if they're not feeling well or whatever the reason. Recording the class presentations has two benefits. The first is that if students miss class, they can watch the recording. The second benefit is that students can watch later and review and slow the recording down for study purposes.

P23.4.P1 Scheduler likes the integration of 25Live and LionPath

A staff member describes a positive experience as the main scheduler for BBH using the 25Live tool to schedule classrooms. He has 60 sections a semester of classes to schedule and really likes how LionPATH and 25Live communicate with each other. For example, if an instructor is teaching one section of a class and then another section of a class back to back, and they are the same size, they will be scheduled in the same building area or partition. The instructor is not running from one side of campus to another. He finds this very helpful and works well.

P24.4.P1 Good enough learning spaces

A staff member who does the schedule for her department generally feels that she can almost find something for everybody when it comes to classrooms. The department doesn't need labs, science stuff, or computer labs, just tables and chairs. She does feel that there is a wide-variety of spaces on campus but she felt like some of the classrooms do need updating but she's not too involved in the technology aspects of classrooms.

P25.4.P1 Access to presentation from anywhere

A staff member describes his positive experience using OneDrive. From 2017-2020 he did recruiting for Penn State graduate programs. He would give presentations on Penn State campuses to the general public and to current students. He could access his presentations on Box (previous) or OneDrive (current) from anywhere by logging on to his Penn State website (UP, Shenango, Altoona, hospital). He prefers OneDrive over Box and he also used to carry a jump drive with him, just in case.

P26.4.P1 Technology classrooms are positive space

A faculty member who teaches a EMRs (Electronic Medical Records) course has taught in technology classrooms at Penn State University. He has never taught in a general-purpose classroom that does not have access to a computer or visualization capacity on the screen. He feels the technology classrooms are a very positive experience. He can set his course up on CANVAS, for example, and then go into the classroom and engage in that platform. He has taught in computer labs where he uses a simulated EMR platform to instruct thought. However, he has since change his course and has not been in a computer lab in the last two years.

P26.4.P2 Clear PSU policy about method for course delivery

A faculty member describes a contrasting scenario regarding PSU policy about the method for course delivery (compared to P26.4.N2). In fall 2021 semester, the university made it clear that

classes were back in the classroom 100% (in-person). The university was no longer using Zoom for classes and professors are not accountable for offering a Zoom option. If students wish to take a course and do not want to be in the classroom, they need to take a World Campus course. The faculty member was back in the classroom for courses.

P27.4.P1 PSU investing in several spaces

A student describes the many places that he has seen renovated into state-of-the-art spaces. For example, the renovations in the comms department of the Willard building in the last few weeks (Apr 2022). The recording studios are state-of-the-art and the spaces are spectacular. The business boardrooms integrate technology for presenting. The renovations at the bottom of the library completely changed that space. It really allows for greater engagement with students which really makes students want to use that space more than they did in the past. Another example is a room on the second floor of ? that has been newly renovated. There are four projectors and round tables where people can communicate. It allows for greater collaboration while also being able to interact with different slides on each screen or all on the same screen. This space has helped out The Lion Caucus, a club the student is in. There are several things the university has invested in that have made it leaps and bounds ahead of where it was when he first came to the school.

Objective 3.4: Invest in state-of-the-art classroom and learning spaces - Misalignment Scenarios (33)

P1.4.N1 Projector failure with external honorary lecturer

Approximately 2-3 years ago, a staff member was attending an evening guest lecture on visual arts (3D motion & VR types of simulation) when the presentation projector failed. After she did her best to troubleshoot the problems, the IT help desk was called. The IT individual ignored the staff member's communication about previous troubleshooting and repeated the same steps. The problem was not resolved, and the guest lecturer continued her visual arts presentation with a semi-working projector. The guest lecturer verbally expressed her frustration, and the staff member was embarrassed and frustrated by the action of the IT help desk member.

P2.4.N1 WebCheckout Patron Portal

A student wanted to check out media technology from the WebCheckout Patron portal. There are multiple issues with the tool and process. Many of the items do not have physical descriptions of the actual item. Due to COVID, pick-up times are scheduled appointments that require the person checking out the equipment to be there at a specific time. This student did not have a car so when he arrived to pick up equipment, he was surprised by the 40 pound, awkward projector screen. He struggled with having to pick up multiple items and transport them without understanding the physical description of the items.

P2.4.N2 Library book checkout process during COVID

A student describes how the process for checking out books from the library changed during COVID. The normal process was three steps. Go online, pick out a book, get an email that says your book is ready for pick up. During COVID, you would go online, pick out a book, get an email, follow the link in the email, schedule a time and location to pick it up. The drop-down menu for the location was also the same for room reservations so the process was confusing. The student describing this scenario actually worked at the library. After approximately 3-4 months the website was fixed so that it wasn't so confusing. The student expected that since Penn State

was such a large university, that someone was being paid "a decent amount of money" to maintain the library website that it should have been fixed sooner.

P3.4.N1 Potential technical issues with future colloquium events

A staff member conveys the nervousness of a fellow staff member who helps run the speaker colloquium in the Keller building. She is nervous due to previous technology failures. Guest speakers are often flown in for the event and it is recorded, broadcast, and accessed online in addition to a face-to-face audience. They use a laptop or classroom in the Keller building for the events and there is significant worry that the technologies will fail.

P3.4.N2 Conducting qualitative research interviews via phone

A staff member (research analyst) recalls that interviews, if they weren't doing site visits, prior to COVID were conducted via phone. The new experience of being able to see interviewees on Zoom has made the past practice of using just the phone a negative experience.

P4.4.N1 Physical classrooms need to have Zoom-like capability

A faculty member has become accustomed to teaching via Zoom where anyone in the class can share their screen anytime. He has seen some classrooms that have the ability to mimic Zoom in this feature using a device and a projector but feels that this technology does not exist everywhere and going back to a classroom without this ability may change the way that he teaches.

P7.4.N1 Uncertainty over protection of the digital space

A Ph.D. student recalls a Zoom "bombing" incident that was racially motivated during a university-organized Zoom session. The university put out instructions on how to set the controls on Zoom to prevent future bombing sessions. The student recalled that the incident sparked the conversation of "whose responsibility is it to protect the digital space?"

P7.4.N2 Trouble with sound and video in hybrid working groups

A Ph.D. student recalls the trouble with sound and video during hybrid working groups. Some people would go to a room on campus, and some would call in on Zoom. The Department of Geography tried to get speakers and microphones so they could hear people. The microphone that was provided was "garbage" because they couldn't hear anybody. As a workaround, people would use their personal cell phones and personal computers

P7.4.N3 Geography majors require expensive laptops for program

A Ph.D. student feels that the hardest part of her discipline is students struggling to afford the appropriate laptop for coursework. Geography (GIS and cartography) majors use very large data sets and require computers that run demanding software. While a desktop computer is more affordable, a laptop is really what is needed since it is portable and allows you to conduct work in the classroom. However, a laptop needs to be able to use the demanding software to render images, which forces students into making sacrifices between portability and renderability. Penn State University provides GIS labs but when they have to shut them down, like in the pandemic, students don't have access to those labs and resources. She feels fortunate because she has a job and a husband who helped her set up an expensive computer and monitor to support her work in geography.

P8.4.N1 Student input is less interactive when not anonymous in a virtual class

A staff member guest lectured in a virtual undergraduate class and noticed that student input was less interactive when it wasn't anonymous. When she asked the students to reply to a Mentimeter

survey on an anonymous basis, she got 13 of 15 students to participate. However, when she wanted to talk, which was not anonymous, she got 1 to 2 students to participate. Since the students don't have to turn their cameras on in virtual classes, lecturers don't get verbal feedback and facial expressions. She felt that finding a way to make the virtual classes more interactive would be "really nice."

P10.4.N1 Transition to permanent hybrid makes getting a hold of some people difficult

A staff member describes his frustration in trying to get a hold of people virtually versus in-person which has changed his day-to-day work. Getting a hold of someone in this "permanent hybrid" situation depends upon the "closeness" with the person. If he is pretty close, he will have their text information or catch up with them on MS Teams. The further away from them he is personally, it gets harder to get a hold of people, as they don't reply to voicemail or emails - which he finds frustrating. He has been waiting for a response from one person for almost a week.

P11.4.N1 Nursing lab lacks specific IT support

A faculty member recalls that the nursing lab was built with grant money and has mannequins with built-in technology linked to computers, however, there is no specific IT support for this equipment. The College of Nursing does not have its own local IT department, so the faculty have to use the University's IT services. When there are issues connecting the simulation mannequins, the faculty have to figure it out themselves. There are students waiting sometimes when this happens.

P12.4.N1 Digitalization of IT help vs increasing resources

A faculty member describes a push for "digitalization" of IT help which sounds very economical and effective. However, he finds in his day-to-day interactions with IT help as a user that he just quits trying. The help he gets has too much text to read or too many documents to open. He wonders if that's not true for "our own people at Penn State". He is in favor of increasing resources to the overwhelmed IT guys so IT training and help desk services can be more effective.

P13.4.N1 Physical separation of program buildings limits access to technology

A graduate student in the nursing program in Hershey knows that the program has access to sophisticated technology labs at the hospital, but the academic buildings are on a completely different part of campus. Since she attends class in the academic buildings, she feels that she is not aware of what is available. She feels it would be helpful to have increased access or an orientation to the technology labs available in the hospital. A couple of nursing faculty members who are also getting their Ph.D. have shown her some of what is available, but she still feels there is more to learn about.

P14.4.N1 Hybrid learning a challenge in general-purpose classrooms

A faculty member describes the challenges occurring when conducting hybrid learning in general-purpose classrooms. Due to COVID, some students and some faculty are getting sick and cannot attend in-person classes. Therefore, the classes have to move to a hybrid mode with some people in person and some online. The problem is that the general-purpose classrooms are not set up to accommodate this method effectively. Quality recording is only available if you have a tablet and most faculty are doing problem solving on the board, which is difficult to share with online students when the board is a blackboard in a classroom. It is also difficult for faculty to record a lecture and also facilitate group interactions by walking around. One workaround is to use a tripod to prop up a computer to capture the video in a classroom. Many of the classrooms

require a call to the help desk phone number because something isn't working right. He finds the general-purpose classrooms not faculty-friendly right now.

P15.4.N1 Struggles with hybrid in classrooms

A faculty member describes his struggles with hybrid situations in some of the classrooms due to equipment. For instance, if he's in a class that is supposed to be observed, but the observer wants to do it remotely. Some of the classrooms doesn't allow you to Zoom while teaching so that situation is problematic. He has made accommodation for such situations by putting a computer in the classroom with a camera.

P15.4.N2 Architectural design of classrooms make it awkward for dynamic teaching

A faculty member describes the uncomfortable awkwardness he experiences when trying to teach in a dynamic way in some classrooms due to their architectural design (physical layout). For instance, in Walker building, room 112, you have a podium in the front and then two screens on the left and the right of the podium. He noticed while co-teaching with someone that the students must gaze all over the place to focus their attention on complex material. This is especially true if the person speaking is moving around the room. He also mentioned that the way the technology works, switching between files, is part of the issue. He feels this is all a bit awkward. He also doesn't understand the multitude of microphone options. He thinks if there was just a "superset mic" that just registers it would help.

P15.4.N3 Intermittent issues with Zoom

A faculty member describes intermittent issues with Zoom. Sometimes, students can't log in and keep getting a "you're on standby mode" even though Zoom is open. He cites backend issues and problems, interface issues that do not sync with the infrastructure of certain campuses.

P16.4.N1 Zoom glitches waste class time

A student describes issues with Zoom that would waste class time. Sometimes the Zoom hybrid classes would be an issue when you couldn't see or hear anything. When there were multiple campuses in the Zoom class, there would be technical issues at one campus or another and it would take 30 min to get all the glitches worked out and start class. She feels this was a waste of time. She said now they are smoother but in the beginning it glitched a lot.

P17.4.N1 Classroom set-up not ideal for COVID conditions

A staff member describes the challenges that certain classrooms present to faculty members trying to teach a class and maintain social distancing. Since the students for a single class have to be in a large room or split into two rooms, the instructor uses a microphone so that students can hear in the back of the room. There are heaters and stuff in the rooms that make it hard to hear the lecture. The instructors still struggle to hear students at the back of the classroom when they talk. Some of the spaces have microphones and others required them to buy mobile microphones and hook them on to themselves to use in the rooms without mics. Another solution they thought of was to use a "whiteboard" on Zoom so the instructor could write on a board so that two classrooms could see at the same time. The staff member wasn't sure if there was a whiteboard on Zoom or if the person who recommended that idea actually knew how to use it.

P18.4.N1 Technology in first simulation lab was limited

A staff member recalls the progression of the simulation lab for the nursing program at Penn State Harrisburg. They started with a very limited simulation lab and then moved to a state-of-the-art simulation lab facility sponsored by Select Medical in 2011 or 2012. There were many negative

aspects of the technology in the lab. One piece of technology didn't talk to another piece, or they thought they had video of the simulations for debriefs but it wasn't for the entire facility. They used money to purchase technology but didn't have enough of all of the technology to make it a full simulation. For instance, you may be able to take the blood pressure on a mannequin, but it didn't put out readings or you could simulate it, but they weren't real-time readings. It took years to get the technology purchased and integrated to get the lab where they wanted which was around 2018-2019.

P18.4.N2 Post-COVID software not always available to continue improved simulation

A staff member recalls that specific software like Swift River and others were purchased or donated during COVID to help the nursing program do simulations remotely with students. However, as things started to return to normal from COVID, the companies that donated the software used previously came back to the program and asked them to buy the software. As a consequence, the program can't do the type of multiple crisis-code situations in the simulation lab that they had become accustomed to doing during remote learning due to COVID.

P20.4.N1 One IT thing not working can cause issues during a hybrid presentation

A staff member recalls that it only takes one IT thing to not be working to cause issues during a hybrid presentation. In her experience, she finds that usually, it is the audio component that isn't working during a presentation when people are also on Zoom. For instance, a candidate came in to do a job talk but there were people also connecting via Zoom as well and they ended up having all sorts of issues. When there is IT support from the awesome technology guy in the College of Liberal Arts who is very hands-on and willing to help- it's great! But he is not available 24/7. She also mentioned that faculty seem to have an expectation that staff should be able to troubleshoot technology problems which she feels is asking a bit much given it's not their specialty.

P21.4.N1 Transition from Angel to CANVAS problems

A staff member who was a graduate student in the World Campus program during the transition from Angel to CANVAS remembers some problems. He remembers that some classes were on CANVAS, and some were on Angel. He feels now that CANVAS is being used and it is streamlined, that is definitely a huge positive.

P21.4.N2 WikiSpaces at PSU is outdated

A staff member recalls the use of WikiSpaces as a graduate student in the World Campus. It is an online platform where people can create different things. He felt there were some struggles with the platform, mainly that it was a little more outdated. He did have the option to use other software such as Google Docs or Microsoft Word to supplement his coursework.

P22.4.N1 Technology is wonderful except when it's not working

A staff member describes the frustration that occurs when technology doesn't work after becoming so dependent on it. Lately, she can't recall many meetings that aren't done using Zoom. They are typically hybrid, with some in the conference room and Commonwealth and campus stakeholders online. Something typically goes wrong where people can't hear each other, or Zoom isn't working properly. Due to people's dependence on technology, when things don't work, she noticed that they don't know what to do when they can't use it.

P23.4.N1 Classroom information on 25Live is not always up to date which causes issues

A staff member describes the issues that arise when the information about classrooms is not up to date on 25Live. He explains that you have to be really careful that what you are booking in the

system is correct. For instance, if you don't articulate that you need 30 computers and 30 seats you may only see places that have 30 seats in a general-purpose classroom without computers. Another issue is repeated complaints about the same classrooms. For instance, he gets three or four complaints a semester about the Henderson Building basement rooms. People feel they are stuffy. They are supposed to hold 90 people, but it is tight with 90 people. The staff member explains that it was fine a couple of years ago but now, people are like "get away from me." He schedules the classrooms almost a year out so when he gets complaints from faculty about not liking the room the day before class, he thinks, "It's been scheduled for a year!" A common issue he also has is that he must literally go count seats in classrooms because people have told him that the rooms don't have the number of seats that is on 25Live. He has had to count seats and take pictures of the rooms and his thought is "There are this many seats. I don't understand. Why are you lying to me?" He had a couple of solutions. Perhaps an "interactive room tool" could let you see what the room was actually like without going there. He also thought if rooms had ratings that people could leave, maybe that would help. Then he realized that no one would want to go to poorly rated rooms. He explained that scheduling rooms is a very, very complicated task and he spends a lot of time on it.

P24.4.N1 Faculty complaints suggest that classrooms are not that up-to-date

A staff member who schedules course classrooms for her department receives complaints that the classrooms are not that up-to-date. Her department uses the Willard building often because of the availability of classrooms. Certain professors prefer the newer buildings which you can't always get. The department gets classrooms based on the assigned partition. She doesn't know if the faculty has technological needs in the classrooms, but she often feels faculty are picky about which rooms they get.

P25.4.N1 Inconsistent access issues across PSU

A staff member describes some of the issues he would have when we would go to different locations within Penn State and couldn't get access to his presentations. Sometimes the system wouldn't take his Penn State ID and the faculty on-site would have to log into the system for him and it would be harder for him to find what he needed, which was frustrating. At other times he would take his own computer, which was always old, or ones that he would get right before the "higher-ups" would send their computer to salvage. He was often not able to use his own computer because there would already be a keyboard set up with a computer and to disconnect it and get his computer to work would require a manual process with instructions. When using the computers on-site, the directions would often be outdated and would not match the newer computer. When he tried to follow the directions, the photos wouldn't match what was there. He was frustrated by the non-standardization.

P26.4.N1 Faculty member desires flexibility in technology classrooms

A faculty member describes his desire to have flexibility in technology classrooms to teach with different methods, including low-technology methods such as blackboards. In technology classrooms, the screens are so large and cumbersome that it is difficult to use a chalkboard in addition to a screen. The classrooms are designed for all or none in regard to technology. He likes to use different techniques to demonstrate a concept. For example, in his management class, he divides students into small groups and has them work on the chalkboard. He understands that this is very "me-oriented", and he works around it.

P26.4.N2 Unclear PSU policy for student class attendance

A faculty member describes the difficulty with the unclear class attendance policies during COVID. During COVID, he was doing hybrid but prefers to do in-person classes. In 2020 sometime, there was confusion about what mode the university was in. At the beginning of the semester, students were able to declare if they would be in the classroom or on Zoom. During the semester, students changed their minds and he only had three students coming to an actual class and the rest were on Zoom. His opinion was that the students were taking the path of least resistance, and the university permitted them to do that. He refused to teach in that manner and moved his class to 100% online until there was a more "exacting policy" to where the students may be (online/in-person) or allow faculty to hold them accountable for being where students were supposed to be.

P26.4.N3 Difficulties of teaching online during COVID

A faculty member describes some of the difficulties he had teaching online during COVID. He said he loves teaching online but during the semesters during COVID he was teaching undergrad students and had some negative experiences. He found himself talking to a blank screen and students were not engaged. They were not asking questions and they weren't turning on their cameras. Despite the university policy that professors can't make students turn on their cameras, he did require cameras to be on. He received a lot of complaints about that decision. When cameras were turned on, some students were still in bed or wherever. Some were holding their dogs, and the dogs were going crazy. He thought it was just mayhem. He feels that part of the issue is the lack of professionalism of the age group. He doesn't make a blanket statement about these students, but these activities were disruptive to those who were trying to learn. He wanted to get the students engaged but that failed, and he didn't see a win-win situation.

P27.4.N1 Outdated computer lab

A student describes the computer labs on the bottom floor of the Willard building as outdated. The hardware is clunky, bulky, and outdated. They may have been made in the early 2010s. The space doesn't look clean. The student envisions integrated technology spaces as those where it's open but there's a connection to the devices that still allows both the human connection and the technological connection. In these labs, there is a central clump of desks and computers. This layout prevents every student from having an equitable view of the presenter.

Objective 3.5: Provide IT Training- Alignment Scenarios (37)

P1.5.P1 IT Training to students

A staff member of the Visual Resources Center in the College of Arts and Architecture partners with the IT department of the college to train students to use relevant information technology tools. Some of the students were professional photography interns who learn the skill of digital asset management. This skill is done by creating a photo archive from open-source software (AARC). Many times this training would be done via Zoom, or walking the student through the training via email or phone.

P2.5.P1 Software training sessions via Zoom

A student had a positive scenario attending Zoom sessions set up by his instructor in the communications internship program. The instructor set up weekly sessions for people who wanted to learn how to use different tools. The student mentioned the Adobe Premiere Pro tutorial and how to streamline your work process through automated tasks instead of manual copy-and-paste.

P3.5.P1 Availability of IT Training

A staff member feels that the availability of IT training is a positive experience at Penn State. She sees emails for IT training at least twice a week but doesn't take advantage of them. She feels like she is okay with all the tools she uses on a regular basis.

P4.5.P1 IT training transition due to/during COVID

A faculty member recalls that the transition to remote due to COVID required everyone to learn IT very quickly. Despite being stressed and overwhelmed, people made it happen. During this time, he recalls contacting the local IT help desk, having them remote into his computer and installing software. He feels the most difficult thing is keeping track of all the IT training possibilities and the numbers to call to get IT help.

P6.5.P1 Intuitive software applications and training

A World Campus student feels it was a little difficult at first to understand where software was located and what they each do but once he found them, they were "very intuitive" and "easy to use". He felt the same initial confusion about the library and what it does for students. A guide or introduction to new students would help. For example, "Okay, this is all the software that we have and what they do."

P7.5.P1: Librarian direct chat function used to resolve browser issue

A Ph.D. student was having server error issues when using the PSU library website which she was able to resolve by talking to the librarians on the direct chat function. The librarian couldn't tell her what the actual problem was but was able to send her a link to documentation that eventually led to the resolution of a browser cookie cache issue. She uses the direct chat function with the librarians often.

P7.5.P2: PRI Zoom drop-in IT help desk

A Ph.D. student who is part of the Population Research Institute (PRI) uses the Zoom drop-in IT help desk to solve an issue on her new phone with dual-factor authentication. She just drops in via Zoom during the hosted open hours, states her problem and they walk her through resolving the issue.

P7.5.P3: One-on-one IT training via Zoom

A Ph.D. student praised a specific librarian who spent an hour and a half teaching her the in-depth functions of Zotero. She had an issue with her data being coded in NVIVO but she couldn't make it work with Zotero to match up her citations. During the training, the librarian and student used the screen share function on Zoom to work through the issues. The student found the hour and a half training session a very personal one-on-one and very helpful.

P8.5.P1 College IT support some of the best

A staff member feels that the College of Agriculture has some of the best IT support that she knows of. For instance, the IT website has pages and pages of IT guides such as how to link a new cell phone or set up a drive. They are very detailed and explain everything "a to z". If you have questions, you submit a request, and they will reach out to you within hours.

P9.5.P1 Engineering department provides great IT training

A staff member in the engineering department gives several examples of IT training that is available. A training center in the department offers monthly sessions that you can sign up for. The Leonard center provides training to engineering faculty and staff on teaching and course

improvement. Two other individuals (presumably local IT) in the engineering department offer special summer workshops. Overall, she feels that Penn State and the IT departments "knock it out of the park" with helping the faculty to get to know what platforms are available.

P9.5.P2 Zoom webinar training during COVID transition

A staff member in the engineering department recalls a Zoom webinar training during the COVID transition. The training was live over Zoom on how to use the webinar feature of Zoom. She found the training really nice because you could ask questions and the trainers were very supportive.

P9.5.P3 Staff member shares her positive student experience with IT training

A staff member recalls her campus orientation as a new student as it relates to IT training. She was directed to an IT training site for CANVAS that explained how to find your assignments and communicate with students and instructors. She felt that the training was so helpful that as a staff member she shared the website link to the faculty in the undergraduate office to put in all courses for students. She even took a refresher course on CANVAS even though she knew how to use it.

P9.5.P4 IT assistance is responsive

A staff member acknowledges that problems happen when we use new software but feels that IT (local or enterprise level) has a great website. She feels you can call and be connected with someone who is an expert or open a help ticket. She has never had a problem that didn't get solved within 24 to 48 hours.

P10.5.P1 In-person training coupled with experience equals confident staff user of AWA

A staff member recalls in-person training four years ago coupled with experience using the AWA (Advance Web AWA) system makes him feel like he could "play it like a piano." The AWA is an "Oracle database that houses data on alumni, donors, and prospects." While the AWA system is "remarkably complex" and "not necessarily intuitive" he finds it "marvelously powerful." He attributes it to the in-person training, with computers and a screen, in the Bristol building (4 yrs ago) and practice over the years. He also comments that "it took a lot of time and effort learning" the system.

P11.5.P1 Training support videos enables the use of more current technology

A faculty member in the College of Nursing feels that the many training support videos available on the IT website are positive examples of this goal. Some of her colleagues use older technology such as iClicker when they could be using their cell phones with Kahoot! in the classroom. She refers to the training videos to learn to use more current technology.

P11.5.P2 Transition to online has forced colleagues to learn IT

A faculty member who feels pretty IT literate, thinks that the transition to online learning due to COVID has been a good forcing function for her colleagues to have to learn to use IT. Usually, her colleagues come to her with IT issues since she is comfortable and knowledgeable about IT. Now they have been forced to learn how to use IT to teach online.

P12.5.P1 Zoom enables virtual classroom during pandemic

A faculty member remarks on multiple virtual classroom activities he was able to accomplish via the Zoom technology during the initial part of the pandemic. These included the capacity to include all the students, the easiness of participating via computer and cell phone, the capacity to

break down a class into small groups in break-out rooms and do activities, showing videos, and facilitating class participation.

P12.5.P2 Host an international educational event virtually

A faculty member recalls the ease of hosting an international educational event that included presenters from different parts of the world. The event included somewhere between 600-700 people and lasted over four hours. The faculty member was able to bring together many relevant family members and scholars of the event topic. The recorded event is also available on a website with an international society that the professor was the president until July of 2021. The faculty member recalls that he enjoys the benefit of that platform.

P12.5.P3 Video Editor software

A faculty member identifies a video editing software that has limited features that help him produce his work. He asked me to keep this information "Confidential" for fear that someone would remove the software from the Penn State website since the IT university help desk was not aware that it was available. The features he likes are the ability to place and keep a title on the video and the ability to cut and insert at any given point in the video.

P13.5.P1 Library specific training set up graduate student for success

A student feels that the library and university-specific training modules set her up for success as a graduate student. Although she had a master's degree and she felt she was fluent in performing scholarly searches, she found the training really useful, and it expanded her current knowledge.

P13.5.P2 Student observes professor using software to make classes more interactive

A graduate student taking a pathophysiology class last year (2021) observed her professor using Top Hat to make the class more interactive. For instance, he logged attendance and presented slides. She struggled to figure out from a student perspective how she could optimize the software but feels that technology doesn't come as intuitively to her as someone seven or eight years younger than her. Top Hat was different than the traditional PowerPoint enhanced lectures that she has been used to since she started graduate school. She didn't feel like she had the time to extensively research how to use the software but understood that it had the capability to flag different class notes and interface between the slides that teacher is presenting and taking notes.

P14.5.P1 Remote proctoring of exams is better with Honorlock

A faculty member describes the positive change that has occurred from switching from Examity to Honorlock for remote proctoring of exams. Of note, a Zoom training video was recorded on how to set up an exam through CANVAS. The faculty member thought that the video was well done, and thorough and he was able to email the link to the video to a colleague who needed help. The recorded video was considered to be identical to the in-person training, according to a colleague. The number of steps to set up an exam through CANVAS is less than it was for Examity.

P16.5.P1 IT assistance is responsive

A student describes the IT assistance as responsive. When she has an issue, she Googles it online first. If she can't figure it out after that, she emails an IT person, or the nursing IT person and they will come and figure it out.

P17.5.P1 LionPath is pretty user-friendly

A staff member describes LionPath as a pretty user-friendly software. She takes a look at student schedules, is able to see who is enrolled in the appropriate courses, and easily shares unofficial transcripts with students. When the students go to clinical sites, she is able to get information such as date of birth, put it on the appropriate paperwork, and send it to the sites. She likes to use LionPath and finds it easy to find information and share it.

P18.5.P1 Local IT team made Box migration a positive experience during COVID

A staff member recalls a positive experience migrating from Box to Office 365 during COVID. She has worked with the local IT team for 34 years at Penn State Harrisburg and they are down the hall from her office. During COVID, when everyone was remote, the IT team had a Zoom link that you could just go and talk directly to the IT team for any issues. Since the staff member had an archive file that dated back to 1988, she wanted to ensure that her archive file would successfully be migrated. The file contains historical data about programs that she could not risk losing. The migration was a successful experience.

P19.5.P1 Training system was better than implemented system

A staff member describes training on Worklion with the Neocase backbone as very good. However, the user interface that Penn State got was different. The training was hands-on, and he was allowed to go in and do things. The staff member doesn't think the university is taking full advantage of what Neocase has to offer but assumes there is a valid reason why certain things were not implemented. He didn't understand why they were trained in certain features of Neocase but then the university didn't implement them in the system they had personalized for Penn State.

P20.5.P1 College-requested training helpful

A staff member described IT training that was specific training requested by the College of Liberal Arts as helpful. The training covered the differences between SharePoint and OneDrive and was specific and direct. It was over Zoom so she had her computer in front of her and they could talk through different scenarios and drill down into the specific ways in which their department was using those technologies.

P21.5.P1 World Campus IT training materials very good

A staff member recalls that when he started his master's degree with PSU World Campus there were informal documents which helped him get reoriented to IT again. For example, CANVAS, the discussion boards, and Zoom. He felt it was easy to access and oriented so that someone who doesn't fully understand IT was able to learn. He also liked that there were multiple mediums for learning, such as videos, diagrams, and readable documentation. He liked having the choice of mediums in which to learn.

P21.5.P2 Local IT help and training a positive arrangement

A staff member describes an individual within his office who can help with IT training and IT all the time. The individual holds in-classroom training that they can attend and even does "check-ins" to see if anyone needs any extra training on certain systems.

P22.5.P1 IT very helpful in making transition to remote due to pandemic

A staff member recalls how helpful IT was in getting everyone transitioned to remote due to the pandemic in the spring of 2020. The IT department was helpful in getting the equipment to people, showing them how to use Zoom, using the cameras, and making sure the audio worked. They were very helpful and patient in answering questions and meeting with the staff. Once everyone was home, they transitioned to online help. This was very important because the

transition happened at one of the busiest times of the semester when students were coming back from Spring break, and staff members were providing academic advising for the fall semester.

P23.5.P1 Used LionPATH help option to train others

A staff member recalls training people during the pandemic over Zoom in the Department of Nutrition on how to use LionPATH. He uses the LionPATH help option which takes you to Oracle where you can type in anything you want to learn. It then will take you through a step-by-step tutorial on the task. He also took screenshots of certain things to help people and Zoom with them or send them via email. In another example of why it was helpful, he describes that adding an honors advisor to a student's account is a rare task that lives in a weird place in LionPATH so he always must use the help button. He recalls a user productivity kit on Oracle that has an entire index of tasks you can do such as: removing academic history, adding a test score manually, updating a standard meeting pattern, signing in a new advisor, and creating a waitlist. He finds this very helpful but is not sure that many people know about it and if they have access to do what the tutorial tells them to do.

P24.5.P1 College IT is great

A staff member describes her positive relationship with her college IT staff. She feels they come to the rescue many times and show them how to use the technology and set up their spaces. The afternoon of this interview one of the IT guys, who is super thorough, was doing a website training that was one-on-one. She feels they are very accommodating and available to them. She doesn't use the university IT often, only for classroom issues.

P25.5.P1 IT Training has flexible options

A staff member describes her appreciation of the different and flexible IT training options. First, she recognizes the amount of training that is available. Second, she appreciates the flexibility afforded by the training recordings. Sometimes she doesn't have an hour and a half to attend training courses. Now she can schedule her training time when it's convenient for her. You can stop, start and go back in the video. She has had "teach myself Office 365" on her calendar for almost a year. Finally, she enjoys the in-person training when there are around six people, you have your own computer, you're doing it together and there's someone there to ask questions. Some in-person training isn't the best because people go at different paces. The instructors do their best but after 10 or 12 questions, she feels like she is slowing other people down. She feels they need a class for dummies and a class for regular people. She finds those very helpful. She likes the training because it can make her more efficient. Not that she can't function. It's just painful.

P25.5.P2 Officemate is good with IT

A staff member describes an officemate who is, fortunately, for her, good with IT. The department was doing a media presentation for the students on Kaltura through My Media. The video goes to Kaltura to be processed and add captions. When the staff member was having problems publishing the video, an officemate who is good with IT helped her out. She was glad that someone in the office could help her because she doesn't find it intuitive as she thinks she is more of a broad picture than a linear thinker.

P25.5.P3 Local IT team is stupendous

A staff member feels that her local IT team (HHD in BBH) is stupendous and absolutely wonderful. Once she had a student coming in two min and her Zoom wasn't working. She called her local IT team, and they came up right away and made their own ticket so that she could move

on with what she needed to do. She understands that they need to keep a record of all that they're doing, but they have been very accommodating to the people they help. They recognize when something is urgent and when it's not and they will address it if it's urgent. She also feels they are very patient, competent and kind in explaining things without making her feel stupid.

P26.5.P1 IT training good quality, just not for me

A faculty member describes the positive aspects of the IT training he has attended despite not getting what he wanted from the training. The trainer was very knowledgeable, responsive to people's questions, and very helpful. He feels perhaps he didn't have the right question to get the most out of the training for him.

P27.5.P1 IT training of CANVAS Speedgrader helpful for learning assistant

A student describes how helpful the IT training on the CANVAS Speedgrader has been to him as a Learning Assistant (LA). The training was with the College of IST where he works as a LA for a World Campus online course. The training taught him how to navigate the functions of the Speedgrader in an IT playground where he could fool around with the product and explore what works and what doesn't. He appreciated the training environment that allowed him to understand the admin perspective versus the user perspective.

Objective 3.5: Provide IT Training - Misalignment Scenarios (28)

P1.5.N1 Use of Canvas to support coursework

A staff member teaching a multimedia arts PR course had multiple issues with Canvas. Her course has approximately 22 students with a range of skills. She had problems with the students accessing course material on Canvas and uploading course submissions. Some of the workarounds include having students email her submissions or using the Canvas inbox. Her TA had trouble learning how to look at grades or assignment due dates. Unfortunately, as the instructor, it falls on her to fix the issues. She had to spend 30 min the other day creating a document version of her midterm because Canvas wasn't able to deliver it in a way for students to access it. She feels the transition to remote has forced a steep learning curve for faculty and students.

P2.5.N1 Freshman library orientation not helpful

A student recalls his freshman library orientation experience. For a class grade, he and his classmates had to visit checkpoints at the library to introduce students to the resources. The student recalls that he only paid attention to the checkpoints that he was interested in such as the microfilm section as he is a film photography student. His main problem with the checkpoint approach was that it was too pushy and forced, especially when the students could figure out how to "swipe" each other's cards through checkpoints to finish sooner. He especially found the Adobe Software introduction like an advertisement since they had frisbees and signs at the checkpoint. Considering how "obsessed" he is with the software now; he recalls how scared he was as a freshman to understand and use the software.

P4.5.N1 Need improved connection between faculty/staff and local IT desk

A faculty member describes how he spends time looking for the link to connect to his college's local IT help desk. When he starts a ticket and receives a message on his computer to chat online, there isn't a photo of the person he is talking to and therefore no "connection between the face and the name." He recommends a "Google-like" capability to find IT help desk resources within the university.

P5.5.N1 Transition of IT support from local to university level

A faculty member expresses the desire to have IT and access to local IT help like it used to be around eight years ago. She recalls that you could walk down the hallway in your building and a local IT person would help you "real-time". Starting eight years ago, the local IT resources were gradually taken away. Now she must call the university level IT desk, they create a ticket and by the time they get back to her, she has forgotten what the problem was and moved on in her work. She prefers more one-to-one person, on-demand training for IT.

P6.5.N1 New student introduction to available IT

A student was confused as to where to go to understand what software and applications he needed to understand as a new student at the Penn State World Campus. He gave examples of CANVAS and LionPath. As he took each class, he would find another application he would find he needed. He suggested online training for everything that was available and needed as a new student at Penn State.

P7.5.N1 No access to NVIVO software at the start of COVID

At the onset of the COVID pandemic, a PhD student tried but was not able to access and use one of the NVIVO licenses that Penn State had available in the library. She tried to work with the library to see if she could have the license temporarily transferred to her computer or through VPN access the licensed computer in the library. Since the issue was not resolved, she used a coding solution based off Excel that "wasn't awesome." She gave the library some slack as it was the start of the pandemic and "things were very much in a nebulous world."

P7.5.N2 Failed access to external research data

A Ph.D. student needed some Ukrainian historical maps from another university and the Penn State library tried to use Dropbox to help facilitate file sharing due to the large file sizes. The file sharing didn't work, and the student had to use another source to get her question answered about Ukraine.

P8.5.N1 IT training did not help with non-user-friendly SIMBA financial system

A staff member expressed extreme frustration with the SIMBA financial system for understanding grant funding and ordering office supplies. She sat through the SIMBA training "from hell" which was a "nightmare" and "everybody was lost." System use is mandatory for grant funding and ordering office supplies. When she must use the system, the staff member reaches out to fellow staff members or a financial administrator to walk her through the system. She gave two examples of how the system was frustrating. In the first example, the system seems to lose money. This is where you have a certain amount of money one time and then later the number is significantly different. The second example was the staff member trying to buy a pack of binder clips and got stuck on page six of nine pages of instructions.

P11.5.N1 Lack of organized IT training

A faculty member feels that the lack of organized IT training is a negative situation since it takes away from her classroom time to teach students how to use IT tools such as CANVAS, iClickers, and Office 365. She facilitates this with either time in class or an IT-day where students can come in and learn what they're doing with IT. She is not sure if the students are aware of all the things that they have access to such as the Adobe suite of products, which would help them with their project work.

P12.5.N1 Fast pace of change requires faculty to be a quick learner

A faculty member admits that while he enjoys the benefits of IT, the fast pace of change in IT requires him to become a quick learner. While he is not afraid of learning new things, he feels the pace is so fast that by the time he gets to learn one IT, there is a transition to another to learn.

P12.5.N2 Transition from Box to other online storage capabilities

A faculty member is frustrated by the transition from Box to other storage capabilities. He used Box to edit his books with his co-authors and stored all of his information in Box, which he considered "fantastic". He mentioned faculty, administration, and students having access to information with confidentiality boundaries. He also describes the transition process as frustrating because he is trying to figure out how to re-organize all the information on SharePoint or Google docs, which is a massive effort.

P12.5.N3 Assumption that faculty doesn't understand all this technology

A faculty member recalls specific events that are examples of the assumption that the "faculty doesn't understand all this technology." Kaltura is a program that can save all his recorded lecture videos. He had an expectation that he would be able to edit and produce the videos and summaries of his lectures and insert them into PowerPoint. Unfortunately, he figures out that he can only cut at either the beginning or the end of the videos and that's all. Even though IT provided him with documentation about the benefits of Kaltura, it is his assessment that Penn State is providing limited options for this software. This is drawn from some research he did on Kaltura at other universities. His choices are to use Kaltura, use the editing software in the library or produce lower quality edits with "a puny little platform that Penn State has, and nobody knows about it." He tried to get help with this other software program, but the IT help said, "No, that doesn't exist." He made about 30 videos from a conference with this software and working with external partners, they are trying to figure out where to post these videos so that they are available to the world.

P13.5.N1 Initial trouble accessing Zoom during COVID remote learning

A student describes the challenges she initially had in accessing Zoom during the transition to remote learning due to COVID. She dug into the university archives to figure out how to activate her Penn State Zoom account. One issue she had was that she didn't know she had to register for the Zoom-specific account.

P14.5.N1 Access to IT and IT training for remote proctoring not obvious

A faculty member describes the access to IT and IT training for remote exam proctoring as not obvious. He was not sure who to go to get the information about remote proctoring an exam, that it was Honorlock, and where to get the training. He feels it may have been in his emails, but he is not sure because he gets so many. He feels the information may have been posted in Yammer but was also not sure. He describes the confusion as part of his new role as faculty since in his previous role as instructional design staff on World Campus, he would have known what software is being used for remote proctoring of exams.

P15.5.N1 Faculty member prefers short video, a checklist, or FAQ vs "IT training"

A faculty member explains that he prefers to receive training on IT via short videos, FAQ, or concise steps identified vs other types of IT training. He says that he would ignore other types of training and in fact he hates to do regular IT training. He has taken specific lessons for CANVAS but otherwise avoids typical IT training. He does feel that most of the tools are user friendly.

P16.5.N1 Student doesn't see that many resources on IT training

A student describes her exposure to IT training. She remembers doing a little university-provided IT training when she started school but hasn't done any IT training in the last year. She says that she doesn't see that many resources on IT training.

P17.5.N1 Can't cancel a booked room in the system with 25Live

A staff member describes the difficulty she has in using 25 Live to manage room bookings. One issue is after she has booked a room and needs to cancel it, she can't do that in the system. She has to contact the person who has confirmed the room and have them cancel the room for her. She doesn't find it a very user-friendly system and admits that she's not that comfortable using it but attributes that to not using it that often.

P17.5.N2 "SIMBA, I hate"

A staff member describes her frustration with using SIMBA. She admits that she is not really comfortable with it because she doesn't use it that often. She thinks it is cumbersome and not very user-friendly. For example, she feels that there are so many things to click on, but it still doesn't save your information from the previous time, so you must put in everything all over again. She took training and was lost from the beginning. She feels there are many different things you do and different ways to do it. There are many different screens, and she would like to be able to use SIMBA without having to call anyone. She "really hates it" and doesn't think she is alone in this feeling. A girl down the hall asked for her help in ordering something and they both just looked, and the screen and she thought, "Oh my God, what do I do next?" She has part of the training guide to follow but finds it's just so much.

P18.5.N1 Move to remote learning via Zoom was difficult for nursing and older staff and faculty

A staff member recalls the transition to remote learning and working was difficult for nursing and older faculty and staff. Due to COVID, Penn State went to remote work and learning on March 16, 2020. She recalls that no one knew how to use Zoom at all. They typically conduct nursing simulations in the on-site simulation lab, so they had to figure out how to do patient scenarios on Zoom. As a patient in the simulation, she was trying to figure out how she was going to simulate getting anthrax with her skin changing, for example, over Zoom. She also recalls during the first faculty meeting after COVID started her supervisor wanted her to share her screen and she did not know how to do this task on Zoom. She felt she was not competent during the transition to Zoom and that she often consulted her older kids and husband for help.

P19.5.N1 IT training for Workday was "hands off" and frustrating

A staff member recalls the training for Workday was "hands off" training where trainees weren't interacting with the system but watching the instructor walk through the tasks on a large screen. The staff member recalls that the decision was made to train the staff as HR professionals are trained. The training was in-person at the enterprise IT building on Science Park Road in a large classroom. The instructor just kept saying, "if you click here, it will do this. If you click here, it'll do that." The staff member felt he learns best by "tinkering" on his own in the actual system, to make mistakes and learn from his mistakes. He understood that the training method was driven by how the contract was written. As a result, when the system was launched and he had to use it for work, he was unfamiliar with using it. When he asked people who used it on a day-to-day basis, they were also lost. After using the system for years, he can help people who are new to the university, but he recalls the training and implementation experience as very frustrating, professionally and personally.

P20.5.N1 IT training needs to be specific to job tasks

A staff member describes her experience taking in-person training to learn iTwo. She described it as a 5,000-foot view and understands that it is a challenge to create training where many people can get value from it without being too narrow. Unfortunately for her, the exercises and queries used had nothing to do with her job duties of student enrollment or headcount. She needed to learn tasks such as how to see how many credits students take each semester or how many people are dropping or withdrawing from courses. When she got back to her office, she didn't even know where to begin. She eventually connected with a data guy in her college, and he helped her in a one-on-one session even though that's not his job.

P21.5.N1 Initial PSU IT experience is overwhelming

A staff member recalls that as a freshman student at Penn State, the IT experience was overwhelming. There were so many different platforms that are used and there was so much at once. He felt the same way as a staff member in 2018 when he came on board. There was a ton of IT training in the first couple of weeks. He felt the material was presented well but he didn't fully understand enough to know what questions to ask. He recommends that perhaps there can be training at three, six, and nine months after starting school or work as a way to pace the amount. He feels that with experience and time he has a better grasp on the IT he needs to use. Initially, it was so much at once.

P22.5.N1 Academic advising customer service impacted by kiosk issues

A staff member recalls multiple issues with a kiosk that was in the waiting room of the BBH academic advising office space. Students would use the kiosk to sign into LionPath or Starfish to let the staff know that they were in the waiting room. Students could either swipe their ID cards or type their information in. The kiosk had problems so often that the staff member remembered contacting IT almost every other week to fix it. After everyone came back to campus after COVID, the kiosk still had issues. A QR code was created and attached to the kiosk because it wasn't working again, and it was a more hands-free protocol which was better in terms of COVID. Unfortunately, the QR codes didn't work with everyone's phones. Students ended up walking into the office and letting the staff know that they were there in the waiting room. It wasn't the type of customer service that this staff member felt she would have liked to provide. The staff members eventually gave up on getting the kiosk fixed and stopped asking IT to try to fix it. They have since moved offices where there isn't a kiosk anymore.

P23.5.N1 Social Media position is confusing

A staff member recalls recent staffing issues in BBH, namely the social media position. He feels that the position is a nightmare despite the College of Communications trying to make everything clear. He had this duty added to his workload and finds it confusing. The training sessions he attended for CANVAS were not very clear and when he asked for help, he didn't feel like he got help. When the new person arrived for the social media position and asked him questions his response was, "Honestly, I don't know. I've been waiting for you to get here so I could say 'Oh, hey, here's this.'"

P23.5.N2 Numerous and ever-changing social media policies

A staff member describes a negative training scenario when he was trying to understand the college's rules regarding social media postings and websites. There were so many policies, and they were ever changing. The duties to maintain the website for the College of Health and Human Development were thrown at him without time to train or train anyone else. A new employee

didn't like her social media photo and kept emailing this staff member asking, "Hey, I hate my picture. Can you fix it?" In his head, his response was "I don't have time to fix your damn picture. I have other things to do. Your picture's not one of them. Here you go." He feels the duty is just made more difficult than it needed to be.

P24.5.N1 iTwo student database complicated

A staff member describes the iTwo student database as complicated. There are a lot of queries available in the system, but for her job she only uses a portion of what the system does. There is a gentleman in their advising unit who seems to get how to use the system and has his own queries. She hesitates to get any more training on the system because she feels she will never use all the training. She finds all the information related to using this system just big and mind-boggling.

P26.5.N1 IT training is not specific to my needs

A faculty member compares his experience of IT training at PSU to his previous experience of IT training when he worked in industry. He describes the industry IT training as a "roll-out" where you take the training courses that fit your needs. There is a solicitation from the trainers asking what the user needs for training. For example, if he is learning Excel and his goal is to develop a spreadsheet with formulas, it would be best for him to go to training on formulas in Excel, as opposed to Excel training. He finds Penn State training the opposite. The initial training is not specific to his needs, and he often doesn't participate after that initial training. He will just figure it out himself. He feels the training is done well and he is aware that it is offered. They just don't meet his specific needs.

P27.5.N1 Sudden inability to access SharePoint site

A student describes his sudden inability to access a SharePoint site that he has been accessing all year. He is a member of the Penn State Singing Lions, and they store all of their documents and rehearsal tracks on a SharePoint site. He has been able to access the site all year but one day was not able to open it in his Chrome browser at all in the last week or two (April 2022). He received an error message that the site is not running. He was still able to access the site on Safari or his other devices that have Chrome, so he did not contact IT for help. He did a Google search and read through a Wiki guide to solve the problem but despite all the online resources couldn't find anything relating to this issue.

Appendix D

IRB Information

All applicable Institutional Review Board (IRB) documents for Study 00013858 are available online at the Penn State University IRB Centralized Application Tracking System (<http://irb.psu.edu>).

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Bellusci, Heather O. and Price, Dave J., "The Case for a Single Space-Security Agency, Command or Corps." *Purview*, Issue 1, October 2017, [Single Space Corps > Purview > Story Display Page \(dodlive.mil\)](#)