INCOMPLETENESS IN DIGITAL PUBLIC SERVICES: A CASE STUDY OF LETHBRIDGE'S CONSTRUCTION PERMITTING PROCESS

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ABSTRACT

This thesis examined the digitization of the permit application process at the City of Lethbridge. The findings focused on service delivery and the tension between operational efficiency and human-centric values by employing a grounded exploratory case study approach, interviewing eleven members of the public and nine staff members. The research identified significant time savings and efficiencies while highlighting challenges, such as accessibility issues, personal interaction loss, and trust degradation.

The concept of incompleteness is introduced in complex and non-transactional public services, highlighting how digitization can negatively impact human-centric values such as connectedness, satisfaction, and trust. This research integrated design thinking with public value management theory to emphasize the need to balance operational efficiency and human-centric values. The case study revealed that while digitizing the permit application process increased accessibility for many users, it created new inequities.

This thesis advocates for a hybrid model that combines digital service platforms with additional support to address the issue of incompleteness. This ensures that the digitized services remain accessible and legitimate. This research provides insights into the lived experiences of digitizing public services and emphasizes the need to balance technological efficiencies with human-centric values and proficiencies. It contributes to the theoretical discourse on public value management and offers practical recommendations for policymakers, service designers, and practitioners looking to implement inclusive digital public services.

ETHICS STATEMENT

Work described in this thesis received research ethics approval from the University of Alberta Research Ethics Board, Project Name "An Exploratory Case Study of the Emerging Digital Divide in a Municipality's Construction Permit Services", No. Pro00120029, May 24, 2022.

USES OF AI IN THIS WORK

Generative AI tools, including ChatGPT, Copilot, and Grammarly, were used to assist in the editing and review of the thesis for spelling, grammar, and readability purposes. Additionally, Otter.ai assisted with the initial transcription of interviews during the research process.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1. Introduction

The digitization of services has become a common practice within the public service. For example, between 2014 and 2020, the City of Lethbridge saw the release of new online permit applications, intelligent parking meters, 311 services, transit bus tracking, and online recreation booking. Communities worldwide have experienced the digitization of public services accelerated by health measures implemented to control the spread of COVID-19, which limited traditional in-person interactions throughout the pandemic (Agostino et al., 2021; Gabryelczyk, 2020). This is true for the City of Lethbridge, where City Hall closed public access in May 2020 due to a rise in local case numbers during the first wave of the pandemic. During this period, greater dependence on online services highlighted the ongoing challenges caused by an emerging digital divide: the gap between those who benefit from digitized services and those who are left behind. Significant pressures are being exerted on the public sector, particularly permitting services, to digitize their offerings to improve efficiency (Eirinaki et al., 2018). This research can help guide managers and policymakers through the digitization process by developing a better understanding of the potential challenges and pitfalls.

By the end of 2020, the City of Lethbridge's Building Inspections observed that approximately 96% of the professional contractors chose to take advantage of the online applications, while a smaller proportion (78%) of homeowners utilized the online service. This gap in preferences between the two user segments has considerable implications for the future design and delivery of public services in the City of Lethbridge and was fundamental to developing the initial research objectives. By improving the understanding of the needs of the differing customer groups and their preferences towards digital services, the City of Lethbridge

and other municipalities can leverage this knowledge in operational decisions, including the availability of in-person staff.

Research on the topic of digitizing public services has generally focused on the optimization of the implementation process and its operational gains (Fischer et al., 2021). However, with a narrow focus on delivering a like-for-like digital copy, these implementation strategies fail to challenge the core processes and assumptions underlining the services. They may miss the opportunity to make meaningful improvements for customers and citizens. For example, the City of Lethbridge's decision to automatically issue residential subtrade permits challenged the traditional belief that every permit required a review before being issued, creating a unique and highly beneficial improvement to their services. However, in some cases, digitization may fail to identify the hidden values provided as part of the original service.

As public sector organizations face significant external pressures to digitize public services (Agostino et al., 2021; Mergel et al., 2019). A wide range of everyday systems, including parking meters, street lighting, utility meters, transit, and permitting systems, have undergone a significant transformation (Andersson & Mattsson, 2018; Gabryelczyk, 2020; Tomičić Pupek et al., 2019). I question how (and if) the general public benefits from these initiatives.

Studies on the digitization of public services have often been examined by researchers with the implementation strategy at the focus of their studies (Eirinaki et al., 2018; Noardo, Malacarne, et al., 2020; Noardo, Wu, et al., 2020). The primary considerations identified in these studies include timeliness, efficiency, and trust. Though digitization has resulted in benefits towards those considerations, much remains to be examined regarding the broader consequences. Challenges beyond the typical economic benefits, particularly regarding equity of service and

issues regarding access, have been identified as potential downsides of digitizing public services (Cordella & Bonina, 2012; Larsson, 2021).

Through my scan of the literature, I tried to find research exploring the implications of the emerging digital divide for mandatory public services provided by municipalities. Despite the limited availability of research on the topic, both Provincial and Federal governments have invested heavily in grant programs to help accelerate the digitization of permitting services in hopes of reducing permit processing times with the ongoing housing crisis (BC Ministry of Housing, 2023; Canada Mortgage and Housing Corporation [CMHC], 2023). With the continuing interest in the topic, the opportunity exists to improve the understanding of the digitization of services and the processes that lead to public value creation for everyone (Panagiotopoulos et al., 2019). The permitting process plays a critical role within the community, as the failure to deliver these services promptly or adequately may result in delayed construction. This issue is particularly poignant as Canada faces discussions regarding housing and its contributing processes, such as municipal approvals.

A key concept introduced through this study regarding these hidden values is incompleteness. Incompleteness was observed when digitizing public services, where outcomes prioritized operational efficiency and cost-effectiveness at the expense of human-centric values such as trust, accessibility, and inclusivity. The concept highlights the gaps between the technical functionality of a system, the experiential needs of the user, and the failure to accommodate the diverse needs and preferences of users who depend on the systems. A failure to address these gaps can severely limit the service's overall experience and public value.

Consequently, due to the poor delivery of permitting services, contractors or homeowners may choose to circumvent the regulatory practices out of frustration (Eirinaki et al., 2018). With

the possibility of fatalities resulting from the failure to ensure safety standards are met, the construction permit service impacts public life. In his address to the Canadian Senate, Genereaux (2014) informed his colleagues that approximately 50% of Canada's fire-related deaths are caused by uninspected wood-burning heating systems. Members of the public rarely consider the thousands of decisions and the extent of efforts that are required to build safe communities (Pauley, 2021). Exploring the digitized permitting service and its use (or non-use) by customers can help ensure that the service meets user, and community needs through the design processes.

1.1. Research Questions and Objectives

There is a tendency for public administrations to mimic the private or market sector in their designs and assumptions when digitizing a public service such as construction permit applications. As these impact a broader group of stakeholders, additional considerations and a holistic approach are necessary when designing public services (Dunne, 2018). The assumption that the users will have sufficient support or access to continue to engage with the digitalized services may only sometimes hold. Some users and demographics unfamiliar with digital technologies may face additional barriers or resource constraints that further inequality within the community. This research was intended to explore the outcomes surrounding the digitization of construction permit applications at the City of Lethbridge. An observed emerging divide between contractors and homeowners inspired the topic. This research assists in understanding the digitization of public services, such as construction permit applications. The study will also explore the following three subquestions:

Subquestion 1: What are the perceived benefits, challenges, and lessons learned from digitizing the permit application, plan submission and review, and inspection services?

Subquestion 2: Why are fewer residential homeowners taking advantage of the online permitting service relative to contractors?

Subquestion 3: What improvements or changes, if any, could reduce the gap between the two user segments?

1.2. Summary of Findings

The findings of this study reveal the impact of digitizing the construction permit application process at the City of Lethbridge. Participants observed significant time savings and efficiency gains as the digital platform streamlined workflows, reduced issuance times, and improved overall process efficiency. However, the study also identified several challenges, including accessibility issues for certain populations, such as older adults and non-native English speakers, and a noticeable loss of interaction. These challenges highlight that not all users benefit equally from digital transformations. The lack of supportive resources further exacerbates these issues, leaving some users overwhelmed and underserved. Despite these drawbacks, the study highlights the potential for digital platforms to enhance service accessibility and availability when designed inclusively and supported adequately.

1.3. Theoretical and Practical Contributions

Theoretically, this research contributes to understanding public value management in the context of digital transformation, emphasizing the concept of incompleteness in public services. It integrates design thinking principles with public value management theory, highlighting the need to balance operational efficiency with human-centric values such as empathy, satisfaction, and legitimacy. Practically, the study provides empirical evidence on the benefits and drawbacks of digitized public services, offering insights into best practices for implementation. It advocates for a hybrid model that combines digital platforms with additional supports, recommending

iterative design processes and continuous feedback to ensure services remain accessible, legitimate, and trustworthy. These contributions provide valuable guidance for policymakers and practitioners aiming to implement effective and inclusive digital public services, addressing the nuanced impacts of digital transformations on diverse user groups.

Chapter 2. Literature Review

This chapter explores the literature regarding the digitization of public services and the emergence of digital divides within the public sector. As is typical with academic research, this study will introduce several concepts, such as digitization, public services, design thinking, digital divides, and legitimacy, which will be elaborated upon and operationalized throughout the chapter.

2.1. Public Services & Public Value

Exploring the concepts presented within this chapter requires an introduction to what a service may consist of. Within economics literature, 'services' were limited for many years by a "definition by exclusion" (Judd, 1964, p. 58) and they were viewed as an antithesis of goods. Goods represented tangible products such as a loaf of bread. Conversely, services such as building inspections present themselves as intangible and abstract. The definition of services gradually matured as Zeithaml et al. (1985) outlined four key service characteristics: intangibility, heterogeneity, inseparability, and perishability. The heterogeneity of a service is the inconsistency in delivery between every instance of the service. No two building inspections are precisely alike, as each construction project introduces its own considerations. Another key characteristic was the inseparability of the production and consumption of a service. Continuing with the example of a building inspection, it is performed and delivered simultaneously. The final characteristic presented by Zeithaml et al. (1985) is the perishability of a service. This is the inability to store or save the service for later use. For example, an inspection on a building not performed today can not be reclaimed tomorrow. Despite the efforts to neatly conceptualize goods and services, the emergence of digital economies has blurred the line. This shift has led modern scholars such as Vargo et al. (2014, p. 40) to define services as "the application of

specialized competencies (knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself."

Generally, public services are present or emerge in cases where the private market may under-provide a service due to a natural monopoly or the service benefits the greater public good. These factors lead public institutions to a different and broader set of considerations that must be incorporated into the design of public services (Dunne, 2018; Moore, 1995). These services must consider the broader implications of diverse stakeholders who depend on the service, the complexity of the sector or industry, and the systems in which the service will be delivered (Dunne, 2018).

The consideration of wider implications of diverse stakeholders arose as a reoccurring topic throughout the research, with issues of access and availability being a concern for multiple demographics, including older adults and new Canadians.

Moore's (1995) book *Creating Public Value: Strategic Management in Government* introduced public value to assess outcomes for public administrations equivalent to shareholder value within the private industry (Moore, 1995). The concept differed from traditional economic concepts such as *public goods* in recognizing that a net positive value could be created through government intervention beyond the traditional demarcation between public and private goods, i.e., government involvement in cases of market failure (Bozeman, 2002; Kelly et al., 2002). The contribution provided by public value as an outcome of services came from its ability to incorporate moral, value, and societal issues which were not considered within the traditional economic models of *public goods*, *pure public services*, and *externalities*. Public value goes beyond the narrow focus on goal achievement and operational efficiency as the primary role of public administration outcomes (Gains & Stoker, 2009; Kelly et al., 2002; Stoker, 2006).

Public value management has a relational approach to services aligning with those presented in design thinking literature. An emphasis on human-centred services minimizes the divide between the client and contractor and sees them as partners in public value creation (Stoker, 2006). Both the concepts of public value management and design thinking empower managers to be responsive, innovative, and creative (Benington & Moore, 2010; Gains & Stoker, 2009; Moore, 1995; Simon, 1961).

The concept of public value is well-suited for lower levels of government, such as local authorities and municipalities (Grant, 2021; Grant & Fisher, 2011; Morrell, 2009; Rhodes & Wanna, 2007). Local governments can benefit from public value management due to the structure of governing bodies relying heavily on appointed officials (Gains & Stoker, 2009; Grant & Fisher, 2011). Appointed officers within the local governments are better positioned to take on an active role in enhancing and designing public services and have the legitimacy and accountability required to succeed (Gains & Stoker, 2009; Grant & Fisher, 2011). For these reasons, the public value management approach to delivering services and measuring outcomes is well suited for studies at the municipal level.

Cordella and Bonina (2012) argue that public value management is a more appropriate approach to evaluating the socio-political implications of information technology investments within the public sector. In the past, a narrow focus on efficiency led public administrations to focus on developing universal strategies and best practices as the primary approach toward technological implementations at the expense of contextual factors such as the needs of their citizens (Cordella & Bonina, 2012). Ignoring the missing contextual factors and relying on shared assumptions opposes public value and design thinking principles. The issue is aggravated at the local level of government as municipalities are more likely to mimic each other without

assessing the needs of their respective communities in an attempt to deliver solutions as cost-effectively as possible (Karkin & Janssen, 2014). Rather than solely optimizing processes and procedures for operational efficiency and cost-effectiveness, the public value management approach encourages managers to evaluate competing public values by searching for creative alternatives (Cordella & Bonina, 2012; Moore, 1995). Local governments are also challenged in delivering public value with the limited capabilities of their public administrations and often default to the most readily available solutions (De Tuya et al., 2020).

2.2. Digitizing Services

Digitization consists of taking analogue processes and recreating them within a digital medium (Bloomberg, 2018, April). Hess et al. (2016, p. 124) define digital transformations as "concerned with the changes digital technologies can bring about in a company's business model, which result in changed products or organizational structures or the automation of processes." The concept of digital transformations can represent scenarios in which digitalization successfully incorporates design approaches to challenge basic assumptions and create solutions that deliver transformative results for stakeholders. One such example is Aravind's use of digital technologies to provide ophthalmic telemedicine services to customers in remote areas of India (Brown, 2008).

The exploration of digitizing public services and their impact on public value creation remains understudied (Panagiotopoulos et al., 2019). Leaders within the public sector find themselves driven by external pressures to undergo the process of digitization (Mergel et al., 2019). As a result of the COVID-19 pandemic, public sector organizations have been pushed further towards digitizing public services (Agostino et al., 2021; Gabryelczyk, 2020). With technology, organizational structures, and processes deeply intertwined in modern organizations

(Zammuto et al., 2007), adapting to change presents a significant challenge for large and bureaucratic organizations in the public sector (Sebastian et al., 2017). The design of digital public services can be viewed as a wicked problem because of the introduction of new challenges through digitization. Challenges include the possibility of failure, squandered resources (Sebastian et al., 2017), and data privacy (Kitchin, 2016). At the City of Lethbridge, an emerging challenge since the digitization of the construction permit service is the diverging service preferences between professional contractors and residential homeowner applicants.

Value creation from digitization can be expressed in multiple ways by researchers, including as a strategic asset (Anthony Jnr, 2020; Hess et al., 2016; Kitchin, 2016; Zammuto et al., 2007), the improvement of operational efficiencies (Hess et al., 2016), revenue increases (Hess et al., 2016), and establishing trust and legitimacy with stakeholders (Anthony Jnr, 2020; Lara et al., 2016; Mendel & Brudney, 2014; Neumann et al., 2019; Panagiotopoulos et al., 2019). Mirroring design thinking principles, value creation from digitization results from the alignment of processes, technologies, and delivery models (Anthony Jnr, 2020). Within these instances, opportunities also exist for value co-creation with customers and citizens (Nadkarni & Prügl, 2020). Within the context of public services, it is suggested that the public value management approach is best suited for capturing the outcomes of information technology investments through the digitization of public services (Cordella & Bonina, 2012).

2.3. Service Design & Design Thinking

Shostack (1982) popularized the service design concept to describe the process and activities of planning and designing services. Miller (2015) defines service design as "rooted in design thinking and brings a creative, human-centred process to service improvement and designing new services. Through collaborative methods that engage both customers and service

delivery teams, service design helps organizations gain a true, end-to-end understanding of their services, enabling holistic and meaningful improvements." Simon stated that design is "concerned with how things ought to be — how they ought to be to attain goals and to function" (Simon, 1961, p. 7). Service design, by extension, brought forward design principles in the creation or transformation of services.

Stickdorn et al. (2018, p. 26) present six principles when designing services:

- Human-centred: The service should consider the experience of any individual who may interact with the service.
- Collaborative: A wide variety of stakeholders should be engaged through the service design process.
- Iterative: Following traditional design processes, service design implementations take on an exploratory and iterative approach to generating the best solutions.
- Sequential: Tools such as Shostack (1982) *process blueprint* can be utilized to map and visualize the sequence of events and activities within a given service.
- Real: An understanding of the requirements and needs should be investigated based on reality. With prototyping, ideas can be explored, and values can be evidenced.
- Holistic: The needs of all stakeholders should be incorporated within the design throughout the entire service.

Lawrence (2019) provides four stages of service design: research, ideation, prototyping, and implementation. The research conducted as part of service design can include feedback through both quantitative and qualitative methods to enhance understanding of stakeholder needs. This study hopes to advance the understanding of digitized public services and aid in

researching and ideating the permitting services at the City of Lethbridge. The ideation process requires designers and practitioners to explore ideas as potential solutions, followed by prototypes to demonstrate how the ideas can address the requirements. Finally, the implementation of the new service begins once a sufficient level of understanding and development has been achieved.

Practical applications of service design and design thinking practices have demonstrated an ability to create public value by improving public service delivery. For example, Tim Brown (2008) recounts how Kaiser hospitals, in cooperation with IDEO, improved nurses' information exchange during shift changes. Through a holistic design approach involving practitioners, nurses, doctors, software engineers, and designers, the team prototyped various ideas. Eventually, a solution that significantly decreased the time required to exchange information between shifts was implemented. These changes resulted in improvements in both the patient's experience and the nurse's job satisfaction.

2.4. Digital Divide

With the emergence and gradual popularization of digital services, a gap emerged between those with and without access. Initially, the concept focused on segregating those who could not participate in the digital economy due to limited computer access or a reliable internet connection (Lane, 1999). The concept eventually grew to include other resource constraints faced by those who benefited from digital technologies and those who did not. Warschauer (2003) identified a broader set of resource constraints that limit the adoption of technology in social development, including:

- Physical resources: access to computers, smart devices, and the internet
- Digital resources: availability of relevant content in the appropriate language

- Human resources: literacy and education
- Social resources: community and institutional support

In Warschauer (2003) study, providing physical access to technology did not fully resolve the digital divide. It was found that the emphasis on physical access ignored the more complex underlying social issues leading to the emerging inequities caused by digital economies and services. In 2020, approximately 95.2% of all Albertans had some level of internet use, with the highest physical access levels in Canada (Statistics Canada, 2021). Within this dataset, a degree of variability can be observed when comparing demographics such as age. Approximately 83% of individuals aged 65 or older in the province of Alberta had accessed the internet for personal use, while younger demographics reported uses above 96.8% (Statistics Canada, 2021). This high degree of access across all demographics in Alberta implies that it is unlikely that physical and technological resource constraints can explain the observed gap in the use of the digital permitting service. Instead, exploring the expanded set of constraints may better explain the emerging divide. This study will look to understand if the social, digital, or human resource constraints, as presented by Warschauer (2003), may be responsible for the emerging trend observed by the City of Lethbridge.

2.5. Legitimacy

Within the public sector, the legitimacy of the organization and its services are shared between the publicly elected officials and appointed officers, each with their distinct responsibilities (Rhodes & Wanna, 2007; Stoker, 2006). The public value framework finds itself intrinsically tied to the concept of legitimacy. To succeed as a public manager or official, decision-makers must deliver services that are seen as sustainable and legitimate by stakeholders (Moore, 1995; Panagiotopoulos et al., 2019; Stoker, 2006; Talbot, 2009). This has encouraged

public managers to seek the creation of public value as a means to creating legitimacy, transparency, and accountability for their public institutions (Cordella & Bonina, 2012; Neumann et al., 2019; Talbot, 2009). Faulkner and Kaufman (2018) found that legitimacy and trust were among the four common themes identified through their review of studies regarding public value outcomes. Gains and Stoker (2009) argue that these concepts of legitimacy and accountability from the public value model are also well suited for initiatives and outcomes at the local government level.

With the evolution of public services through digitization, a question regarding the legitimacy of these outcomes arises. For example, while digital alternatives to in-person interactions may be more cost-effective, it is possible that the participant may question the legitimacy of the digital service and may be reluctant to engage with the platform (Lindgren et al., 2019; Trischler & Westman Trischler, 2021). This is particularly true when the automation of the services may impact the eligibility and access of the service (Lindgren et al., 2019). Understanding and measuring legitimacy has presented itself as a unique challenge to researchers and practitioners, as no single measure of trust has been adopted (Faulkner & Kaufman, 2018). Those responsible for implementing digital projects within the public sector must balance a knife edge when focusing on the efficient delivery of services, as it may harm the public's perceptions of legitimacy (Trischler & Westman Trischler, 2021). This tension arises as public agencies who deliver services ineffectively are also at risk of harming their legitimacy (Cordella & Bonina, 2012).

It is essential that when designing public services, managers avoid the creation of "red tape" processes that are seen as bureaucratic and lack legitimate value (Bozeman, 1993; Larsson, 2021). Vial (2019) found that when leadership fails to demonstrate the legitimacy of the

processes and transformations achieved through digital technologies, it will result in organizational and institutional barriers resisting implementation. One approach that was found to assist in the legitimization of service design was the incremental and iterative approach common within design thinking frameworks (Dunne, 2018). This strategy allows leadership to generate momentum through small successes, further legitimizing the overall goals of the digital implementation.

Further studying the impact of digitizing public services may legitimize these investments as their outcomes are realistically defined (Fischer et al., 2021). There is also cause for further existing research on the impact on citizen trust towards a government that is undergoing the digitization and automation of services (Lindgren et al., 2019).

2.6. Incompleteness in Digital Public Services

Incompleteness refers to the phenomenon where digitized public services fail to meet users' values and expectations. These human-centric values, such as trust, accessibility, and inclusivity, were previously provided as part of the interpersonal interactions inherent within a public service. Incompleteness occurs when digital systems, designed primarily to enhance speed and convenience, neglect the relational and emotional elements that foster public trust and ensure equitable access for all users, particularly those most vulnerable or less digitally proficient.

An example of incompleteness within the study includes the discovery that the system improved efficiency for contractors but left homeowners and new users feeling excluded. Contractors benefited from time savings and easier access to records, but homeowners, who often needed additional guidance, felt that the system lacked empathy and accessibility. This imbalance shows how digitization can achieve high-level operational goals without addressing the broader human-centric values that public services traditionally deliver.

The concept of public value (Moore, 1995) emphasizes the importance of trust, legitimacy, and citizen satisfaction in public services. Digitization can undermine these values when systems become too impersonal and inaccessible to segments of the population. The literature highlights that while efficiency metrics are often the focus, public services must also create relational value by fostering trust and accessibility. In the service design literature, key principles like human-centered design (Stickdorn et al., 2018) are essential for ensuring that services are both effective and accessible. However, the research showed that the eApply system in Lethbridge failed to fully consider these principles for all user groups.

The literature on design thinking (Brown, 2008) emphasizes the importance of human-centered design elements such as empathy, iteration, and user feedback in creating services that meet users' needs. These considerations may mitigate the impact of incompleteness by integrating these principles into digital public services. For example, while the eApply system may work well for contractors who are frequent users, homeowners, who are less familiar with digital tools, were not considered adequately during the design process.

The literature on the digital divide (Warschauer, 2003) discusses how access to digital services is not uniform across populations. Factors such as digital literacy, access to technology, and familiarity with digital interfaces create a divide between user segments. Incompleteness in the study manifests as the system's inability to bridge these divides. Contractors benefited from faster processing, but homeowners, older adults, and non-native English speakers struggled to navigate and engage with the system. The literature highlights that without addressing the digital divide, digitization can exacerbate inequality in public service access—leading to incomplete service delivery.

Chapter 3. Research Design & Methods

This exploratory case study aimed to examine the impact of digitization on the construction permitting process at the City of Lethbridge. Additionally, I was interested in further exploring the observed preference gap between contractor and homeowner applicants that emerged since the digitization of the service. This section begins by revisiting the research question, sub-questions, and the rationale for an exploratory case study design. Next, I outline the chosen case study site and its context. Following, I discuss participant selection criteria, methods, data collection, and analysis. This leads to my role as a researcher, reflexivity, and additional considerations as an insider researcher.

3.1. Design and Rationale

Yin (2018, p. 15) proposes that a case study design should be pursued when "you want to understand a real-world case and assume that such an understanding is likely to involve important contextual conditions pertinent to your case." A single exploratory case study design was selected as the preferred approach to investigate the research question: "What is the impact of digitizing a public service construction permit process at the City of Lethbridge?" This study is also concerned with the following three subquestions:

Subquestion 1: What are the perceived benefits, challenges, and lessons learned from digitizing the permit application, plan submission and review, and inspection services?

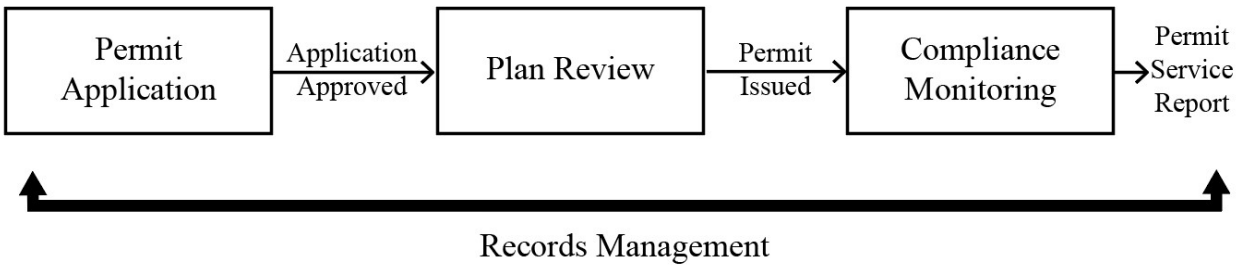
Subquestion 2: Why are fewer residential homeowners taking advantage of the online permitting service relative to contractors?

Subquestion 3: What improvements or changes, if any, could reduce the gap between the two user segments?

The service investigated throughout this study was the digitization of the City of Lethbridge's construction permit life cycle (Figure 1) including the permit application, plan review, and compliance monitoring processes. This essential offering by municipalities nationwide is a mandatory part of the approval process for all new constructions and alterations. The permit application process ensures that applicants have provided adequate information in line with local development requirements. The plan review and compliance monitoring processes ensure that the proposed construction project meets the life safety requirements outlined within the Safety Codes. Compliance monitoring in this context refers to the periodic site inspections performed by the municipality's Safety Codes Officers, often called building inspectors, as construction progresses. The process in Alberta is concluded with the Permit Service Report sent to the property owner as a final record of the completed (or incomplete) permit. At the City of Lethbridge, the permit lifecycle is recorded through Tempest's electronic records management system.

Figure 1

Permit Life Cycle



Examining this public service to develop a thorough understanding of the issues regarding digitization lent itself to a qualitative research design (Creswell & Creswell, 2018). The selection of a qualitative design enabled the exploration of the participants' opinions, attitudes, and perceptions of the digitized service. Yin (2018) describes several considerations when selecting a case study approach to research, such as a) the exploration of "how" or "why"

research questions; b) the limited control over the events of the phenomena; and c) a focus on contemporary rather than historical events. For this case, the research question and sub-questions were well suited for the approach. The construction permit application process is not a phenomenon in which a limited number of variables can be measured and controlled. It is a complicated and heavily regulated process where each project and application are unique, creating too many factors to control reasonably. Therefore, the research question did not lend itself well to a quantitative or experimental design when selecting a research approach. Additionally, with the City of Lethbridge's continued investment in digitizing the development permit application process, the phenomenon under investigation remains relevant and rooted in contemporary challenges.

As the researcher, the case study approach allowed me to incorporate the important contextual factors when examining a real-world case. Additionally, case studies are one of the preferred methods when examining operational processes, such as the ongoing digitization of a public service, that occurred over time and where the relevant phenomenon could not be manipulated in an experimental fashion (Yin, 2018). The inclusion of a rich description and context is what made the case study approach exciting and helped in developing a broader understanding of the phenomenon (Buchanan, 2012).

Of the various case study strategies available, an exploratory approach was selected to investigate the impact of the digitization of the public service on three major user segments: internal staff, contractors (high volume applicants), and homeowners (low volume / single permit applicants). As a single case study, this exploratory research was defined, or bounded (Buchanan, 2012; Creswell & Creswell, 2018; Creswell & Poth, 2016), to examine a single

service (construction permit applications) within a limited geographic area (the City of Lethbridge).

Limitations to the case study approach include considerations regarding the rigour of the research design and the ability to generalize from a single case. These limitations are further exasperated by the challenge of managing my relationship as an internal investigator during the data collection period.

By employing a qualitative approach while exploring the subject of digitizing construction permits, the case study was not intended to determine causality. Instead, the approach lent itself to a better understanding the context and the dynamics of customer and staff interactions with the digitized service. This research was designed to lay the foundations for future research, service design considerations, and policy impacts.

3.2. Research Methods

3.2.1 Case selection and Context

Research relies on the partnership of researchers, practitioners, and research practitioners to gain a comprehensive view of the experiences of those engaged in a phenomenon (Schon, 1983). The selection of the City of Lethbridge as a case study was, in part, an 'opportunist approach (Symon & Cassell, 2012, p. 37) which took advantage of my status as an employee during the study. This greatly facilitated access to the organization to conduct the study. A case must be representative of the phenomenon under investigation (Buchanan, 2012). The City of Lethbridge, having undergone the digitization of a core service, served as an ideal site to investigate the emerging trends and their impacts on the digitization of public services. Another consideration in selecting the City of Lethbridge was the willingness of participants and the interest the organization demonstrated during the initial pre-discussions. These discussions

regarding the digitization of the permitting system were held with seven participants, including an online permit applicant, a permit technician, two analysts (one internal and one external), two Safety Codes Officers, and a member of the administration. Feedback from these early discussions led to refining the project's initial research question and identifying the divergence in service preferences between the homeowner and contractor user segments.

Context. The City of Lethbridge first began digitizing construction permit applications in 2010. Starting with a team consisting of one business analyst in partnership with a municipal software developer, the city released its first iteration of eApply in late 2014. The release focused on residential subtrade permits (electrical, plumbing, and gas) and represented a significant change for the City of Lethbridge. Before implementing the eApply system, the City of Lethbridge managed the issuance of permits using a hybrid approach using both a digital records management system and a paper-based plans examination process. The new online system automatically issued many of these permits which no longer required manual intervention at the approval stage. These automatically issued permits are commonly called "in and out" or "vending machine" permits within the construction industry. The initial release of online applications for "in and out" permits proved popular with the construction industry's contractors, seeing over 68% of applications being made online after the first year of release (Table 1).

Table 1

Percentage of permits, grouped by review type, by application source

Review Type	Application Source	2013	2014	2015	2016	2017	2018	2019	2020	2021
In and Out	Paper Application	100%	95%	32%	26%	19%	14%	9%	2%	0%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	2%	3%
	eApply	0%	5%	68%	74%	81%	86%	90%	97%	97%
Plan Review	Paper Application	100%	100%	92%	71%	66%	55%	39%	9%	6%
	City Hall (eApply)	0%	0%	0%	0%	0%	1%	1%	4%	6%
	eApply	0%	0%	7%	29%	34%	44%	60%	87%	89%
All Permits	Paper Application	100%	98%	64%	51%	43%	35%	24%	5%	3%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	3%	4%
	eApply	0%	2%	36%	49%	57%	65%	75%	92%	93%

The digitization process of the construction permit applications continued, and in 2015, the team added a second analyst to assist in developing and supporting eApply. By the end of that year, residential permits requiring a plan review were released to a limited group of users. Starting in 2016, all residential construction permit applicants could submit a digital copy of their project plans and receive an approved plan set through an online portal.

Later, in 2016, the City of Lethbridge began re-evaluating its approach to construction permit applications and initiated the eApply 2.0 project. The intended goal was to restructure and simplify the permit fee calculations, adapt the website to a mobile-friendly format, and release commercial permit applications. The project's first phase was completed in early 2018 with the re-release of the existing residential permits. Gradually, over the next two years, commercial permit applications were sequentially released to the construction industry as the software development and quality assurance testing was completed. Online commercial building permit applications were released only a few months after the COVID-19 restrictions were first imposed in 2020. During the pre-discussions with City of Lethbridge employees, eApply was credited with allowing the Building Inspections team to continue many of their day-to-day tasks with

minimal interruptions despite the closure of City Hall. With the release of the final commercial permit application types in late 2020, approximately 92% of all construction permits were applied online, with approximately 8% being applied for in person (Table 2).

Table 2

Permits by application source

	Application Source	2013	2014	2015	2016	2017	2018	2019	2020	2021
	Paper Application	100%	98%	64%	51%	43%	35%	24%	5%	3%
All Permits	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	3%	4%
	eApply	0%	2%	36%	49%	57%	65%	75%	92%	93%

After completing the digitization process for Safety Codes construction permits, the City of Lethbridge turned its attention toward development applications. Though these development permits were not included in the investigation, it is important to note that the municipality continued its intentions to bring development and planning services online at the relevancy of this research to ongoing efforts.

In 2021, 93% of the year's permit applications were submitted online (Table 2). By many accounts, the eApply initiative has been incredibly successful for the City of Lethbridge. However, some discrepancies and shortcomings emerged during the conversations with frontline staff. It was suggested that while contractors often choose to apply online, fewer homeowners take advantage of the service. Instead, staff observed that homeowners continued coming to City Hall to make their permit applications. The City of Lethbridge (Table 3) later quantified and confirmed these observations, demonstrating that 22% of homeowners still applied for permits in person. In comparison, only 3% of contractors chose not to use the online services.

Table 3

Percentage of permits, grouped by applicant type, application source

Applicant Type	Application Source	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contractors	Paper Application	100%	98%	59%	47%	38%	30%	19%	5%	3%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	1%	2%
	eApply	0%	2%	41%	53%	62%	70%	80%	94%	96%
Homeowners	Paper Application	100%	100%	98%	83%	81%	69%	59%	7%	2%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	3%	11%	20%
	eApply	0%	0%	2%	17%	19%	31%	38%	82%	78%

Site Access. While negotiating access, it was important to have a clear research design that communicated the participant selection criteria to the gatekeepers at the City of Lethbridge. This resulted in minor compromises from the original design to ensure continued access to the research site and participants. Namely, access to participants was limited to those within the primary department in which permits were issued. I could not contact and recruit potential participants from other business areas who contributed to the process. As Symon and Cassell (2012) note that it is better to compromise as rigidity may instead result in having access revoked entirely.

Before conducting the formal research project, informal discussions began in January 2021 regarding the possibility of using the City of Lethbridge as a research site. Information such as the nature of the research question, the topics of discussion, a list of potential staff participants, and the duration of interviews were shared with the organizational gatekeepers, such as the relevant members of the administration and the Freedom of Information and Protection of Privacy (FOIP) officer. A discussion regarding the collection of additional information necessary for the organization to gain access (Symon & Cassell, 2012) resulted in an agreement that the City of Lethbridge would receive a summary report of the findings once the research thesis had been completed. The proposed report will focus on suggestions for improving their digital

systems based on what has been learned from the research. Navigating the agreement required constant interaction with the involved parties to ensure continued access to participants and organizational documents for research purposes.

As the municipal corporation is considered a public institution operating in Alberta under the province's jurisdiction, access to personal information fell within the Freedom of Information and Protection of Privacy Act's (FOIP) scope. Section 42 of the Freedom of Information and Protection of Privacy Act, RSA 2000, c. F-25 includes provisions that allow for the disclosure of personal information in the custody of the City of Lethbridge for research purposes by signing a research agreement. The agreement outlines the conditions of use of the information provided by the institution and is viewed as a binding legal document that grants access to the specified records. An informal agreement was established with the Deputy City Clerk and FOIP officer by email in June of 2022, which provided access to the contact information of City Staff participants and internal documentation relevant to the study. The establishment of the FOIP agreement was not pursued until the Human Participant Research Committee (HPRC) approved the research project to ensure that the request accurately captured the requested data collection methods and necessary records.

3.2.2 Methods

To create a rich description, data was collected from the following sources:

- Internal and public documents, including specification and design documents
- Corporate Values and Onboarding Documentation
- Archival records such as announcements, news interviews, and council minutes
- Interviews of staff and applicants
- Artifacts, including the existing digital permitting system, were also examined

The collection from multiple sources assisted in the triangulation of the data to improve the reliability and rigour of the study (Yin, 2018). A key strength of the case study design is using these varied data sources to triangulate facts, converge evidence, and produce accurate accounts of the phenomenon (Yin, 2018).

In-depth semi-structured interviews were conducted with the participants as the primary source of data collection. A total of 19 distinct interviews with 20 participants were completed with both internal and external participants. In one case, two participants requested to conduct the interview simultaneously as they participated in the process together. One challenge with collecting several different accounts from various sources within an organization was the competing narratives, in part due to differences in experiences and power imbalances within the organization (Buchanan, 2012).

3.2.3 Participant Selection and Recruitment

The selection of participants was intended to meet the needs of the research question and propositions of the study. Three categories of participants were identified: municipal staff, contractors, and homeowners. I undertook a purposeful theoretical sampling method to explore the impacts of digitizing the permitting service. Purposeful selection is a non-probabilistic sampling technique in which participation is based on how well-suited individuals are to provide information that will illuminate the research question (Creswell & Creswell, 2018). I was able to secure 20 participants over the course of the study (Table 4) .

Table 4

Recruitment Summary

	Municipal Staff	Contractors	Homeowners
Selection	The municipality provided a list of staff members for all of the staff who were directly involved in the Building Permit process.	Using the Open Data Portal, a list of contractor applications was compiled from those who completed a permit of any discipline in the last two years.	A list of homeowner applicants who completed a building permit in the last two years was created using the Open Data Portal.
Sampling Technique	*Purposeful Theoretical Sampling* All municipal staff members were contacted through a recruitment email.	*Purposeful Theoretical Sampling* All the contractors on the list were contacted through a mail-based recruitment letter.	*Purposeful Theoretical Sampling* After three iterations, all the Homeowners on the list were contacted through a mail-based recruitment letter.
Methods	Recruitment Message	Recruitment Letter & Snowball	Recruitment Letter & Snowball
Response Rate	35% of 26 Staff members contacted	4% of 143 Unique businesses contacted	1% of 385 Unique properties contacted
Participants	9 Participants	7 Participants (1 recruited via snowball)	4 Participants

Selection continued until theoretical saturation was met, and no new themes or information emerged from the data (Creswell & Creswell, 2018). The final of the 54 third-order codes was identified during the 16th interview, with no new significant codes emerging afterwards (Table 5).

This saturation was accomplished through multiple iterations of recruitment, including the initial email to staff and three batches of letters to external participants.

Table 5

Code Emergence Summary

Participant	Role	Segment	3rd Order Codes
Participant 1	Permit Technician	Municipal Staff	31
Participant 2	Development Officer	Municipal Staff	9
Participant 3	Senior SCO	Municipal Staff	1
Participant 4	Building Inspections Manager	Municipal Staff	5
Participant 5	Electrical SCO	Municipal Staff	0
Participant 6	Building SCO	Municipal Staff	0
Participant 7	Permit Technician	Municipal Staff	0
Participant 8	Permit Technician	Municipal Staff	2
Participant 9	Permit Technician	Municipal Staff	1
Participant 10	Commercial Contractor Applicant	Contractor	1
Participant 11	Homeowner	Homeowner	0
Participant 12	Estimator (Contractor Applicant)	Contractor	1
Participant 13	Homeowner	Homeowner	1
Participant 14	Contractor	Contractor	1
Participant 15	Office Manager	Contractor	0
Participant 16	Management / Ownership	Contractor	1
Participant 17	Homeowner	Homeowner	0
Participant 18	Owner	Contractor	0
Participant 19	Clerk	Contractor	0
Participant 20	Homeowner	Homeowner	0

Municipal Staff.

Selection & Recruitment. The initial selection of participants internal to the organization was through convenience and opportunistic selection. Only participants within the Planning & Design department were targeted as part of the research agreement. Ancillary services, such as local utility authorities, who may have limited contribution to the process, were not included in the recruitment activities. Despite relying on an opportunistic selection, the recruitment was aligned with purposive sampling techniques as the targeted participants were individuals involved in the digital permitting process and could provide illustrative feedback regarding the research question. The City of Lethbridge provided a list of potential participants as part of the

FOIP agreement request. This list included the core Planning & Design department members who regularly interacted with the digitized permitting system. A mass email was sent to staff for recruitment. Following the recommendations from the Ethics Approval and standard research practices, no direct contact was made with staff regarding the study to avoid creating an undue sense of obligation to participate. A copy of the recruitment message which was sent is available in Appendix C.

Results. Nine internal participants from the City of Lethbridge volunteered to participate in the study. Though this was below the initial expectations of at least 14 internal participants, broad coverage from the various user groups (Customer Service Representatives, Development Officers, Safety Code Officers, and Administrators) was achieved. A list of these participants with a generalized description of their roles and responsibilities is available in Appendix I. The role descriptors have been modified and aggregated to protect the anonymity of the participants.

Homeowners.

Selection & Recruitment. The external selection of participants was much more challenging, utilizing a combination of snowball sampling and volunteers. Snowball sampling was attempted as it was difficult to identify members of the public who wished to participate in the research. Only one of the snowball referrals resulted in an interview with an external participant. The snowball recruitment was done by requesting the referee to provide my contact information and recruitment message to the potential participants. I did not directly contact participants prior to their expression of interest to avoid creating an undue sense of pressure to participate in the study. The low response rate from this sampling method was not a major concern regarding the rigour of the study, as a significant challenge with the snowball sampling

technique is the risk that participants are most likely to refer others with similar views (Lee, 1993).

Additionally, members of the public who choose to make their permit application in person at City Hall were provided with an informational slip asking for their participation in the study by the Customer Service Representatives. None of the interviewed participants indicated receiving my letter through this medium.

Finally, in cooperation with the City of Lethbridge and in line with jurisdictional privacy legislation (FOIP), members of the public who had previously applied for a permit were contacted by mail for voluntary participation in the study. A copy of the recruitment message is available in Appendix C. Using the Open Data portal, a list of permit applicants was generated based on having completed (i.e. the final inspection was completed) a building permit in the last two years. Only those who had completed a building permit were selected to avoid creating undue pressure on those still actively engaged with the Municipality. A verification process was incorporated into the selection to ensure no property received multiple letters. It is possible that an individual who owned multiple properties may have received multiple letters.

Results. The initial master list for recruiting homeowners included 535 completed building permits and 356 unique properties. Three mailings were completed to recruit external participants, with each mailing cross-checking to ensure that a property (homeowner) or contractor was not contacted multiple times. The first set of letters was sent in October 2022 to 176 potential participants, of which only one member of the public responded (0.56% response rate). Due to the low number of responses, a second mailout targeting homeowners was sent in March 2023 in an effort to recruit external participants. Using the Open Data Portal, a total of 257 permit completions since the previous sample in 2022 were identified. From this list, 209

letters were sent to each unique address within the sample. This second mailout was more successful, recruiting three homeowner participants (1.44% response rate). After these iterations of mailings, the entire list of applicants was eventually contacted.

Contractors.

Selection & Recruitment. The process of recruiting and selecting contractors is strongly aligned with the techniques employed to recruit homeowners. Initially, the recruitment of contractors was attempted by requesting that professional groups such as the Building Industry and Land Development Association (BILD), the Lethbridge Construction Association (LCA), and the City of Lethbridge Building Inspections Newsletter forward a generic recruitment message to members of the industry. This recruitment method was unsuccessful and did not result in the recruitment of any participants. As such, the decision was made to send a letter in March 2023 to members of industry who had completed a permit within the City of Lethbridge within the last year. A copy of the recruitment message is available in Appendix C.

Result. A list of all contractor applications was compiled from those who completed a permit of any discipline in the last two years. Thirty-four builders were identified from the Building Permit dataset, and 109 sub-contractors were compiled from the sub-trades permit dataset. Utilizing online information through services such as Google Maps, a letter was sent to the regional office/place of business. One hundred forty-three letters were sent out, and six volunteers (4.2% response rate) responded to the recruitment letter.

3.2.4 Design

Interviews. Interviews are one of the most common data collection approaches employed in qualitative methods and provide an excellent opportunity for participants to express their thoughts and feelings (Creswell & Poth, 2016).

The interviews were conducted in a semi-structured approach using open-ended questions. The duration varied from 13 minutes to nearly two hours, with the average interview requiring approximately 50 minutes to complete (Table 6).

The average session with municipal staff ran slightly over an hour, while interviews with external participants were closer to 40 minutes on average (Table 6). The interviews, which ran longer than the initially anticipated 30-60 minutes, were done to allow participants to thoroughly and exhaustively communicate their thoughts and feelings regarding the topic. A total of 15 hours and 55 minutes of interviews were recorded. A complete list of the interviews by participants is available in Appendix I. Two sets of interview questions were used; one focused on internal participants (Appendix E) and a second for external participants (Appendix D).

One group interview was conducted in which two participants from a single organization indicated a preference to participate in the interview together as they had different responsibilities with their engagement with the City of Lethbridge. The interview questions were not modified for this session (Appendix D), and each participant was provided with an independent copy of the transcript for review and feedback.

Table 6

Interview Overview

Participant Category	Interviews	Participants	Minimum Duration	Average Duration	Maximum Duration	Total Duration
Municipal Staff	9	9	0:33:00	1:01:40	1:42:00	9:15:00
Contractors	6	7	0:14:00	0:41:10	1:28:00	4:07:00
Homeowners	4	4	0:13:00	0:38:15	1:01:00	2:33:00
All Interviews	**19**	**20**	**0:13:00**	**0:50:16**	**1:42:00**	**15:55:00**

Participants were allowed to withdraw at any point during the interview and were made aware of this right as part of the informed consent process. It was explicitly communicated to the internal participants that if they chose to withdraw, it would have no adverse effect on their

relationship with me as the researcher. This statement was included as I may have had a pre-existing relationship with the participant and did not want to create pressure for them to participate against their will (Appendix F). None of the participants who participated in an interview chose to withdraw from the study.

As part of the informed consent process, participants were informed that only the audio was recorded during the interview for transcription and analytical purposes. The transcripts were initially generated using transcription software (otter.ai) and manually verified by me as the researcher. A copy of the transcripts was provided to the participants to confirm that they were comfortable and agreed with the information shared during the interview. Participants could delete any response during the feedback period and were given two weeks to review the transcript and determine if they wished to withdraw from the study.

Though none of the participants chose to withdraw, they were informed that if they withdrew during the interview or review of their transcripts, the information they provided would be destroyed and removed from the study. The review of the transcription was an additional opportunity for participants to withdraw their data from the study. Participants maintained the option to withdraw participation at any time; however, after the review period, they were informed that their data may be incorporated within the research and could not be reasonably removed. Additional information and clarification were occasionally requested from participants throughout transcription and review to ensure that the information captured during the interview accurately represents their intentions and thoughts.

Based on feedback from the first set of research participants, changes to the transcription approach were made throughout the study. Initially, transcripts were provided following a verbatim approach with minimal editing. However, some respondents indicated a negative

opinion of themselves when reading their responses in this format. One participant asked, “Do I really speak like a Valley Girl?” due to their use of filler words, such as “like,” which they were unaware of. For this reason, I decided to take a more aggressive approach to cleaning up the dialogue before providing transcripts. False starts and filler words were removed from the transcripts prior to their review by the participants. After this modification to the transcription process, I received no additional negative feedback from participants regarding their responses.

To improve validity, participants were given the opportunity to review the transcription for any errors, omissions, misinterpretations, or potentially inaccurate representations of their intended message. Only one participant amended their interview statements throughout the study during the transcript review process.

Due to the COVID-19 pandemic, which was ongoing at the time of data collection, additional considerations to ensure the health and safety of all participants were incorporated into the study. Videoconferencing and telephone solutions were used as the primary and preferred medium for data collection, with 12 of the 20 participants electing to conduct their interviews electronically. Eight participants expressed a preference for an in-person interview. All the face-to-face meetings followed provincial health guidelines and recommendations during their recording. Three interviews were conducted in public venues, while the remaining five were conducted with internal participants at City Hall.

Institutional Documents. To develop a comprehensive case study description (Yin, 2018), various institutional documents were collected, including planning and strategy documents, meeting minutes, internal reports, and press releases. These documents provided essential context and complemented the interview data, offering a holistic view of the digital permitting system

Field Notes. I undertook the process of taking manual notes during the interviews and throughout the research process. These notes included reflections documented immediately after the completion of interviews and occasionally when reflecting during the analytical and writing process. The interview notes were used to supplement non-verbal communication during the session that electronic audio devices could not pick up and help convey the message in transcription (e.g., participants making gestures as illustrations or examples). These memos were heavily relied on during the transcription and reflective processes of identifying codes and themes. The use of field notes as part of the reflexive process to supplement the data is quite common (Haynes, 2012). Most of the reflections were collected by leveraging the transcription software (Otter.ai) as I dictated my thoughts.

3.2.5 Analysis

This study employed Creswell and Creswell (2018) data analysis process outlined for qualitative studies, which is broken into five primary categories:

1. Organizing and preparing the data for analysis
2. Reading or looking at all the data
3. Coding all the data
4. Generating the description and themes
5. Representing the description and themes

A detailed description of the context, setting, and individuals involved was created before analyzing themes Yin (2018). The creation of this rich description was intended to help readers feel situated in the study and understand the context in which the research was conducted (Creswell & Poth, 2016). A ground-up analysis strategy allowed themes to emerge from the data

(Yin, 2018). As the exploration was refined, the procedures were further adapted throughout the study (Burkholder et al., 2020; Chun Tie et al., 2019; Corbin & Strauss, 2007).

Organizing and Preparing the Data for Analysis. This step consisted of transcribing and verifying the interviews and incorporating the field notes as contextual information. Otter.ai was leveraged to complete the initial transcription, which I manually verified. Information was initially sorted based on its chronological collection. This step was essential as qualitative research often results in massive amounts of raw data (Bouma & Carland, 2016). This study resulted in nearly 16 hours of raw interview data. The transcription process, even with the assistance of software, took an extensive amount of time for validation, with an approximate three-to-one ratio of time spent transcribing to each minute of recording. Part of this challenge was rooted in the terminology, as many acronyms were used specific to the construction industry. Otter.ai struggled to transcribe this jargon accurately and required significant manual intervention and verification. Memoing and field notes were conducted throughout the analysis process to document the non-verbal expressions of participants and assist with enriching the transcripts. Memoing was also conducted to assist in documenting my experience and reflections from the researcher's perspective.

Reading all of the Data. Creswell and Creswell (2018) recommend this early step to assist the first stages of reflection on the overall meaning of the study. It provided an opportunity to reflect upon the emerging ideas and tones of the participants and the quality of the information that had been collected. This process was iterative with the data coding and served to enhance my overall understanding as well as the emerging themes. This step was conducted iteratively as additional rounds of interviews were conducted.

Start coding all the data. The case study analysis begins with a detailed description of the site, phenomenon, and participants before coding (Creswell & Creswell, 2018; Yin, 2018)..

Initial attempts at line-by-line coding were made during this exploratory process. Creswell and Creswell (2018, p. 193) define coding as "the process of organizing the data by bracketing chunks (or text or image segments) and writing a word representing a category in the margins." The individual line-by-line chunks and the resulting volume of codes were overwhelming at this level of granularity. The process resulted in approximately 900+ codes per interview. A decision was made to chunk the data by sentences or ideas, resulting in a more manageable set of roughly 200 codes per interview. The initial coding from the line-by-line was discarded. However, the act of performing this analysis helped build an understanding of the dataset (Yin, 2018). To evaluate their potential alignment, other attempts at "playing" with the data included organizing emerging codes based on pre-existing theoretical frameworks, such as the public value, design theory, and social capital theory.

This iterative coding process was assisted with the use of NVivo, which supported the organization of the data and analysis process. As part of the process of exploring and playing with the available data and toolsets, the automatic coding functionality of NVIVO was explored. However, the resulting codes provided by the tool were mostly nonsensical and were quickly discarded. With the emerging popularity of ChatGPT, I asked the online AI tool to code an exemplary paragraph from the study. The initial results were very promising, though unfortunately, the surprisingly comprehensive result was short-lived. I attempted to provide ChatGPT with another paragraph, which subsequently resulted in it providing me with a sample of Python code to print the block of text. I was unable to have the tool replicate the initial results and abandoned any further attempts to leverage the tool to assist with the coding process.

The manual coding process began with open coding, followed by axial, selective, and theoretical coding. This first stage assisted with exploring emerging themes as I organized the data. Sinkovics and Alfoldi (2012, p. 123) axial coding is "coding the data into an evolving structure based upon the analyst's ongoing interpretation of the action." This was combined with Creswell and Creswell (2018, p. 197) modified version of Tesch (1990)'s eight-step coding process. The initial coding steps were concluded with selective coding, in which I refined the core themes essential to this study's emerging results. This was accomplished by synthesizing the data and developing a coherent understanding of the relationships between themes and topics. A sample of the data structure overview can be found in Appendix J.

Generate a description and themes. During this stage, themes that emerged through the iterative process of coding, analysis, and reflection upon the data results were incorporated within the thesis. This process was also supported by discussions with my research supervisor, who provided insights on how the information could be interpreted and leveraged. The iterative approach allowed me to develop a comprehensive understanding of the data which had been collected to identify the key concepts and themes and to develop a strategy for their presentation. Throughout this process, it was important to ensure that the themes reflected the varied perspectives of the participants, as advised by Creswell and Creswell (2018).

Representing the Description and Themes. This step focused on how the description and themes were represented and reported. During this step, I worked to package and communicate the relationship between the emerging categories (Creswell & Creswell, 2018). The nature of qualitative research results in unique challenges in presenting the conclusion and narrative (Bouma & Carland, 2016). I was surprised at how intrinsically linked the processes of writing and analysis were, evolving my understanding during the stage of representing the

themes. The act of writing often resulted in re-interpretations and consolidations, improving the synthesis of themes and ideas into a coherent structure and narrative.

3.3. Role of the Researcher

The potential of bias impacting myself as a researcher in selecting participants, data collection, and analysis must be acknowledged. As the selected site was my place of employment during the data collection, honest and forthcoming reflexivity was integrated within the data collection, analysis, and summarization to help limit the impact of my biases (Greene, 2014). Special care was taken throughout the process to minimize my influence and impact as a researcher.

3.3.1 Reflexivity as a Participant-Observer

I considered two factors as part of the reflexive process (Creswell & Creswell, 2018), my *past experiences* and *how my past experiences may shape interpretations*. My experiences are intertwined with the research as the City of Lethbridge employed me. Within my role, I was responsible for supervising business support activities for the Building Inspection team, including developing and supporting the eApply system. I was also the project manager and primary designer of eApply 2.0 and was heavily involved in its development. These factors significantly influenced my decision to pursue the research topic from an academic and professional perspective. I wished to better understand the outcomes resulting from the digitization of the public service and explore what potential design considerations could improve future endeavours. These influences are acknowledged as these experiences impacted my interpretations of the study.

Reflexivity also required active management throughout the research process. As this study's primary data collection method was to interview, I had to consider what influence I may

have as a researcher throughout this process. These considerations were stressed during the ethics approval process to ensure that the participants did not face undue influence to participate in the study. For this reason, providing transcripts to participants helped ensure that my interpretations of the conversations were accurate and agreed upon.

While conducting interviews, I was aware of the need to manage my influences on the line of inquiry and the potential influences I may have on participants. Throughout the study, reflexive notes were taken as memos to assist in the reflective process of generating codes and themes (Creswell & Creswell, 2018; Haynes, 2012).

As a researcher who was a member of the organization being investigated, additional considerations were required for the study's design and conduct (Greene, 2014). As part of the ethics approval process, I was obligated to provide extensive reasoning behind my approach to ensure that undue influences were not prevalent throughout the study. All qualitative approaches must manage the influences, assumptions, and biases a researcher brings. Inside research is known to magnify these issues and potential conflicts (Tietze, 2012). Negotiating access required navigating a delicate balance between my role as a researcher and insider by formalizing the request from an outside source (the University of Lethbridge email account) through the appropriate channels at the City of Lethbridge.

This approach presented unique challenges and trade-offs between my immersion, understanding of the culture, and the validity and objectivity of the qualitative data collected and analyzed (Greene, 2014). As an insider during data collection, I had the unique opportunity to incorporate important and broader knowledge that may not have been accessible through the traditional outsider approach (Greene, 2014; Tietze, 2012). Inherently, my study was subject to the political dynamic of the organization, as members may have wished to influence the direction

of the research and findings (Tietze, 2012). I also had to navigate these challenges with the realization that my relationship with several participants extends beyond the defined boundaries of the case study. Tietze (2012) describes this experience as a duality between the familiar and the strange. I brought my experiences and relationships with several internal participants into this study. For external participants, my role at the City of Lethbridge may have impacted the information they shared in our discussions.

Tietze (2012) provided several guidelines as I undertook a project within my place of employment. This included considering that the research resulted in written accounts that brought forward a duality of identities that had to be managed and that emotions are part of the research process. Naturally, when facing the discussion of the system with participants, there were periods in which I felt uncomfortable and had to manage my own emotions and reactions. This was particularly challenging when participants made very direct and pointed criticisms aimed at my coworkers. Despite the discomfort of those discussions, I did not want to create an undue influence and introduce additional bias into the participants' responses.

Written Accounts. The research process of a case study results in a publicly available written account of events and themes surrounding the digitization of the permit process at the City of Lethbridge. This thesis, the final product, carries risks that the research could be interpreted in a potentially harmful manner to the participants or myself (Tietze, 2012). I made two considerations based on Tietze (2012, pp. 67-68) on this matter: a) the authorial voice I adopted while writing my account; b) the permanence of any written research that is subject to interpretation by readers. Regarding the latter, participants were made aware of the potential consequences resulting from the release of information into the public domain. During the interview and transcript review, they were reminded of their right to withdraw from the research.

Examples of this language can be found in the Recruitment Letter (Appendix C), the Interview Guide (Appendix D & Appendix E) and the Letter of Consent (Appendix F).

As for the authorial voice and tone of this written account, my thesis, I chose to take on a first-person perspective in my writing. With my situatedness as an insider researcher in a qualitative study, the choice to embed the natural subjectivity of the first-person perspective in the writing felt necessary. It was important to ensure that readers understood my role within the research as an active participant with my thoughts, feelings, and interpretations rather than creating distance and a false sense of objectivity by utilizing a third-person approach to writing.

Emotions in Research. Unsurprisingly, positive and negative emotions were a regular part of the research process. Moments of discomfort were the most challenging as the process and people were criticized throughout the discussions and interviews with participants. Through awareness of the influence of my emotions, I was required to manage and sensitize myself within the research (Tietze, 2012). Managing emotions was essential due to the existing relationships with several participants in the research.

3.4. Issues of Trustworthiness

3.4.1 Ethical Considerations

The ethics approval was submitted and approved through the University of Alberta's ARISE system and process. The HPRC's review helped ensure that the methods employed within this study met modern research's ethical considerations and practices. Issues regarding potential consequences were communicated to any potential participant. City of Lethbridge employees were not coerced into participation and were given multiple opportunities to withdraw from the study.

Privacy and Confidentiality. As the researcher conducting the study, I made every effort to protect the confidentiality and privacy of participants. Confidentiality, as outlined in the *Application for Ethical Review of Human Participant Research,* is "the protection, access, control and security of the data and personal information," while anonymity is the "protection of the identity of participants." Internal staff interviews were conducted from a list of predetermined candidates vetted by the site's gatekeepers. As such, there was a loss of anonymity for internal research participants whose information was provided by the administration. However, any information collected through the interview process was anonymized using participant codes combined with a generalization of the participant's role. This information was also kept confidential throughout the study. Extra caution was taken when including excerpts from the interviews within this thesis to ensure that the comments did not include identifiable information.

Digital data was secured through a personally managed and encrypted data hosting service to which only I have direct access. Physical notes are currently locked within a cabinet in a secured office location. Should a participant have chosen to withdraw from the study at any point throughout the interview or during the review of the transcripts, the data they provided would have been immediately destroyed or deleted. At this point, information is being retained based on the University of Lethbridge data retention policies and in accordance with my ethics approval.

Potential Risks and Benefits. There was no direct risk of physical harm and low risk that the topics discussed would result in emotional harm or discomfort for participants. Remote options such as videoconferencing and phone calls were given preference for conducting interviews. Appropriate health measures following provincial guidelines were in place for any

in-person activity. In-person interviews were only conducted when participants expressed this as their preferred interview method.

There was a potential risk that participants from the City of Lethbridge may experience a degree of discomfort or anxiety due to the nature of the research or due to their pre-existing relationship with me. For this reason, I took as many precautions as possible to ensure that the City of Lethbridge participants did not feel obligated to participate in the research. I explicitly stated that non-participation would not negatively affect our existing relationship, and there were multiple opportunities to withdraw from the study.

I prepared for the possibility that if during the interview process, should applicants exhibit any signs of distress, they would be reminded of their right to withdraw their participation from the study. As anticipated, the research did not require additional measures for an exit strategy for terminating the study.

Participants were informed that the study's anonymized findings would be disseminated to the municipality and used for academic purposes, including this master's thesis. The clear communication of the anticipated dissemination of the findings ensured that the participants were aware of the potential consequences resulting from the release of information into the public domain.

There were no direct benefits to participants who participated in the study. An indirect benefit may come from a better understanding of the impact of the digitization of the public service. Additionally, the feedback collected may assist in improving the design of future public services.

Informed Consent. The informed consent form (Appendix F) was created to ensure that participants were appropriately informed of the study's intent, the interview process procedure,

and any foreseeable risks. The elements outlined in the University of Lethbridge's *CONSENT FORM – REQUIRED ELEMENTS* were included to comply with Article 3.2 of the TCPS2. I obtained consent prior to the interview commencing, either signed or verbally. A record of the consent was collected verbally when conducting tele-interviews, and for in-person interviews, it was collected with a physical form. The research did not use deception or partial disclosure when seeking consent from the participants.

There was potential that participants may have had an employer/employee relationship with me as the researcher. I can not disclose if this was or was not the case to protect the anonymity of all the participants, as the disclosure could result in the identification of participants. However, any such participants would have been given a copy of the form in advance and additional time for consideration before participating in the research to minimize the risks associated with perceived power differences.

Chapter 4. Research Findings

This section explores the findings collected through the responses from interview participants regarding the digitization of the permit application process. The information gathered was valuable in understanding the shared context and lived experiences in which participants found themselves. This chapter introduces the major themes that emerged during the analysis.

A positive aspect emerging as a nearly universal experience among 19 participants was the time-savings and efficiencies resulting from the digitized permit application process. The streamlined workflows, simplified processes, and reduced (if not instant) issuance times were widely appreciated by applicants and staff. Participants acknowledged the benefits of automated permit issuance, quicker response times, and the overall efficiency of the digital platform.

By exploring the impact of the digitization of the permit application process, a recurring theme emerged regarding the accessibility and availability of making online permit applications and accessing the application status. Participants, including municipal staff and applicants, frequently discussed the improved accessibility to information as a benefit of digitization.

The convenience of submitting applications online was cited as a significant advantage, particularly for smaller businesses and independent contractors. However, it was noted that despite digital platforms improving access for many, disparities still existed, and new ones began to emerge. These inequities typically existed among populations with limited technological resources, digital literacy skills, or non-native English speakers. This disparity particularly impacted those unfamiliar with digital technologies who may already face additional barriers contributing to the community's digital divide. The theme highlights a complex relationship between technology and access to public services and the inequities it resolves and creates.

Another prominent theme from the data was a lack of supportive resources accompanying the digitized permit application process. Participants expressed concerns about the insufficient support and guidance, particularly for those making their first permit application with the City of Lethbridge. Also, staff and applicants reported that several older adults felt overwhelmed and frustrated by the lack of assistance in making their applications or being directed online. Other groups, such as Canadian newcomers and those who have learned English as a second language, were also identified as lacking the necessary support to succeed when making a permit application. This theme highlighted the importance of comprehensive support systems and materials to ensure community members can effectively engage with the municipality through digital services.

The digitization of the permit application processes also raised concerns about losing humanity and social connections. Participants shared experiences where the digitized processes seemed impersonal, resulting in the erosion of the personal touch in traditional face-to-face interactions. The absence of direct communication was viewed as detrimental, especially for those making their first application or those taking on complex projects. This disconnect has led to frustration and was seen as potentially delaying problem identification.

However, participants engaged with the process before the digitization of permit applications generally found that they could maintain their existing long-standing relationships. These positive experiences were, in some cases, tempered by the emergence of new challenges arising from the implementation of work-from-home arrangements for municipal staff, resulting in new limitations to meeting with them directly.

This theme describes digitization's social implications, emphasizing the need for thoughtful integration of technology and the essential human-centric values of public service interactions.

The theme of legitimacy emerged regarding perceptions of the credibility and authenticity of digital interactions with the municipality. Many participants appreciated the formalization of processes brought forward through digitization, which improved the consistency of decision-making between staff members. While the digital platform offered convenience, concerns about online transactions' legitimacy were raised. For example, one participant questioned the automated issuance of residential electrical, plumbing, and gas permits, raising doubts about the validity of digital in-and-out permits. Addressing these concerns and ensuring transparent and reliable digital processes is important to establishing legitimacy in the eyes of the public. This theme stresses the importance of trust and confidence in digitizing public services and the inherent weight carried by the municipality.

The findings of this study reflect diverse perspectives on the digitization of the permit application process at the City of Lethbridge. While the system may offer enhanced access, time savings, and efficiencies, the challenges of supportive resources, the erosion of social connections, and issues of legitimacy highlight the need for a balanced approach to digitization. These emerging themes may provide valuable insights for policymakers and practitioners aiming to create inclusive, user-friendly, trustworthy, and human-centric digital public services.

4.1. Improvements in Time Savings and Efficiencies

A major theme which focused primarily on the transformative benefits of digitizing the permit application process was “time-savings and efficiencies.” All 20 of the participants in the study at some point spoke to these improvements since the switch to a digital system. Several

sub-themes emerged as part of the greater topic of time-savings and efficiencies. These include improved working conditions, standardization, organization savings, faster service, and improved communications and collaboration.

4.1.1 Evolving Work Conditions

This sub-theme largely concerned itself with the benefits of digitization for the municipal staff. Implementing digital tools increased productivity and resulted in greater degrees of independence, autonomy, resiliency, and flexibility. Additionally, by moving away from physical documentation, the City of Lethbridge was able to implement flexible working schedules and hybrid/ remote work options for several staff members, depending on their roles. From the beginning of an application to the final stages of inspection, implementing a digital permitting system has empowered many staff members to manage their workload with greater self-sufficiency.

With the ability to digitally access comprehensive records and resources, track the progress of permit applications, and respond to customer inquiries remotely, new flexible work options have begun to emerge. The digital permitting system introduced a greater degree of flexibility that opened up the possibility of new work structures. Staff were untethered from City Hall, their physical workspaces, and a highly regimented work schedule. Staff members, such as customer service representatives and inspectors, have obligations requiring on-site presence. Those roles that don't necessitate an in-person presence, such as several reviewers and support staff, have been allowed to work remotely. This new-found flexibility can also be extended to those staff with on-site duties when necessary due to minor illness or unforeseen circumstances. Participant 6, a municipal staff member, described the impact of the new flexibilities on their

daily work “I'm starting way earlier. We used to have discussions in the morning, and you'd be lucky if you got out by 9:30 AM. Now I can be doing inspections at 7:30 AM.”

My experience at the municipality mirrored the responses from participants as I spent several weeks of the year working out-of-province to spend time with my family. The digital system, combined with other operational and technological improvements during the COVID-19 pandemic, facilitated remote access to the system, enabling staff to work from different locations without compromising efficiency. The ability to integrate work-life balance in a meaningful way while balancing professional and personal responsibilities helped further a healthier working environment. Participant 6 speaks to the new efficiencies as they performed inspections earlier due to their compressed work-week schedule. This flexibility has been beneficial for customers, as well as increased the hours of availability for inspections in the early morning in previously unavailable time slots. Additionally, this flexibility created a resiliency that allowed the Building Inspections group to continue their operations during the height of the COVID-19 pandemic. Participant 6, a municipal staff member, spoke to how these measures helped the City of Lethbridge continue to operate despite the restrictions:

> That was just because we weren't allowed in houses, but we didn't want to shut anything down. I think we were much better off than we did [digital approvals and video inspections]. Because some of the other jurisdictions weren't going in at all. Then you really had a catch-up.

The digital system's benefits and workplace changes were not without compromises. In-office staff were frustrated when accessing support while interacting with customers at the front counter. With fewer inspectors available in the physical workplace, questions were often left unanswered as applicants were directed to email or call the out-of-office team members for additional information. Participant 1 lamented how the municipality used to have staff available on-site to answer customer questions at the front counter; now, they are forced to give a copy of

their business cards, which feels impersonal. However, in this case, Participant 1 also acknowledges that the Safety Code Officers are likely more productive as they face fewer interruptions throughout the day and have greater flexibility on when to respond to inquiries. Since the implementation of flexible work options, customers now rely on communicating through digital substitutes such as virtual meetings, emails, and phone calls. Participant 10, a contractor, expressed concern about this practice change when attempting to engage in discussions and submit applications for complex projects:

> I would be going back in person, but the organization of the City of Lethbridge has changed a little bit where the people that I used to see regularly are now actually working from home. So, my only option... I can still drop it off but no one that matters to me is there.

This flexibility has also brought forward challenges of accountability, which will be discussed in greater detail in a later section. However, the crux was that these efficiencies and time-savings may not have been universal, as some participants, such as Participant 16, a residential contractor, suspected that staff were abusing the work arrangements: “some people are just better at working remotely and are better suited to handle that responsibility and accountability. I think some people use it really well, and I think some people don’t.”

Several participants expressed greater satisfaction with their work as automated processes ensured that routine and repetitive tasks were completed quickly and reliably, freeing their time to concentrate on more satisfying tasks requiring manual intervention and expertise. It was reported that participants could better manage their workflows independently and contribute towards their tasks in a more meaningful and satisfying way. This, coupled with streamlined processes, contributed significantly to enhancing productivity at the municipality. Staff were no longer expected to perform complex and inconsistent manual procedures and were instead afforded greater opportunities to focus on tasks that required critical thinking, creativity, and

decision-making, as described by Participant 9, a municipal staff member: “It’s made me more efficient. In some ways, it’s made me be able to focus more on the work itself as opposed to the paperwork part of it.”

This change in focus from manual administrative tasks to more intellectually stimulating activities elevated staff productivity. The digital permitting system has automated tasks that once required significant administrative overhead, time, and effort, such as manual data entry, document filing, and coordinating records. With the elimination of these repetitive, low-value administrative tasks, several staff reported feelings that their contributions were meaningful and beneficial to the organization. Participant 1 recounted their experiences manually counting permits in the past, a task which has since been largely automated and provides much more accurate reporting than the previous manual methods.

4.1.2 Standardization

A sub-theme regarding the time-savings and efficiencies improvements includes the benefits derived from consistent and streamlined processes. Through digitization, services were reimagined and redefined as unnecessary steps were eliminated. These changes extend beyond efficiency improvements and create a reliable and predictable environment that benefits applicants and city staff. Standardization was introduced for every step of the process, from application submission to permit issuance to inspection processes.

These structured definitions of processes have resulted in a minimization of variability in permit applications. Participant 4, a municipal staff member, describes how this variability was once a major pain point for applicants and has since reduced the likelihood of errors and conflict with the municipality: “There's less arbitrary decisions being made, which means there's less problems with customers. The staff become more independent and less reliant on management

because things are black and white now." Standardization has contributed towards a smoother, more efficient, and less contentious permit application process.

Manual processes were often subject to personal interpretation, introducing greater degrees of human error and unpredictability. Implementing a digital system has significantly reduced this variability, ensuring that permit applications are processed through a standardized path. Applicants now interact with a simplified and consistent application "journey" through the online system, guided by an intuitive digital interface structured to best support varying applicant types. One such innovation described by Participant 4 is that a homeowner no longer had to know in advance which permits were required when using the online system. Instead, the homeowner would simply select the nature of work they wish to perform and have the necessary permits automatically added to their application. These standardizations helped to save time but have also enhanced the overall user experience, making permit applications more accessible and user-friendly than they once were.

By standardizing and implementing consistent, streamlined processes, redundancies from the manual process have been gradually eliminated, further improving the overall efficiency of the application process. Automating data entry and application coordination has eliminated many repetitive and transactional actions, creating a greater focus on the value-added aspects of the work. Participant 9 spoke "I think it allows me to focus on learning the requirements in my job and make the decision that I do because I'm not inundated with details of paper and shuffling paper." about how even simple and repetitive manual tasks were a significant source of issues, sometimes due to entry errors and others due to misinterpretation of the applicant's handwriting. These reductions have directly translated to more efficient allocation of resources and an evolution of the staffing requirements at the municipality.

One benefit of digitization that nine participants discussed was improvements regarding the process for managing and requesting inspections. Previously, inspection requests were made through several different mediums. Some applicants would call the inspection phone line. Others would try to contact the front desk directly. In some cases, applicants leverage their connections to attempt to book inspections directly through the Safety Code Officers. Often, these applicants were left without confirmation that they had successfully booked an inspection. By standardizing the request process and medium, the municipality could centralize the requests and leverage many of the automation abilities of the digital system, such as automatic confirmations and online scheduling. Customers are now kept aware of any potential changes in their scheduled inspections, as automatic notifications are sent should the Safety Code Officers need to reschedule. Participant 14, a contractor, describes how this simplified the process of requesting information: “It’s a lot easier than having to phone in, leave a voicemail, and hope somebody calls you back and confirms.”

The consistency that has been introduced has also further evolved the ability to effectively utilize information on the permit applications. Participant 4 spoke about how standardized information is now readily available to staff and the public when previously it was neither streamlined nor professional in its appearance. The real-time monitoring of the permits has also resulted in a more responsive and agile work environment, with inspectors able to better assess priorities and identify permits requiring follow-ups. Issues can now be more easily identified and resolved prior to escalation, creating a smoother and more hospitable environment for staff and applicants. Participant 4, a municipal staff member, describes how information can also be aggregated to provide accurate statistical information for reporting purposes:

> We're capturing all this information; it was going one way into the system that could never be exported in any kind of meaningful way. But now that things are consistent, it allows for much better statistical reporting.

4.1.3 Quicker Service

A significant benefit for applicants and the community since the digitization of the permit application process has been the improvements in service delivery timelines. This sub-theme explores a key benefit realized by applicants as the digitized system has drastically reduced the time required for application, submission, review, approval, and issuance. This has largely been accomplished through the standardization and automation of tasks, eliminating redundancies, and reprioritization of resources, all facilitated by the digital system. In some cases, a process viewed as lengthy and cumbersome has become instantaneous, allowing applicants to move forward with their construction projects in a timely fashion. These improvements have particularly benefited residential electrical, gas, and plumbing contractors. Participant 4, a municipal staff member, describes who they believed benefited the most from the digitization of the permitting services:

> Those [contractors] probably saw the single largest benefit because they don't have to come down anymore at all. Their stuff is in and out, they've got a permit in 20 seconds, and they're away to the races.

The digital platform has successfully streamlined interactions, particularly regarding submitting documents and communicating information between applicants and municipal staff. These automations allow applicants to reply to requests for additional information responsively. However, breakdowns in these automated communication channels can negatively affect the timelines. Several applicants had indicated frustrations with the system as they were not receiving these automated communications and, therefore, had to manually monitor their applications for changes in their status. These failures in the system created avoidable delays that

reduced the timeliness of the permitting process. Participant 20, a homeowner, spoke of their frustrations with receiving the automated notifications:

> If there was a way that when there was updates into the portal, that they would send you an email so you would know. I would always have to be logging back into the portal to check to see if anything's changed on my application.

When the system worked correctly, these real-time updates reduced some manual back-and-forth interactions. Reducing these routine administrative tasks resulted in time savings and enhanced the overall user experience, making the process accessible and user-friendly. Several participants found clear instructions, an intuitive design, and the necessary features to guide them as applicants through each step. All these design considerations helped facilitate a faster turnaround for permit applications. Despite these successes, many participants found areas for improvement, with 16 of the 20 participants sharing suggestions on how the user interface could be improved.

4.1.4 Improved Communications and Collaboration

The sub-theme of improved communication and collaboration reflects a change in the dynamics both externally, between municipal staff and applicants, and internally, among coworkers. As discussed above, improvements in this process expedited permit issuance but also improved collaboration and transparency. Several participants discussed implementing automated communication embedded in the digital workflow, disseminating information to various stakeholders. These automated messages inform city staff from various departments and applicants of key milestones within the process and communicate necessary information to facilitate the initiation of secondary processes. Internal notifications allow different business areas, such as Tax and Assessment, Utility Services, and Regulatory Services, to engage with the applicant when necessary. This, however, is not without criticism as Tax and Assessment have

become more responsive towards supplementary notices to the ire of some developers. Participant 14 expressed their frustration with this system “I would really love it if building permits didn't automatically link over to taxation. That kind of bothers me a little bit.”

Improvements in collaboration with peers were well-praised by several participants. Safety Codes Officers especially appreciated the ability to work concurrently on a single set of commercial drawings and communicate in real-time. These improvements have resulted in significant time savings for the municipality and the applicants.

The digitized system’s customer access portal, MyCity, now acts as a centralized information hub for communicating the status of permit applications. It consolidates relevant information in a single location. Large-volume applicants can leverage this as an information repository when managing a large number of projects, reducing the number of communications seeking clarification on the status of individual projects. Participant 8 praised the system's functionality in making communicating with each other when working with a group significantly easier. According to Participant 9, these improved communication channels taught staff to cooperate and rely on other's skills because no single team member can know everything regarding an application.

The formalization of communications, such as inspection notices and requests for additional information, has been well received by applicants and staff members. These communications clearly outline any outstanding requirements, reducing the need for unnecessary back-and-forth communication between the municipality and the applicant. Participant 6 appreciated that they could send inspection results by email immediately, which can be subsequently shared by the applicant. For example, a unique efficiency brought forward by Participant 14 was that the automated communication from the municipality allowed them to

make necessary financial draws quickly as a developer. When a notice is sent that a certain inspection or milestone has been completed, the participant can forward the message as an official report to financial institutions and clients to request payment or releases of necessary funds.

4.1.5 Organizational Savings

Organizational savings represent the straightforward operational gains the applicants and the municipality realize. Many of these savings are derived from the time savings and efficiencies discussed in the sub-sections above. The stakeholders share these savings, though their distribution may not be entirely equitable. At the core of it all, efficiency and time-savings simply reduce the costs associated with the permit issuance process.

The digitization of permit applications, cutting out inefficiencies of low-value administrative tasks, has directly translated into cost savings for the municipality. These efficient processes have resulted in faster permit issuance and significant time savings for applicants. This is important in the world of development where time is money. Efficiency resulting from the expedited permit application process, therefore, becomes a catalyst for revenue generation within the industry. Faster permit issuance means projects can commence in a timely fashion, directly impacting the development of the community and capturing the regional economic contributions sooner. Participant 18, a contractor, highlighted the importance of delivering services in a timely manner:

> The one thing that I've talked about lots over the years with the city is for a builder, time is money. Anytime you delay things for development permit, or consultation, or stop for inspections… Anytime you delayed construction, it's money.

Automating workflows, particularly with the introduction of “in-and-out” or “vending machine” permits, resulted in the greatest improvements in efficiency and, therefore, the greatest

organizational savings for the municipality. These routine, high-volume residential electrical, gas, and plumbing permit applications did not require formal review. Instead, they presented themselves as a transactional and administrative task in the previous paper-based systems. Staff were formerly required to manually input the information from the paper applications into the record management system and bill the customers. These routine tasks were often time-consuming and resulted in significant overtime as the municipality attempted to meet service levels during peak seasons. This challenge was described by Participant 1, a municipal staff member, as "We still got faxes, we would enter [the information manually] and then they would pay. That's a huge time saver. I mean, there was lots of overtime for that."

By optimizing the resources available to the municipality, the organization can better allocate resources towards strategic goals and objectives, positioning the municipality to invest in initiatives that may proactively benefit the community and further evolve the digital system. Participant 9, a municipal staff member, posed the difficult reflection "Does leadership have enough foresight to look at this and not muddy it?" with other participants bringing forward concerns that the executive leadership at the municipality may not recognize these opportunities.

There were also concerns about hiring qualified people who understand the system, departments, and regulatory processes. This has made hiring much more difficult because the municipality needs to look for multiple skill sets. Participant 4 described how some Safety Codes Officers retired early because of the change from a paper-based process to a digital system. It has also meant that the technical side of the process requires more coordination that didn't have an impact before digitization. Participant 3, for example, was concerned that with staff retirements, they will have to learn more about the plan review process than what was previously required of their role.

These changes have also led to challenges in change management regarding an increased reliance on technology. Though the organizational savings may be a net positive, these changes were not without costs. Five staff members spoke about the difficulties regarding ongoing change management and the continuous learning curves resulting in temporary inefficiencies and costs. Additionally, the digitization of applications has not been completed for all areas of the organization, resulting in a sometimes disjointed process for both applicants and staff.

4.2. Access and Availability

Another area focusing largely on the benefits of digitization, which participants brought forward, is the access and availability of digitized services. The accessibility and availability of public services have undergone significant changes since COVID-19. This section explores the sub-themes of access and availability, including access to permit information and status, managing records, sharing information, and the always-available nature of digital systems. However, despite many improvements for users, this section will also explore emerging disparities experienced by those with limited internet connectivity or digital literacy skills.

4.2.1 Access to Permit Information

A significant advancement afforded by the digitization of the permit application process is the increased accessibility of permit information. Internal and external users can better monitor an application's status in real-time, ensuring transparency and reducing anxiety. Previously, applicants relied on sporadic updates or visits to City Hall for this information, aggravating delays and frustrations as staff members' efforts were redirected toward answering these routine administrative questions. During those times, long-tenured staff members detailed the frustrations of working in a paper-based system when attempting to promptly find necessary information.

Staff reported that before digitization, many contractors would visit or call the permitting office to ensure the review work and inspections were completed. They also indicated that since digitization, contractors no longer had to search for their physical records of the permit, which were often lost on-site. Large volume applicants described using the MyCity portal as a digital filing system in which they could access necessary information regarding both active and past applications. As stated by Participant 10, a contractor:

> I understand the system well enough that I know how to manage it. It is helpful for me be able for me to be able to check exactly what I submitted. Sometimes we go through iteration, after iteration, and I can be confident in my submission that it's accurate to what I intended to submit.

Efficiencies have been increased significantly through a centralized and comprehensive record management system known as Tempest. When receiving customer inquiries, staff can quickly identify the stage in the permit's current process. They can either provide an immediate status update or put the applicant in touch with the appropriate contacts. Staff can better manage permits, verify information, and perform research, accelerating permit issuance.

The permit process requires input from many individuals throughout its lifecycle. This begins with the Permit Technicians performing an initial review for completeness. Once an application submission is deemed complete, a Development Officer might review the permit to ensure that it is compliant with the Land Use Bylaw, ensuring uses are in line with community expectations. Upon receiving development approval, the permit will be reviewed by a Safety Codes Officer, also known as a Plans Examiner, to ensure that the proposed development meets the required life safety standards outlined through the various Safety Codes. After completion of their review, the Plans Examiner is responsible for issuing the permit. Finally, a Safety Codes Inspector will access the records remotely in the field as part of the inspection and compliance monitoring process while construction is ongoing.

With so many different hands operating in a team-based environment, the ability to quickly access the information has greatly improved the efficiency of the permitting process. Through the digitized record collection process, staff members can quickly look up the necessary information to answer questions, even if they were not one of those who contributed to the approval process. Participant 8 appreciated that these records allowed them to access information normally retained in coworkers' minds in their previous work environments. In the case of hold-ups, staff can quickly identify the status of an application and the potential causes as well. Simple matters, such as being aware of the payment status of the permit, were described as significant issues before the digitization of the application process. Safety Code Officers would have to call the Permit Technicians in the office to confirm that the permit was in good standing before finalizing the inspections and issuing occupancy. Participant 9, a municipal staff member, spoke to these benefits:

> Because there's efficiency, there's the ability to be able to compare, to be able to gather all the information, and do a complete plans review with all the different components whether the HVAC, the electrical, mechanical, and the building.

Those responsible for managing an application no longer need to rely solely on another individual's knowledge of a file and have gained a greater degree of independence in their work. Additionally, team members have some knowledge, memory, and cognitive burden alleviated as a permanent record of their actions are automatically tracked by the system and maintained in perpetuity. These passive and automated documentation supports provided by the digital system significantly reduce the manual effort required by staff for what is often viewed as a tedious and burdensome administrative task.

The ability of municipal staff and applicants to access real-time data, analytics, and feedback has empowered users to refine their approach to permitting. Improvements in information access have been particularly empowering for field staff, who have gained a greater

degree of independence while performing inspections. The Safety Code Officers have become more self-sufficient once relying on in-office staff to answer routine questions regarding an ongoing inspection. This garners a sense of empowerment for the officers while reducing the administrative burden on office staff who would have to perform the research on their behalf. Additionally, this has enabled many of the inspectors to perform their work much more efficiently in the field, as they were no longer constrained by informational bottlenecks. Participant 9, a municipal staff member, spoke to their experience witnessing inspectors develop: “What happened is the inspectors became much more independent. They weren’t phoning every third inspection to say, ‘Hey, can you do this?’”

4.2.2 Ability to Manage Records

The ability to manage records electronically has been a significant improvement facilitated by the online permitting system. In the past, paper-based records were susceptible to damage, loss, or misplacement, an issue brought up by all the participants who had experienced the system pre-digitization. The electronic records management system mitigates these risks, ensuring the integrity and longevity of permit records. The record management system enabled efficient storage, retrieval, and organization of vast amounts of information, which can be scaled as needed, enhancing the overall management of permit-related data. Participant 2, a municipal staff member, expressed that this information was important in many approval processes that required a thorough understanding of the project, the parcel's history, and the proposed construction site. They also described the issue of lost physical copies:

> When [contractors are] going in a home, they're not hunting for "who put the pouch where?" and "why isn't it here?" and "isn't it supposed to be there?" and some of the drawings are missing, somebody's stolen the package. Which has happened in the past, where drawing pouches have been stolen. We've had complaints from contractors about that.

The digital management of permits and related records has simplified record-keeping for applicants and the municipality. Applicants can easily access their historical permit records, aiding in future applications. Digital records facilitate data analysis for the City, allowing them to identify trends, allocate resources effectively, and make informed policy decisions based on historical data. One experience shared in which I was directly involved was the restructuring of the permit fees, which depended on the thorough analysis of multiple years of digitized permit records to assess the fairness of the fee levied between disciplines.

However, the ability to manage records is one of the first instances in which we discuss the challenges of digitizing permit applications. Some users who lacked language or digital competencies were left unable to leverage this platform and relied on calls or trips to City Hall for updates on their permit status. The findings suggest that access was not a universal experience, aggravating a digital divide where those without these competencies or tools were left at a disadvantage as staff were now often preoccupied with more demanding tasks. During the discussions, participants shared that some compensating processes did exist for these unique situations. An example described by Participant 7 indicated that staff would manually manage an application on behalf of a customer. Participant 9 also stressed that there had been multiple attempts to request additional resources for applicants where English was a second language. However, the municipality had not put a solution in place.

4.2.3 Ability to Share Information

Digital platforms can greatly enhance the sharing of permit-related information among reviewers and stakeholders. In traditional systems, communication between applicants, the municipality, and other parties was often cumbersome and time-consuming. This process also involved the management of large physical rolls of plans, which were submitted in triplicate as a

mandatory requirement of the application submission process. With digitization, information sharing has become nearly instantaneous and can operate in parallel. Applicants can submit necessary documents electronically from any location, reducing paperwork and travel time and ensuring the timely processing of applications. Participant 2, a municipal staff member, spoke to this benefit:

> It means they don't have to come into the office during our working hours, they're not bound by office hours that way. They can apply at eight o'clock at night if they want. They're not having to load rolls of documents into their vehicle to come down physically to the office to do that.

There are many benefits for customers who can freely share their information without making physical copies of records, such as large rolls of approved plan sets. An applicant can quickly share a digital copy of a complex project with all the necessary stakeholders instantaneously. As discussed in the previous theme, one example would be how Participant 14 could easily share their digital communications with their customers and financial institutions to make timely demands for payment.

Additionally, digital platforms enable effective communication between the municipality and other stakeholder agencies, such as health services and utilities, who are involved in the permit approval process. Digital systems enhance coordination, allowing different departments to access and share information simultaneously, expediting the overall approval process. Previously, the physical records could only be handled by a single individual at any given moment, prohibiting the ability to work in parallel. This change from a linear to a concurrent process greatly reduced the approval timelines for large commercial projects.

4.2.4 Always Available

The always-available nature of digital systems proved to be a benefit identified by participants. Unlike the traditional office hours of City Hall, the online application platform is

not burdened by that constraint, allowing applicants to submit their applications, check their permit status, or access their drawing submissions at any time, from anywhere.

Simply put, applicants were no longer restricted to interacting with the municipality during regular business hours or faced with geographic constraints. This round-the-clock accessibility aligns with the modern, on-the-go lifestyle while accommodating diverse schedules and time zones. Participant 1 spoke to how the flexibility granted to applicants enhanced their overall experience, ensuring that engaging with municipal services is a convenient process:

> [Contractors] liked the fact that they can apply for a permit at two o'clock in the morning because they're busy working. If they're a sole proprietor and they're busy trying to work, they can come home, do their family stuff if they wanted to, and then apply for the permit… That's what I think that they like about it is, that they can apply wherever. If they're doing a job in Sparwood or whatever, they can still apply for their permit in their hotel room; they love that. Industry really, really likes this.

This convenience was noted as particularly valuable by sole proprietors and smaller businesses such as Participants 11, 12, 14, and 16. Interacting with the municipality on their terms enhanced satisfaction and participation. Participants 3 and 4 both recounted a story of an independent contractor who expressed gratitude for implementing the online system. This contractor achieved a greater work-life balance as they no longer had to arrive at City Hall first thing in the morning or before closing time to request permits. Instead, this contractor prioritized spending time with their child and driving them back and forth from school during those hours. With the online system, the contractor could make their permit applications later in the evening after their child had been put to bed without interrupting quality time spent with their family. Participant 2 also stressed that many independent contractors normally performed billable work during office hours and that the system's availability made them more competitive with larger contractors who could afford office staff.

Throughout the discussions, the issue of access brought forward new challenges as the services were digitized. In particular, it was recognized that many groups, such as seniors, those who speak English as a second language, and newcomer Canadians, were less likely to benefit from these changes. Six participants brought forward these concerns on behalf of other groups or, in some cases, members of their own families. In some cases, the issues being brought forward were centred around applicants who did not have access to technology (no computer or email address). The discussion regarding these issues emerged as the next major theme: the access and availability of the supportive resources required to be successful in making a permit application. Participant 9, a municipal staff member, describes how these issues were particularly challenging for non-native English speakers:

> I think people who have English as a second language have an incredible uphill battle because of the technical terms and the requirements that we need. I think that they're intelligent, educated people who just aren't comfortable with the English language. And we don't have any support for that.

4.3. Lack of Supportive Resources

While delivering new efficiencies and conveniences, the digitization of the permit application process began to reveal new challenges faced by staff and applicants centred around a lack of supportive resources. This theme exposes difficulties experienced by the participants, including a wide spectrum of issues that have undermined the implementation of the new digital permitting process. This section discusses many challenges, including access to supportive information, new responsibilities, supportive resources, and difficulties with first-time applications.

4.3.1 Accessing Supportive Information & Resources

Successfully navigating digital permit applications demands a new balance between digital proficiencies and familiarity with the safety code requirements. These distinct realms of

knowledge present themselves as significant hurdles for many applicants, both of which have steep and ever-growing learning curves. The challenges relating to accessing supportive resources can be aggravated by other factors, including digital literacy skills, language barriers, and the limited availability of resources present on the municipality's website. These factors present additional burdens that make it difficult for applicants to comprehend the complex procedures and expectations when navigating and experiencing the permitting process. In some cases, a lack of awareness about available resources, such as online user guides or the availability of staff, aggravates these challenges and leaves applicants feeling disoriented and overwhelmed. Participant 11, a homeowner, expressed their frustration and the potential impacts regarding the challenges they faced in the process:

> I think many people in this city are not getting a permit because it's such a difficult process. [..] you can't find any information. We filled [our application] out to the best of our ability, but without being able to get any information if we're filling it out correctly, if the drawing is correct, and what [information] needs to be on there.

The knowledge requirements of the Safety Codes were acknowledged as a significant challenge by several participants who have seen the standards evolve over the decades. In discussion with Participant 3, they informed me that many applicants come to the counter looking for construction knowledge and information. Participant 3 described this information as being incredibly complex and challenging to understand. Even if the municipality were to publish the entirety of the Safety Codes online, the documentation would be difficult to read, decipher, interpret, and understand. By directing inexperienced applicants through the online system, internal participants felt it delayed and deferred problems to later stages. This was a result of customers not having the necessary discussions upfront as they would through traditional in-person applications.

Related, “Code creep,” which is the gradual evolution of Safety Codes requirements, was also a source of frustration. This escalation in expectations requires that even experienced developers constantly seek continuous education to meet new standards. Participant 16, a contractor, spoke about their willingness to learn new code requirements to save business costs. However, they also expressed a concern with the direction of regulation: “It's just the movement towards more and more rules, but not more value being added. It doesn't make the house any better.”

Several internal participants described how many customers lacked the necessary knowledge and experience to be successful when making their permit applications and engaging with the municipality. Applicants seemingly don't understand the process or expectations, resulting in submission errors. One frequent issue included homeowners applying for the wrong permits or duplications of permits for which sub-contractors are responsible. For example, when performing a hot tub installation, the homeowner may take responsibility for the requirements contained within the building permit but hire an electrician for the electrical connection to the house. Many homeowners mistakenly apply for the electrical permit in addition to the existing contractor permit, resulting in lost administrative time processing refunds for the application made in error. Participant 8, a municipal staff member, describes one such situation “It's not clearly indicated you should have an electrician apply for the electrical permit. They start clicking all of these and then we're having to cancel and refund if they've done it from home.”

Beyond the challenges of interpreting the Safety Codes, many customers face digital literacy barriers. These issues can vary greatly, with internal participants reporting that many applicants did not understand how to submit documents correctly. Customers often forget to upload and submit their drawings after making their permit application as they don't know where

or how to do it. Even when they successfully submitted their documentation, it was also reported that if the application was deemed incomplete, applicants had difficulties finding the letter asking for additional information and pulling together a resubmission package.

Numerous staff at the municipality expressed their frustrations with the website and the limited availability of information to support applicants. Better information availability for the application would alleviate pressure on permit technicians, who were often tasked with resolving issues as they arose. Participant 1, a municipal staff member, spoke to this issue:

> …alleviating having to cancel the permit, the refund, the time… If you're gonna make [customers] do it digitally, we might have to give them more information. Because the city's website is horrible, you can't find that information on there.

A fundamental challenge in digitizing the permitting process is the inherent deficiencies of digital systems. Glitches, slow response time, the user interface, and compatibility issues with the various devices can greatly hinder the delivery and effectiveness of the service. These challenges lead to frustrations for applicants and staff as they impede the timely processing of permit applications. These technical challenges require extensive support from staff with the appropriate skills and knowledge. Participant 1 noted numerous frustrations trying to get in contact with technical staff, noting that though their support is exceptional, the demand for their skills and limited capacity has left them with reduced availability to support troubleshooting and resolving issues when faced with immediate concerns.

Eight participants suggested that the municipality should invest in proactive measures to alleviate issues. Suggestions included creating various supportive resources that could assist with navigating the digital system, such as multilingual, user-friendly guides written for different levels of digital literacy. Other suggestions included online tutorials and videos to ensure applicants could be empowered with the necessary knowledge to complete the digital application process. Improving the available information on the website for the common types of work was

highlighted as an important issue in educating applicants about the information required. Twelve participants brought up issues with the availability of information on the website. Participant 9 felt that the City of Lethbridge could partner with community programs and local organizations, such as the builders' associations, to bridge the information gaps. These measures could help ensure customers have more equitable access to the necessary guidance and support when making applications.

4.3.2 New Responsibilities

With such a significant shift in service delivery through the digitized permitting system, the roles and responsibilities of staff have been redefined. Internal respondents noted an increase and expansion in expectations and responsibilities as they've taken on new responsibilities. Staff are now expected to manage digital records, ensure data integrity, and offer technical assistance to customers engaging with the municipality online. Staff members of all disciplines find themselves acting as a point of contact for applicants struggling with the digital interface, demanding high degrees of knowledge, understanding, patience, and effective communication skills. Participant 9, a municipal staff member, described the experience as "I think [the digital permit process] has streamline things but it's also changed my role in that [I've become a] technical support kind of person."

Normally, adapting to these additional duties requires extensive amounts of training, time, and resources. Several participants reported not receiving adequate support as either part of their onboarding or continued service. Participants felt that it is important to develop comprehensive training programs to equip staff members with the skills and knowledge necessary for their roles. Participant 6 suggested that the municipality invest in the continuous professional development of their staff by providing workshops and access to expert support who

can help answer staff questions regarding the practical applications of the system. These resources could help enhance staff confidence and competence in delivering services through a changing medium.

4.3.3 First-Time Applications

A reoccurring topic that emerged from multiple discussions with participants was the challenges faced by first-time applicants. For those venturing into the application process for the first time, the experience has been described as overwhelming. These challenges are often intertwined with the previously discussed themes as new applicants lack familiarity with the digital system and the Safety Codes, leading to errors and uncertainties. Internal participants believed that the tasks of providing the correct information, understanding the application steps, uploading the necessary documentation, interpreting the questions, and grasping the domain-specific terminology act as intimidating barriers for any first-time applicant. These numerous challenges inevitably lead to incomplete or inaccurate submissions requiring multiple iterations prior to issuance.

Tailoring support for first-time applicants will be a significant challenge for the municipality. Various opportunities suggested by participants include creating interactive onboarding modules, video tutorials, and intuitive tooltips within the interface to assist in guiding applicants through their first application. Some applicants such Participant 17, were unaware of the option to apply in person, and may also not be aware of the supportive resources available to them. Participant 17 expressed “I did it all online. I didn't know there was an in-person option.”

4.4. Loss of Humanity

> The digital world has taken away the humanity of this.
>
> —Participant 3, Municipal Staff Member

An important theme began to reveal itself through the discussions regarding the digitization of the permitting process. Participants recognized that though many efficiencies had been introduced, digitizing the permit application process had resulted in a loss of humanity. The theme regarding the loss of humanity centred on the disconnection between the municipal staff and customers, resulting in the process's depersonalization and weakening of personal relationships. This section explores the subthemes of depersonalization and disconnection, the importance of establishing and maintaining relations, and a lasting preference for personal interactions.

4.4.1 Depersonalization and Disconnection

> And that's the part that is missing, is the human interaction. I do miss that.
>
> —Participant 10, Contractor

One of the sub-themes is the depersonalization and disconnection created through the transactional nature of interactions brought forth by implementing the digital permitting system. Digitization inadvertently stripped away the personal touch and opportunities for interactions and establishing personal connections. It may also result in an escalation in misunderstandings, leading to conflict or subpar service.

When interactions become primarily transactional, some participants felt a sense of detachment, perceiving the process as being depersonalized. This experience may not be universal, as participants who had previously built relationships with staff over the years prior to digitization did not necessarily share these feelings. Participant 16, a contractor, described their experience as:

> It's not like an unfriendly, cold, technocratic future hellscape or anything, it's the same, just as good or better. […] I guess maybe had I not had that experience prior to starting on myCity, maybe the whole thing would feel a little bit cold.

This distance has been a blessing for some internal participants as the depersonalization protects them from direct criticisms from the community. Participant 8, a municipal staff member, described past experiences when customers had taken decisions personally, resulting in being attacked through public forums and social media:

> People that make one application […] That personal touch is a little bit different. Because in some part yes, I miss it, the ones that definitely generally enjoyed your help. The ones that made it personal and were also blowing an application process into a huge, big ordeal. No, I don't miss those.

This detachment and depersonalization can lead to misunderstandings, miscommunications, and, in some cases, conflicts. The absence of a personal touch might contribute to a perception of poor service, as individual needs and circumstances may get lost in the digital transaction. As a contractor, Participant 16 expressed concerns that a poor experience in service relating to the approval of one of their permits was significantly aggravated by the depersonalized nature of the interactions:

> I wouldn't have let [the staff member] do that to me in person. We would have gotten through it a lot faster.[…]I think sometimes people like [the staff member] get to depersonalize it. There's a person who's paying rent, there's a person whose interest is building up on their mortgage, there's a person who is trying to reserve a rate on their mortgage, and you're not thinking of anybody who's involved. There's a framer that needs to do this because he needs to make the money to feed his kid.

These escalations in conflicts significantly impacted the relationship between the customers and the municipality. Participant 16 strongly questioned the staff's accountability and competencies due to the extensive challenges and inconsistencies they faced in processing an application. This frustration led to decreases in the sense of legitimacy not only for the municipality but also for the entirety of the permitting process and its related legislation.

The results of the conflicts between the municipality and customers have real consequences as they often increase the overall cost of a project due to delays or revisions to the intended design of the construction. Participant 18, a contractor, spoke to these consequences:

> The one thing that I've talked about lots over the years with the city is for a builder; time is money. So anytime you delay things for development permit, or consultation, or stop for inspections, or that kind of stuff. Anytime you delayed construction, it's money. It's interpreted to be that's just the cost the builder bears. No, it's not. It's a cost the customer bears, and it has an impact on the community in that way too. It's good for people to at least to understand the consequences.

Participants also expressed feelings of loss regarding personal connections. Several lamented that the transactional nature of the system had reduced the opportunities for genuine interactions and expressed nostalgia for face-to-face conversations with applicants. The loss of personal connections had tangible implications for participants. Participant 8 acknowledges the importance of providing a personal touch to ease a challenging or complex situation. This sentiment was shared with Participant 9 who expressed "I think that personal connection that we have with our citizens, the city loses out on […] And I think we lose that ability with the technology."

4.4.2 Establishing and Maintaining Relationships

> You would think permitting is a matter-of-fact process, but it's not. There's a lot of relationship pieces that come into play…
>
> —Participant 10, Contractor

This theme acknowledges the importance of establishing and maintaining relationships between applicants and the municipality. While efficiency gains have been evident, they have come at the expense of the interconnectedness between the municipality and the community. Participants acknowledged the complexities of permit applications, particularly for non-routine projects that include several intricacies that require understanding and cooperation from all parties involved. For example, Participant 19, a contractor, described the importance of meeting with the municipality in advance:

> I can see that because the projects are so varied in their complexity. There could be usefulness there in terms of meeting with somebody going through [an application]. […] Doing that seems like a good idea.

Establishing a connection between applicants and staff goes beyond the transactional nature of the permit application. It allows for a deeper understanding of the application's unique needs, challenges, and goals and can facilitate its success. Some participants expressed that they were unaware of the option to apply in person at City Hall. Others indicated that they had no intention of ever making a digital application. This was solely to meet with those responsible for approving their permit. Participant 13 was one such homeowner:

> Just knowing and meeting the people personally, makes a big difference because you're building a relationship for the next little while, and so you depend on each other to get the job done.

Maintaining an already established relationship did not seem to suffer the same effects as those who have worked exclusively with the digital permit application process. Long-time applicants who participated in the study expressed thankfulness for the efforts of the municipal staff, who would often go above and beyond their call of duty. However, some tensions were observed as miscommunications and oversights have led to significant conflicts in recent years.

4.4.3 Lasting Preference for Personal Interactions

> One of the pieces of feedback we got: "I know, you guys have introduced this thing, but I still like coming down to see you, I like the human interaction [..] don't take that away from me, don't push me out of the city hall, because this is a social trip as much as it is a business trip.
>
> —Participant 4, Municipal Staff Member

Despite the efforts to divert as many customers as possible online, the sub-theme indicating a lasting preference for interpersonal interactions emerged among several participants. Despite the benefits of the digital process, several members of the study expressed an inclination towards prioritizing personal interactions that were still available. Many participants employed a hybrid model, leveraging the digital system to manage their application, but still chose to apply in person and call for assistance.

This preference was sometimes rooted in resistance to technological advancements. Some participants found it difficult to communicate over virtual media or found that due to their limited technical competencies, they were unable to express themselves adequately. The use of less rich communication tools, such as email, was found by participants to complicate and elongate the permit approval process. Participant 5 suggested that remote options such as video calls, photographs, and verbal communication were preferable to email dialogue when in-person options were unavailable. As a homeowner, Participant 13 emphasized the importance of meeting with municipal staff "The only downside [to applying online] I would say it's just that it doesn't let you meet the people in person before you get started. And I think that saves a lot of headaches on both ends."

For others, they believed that the opportunities for interpersonal connections were irreplaceable. Participant 14 found that their interactions with municipal staff were pleasant and that they enjoyed the opportunity to visit as they were very helpful. Participant 4 recounted stories of customers who lamented about the choice to implement digital permit applications. These customers were unhappy as they didn't want to lose the established connections with municipal staff members. For example, Participant 11, a homeowner, described the loss of the human component "I think that piece, if you go full digitalization, you're missing that whole human piece that is needed.".

Many participants expressed that personal interactions were preferable when working through difficult or complex projects. This was largely driven by the perspective that navigating the permitting required a mutual understanding of expectations and room for negotiation regarding the interpretations of the Safety Codes. When participants were asked if virtual

meetings would satisfy this need, many felt it would be an adequate solution to establishing the necessary framework to proceed with the project.

4.5. Legitimacy

The digitization of the permit application processes identified several considerations regarding legitimacy. This emphasized the relationship between technological advancements and the credibility of the municipal processes in the eyes of its customers.

4.5.1 Accountability

Staff accountability is one of the considerations in ensuring the legitimacy of a digitized permit application process. Within a digitized environment, the actions taken by staff members are automatically recorded, creating a transparent, traceable, and auditable trail of many elements of the decision-making process. This transparency enhances the accountability of individual staff members but also contributes significantly to the overall legitimacy of the municipality. The systematization of the processes also resulted in a greater degree of consistency within a subjective process, improving the experience and expectations of customers. A comprehensive record is established by documenting staff interactions within the digital system, reinforcing stakeholder trust. Leveraging these records, applicants and staff can observe the interpretations of the rules and regulations over time, strengthening their confidence in the digitized permitting system. Participant 5, a municipal staff member, noted that “it's easier to hold staff accountable when there's digital records on every project that's being touched.”

Moreover, the ability to aggregate and analyze data on actions allows for a broader understanding of the permitting process and the municipality's performance among its peers. This aggregated information can be harnessed to identify patterns, streamline decision-making, and ensure that the system operates fairly and consistently over time. Remarkably, the

accountability created by the new system extended beyond the municipal staff to include industry members. By utilizing systematized processes to accurately assess the scope of a project, applicants are expected to accurately report the nature of their project to determine permit fees. Participant 5, a municipal staff member, spoke to this change:

> [Applicants] declare a construction value, and we had no tools to know whether they were reasonable or not. But now vetting that and having more accurate reporting for Stats Canada, it ultimately impacts our revenue. I think that we will probably… hopefully collecting more accurate revenue than what we did before… We're holding industry accountable for the value reported now. I don't think it was ever done before.

4.5.2 Emerging Preferences

The legitimacy of a service is linked to the emerging preferences of the users. Should technological expectations not be met, a service runs the risk of being viewed as either archaic or experimental, either of which could undermine its legitimacy. A system that fails to align with expectations may be associated with unreliable practices regardless of performance. As the public increasingly embraces digital platforms, there is a growing expectation that public services align with these preferences. The legitimacy of a permitting system is, therefore, influenced by its ability to meet its users' evolving needs and preferences. Many internal participants remarked that younger generations of permit applicants preferred to interact with the municipality digitally. Some went as far as leaving City Hall when they discovered that an online option was available, as described by Participant 8, a municipal staff member: “It’s kind of funny, you tell them it’s online and then they leave right away. They’re like, ‘Sweet, I don’t want to talk to you,’ and they leave.”

The convenience, accessibility, and speed offered by digital mediums generally contribute to the perceived legitimacy of the system. However, as observed in a previous section, there is a double-edged sword where the speed at which the approvals are provided may also create doubt and skepticism in the minds of certain applicants. Participants in the construction

industry were excited to discuss the possibility of implementing technologies such as AI within the approval process. These participants also advised caution and suggested the municipality take a careful approach to implementing emerging technologies, including AI. Participants felt that these tools could have meaningful impacts on the success or failure of industry partners due to the inherent legitimacy of a municipal agency and could influence the public's perceptions towards certain builders and developers. Participant 16, a contractor, expressed a desire for the Municipality to continue with the technological evolution of permitting in a measured and thoughtful manner: “I think with any of the AI stuff, let’s do it slowly. Let’s monitor the output of the system, and have it be where it’s fair.”

4.5.3 Fairness & Transparency

Fairness and transparency as components of digitization present an important sub-theme regarding legitimacy. The ability to record the entire process passively and digitally is an important tool in addressing disputes and ensuring a fair decision-making environment. This digital trail serves as a perpetual record, available to be revisited in the event a dispute between the municipality and an applicant arises. Participants discussed how the journey of each application can be traced to help understand the rationale behind the decisions, the reactions of those involved, and the sequence of actions. This ensures that opaque processes do not obscure decisions but are explained by a well-documented history. Participant 16, a contractor, emphasized the importance of having clear and documented records, especially when dealing with complex tasks. As they explained:

> The email record is vastly superior. If it's going to be complicated, and it's going to involve math, and it's going to involve measurements, then it should be done in writing. The idea that you wouldn't want to do it in writing is... not very many good reasons to not want to put your stuff in writing. I'm happy to do it. I get that I'm the person who has to put that on the line all the time. There's always going to be a written record of all my requests, all of my reactions, and all my everything.

For applicants, this visibility means understanding how their submissions are evaluated, creating a sense of fairness. On the other hand, municipal staff are afforded a clear record of their actions, contributing to accountability. Transparency bridges the informational gap between applicants and the municipality, enhancing the process's perceived fairness. This is particularly important as several participants recounted their experiences with the municipality when problems arose. In the unfortunate event of a dispute, digital documentation becomes a source of clarity, allowing the parties involved to review the sequence of events leading to the disagreement. Participant 14, a contractor, highlighted how digital documentation can transform disputes into opportunities for understanding, ultimately contributing to the fairness and legitimacy of the permitting system: “It’s also nice because if there’s misunderstandings, or whatever the situation may be, it’s literally spelled out…”

A common criticism that was discussed by external participants regarding the municipality was its stubbornness and refusal to take accountability when at fault. A fair and transparent system may oblige the municipality to take on a more cooperative approach in future dispute resolutions. This cooperative and proactive approach would contribute to the system's efficiency and create an environment where conflicts are avoided, reinforcing the perception of fairness and legitimacy. Participants 16, a contractor, expressed that the lack of cooperation between the municipality and industry had far-ranging consequences due to issues such as housing needs:

> It doesn't help when it could be more collaborative and realize this is important to our city. To growing it, to growing the revenue of the city. If we don't have enough houses, we're not going to grow the revenue of the city because there's nowhere for people to live.

4.5.4 Thoughtfulness

A unique consideration is the concept of thoughtful decision-making. With digital applications, applicants and staff are afforded the ability to pause, reflect, and make informed decisions. Participants highlighted that, unlike the immediacy of face-to-face interaction, digital processes allow for a reasoned and deliberate approach without the pressures of providing immediate solutions. Participants 8 and 16 both discussed an appreciation for this pause, leading to better decision-making and reliability when compared to in-person interactions. This digital distance improves legitimacy by ensuring that decisions are made with due consideration, reducing the likelihood of impulsive or rushed judgments to satisfy the immediate needs of the moment. The digital system also allows applicants to review and revise their submissions at their own pace. Participant 16, a contractor, explained how the process allows staff members to prioritize and assess each application, providing space for contemplation and encouraging a sense of thoroughness and fairness in decision-making: "Everybody feels like they're doing a better job… I'm not just standing in front of you being like 'Hey, give me a solution for this.' You can have until tomorrow or the next day to get back to people."

4.5.5 Legitimacy Risk Factors

The digitization of the permitting system has improved the legitimacy of the municipality by increasing transparency and efficiency. It has also introduced new risk factors that have harmed the relationship between users and the city. These factors emerged during discussions with participants and largely stemmed from the challenges that arose due to the increased severity of conflicts between both parties. Many of the issues were rooted in the new processes introduced through digitization, the increased requirements and expectations of the customers, and the relationship management approach of the municipality. Additionally, some of the risk

factors were outside of the direct influence of the City and were due to increases in regulation at higher orders of government.

Participant 14 describes a shift in the relationship between contractors and the municipality. The relationship between contractors and the municipality previously relied on implicit trust. Instead, implementing these systems has increased the bureaucracy of the plan submission process. This is mainly due to the escalating requirements set by provincial and federal governments, often referred to as "Code Creep." These additional requirements have made the plan submission process and related requirements more cumbersome, undermining the previous trust-based dynamic.

These risk factors include tangible risks to the community, as they may deter applicants from engaging with the municipality when approval is seen as too challenging. Instead, some customers may seek to circumvent the process and perform the work without permits. This concern was particularly evident among residential contractor participants (Participants 18 and 19), who discussed the deterrent effect the new requirements have on users:

> Participant 18: I've had lots of those discussions over the years, with folks at the city and I thought it'd be fun to redevelop some stuff downtown but decided that was not cost effective.
>
> Participant 19: It [also] deters a homeowner from pulling permits when they are doing a renovation.
>
> Participant 18: You create an underground economy because you're encouraging, especially people that can't afford it, 'I'm just gonna do this on the sly.'

These insights reveal that when the permitting process is perceived as inaccessible or excessively regulated, it risks alienating users such as small contractors and homeowners. This can lead to non-compliance issues and higher risks to the community when users circumvent the official process to avoid what they may believe to be overly restrictive requirements.

The implications of the risks are significant to the municipality and the community. It highlights the need to preserve the legitimacy of the application process and ensure that it is approachable. As Eirinaki et al. (2018) emphasize that introducing excessive friction in the permitting process may drive contractors and homeowners to circumvent the official process out of frustration. This means continuously assessing and adapting the digital platform and its processes to better align with the community's needs while managing higher-level regulatory requirements. This approach can help mitigate the risks associated with non-compliance and strengthen the legitimacy of the digital permitting system.

Chapter 5. Discussion

While conducting this research, it became apparent that the initial research question was rooted in my assumptions that public administrations should mirror the private market in designing and implementing digital services. Similar beliefs are reflected within the literature under the long-standing concept of New Public Management (Gains & Stoker, 2009). Employing private sector strategies and leadership within the public sector has been ongoing for several generations (Lapuente et al., 2020). This study aimed to understand the outcomes of digitizing a public service through a case study of the building permit approval process at the City of Lethbridge. This exploration of the values created and lost through digitization aligns with the gaps identified by Panagiotopoulos et al. (2019) in understanding the greater impacts of digitizing public services. When starting on this project, I realized I underappreciated the challenge identified by other researchers on the complexity of understanding value creation from digitization (Anthony Jnr, 2020; Lara et al., 2016; Mendel & Brudney, 2014; Neumann et al., 2019; Panagiotopoulos et al., 2019).

The gap in uptake between contractors and homeowners of the online system presupposed that the challenge was centred on redirecting more homeowners through the digital process. Instead, a new discussion has emerged based on the themes found throughout this study. Simply put, the natural incompleteness of the application process has always relied upon in-person interactions to help fill in the missing gaps. In this instance, for non-routine and first-time applications, the completeness provided through direct interaction has been a significant driver of creating public value from these services.

The missing completeness from the lack of humanity is common sense in many ways. This thesis has provided a unique perspective exploring these deficiencies using a grounded

approach. These methods resulted in the opportunity to explore the lived experiences of municipal staff and citizens who had engaged with the service post-digitization. In Fischer et al. (2021) discussion regarding the impact of digitization in the public sector, they found that most papers were written from the perspective of Computer and Information Science with a focus on "utilitarian-instrumental values" such as higher efficiency and performance. Comparatively, this study explored the tensions between human proficiencies and the efficiencies brought forward through digitization and automation. This person-centric research approach allowed for examining important elements beyond the exploration of operational efficiencies, filling a gap identified within the literature.

The subquestions were heavily influenced by the reigning assumptions of the importance of developing greater efficiencies and reducing costs. They sought to explore digitization with the primary goal of efficiency and how it could be extended to homeowners and those who did not engage with the digital service. It did not account for the losses that may occur by transforming an incomplete interaction into a transactional and presumed complete process. My understanding has expanded since realizing that these subquestions may have missed an important piece of the puzzle. Simply put, from the perspective of these customers and citizens, should the municipality be seeking to expand these digital services further? What considerations, if any, should be made to reduce the negative impacts that have been identified?

The perception that public sector services can follow a private market approach to digitization is not universal. Importantly, the findings of this study align with Cordella and Bonina (2012) perspective that the common approach to implementing technology rooted in New Public Management may not always be appropriate. This transactional-based strategy with a narrow focus on efficiency requires that the processes subject to digitization are already

"complete," including the transfer of all the necessary information and knowledge required to be successful.

Popular methodologies such as Malone et al. (2003) MIT Process Handbook employ techniques such as decomposition to organize and break down tasks and activities within a process. These have been adapted for the public sector as part of the business process management required to implement digital solutions (Stemberger & Jaklic, 2007) and designing a service by decomposing processes and activities is a well-established approach (Shostack, 1982). However, despite the perception of Safety Codes permits being understood as a basic and routine task, these interactions can often exceed a simplistic transactional approach as they may include important interactions and negotiations between both parties. Decomposition assumes that the task can still be made whole and complete through its parts. The reality that has been observed is that applicants often do not understand what they are doing, creating a false sense of completeness once the digital application form has been submitted. The important discussions, as well as the trial and error that is required to arrive at ideal outcomes, have been inadvertently removed from the process.

For non-routine and first-time applications, the tasks, activities, and services can not be simply decomposed and separated as they are intricately connected. The unique competencies provided by the staff, a fundamental component of a service (Zeithaml et al., 1985), were lost through digitization. These proficiencies are inseparable from service and can not be broken down as they fill the gaps that are missing in an incomplete process. This tension between human proficiencies can be at odds with the importance of efficiency. The permit process represents a business and personal interaction for many participants. A decomposition in which the proficiency is unaccounted for represents a loss in the public value of the service.

This study highlights the potential drawbacks of sidelining human-centric approaches in favour of streamlined digitally enabled business processes. This is especially the case for non-routine or non-transactional interactions. The responses from participants have offered a more nuanced perspective on the intersection of public administration, the digitization of services, and the proficiencies and value brought through manual interactions.

The permit application process can never be complete, with the many branches and conditions making each interaction unique. It represents a wicked problem in which no singular optimal solution may exist. However, the inherent incompleteness should be seen as benign rather than malfeasance. There is a surprising beauty in the incompleteness as it allows the proficiencies brought forward by public servants to fill in these gaps and create public value.

These findings have prompted reconsidering whether efficiency should be the primary or exclusive objective of digitizing a public service. Concepts such as Public Value Management share this perspective in which other priorities and values should be considered as part of the successful delivery of public services (Stoker, 2006). Applications of this concept can be found within the realm of digitizing public services (Cordella & Bonina, 2012). With efficiency gains acknowledged by all the participants within this study, further analysis revealed nuances where these gains created unaccounted losses. The gains in efficiency often came at the cost of personal interactions and relational elements essential to the effective delivery of the service. There is always a level of doubt and exploration in each application in which the staff and customers must negotiate. Once again, this highlights the tight line between maintaining proficiency and efficiency.

Despite the continued pressure to digitize public services (Mergel et al., 2019), a new challenge in the design of services has been highlighted from the perspective of the citizens and

customers. We must question to what degree digital services are expanded and what compensations are incorporated within the design to safeguard the losses created by a digital medium. How can proficiencies provided through natural interactions to address incompleteness issues be leveraged within a digital framework that demands completeness?

5.1. Complexity of Public Service Interactions

One significant revelation from this study was the inadequacy of compartmentalizing and decomposing the digitized service at the tasks and transactional level. Transactional interactions require a high degree of completeness to be digitized. However, unlike the private sector, where many services follow a standardized linear path, public services often involve several complex interactions that cannot be neatly segmented (Stemberger & Jaklic, 2007). Fundamentally, these public processes require adaptation due to their natural incompleteness in comparison to the common decomposition practices from the private sector (Stemberger & Jaklic, 2007). The lost and incomplete elements of digitization emerged as themes within the study, including a loss of supportive resources, the role of public servants as educators, and the public value created through personal interactions. This study emphasizes the human side of digitization, which is often overlooked as few researchers take qualitative approaches to understand users' lived experiences (Fischer et al., 2021).

Safety Code permits are a complicated service requiring negotiations with a nuanced understanding of an intertwined relationship between citizens, customers, and the municipality. The heterogeneity of the service creates different levels of proficiency and efficiency, requiring a delicate dance to complement each other in a manner that creates the greatest public value. For this reason, the concept of public value management, which stresses the importance of looking beyond simple outcomes and operational efficiency (Gains & Stoker, 2009; Kelly et al., 2002;

Stoker, 2006), aligns well with the results of this study. The public value management framework welcomes the incompleteness of the permit application process as it creates opportunities to engage with the citizens and go beyond considerations of efficiency.

5.2. Public Legitimacy

There is a general belief that digital technologies serve to improve trust and legitimacy with stakeholders (Anthony Jnr, 2020; Lara et al., 2016; Mendel & Brudney, 2014; Neumann et al., 2019; Panagiotopoulos et al., 2019). However, the findings from this study suggest that the erosion of connections in the wake of digitization can have a negative impact on the perceived legitimacy of municipal decisions regarding permitting.

The loss of the human element has further stressed the challenges that arise due to incompleteness, delaying confrontation over mismatches in expectations and aggravating conflict between the applicants and the municipality. These gaps would have often been prevented early in the process through rich person-to-person interactions. These findings emphasize the importance of the proficiencies brought forward by the staff in their interactions with the public.

Examples within the literature call for caution in such circumstances, as the legitimacy of the public sector entity may be eroded when citizens are underserved by automated or digitalized services (Lindgren et al., 2019; Wihlborg et al., 2016). The newly formed distances were suggested to have escalated conflicts that would have normally been avoided. Public services are inherently tied to the decisions of the administration, which impact the community. Therefore, there are questions of accountability and legitimacy regarding the creation or loss of public value resulting from digitization (Gains & Stoker, 2009). The loss of the human component within this service has demonstrated evidence that contributes to a greater sense of disconnection or

skepticism regarding the legitimacy of the decisions made by the municipality. The dissatisfaction potentially impacts the trust citizens have in the decision-making process.

5.3. A Double-Edged Sword

A duality of access and availability revealed itself as a significant theme within the study. In one regard, the digital platform provided greater access to permit information and status, including real-time updates, centralized information, dashboards, and automated notifications. These elements empowered many stakeholders with instant and 24/7 access to crucial information.

However, the study also identified potential pitfalls associated with a digital-first approach to access. Access improvements were not universal, as some customers were left behind. The proficiencies brought by staff to address these gaps were lost due to digitization. Groups such as the elderly, new Canadians, and those who speak English as a second language were recognized by participants as having to face greater barriers through the digital service.

Digitization introduced new challenges regarding the depersonalization of the process, as participants noted concerns about customer service. This was particularly evident for new customers and first-time applicants who faced additional barriers and burdens in navigating the digital platform. Additionally, those customers who were not comfortable engaging with the digital platform may feel as though they were abandoned as the municipality focused its efforts on digital service delivery. It is possible that these individuals lacked the necessary resources required to bridge the gap (Warschauer, 2003) which were previously addressed by proficiencies brought through personal interactions. This reflects a potentially negative direction where digitized public services may increase inequity due to limitations in their access to subgroups within the community (Larsson, 2021; Lindquist, 2022; Warschauer, 2003).

The findings from this study have stressed the importance of maintaining traditional and compensating access to services to deliver a satisfactory and complete experience to the public. Implementing digital systems can often be an additional barrier for those less familiar with technology (Warschauer, 2003). Unlike the private sector, the public sector can't disregard a demographic of users who do not wish to engage with the digital platform (Dunne, 2018; Moore, 1995). Therefore, it is the municipality's duty to incorporate these considerations within the design of future services.

When exploring the impacts of the digitization of the permitting process, the lack of supportive resources was a significant theme. Participants highlighted the difficulty in accessing supportive information within the digitized environment. The importance of these resources is seen as a compromise to addressing the issues created by incompleteness within the permitting process. In the past, these issues of incompleteness were naturally addressed through the discussions and questions at the front counter.

The new challenges run contrary to the often-promoted benefits of digital services, which are believed to increase accessibility to necessary resources (Lindquist, 2022). A personal interaction between customers and staff would have compensated for this by enabling staff to disseminate the information and educate applicants. When applying in person, customers would be informed about the process and the construction requirements as a part of the conversation with municipal staff, which was intertwined with the delivery of the service (Vargo et al., 2014).

The decomposition of the procedural tasks to digitize applications failed to recognize this important service within the service, creating an even greater degree of incompleteness. The resulting challenges caused by the missing elements were much more impactful for new applicants and homeowners who lacked the knowledge and understanding required to be

successful. While routine transactions such as “in and out permits” for contractors may have benefited from the automation, new customers encountered difficulties during the application process, negatively impacting their overall experience. These customers faced additional burdens and barriers when engaging with the platform.

Incoming staff also highlighted a challenge in which they felt as if they were thrown into the digital environment without adequate training and support. They were left with the incredible challenge of learning both the technical requirements of their role and how to engage and interact with the new platform. The proficiencies required from staff have grown from addressing incompleteness through discussion to facing new uncertainties and technological requirements.

Once again, this highlights the broader set of resources required to support digital systems internally and externally (Warschauer, 2003). These experiences do not align with the assumption that “digital tools provide new ways to inform, develop, and test staff.” (Lindquist, 2022). Instead, the lack of accessible resources often hindered their ability to deliver services responsively and satisfactorily. Staff often felt that they were not provided with the tools and resources essential for success in their roles, leading to sentiments of resentment. The absence of comprehensive support impacted the staff's efficiency and effectiveness as they attempted to handle the digital process and satisfy customers.

These staff were also faced with new responsibilities. Veteran members found that the required proficiencies had expanded from Safety Codes and permitting subject matter experts to take on a technical support role within the process. The experience of staff having to take on greater responsibilities aligns with existing literature on the digitization of public services (Anderson et al., 2016; Trischler & Westman Trischler, 2021). This role evolution posed challenges in managing the increased expectations and demands placed on the staff. These

considerations become important factors in the design and implementation of services to ensure that staff are adequately prepared for the evolving expectations of their roles.

The lack of supportive resources has revealed some of the often-neglected challenges resulting from the digitization of public services (Cordella & Bonina, 2012; Panagiotopoulos et al., 2019). Addressing these challenges will require a holistic approach that includes technical enhancement, comprehensive user education, staff empowerment, and continuous improvements. By proactively addressing these challenges of incompleteness through supportive resources, the municipality can create a more inclusive, user-friendly, and efficient digital permit application process.

5.4. Navigating a Digital Abyss

The loss of humanity from digitizing the permitting process touches on public service delivery's intangible and impactful aspects. This theme presents itself as an important aspect that is lost, resulting in citizens finding themselves underserved as a part of the dark side of digitization (Larsson, 2021; Lindquist, 2022).

The inadvertent depersonalization and disconnection introduced new considerations that researchers and practitioners should be aware of. Participants in the study had expressed concerns about how the absence of face-to-face interactions resulted in additional and escalated conflicts and poor service experiences. As technology and modern practices within the public service are pressured to evolve (Mergel et al., 2019), citizens' relationships with the municipal government are increasingly limited. The process's incompleteness previously allowed citizens to engage with municipal staff to acquire a permit. This service may represent one of the few opportunities for citizens to connect with the municipality beyond sterilized transactions such as taxes and utilities.

The study also highlights the significance of maintaining and establishing relationships between the City and applicants. Participants lamented the challenges in building relationships through the digital platform without direct human interactions at the front counter. Several applicants chose to avoid the digital process for their applications to create an opportunity to develop a relationship with city staff by engaging with them in person at City Hall. This behaviour demonstrated a preference for values not recognized through the traditional approach to digitization (Cordella & Bonina, 2012).

New customers and first-time applicants who chose to utilize the digital system went as far as to question if a human was involved in the approval process. This highlighted how connections have been eroded by the digitalization of permitting and the impact it has had on the experience and trustworthiness of the process.

Participants also expressed feelings of loss regarding personal connections. The digital platform failed to replicate the depth of interactions that had previously characterized the pre-digitized process. The intangible elements of personal connections were inadvertently sacrificed in pursuit of operational efficiencies, leaving an emerging void that impacted the quality of service and the perception of legitimacy. This tension between operational efficiencies and intangible values has presented itself as a reoccurring challenge in managing digital public services (Cordella & Bonina, 2012; Panagiotopoulos et al., 2019).

Several participants, including staff and citizens, preferred the personal touch in public service transactions. The incomplete nature of the application process requires an individualized approach to identifying and addressing issues. The public value created through this personalized approach welcomed the often mundane questions and discussions associated with permitting. Through this effort, the customer and staff negotiate a delicate balance between proficiency and

efficiency, resulting in successful applications. This is especially evident in complex or novel applications requiring a deeper engagement to attain suitable outcomes. In these cases, the efficiency gains of digitization were overshadowed by a collective sentiment that the intangible elements of connection and understanding were more important.

Some of the customers took on a hybrid approach, leveraging the efficiencies of the digital system for routine tasks, but continued to visit City Hall for in-person discussions regarding complex issues. For those who engaged in simple and routine applications such as in-and-out permits, this sense of loss was far less evident and impactful as the personal connections were often maintained through the inspection process.

5.5. Incompleteness in the Public Service

The concept of incompleteness, as introduced within this study, refers to the gaps within complex processes that exist inherently. These missing elements were not a significant concern before the digitization of the permit process, as traditional face-to-face interactions enabled staff to address the unique and complex issues on a case-by-case basis as applications were submitted. The personal touch before the original permit application process ensured that the needs of the applicants were being met. However, digitization and automation of building permit applications have seemingly overlooked these attributes.

This study provides a unique understanding of the importance of incompleteness within public services. The theoretical contributions focused on how the natural incompleteness of this seemingly benign permitting process creates a wicked problem through the tensions of efficiency and proficiency. The public value created from the permitting process is rooted in an almost common sense conclusion that personal interactions are an essential part of the process, filling in the gaps in every unique application and completing this incompleteness.

The flaws of incomplete public services manifest themselves when the digital systems put in place fail to replicate the empathy, understanding, and adaptive problem-solving proficiencies inherent in personal interactions. The digitized permit system was able to handle standard and transactional applications but struggled with unique cases which required nuanced judgement and flexibility, attributes typically provided by the staff responsible for supporting customers.

This concept within the context of digitizing public services stresses the importance of human-centric values, including satisfaction, empathy, and legitimacy. The findings demonstrate how a digitized system has eroded these values and contribute towards a deeper understanding of why the incompleteness of public services becomes problematic without the personal element.

It is important to evaluate the tension between operation values such as time savings and standardization against intrinsic values like satisfaction and trust. Maintaining a dual focus makes it possible to leverage digitization beyond the typical efficiency metrics. Public value is not just about efficient service delivery; it includes maintaining legitimacy, satisfaction, and personal connections. This study highlights how certain populations, such as older adults or non-native English speakers, might find digitized services inaccessible or inadequate. This stresses the need for inclusive design, considering diverse user needs to avoid creating or exacerbating inequities.

These findings advocate for an iterative design process in public service digitization, emphasizing the need for continuous feedback and adaptation to address the evolving needs of service users. This contributes to a broader understanding of effectively implementing digital public services without sacrificing the essential human-centric components. This supports the idea that hybrid models, which combine digital platforms with necessary supports, can mitigate

the risks of incompleteness. These models ensure that while routine tasks are automated for efficiency, complex and sensitive cases still receive the personal attention they require.

5.6. Implications: Design Thinking in Digital Public Services

Design thinking principles offer a unique approach to managing the complexities of the digitization process for public services (Trischler & Westman Trischler, 2021). This approach allows researchers and practitioners to preserve the human-centric elements essential for the legitimacy and effective delivery of public services (Dunne, 2018). The iterative and empathetic nature of design thinking aligns with the multifaced challenges in this study.

From a practical perspective, this thesis advocates that those responsible for the design of digital public services, such as permit applications, must acknowledge and address the concerns that citizens and municipal staff express by applying empathy (Stickdorn et al., 2018). A hybrid model combines digital platforms with additional supports, recommending iterative design processes and continuous feedback to ensure services remain accessible, legitimate, and trustworthy. The design thinking approach places a greater emphasis on empathy by stressing the importance of understanding the needs, pain points, and aspirations of the end-users, both internal and external (Kouprie & Visser, 2009).

Customers had expressed accusations that the municipality often provided superficial engagement opportunities when designing and implementing its development practices and systems strategies. Designing systems with a deeper understanding of the nuanced personal interactions, such as the negotiation and educational components lost through digitization, would ensure that efficiency gains do not come at the cost of depersonalization of the users, the customer experience, or perceptions of the municipality's legitimacy.

Design thinking also requires a collaborative problem-solving approach involving stakeholders at every design stage (Stickdorn et al., 2018; Trischler et al., 2019). Within digitized public services such as building permit applications, this translates into engaging with the public, staff, and customers in the co-creation and evolution of digital services. Collaborative problem-solving ensures that the municipality's digital service addresses the needs and challenges end-users such as applicants face. This co-creation approach offered by design thinking could result in a greater sense of ownership and shared responsibility for the success of the digitized processes and further the legitimacy of the municipality, which may be lost otherwise (Dunne, 2018; Panagiotopoulos et al., 2019; Rose et al., 2015).

By employing another core quality of design thinking, iterative prototyping and testing (Stickdorn et al., 2018) the municipality can achieve continuous refinement based on the collected user feedback. Through this principle, the municipality acknowledges that the initial design and implementation are not final, and it opens up avenues for continuous improvement based on the evolving needs and experiences of citizens and staff (Dunne, 2018). A particular area of the digitized application process that could benefit from prototyping would be the user interface and portal through which document submissions occur. Seven participants brought up this part of the process as a significant pain point in the workflow. Working empathetically with internal and external users would allow the municipality to collect feedback on the issues when making applications. Interface elements could be rapidly updated through prototyping to improve the experience and collect feedback through trial and error.

This approach minimizes disruptions and optimizes staff and customer user satisfaction through experimental and iterative innovations (Stickdorn et al., 2018). The case of the user interface is a largely experiential portion of the process and could benefit strongly from

participant input. Continuous user feedback loops resulting from prototyping could create mechanisms for ongoing dialogue between the designers and end-users in other areas of the system (Brown, 2008) and further enhance the legitimacy of the digital platform and municipality (Dunne, 2018).

Design thinking, paired with the considerations brought forward by identifying the public value of the digital system, creates an opportunity to enhance the understanding of the community's broader needs. The two concepts of public value management and design thinking could be leveraged to take on a more human-centred service approach that emphasizes creating public value (Stoker, 2006). Rather than viewing public services as an isolated task or transaction (Zeithaml et al., 1985), these approaches encourage practitioners and researchers to develop a comprehensive and holistic understanding of the entire ecosystem. Within the context of the Safety Code, this may involve considering the interconnected nature of tasks, relationships, decision-making processes, and outcomes. These approaches ensure that digitization aligns with the intricate reality of public services and minimizes the creation of new unintended consequences, empowering managers and designers to be responsive, innovative, and creative (Benington & Moore, 2010; Gains & Stoker, 2009; Simon, 1961).

A hybrid model integrates the convenience and efficiency of digital platforms with personalized support. This recognizes that while some users, such as sub-trade contractors, may prefer the speed and accessibility of an entirely digital system, others may benefit from direct and personalized assistance. Hybrid designs in the context of the permitting process could include the following specific components:

1. Implementing a system to schedule consultations with staff: Users who prefer or require additional support throughout the permitting process could schedule

appointments with city staff to discuss their applications, ask necessary questions, and receive guidance on how best to proceed with their projects. These appointments could be delivered through multiple mediums based on user preferences, such as in-person discussions at City Hall, phone calls, or video-conferencing software. This would help bridge the technological and information gap for users who find the digital system or safety code requirements challenging to navigate.

2. Multilingual support and accessible tutorials: Implementing multilingual support and accessible tutorials can help alleviate language barriers and reduce the impact of digital literacy issues through a combination of digital interfaces and human representatives. The step-by-step guides integrated into the permitting platform would ensure that users from various backgrounds can engage with the system effectively and independently.
3. Direct engagement opportunities: Leveraging the efficiencies of the digital system, Participant 14 suggested the municipality target new applicants and have the inspectors engage directly with the customers to establish a working relationship. Inspectors could begin outlining expectations based on the project and answer questions related to the safety code requirements during construction. This pre-emptive engagement could prevent and reduce the number of issues identified during the inspection process which require remediation and result in conflicts between the users and the municipality.

5.7. Limitations & Future Research

The study of a single case of digitizing a singular service in one medium-sized city greatly limits the generalizability of this research. Additional research exploring competing

values is needed to further advance the understanding of different public sector reform movements in the digital era (Lindquist, 2022).

This exploration of the digitization of public services in the context of building permits has revealed new complexities and highlighted the need for future research to expand our understanding of this evolving subject. Namely, there is an opportunity to perform comparative studies across different municipalities to assess variations in the impact of digitization. This could explore how other factors, such as the size of the municipality, the demographic composition, the nature of the region's development industry, and pre-existing technological infrastructure, influence the outcomes of digitizing public services. The research may also explore how other services within the municipality are impacted.

It is important to acknowledge that other public services could offer valuable insights into incompleteness in digitized services as this study was limited to the construction permitting process at the City of Lethbridge. For instance, digitizing healthcare services, such as electronic medical records or telemedicine, introduces complex issues around privacy, data security, and trust, which could provide a richer understanding of how digitization affects public value. Similarly, social welfare programs often involve vulnerable populations and highlight issues related to digital literacy and access, offering another context for examining the potential impact of the digital divide. Additionally, digitized educational services, such as e-learning platforms, could investigate how different user groups, particularly students from disadvantaged backgrounds, navigate and experience digital systems. Future research in other subject areas could extend the concept of incompleteness to these other public services to broaden the understanding in different contexts.

Several research design constraints may have impacted the research, including the methods chosen and limitations of the sample size. Grounded theory, which brings in the valuable lived experiences of the participants, introduces several limitations, such as theoretical sampling constraints, generalizability, subjectivity, and biases, among other constraints associated with the approach (Creswell & Poth, 2016). The findings of this study may not reflect the experiences of different demographic backgrounds, roles, and levels of familiarity with technologies that were not represented within the sample.

There is also the inherent concern of bias regarding how my perspective and assumptions could have influenced the data collection, interpretation, and presentation. As a researcher, I strove to take the necessary steps to minimize the influence of these biases throughout the study.

Future research can explore how some incompleteness might be inherent and unavoidable in digitized public services. This could be due to the limitations of current technology in replicating human judgment and empathy.

Beyond the expansion and extension of the existing research, other potential opportunities for research include the incorporation of human-centric values in with design principles in the public service enabled through the design thinking philosophy, the impact of digitization on public service legitimacy, and the long-term implications on customer and staff relationships.

Chapter 6. Conclusions

6.1. Summary of Findings

The findings of this case study highlight the often overlooked human elements in the digitization of public services. What appears to be a routine and transactional process between applicants and the municipality is instead a complex negotiation requiring relationship building and mutual understanding. As Participant 10 expressed, permitting is not just paperwork as it includes the complexities of personal interactions and support.

The digitization of permit applications which improved operational efficiencies and increased the accessibility of information, inadvertently eroded the vital human-centric components. Participants expressed a sense of loss when engaging with the digitized services. Connections previously established and nurtured through routine face-to-face interactions were strained and eroded. The absence of these interactions created a new gap, diminishing the experience of this core municipal service. Fundamental to public legitimacy, these personal relationships have become harder to establish digitally.

These findings also revealed that digitization can inadvertently compromise the legitimacy of public services. The City of Lethbridge inherently carries a weight of legitimacy in its decisions as the public administration for the municipality. The automation and quick turn-around for permit issuance have sometimes delayed the identification of problems, which increases the cost of rectifying these issues for the customer. Multiple participants shared experiences in which their trust in the municipality was damaged by issues found in the late stages of inspections, which were missed during the review before permit issuance.

Another finding of this examination of digitization was the challenges faced by new staff, who are expected to perform complex business processes while the technology constantly

evolves. Participant 8's experience reflects a common struggle, thrown into a new situation where expertise in legislative processes coexists with the demands of mastering a new digital environment. This shift also transformed veteran team members, evolving their roles from domain experts to providing technical support.

Customer service bore the brunt of these changes. While the simpler routine transactions flourished under automation, the barriers grew for new customers and first-time applicants. Participant 9's observation highlighted the struggle customers faced, craving additional support that the online system failed to provide comprehensively. The challenge was not just technical but about bridging the relational and informational gaps created by digitization.

While digitization is hailed for efficiency, it inadvertently introduces new complexities and challenges. These findings challenge the assumption that digital platforms universally enhance service delivery. Personal relationships, a core component of effective public service, become much harder to establish and maintain. Particularly concerning are the new customers left to fend for themselves with the gaps in support. This sense of helplessness likely contributes to the observed phenomenon of declining homeowner utilization through digital platforms. The findings shed light on the complexities of digitization, emphasizing the urgency for holistic service design solutions that encompass streamlined processes that preserve and strengthen lost elements, such as the interactions underpinning the experience.

This research challenges many long-held assumptions regarding the digitization of public services. Digitization which lacks the incorporation of human-centric values in its design and the inclusion of supportive resources and relationships can lead to unintended consequences and erosions in trust. Acknowledging the multifaceted nature of digitization’s impact, from changes in staff roles and expectations to customer experiences, is essential. As municipalities adapt to

digitization, this study advocates for a holistic design approach that integrates technology while preserving connections, ensuring the digitization process is efficient, human-centred, and trustworthy.

6.2. Theoretical and Practical Contributions

This thesis contributes to the theoretical understanding of incompleteness in public services by highlighting the essential role of personal interactions in filling the gaps left by digitized processes. The findings challenge the assumption that digital platforms universally enhance service delivery, showing that the personal element remains crucial for legitimacy and effective service provision.

From a practical perspective, the study advocates for a balanced approach to digitization in public services. It suggests that while digitization can enhance efficiency, it should not replace the personal touch essential for complex and non-routine interactions. This study recommends implementing hybrid models that combine digital efficiency with additional supports, ensuring that digitization does not come at the cost of public trust and satisfaction.

Incorporating design thinking principles can help address the evolving needs of service users through continuous feedback and adaptation. Engaging stakeholders in the co-creation and evolution of digital services can enhance the legitimacy and effectiveness of public services. While routine tasks are automated, this approach ensures that complex and sensitive cases receive the necessary personal attention, maintaining the public value created through interactions.

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Appendix A: Online Service Adoption Rates

Table 7

Percentage of permits, grouped by review type, by application source

Review Type	Application Source	2013	2014	2015	2016	2017	2018	2019	2020	2021
'In and Out'	Paper Application	100%	95%	32%	26%	19%	14%	9%	2%	0%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	2%	3%
	eApply	0%	5%	68%	74%	81%	86%	90%	97%	97%
Plan Review	Paper Application	100%	100%	92%	71%	66%	55%	39%	9%	6%
	City Hall (eApply)	0%	0%	0%	0%	0%	1%	1%	4%	6%
	eApply	0%	0%	7%	29%	34%	44%	60%	87%	89%
All Permits	Paper Application	100%	98%	64%	51%	43%	35%	24%	5%	3%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	3%	4%
	eApply	0%	2%	36%	49%	57%	65%	75%	92%	93%

Table 8

Quantity of permits by application source

Review Type	Application Source	2013	2014	2015	2016	2017	2018	2019	2020	2021
'In and Out' Permit	Paper Application	3304	3211	1324	977	751	568	361	56	5
	City Hall (eApply)						7	37	70	123
	eApply		161	2778	2724	3243	3603	3411	3536	4328
'In and Out' Total		**3304**	**3372**	**4102**	**3701**	**3994**	**4178**	**3809**	**3662**	**4456**
Plan Review Permit	Paper Application	4322	4166	4139	3284	2780	2333	1436	295	197
	City Hall (eApply)			3	2	1	31	50	146	208
	eApply			334	1318	1449	1850	2200	2876	3138
Plan Review Total		**4322**	**4166**	**4476**	**4604**	**4230**	**4214**	**3686**	**3317**	**3543**
All Permits	Paper Application	7626	7377	5463	4261	3531	2901	1797	351	202
	City Hall (eApply)			3	2	1	38	87	216	331
	eApply		161	3112	4042	4692	5453	5611	6412	7466
Grand Total		**7626**	**7538**	**8578**	**8305**	**8224**	**8392**	**7495**	**6979**	**7999**

Table 9

Percentage of permits, grouped by application type, by application source

Applicant Type	Application Source	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contractors	Paper Application	100%	98%	59%	47%	38%	30%	19%	5%	3%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	1%	1%	2%
	eApply	0%	2%	41%	53%	62%	70%	80%	94%	96%
Homeowners	Paper Application	100%	100%	98%	83%	81%	69%	59%	7%	1%
	City Hall (eApply)	0%	0%	0%	0%	0%	0%	3%	11%	20%
	eApply	0%	0%	2%	17%	19%	31%	38%	82%	78%

Terms

In and Out: Permits that require no review prior to issuance are automatically issued by the system. This includes residential plumbing, gas, electrical, and furnace replacement permits.

Plan Review: All other permits which require a review of submission materials, such as site plans, structural plans, service installation details, and/or heat loss calculations by a Safety Codes Officer prior to issuance.

eApply: The online systems released by the City of Lethbridge for digital construction permit applications and payments.

City Hall (eApply): The internal eApply is an adapted version designed for City Hall to facilitate applications through the digital permit application process and educate applicants on the process.

Appendix B: Proposed Sample Size

Table 10

Proposed Sample Size

Site	Description	Proposed Sample Size	
		Lower Bound	Upper Bound
Internal (City of Lethbridge)	Permit Technicians	2	4
	Safety Code Officers	5	10
	Development Officer	2	4
	Additional Reviewers	2	5
	Administration (Managers)	3	6
External (Contractors)	Digital Applicant	5	10
	In-person Applicant	2	10
External (Homeowner)	Digital Applicant	5	10
	In-person Applicant	5	10
	Non-Applicant	2	5
	Total	**33**	**74**

Terms

Permit Technicians: Front-line employees responsible for both in-person and online permit intake. Works directly with the customer to ensure the permit application is complete and all the necessary documentation is included. May also perform development officer tasks in certain land uses.

Safety Code Officers: Powers designated through the Safety Code Council of Alberta. Responsible for enforcing the Safety Codes Act and ensuring compliance with the safety codes. Performs the plan review before permit issuance and is responsible for onsite inspections as work progresses. Interaction with the customers at multiple stages (assisting with the application process, plan review, and inspections).

Development Officers: Powers designated through the Land Use Bylaw. Responsible for ensuring that proposed developments comply with the Land Use Bylaw. A review may be performed before issuance based on the nature of the project. Interacts with the customer during the application and plan review phases.

Additional Reviewers: Based on the project's scope, additional reviewers may be required from internal and external stakeholders. This may include utility providers (water, electricity, natural gas, and communications) or life safety agencies (Alberta Health Services and Fire Prevention).

Appendix C: Recruitment Message

Dear [Name of Participant],
You are being invited to participate in a research study on the customer experience with the City of Lethbridge's construction permitting service. This study is being conducted by Bradley McLeod at the University of Lethbridge under the supervision of Dr. Yongjian (YJ) Bao. Bradley McLeod is also employed with the City of Lethbridge within the Planning & Design department; however, the research is being performed independently from the City of Lethbridge. The anonymized results of the analysis from the research will be shared with the Municipality to assist in the design and improvement of digital services. The purpose of the study is to develop a better understanding of the impact of digitizing the permitting processes and the service preferences of customers.
[Paragraph for customers whose information was provided by the City of Lethbridge]
As a recent applicant for a construction permit from the Planning & Design department at the City of Lethbridge, your personal information was requested by the researcher to contact you for your participation in the research study. Contact information was provided by the City of Lethbridge in accordance with the Freedom of Information and Protection of Privacy Act (FOIP Act), which allows for the disclosure of personal information for research purposes.
I am contacting you to invite you to participate in an interview in which you will be asked to discuss your experience with the construction permit process (application, plan submission and review, and inspections). This research will require about 1 hour of your time. During this time, you will be interviewed about your experiences throughout the permitting process. The interviews will be conducted either by telephone or by teleconferencing. In certain cases, the interviews can be conducted in person following Alberta Health guidelines. The interview will be audio-recorded for the purpose of transcription and analysis. For teleconferencing interviews, no video will be recorded, and you are free to turn off your video feed if you so wish.
If you are interested in participating in this study, please contact Bradley McLeod at [redacted] or mcleod@uleth.ca to arrange a meeting time to further discuss your potential interest in participating. Agreement to be contacted or a request for more information does not obligate you to participate in any study.
If you have any questions about me or my project, please contact me by email at mcleod@uleth.ca or by phone at [redacted].
If you know anyone who may be interested in participating in this study, please give them a copy of this information.
Thank you in advance for considering my request,

The proposal for this research has been reviewed by the Human Participant Research Committee and found to be in compliance with the University of Lethbridge's ethics policy. If you have any other questions regarding your rights as a participant in this research, you may also contact the Office of Research Services at the University of Lethbridge at 403-329-2747 or research.services@uleth.ca.

Appendix D: Interview Protocol – External (Permit Applicants)

Hello, and thank you for taking the time to participate in this research study on digitizing the City of Lethbridge's construction permit application process. My name is Bradley McLeod from the University of Lethbridge, and I am conducting this research as part of my master's thesis. I am also employed by the City of Lethbridge's Planning and Design department as the Business Support Coordinator, working directly with online permitting services. With your consent, the audio from this interview will be recorded for the purpose of transcription and analysis. Before we begin the interview, I have several housekeeping items I would like to go over first.

1. Are you willing, of your own free accord, to participate in this interview?
2. Have you reviewed the Informed Consent form?
3. Do you understand the Informed Consent form?
4. Have you signed the Informed Consent Form? If not, could I please have your verbal consent to continue with the interview?
5. Are you aware that you may withdraw from this study without penalty or repercussion at any point during or after this interview up until the point of analysis? I will provide you with a transcription copy within the next two weeks. You will be given two weeks to review the transcription, and the review will be your final opportunity to withdraw from the study if you choose to do so. The information collected today will be used for the analysis of this study and will be kept anonymous and confidential. Any information you provide will be destroyed should you choose to withdraw.

Thank you. Do you have any questions before we start?

This interview will begin with a couple of demographic questions followed by several open-ended questions that relate to the exploration of the research question 'What are the results of digitizing a public service such as building permits at the City of Lethbridge?'.

Demographic Characteristics

1. What is your age?
2. What is your sex or gender?
3. What is the highest level of education you have attained?
4. Is English your first language?

What are the results of digitizing a public service such as building permits at the City of Lethbridge, and what are the perceived benefits, challenges, and lessons learned from digitizing the permit application, approval, and inspection processes?

1. How did you apply for your construction permit?
    a. If the applicant chose not to apply for a permit, why?
    b. PROBE: What kind of permit did you pull
        i. Note, if the scope of work was an "In and out" permit, skip question 5
2. Why did you choose to apply for the permit [ONLINE / IN-PERSON]
    a. PROBE: Have you ever pulled a permit [OPPOSITE MEDIUM]?
        i. If yes, how did that experience compare?
3. Did you ever pull a permit prior to the release of the online system?
    a. If yes, how has the process changed for you?
    b. If no, why not?
4. What are the benefits of applying for a permit [ONLINE / IN-PERSON]?
5. What are the benefits of navigating the plan review [ONLINE / IN-PERSON]?
6. What are the benefits of requesting and managing inspections [ONLINE / IN-PERSON / PHONE]?
7. What are the challenges of applying for a permit [ONLINE / IN-PERSON]?
8. What are the challenges of navigating the plan review [ONLINE / IN-PERSON]?

9. What are the challenges of requesting and managing inspections [ONLINE / IN-PERSON / PHONE]?

Why are fewer residential homeowners taking advantage of the online permitting service relative to contractors?

10. What did you like about applying for a permit [ONLINE / IN-PERSON]?

11. Have you considered applying for a permit [OPPOSITE MEDIUM]?

12. If the participant has not applied for a permit online.

    a. Why did you choose to apply for the permit in person?

    b. When did you become aware of the online permit applications?

    c. What online resources did you use prior to making your application?

        i. Probes: Online research?

    d. What resource constraints may have prevented you from making your application online?

        i. Probes: Knowledge, awareness, confidence, physical access, literacy or understanding, language, social?

13. Are there any barriers that could prevent you from applying for a permit online?

What improvements or changes, if any, could reduce the gap between the two user segments?

14. What would you like to see improved when applying for a permit?

15. What would you like to see improved when navigating the plan review online?

16. What would you like to see improved when managing inspections online?

17. If the participant has not applied for a permit online.

a. Are there any changes that could be made that would convince you to apply for permits online?

18. Is there anything else you'd like to share about this topic that may not have been covered?

Thank you for your participation today. I will follow up once the interview is transcribed so that you may review, revise, and approve the transcription.

Appendix E: Interview Protocol – Internal / Partner

Hello, and thank you for taking the time to participate in this research study on digitizing the City of Lethbridge's construction permit applications. My name is Bradley McLeod from the University of Lethbridge, and I am conducting this research as part of my master's thesis. I am also employed by the City of Lethbridge's Planning and Design department as the Business Support Coordinator, working directly with online permitting services. With your consent, I would like to record this interview for the purpose of transcription and analysis. Before we begin the interview, I have several housekeeping items I would like to go over first.

6. Are you willing, of your own free accord, to participate in this interview? Whether you choose to participate or not, this will not affect our relationship, and I expect to have enough participants if you choose to participate.

7. Have you reviewed the Informed Consent form?

8. Do you understand the Informed Consent form?

9. Have you signed the Informed Consent Form? If not, could I please have your verbal consent to continue with the interview?

10. Are you aware that you may withdraw from this study without penalty or repercussion at any point during or after this interview? The choice to withdraw will not affect our relationship. I will provide you with a transcription copy within the next two weeks. You will be given two weeks to review the transcription, and the review will be your final opportunity to withdraw from the study if you choose to do so. The information collected today will be used for the analysis of this study and will be kept anonymous and confidential. Any information you provide will be destroyed should you choose to withdraw.

Thank you. Do you have any questions before we start?

This interview will begin with a couple of demographic questions followed by several open-ended questions that relate to the exploration of the research question 'What are the results of digitizing a public service such as building permits at the City of Lethbridge?'.

Demographic Characteristics

1. What is your age?

2. What is your sex or gender?
3. What is the highest level of education you have attained?
4. Is English your first language?

What are the results of digitizing a public service such as building permits at the City of Lethbridge, and what are the perceived benefits, challenges, and lessons learned from digitizing the permit application, approval, and inspection processes?

1. How has your role changed due to digitizing the building permit process?
2. What improvements or benefits have there been for you?
3. What improvements or benefits have there been for the organization?
4. What improvements or benefits have there been for the customer?
5. Who has benefited the most from digitizing the permitting process?
6. What challenges or tensions have there been for you?
7. What challenges or tensions have there been for the organization?
8. What challenges or tensions have there been for the customer?
9. Who do you think has faced the most challenges due to the digitization of the permitting process?

Why are fewer residential homeowners taking advantage of the online permitting service relative to contractors?

10. Why do you think so many contractors chose to apply online?
11. Why do you think relatively fewer homeowners apply for permits online?
12. What challenges have you observed with homeowners utilizing the online service?

What improvements or changes, if any, could reduce the gap between the two user segments?

13. What would you like to see improved when applying for a permit?
14. What would you like to see improved when navigating the plan review online?
15. What would you like to see improved when managing inspections online?
16. Do you believe any changes could be made that would convince homeowners who apply in person to switch online?
17. Is there anything else you'd like to share about this topic that may not have been covered?

Appendix F: Letter of Consent

LETTER OF CONSENT
Study Title: Mind the Gap - An Exploratory Case Study of the Emerging Digital Divide in a Municipality's Construction Permit Services

[DATE]

Dear Participant:

You are being invited to participate in a research study exploring the service impact resulting from the digitization of the building permit process at the City of Lethbridge. The information collected from this study will be presented in a master's thesis, potentially in scholarly publications and/or presentations, and in a report to the City of Lethbridge. No personal identifications will be disclosed, and responses will be kept anonymous.

[Internal Participants Section]

Your participation in this research is completely voluntary, and the decision not to participate or withdraw will not affect our relationship. I expect there will be enough participants for the research whether or not you choose to participate.

This research will require approximately 60 minutes of your time for a one-on-one interview. The interview may be conducted in person at a location of mutual agreement following provincial health regulations, by telephone, or by videoconferencing. The interview will be audio-recorded for the purpose of transcription and analysis. The choice to use video during a teleconference is optional and will not be recorded. The purpose of the interview is to explore the experiences surrounding the digitized building permit process.

There are no direct benefits to you from participating in this study; however, you will be contributing to a better understanding of the digitization of public services.

There are no anticipated risks or discomforts related to this research. However, it is important to note that the results of the interview may be shared anonymously as part of the research findings.

Your participation in this research is completely voluntary. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. You may choose not to answer any question, or you may withdraw from the interview at any time for any reason. If you would like to withdraw from the interview, please let me know at any point during the discussion. You will also have an opportunity to review a copy of the transcript and delete any responses should you desire. You will be given two weeks to review the transcript, which will serve as your final opportunity to withdraw from the study. If you withdraw, any information you have provided will be destroyed.

Several steps will be taken to protect your anonymity and confidentiality. Participants who agree to be interviewed will not be identified by name, but your role in the process (e.g. applicant, safety code officer, etc.) may be referenced. All the data collected in this study will be kept in a locked cabinet or on a password-protected computer, and only the researchers will have access to them. Collected information from interviews will be retained based on the University of Lethbridge's research retention policy.

The results from this study may be presented in academic reports and presentations, including quotes from the interview and aggregated data. At no time, however, will your name or any identifying information be revealed unless you have given consent.

If you require any additional information about this study, please call me at [redacted] or email me at mcleod@uleth.ca. You may also contact my supervisor, Dr. Yongjian (YJ) Bao, at

[redacted] or yj.bao@uleth.ca. Questions regarding your rights as a participant in this research may be addressed to the Office of Research Ethics, University of Lethbridge (Phone: [redacted] or Email: research.services@uleth.ca).
This research project has been reviewed for ethical acceptability and approved by the University of Lethbridge Human Participant Research Committee. Thank you for your consideration.
I have read (or have been read) the above information regarding this research study on the use of electronic resources by academic libraries, and I consent to participate in this study. This form may be signed digitally or in person, or verbal consent may be given during the interview prior to commencement.

_____ (Printed Name of Participant)

_____ (Signature)

_____ (Date)

_____ (Printed Name of Researcher)

_____ (Signature)

_____ (Date)

Bradley McLeod
MSc Management Candidate, University of Lethbridge
[redacted]
mcleod@uleth.ca

A copy of this consent form has been given to you to keep for your records and reference.

Appendix G: Project Timeline

Table 11

Proposed Research Project Timeline

Sequence ID	Dependencies	Task	Timeline
1		Proposal Defense	January 20, 2022
2	1	Ethics Approval	January - February 2022
3	2	FOIP Research Agreement Signed	February 2022
4	2,3	Data collection of documents and other materials	February – June 2022
5	2,3	Data collection from internal participants (staff)	February – April 2022
6	2,3	Autoethnography	January - February 2022
7	2,3	Data collection from external participants (customers)	February – June 2022
8	4,5,6,7	Data analysis (ground-up approach)	February – August 2022
9	8	Thesis writing	June – November 2022
10	9	Thesis Defense	November – December 2022

Table 12

Actual Research Project Timeline

Sequence ID	Dependencies	Task	Timeline
1		Proposal Defense	January 20, 2022
2	1	Ethics Approval	May 2022
3	2	FOIP Research Agreement Signed	June 2022
4	2,3	Data collection of documents and other materials	June 2022 – October 2022
5	2,3	Data collection from internal participants (staff)	June - July 2022
6	2,3	Data collection from external participants (customers)	July 2022 – April 2023
7	4,5,6	Data analysis (ground-up approach)	July 2022 – August 2023
8	7	Thesis writing	August 2023 – Feb 2024
9	8	Thesis review	March 2024 – June 2024
10	9	Thesis Defense	August 2024

Appendix H: Budget

Table 13

Originally Proposed Budget

Expense Item	Cost per Unit	Units	Total Cost
Token of Appreciation – Café Gift Card	$10	29 – 45	$290 – $450
Recruitment Letters	$1 - $2	80	$80 - $160
Miscellaneous Costs (other printing materials)			$250
		Estimated Budget	**$620 - $860**

Table 14

Actual Expenses

Expense Item	Cost per Unit	Units	Total Cost
Token of Appreciation – Gift Cards	$10	17	$170
Postage	$0.966 / unit	376	$363.22
Labels			$24.77
Software – NVIVO (2 years)			$500
Software – Otter.ai (1.5 years)			$172.90
		Estimated Budget	**$1,230.89**

The actual costs exceeded the originally budgeted costs. A significant proportion of this overrun was due to software licensing. A significantly greater number of letters were also sent during recruitment efforts.

Appendix I: Interview Details

Table 15

Participant Interview Details

ID	Role	Interview Medium	Interview Duration	Interview Date
Participant 1	Municipal Staff	in-person	01:15	June 22, 2022
Participant 2	Development Officer	Teams	00:38	June 21, 2022
Participant 3	Safety Code Officer	Teams	01:06	June 13, 2022
Participant 4	Municipal Staff	in-person	01:03	July 20, 2022
Participant 5	Safety Code Officer	in-person	01:16	June 14, 2022
Participant 6	Safety Code Officer	in-person	00:33	July 25, 2022
Participant 7	Municipal Staff	in-person	00:47	July 7, 2022
Participant 8	Municipal Staff	in-person	00:55	July 5, 2022
Participant 9	Municipal Staff	in-person	01:42	July 6, 2022
Participant 10	Commercial Contractor Applicant	Teams	00:29	July 15, 2022
Participant 11	Homeowner	in-person	01:00	October 21, 2022
Participant 12	Residential Contractor Applicant	Phone	00:30	March 10, 2023
Participant 13	Homeowner	Facetime	00:13	March 13, 2023
Participant 14	Residential & Commercial Contractor	Phone	00:45	March 13, 2023
Participant 15	Office Manager	Phone	00:14	March 14, 2023
Participant 16	Management / Owner Residential Construction	Teams	01:28	March 15, 2023
Participant 17	Homeowner	Phone	00:19	March 17, 2023
Participant 18	Management / Owner Residential & Commercial Construction	Teams	00:41	March 17, 2023
Participant 19	Residential & Commercial Contractor	Teams	00:41	March 17, 2023
Participant 20	In-Office Applicant Homeowner	Teams	1:01	April 5, 2023

Appendix J: Data Structure Overview

Table 16

Data Structure Overview

	Sub-Themes	Third Order Themes (Codes)	Representative Data
Time-Savings and Efficiencies	Evolving Work Conditions	Remote and flexible work options resulting in higher productivity	I'm starting way earlier. We used to have discussions in the morning, and you'd be lucky if you got out by 9:30 AM. Now, I can be doing inspections at 7:30 AM.
		Work has become faster, easier, and better focused	It's made me more efficient. In some ways, it's made me be able to focus more on the work itself as opposed to the paperwork part of it.
	Standardization	Too much latitude for judgment calls	There's less arbitrary decisions being made, which means there's less problems with customers. The staff become more independent and less reliant on management because things are black and white now.
		Consistent and linear process	It's definitely very nice to be more consistent so that any of us could argue why a decision got made.
	Faster Service	Contractors have benefited the most from the digitization of the permit application process	Those [contractors] probably saw the single largest benefit because they don't have to come down anymore at all. Their stuff is in and out, they've got a permit in 20 seconds, and they're away to the races.
		Faster or immediate turnaround times on permits due to automation	I didn't have to go into the office to bring a lot of paperwork in. I could simply just scan it, attach it, and send it away. Everything was done. I think it's quicker, because you get it to them quicker, all the paperwork is there. And then you get your permit back.
	Improved Communications and Collaboration	Ability to collaborate with peers	We're able to share documents really easily from one level of review to another. It's nice to just to be able to get it from the CSRs [Customer Service Representatives] to myself to review. Hand it off quickly to the next to [commercial building plans examiner] or any of the other permit techs. It's not a physical walking of paper down somewhere. It's just now in their queue, they can take control of it, I can take control of it. When it comes in, I can view it quickly. We can bring it up on the screen, we can talk with each other at the same time about those drawings. We can actually view them at the same time so we can have a discussion about them as needed versus having to take a roll of documents to somebody's desk and roll them out for joint review.
		Improvements in communication with customers	I think it's about how efficient it is for inspectors and how communication can be quick if people are ready with applications.

Organizational Savings	Corporate & and staff cost savings	We went from four permit techs and two clerks [to four permit techs], and now we've diverted all of that work away. We've diverted 6,000-8,000 transactions away from the front counter to online. We saved two salaries. Certainly, that's a corporate benefit and probably savings.
	Time-saving and cost-saving	The one thing that I've talked about lots over the years with the city is for a builder; time is money. Anytime you delay things for development permit, or consultation, or stop for inspections… Anytime you delay construction, it's money.

	Sub-Themes	Third Order Themes (Codes)	Representative Data
Access and Availability	Access to Permit Information	Customer Access to information	I know how to access the permit, the approved plans, comments from mechanical, electrical as well as my original submission. I do like that.
		Ability for staff to quickly access information which is retained indefinitely	They can just look on their phone or look on their tablet and grab that set of drawings right in front of them.
	Ability to Manage Records	Coordinating multiple contributors	This works efficiently because you have so many people, so many hands, touching an application. And even people calling about an application, if it's not one of mine, I can still look up that information and still relay that to them. So there's that benefit because I can see other people's letters that have been sent. I can see where it's sitting on status. I can see if there's been some new comments made.
		Easing reliance on others	It's less memory on each specific [project]. Firstly, you have that somewhere and you can communicate that to somebody else. When something comes up two years from now, it's still there. It's not a sticky note that got lost.
	Ability to Share Information	Customers sharing information with interested parties	This is nice, they can share them amongst the contractors that need it. You don't have to have that physical copy on site to be lost or, damaged or destroyed by rain or blown off in the wind.
		Permit information is shared with multiple areas of the organization	The other thing that we didn't talk about is the electronic permits now are tied to other departments where before there was a lot of having to email back and forth. The electric permits is one, 200 AMPs, those are automatically sent to [the Electrical Distribution Engineer]. We get automatic emails saying whether there's no fees or additional fees. That is massive, not having to go back and forth.
		Convenience and ease of use when applying online instead of in-person	I just thought if I could do it online because I work in an office, it's simpler for me to just be able to do it online.
	Always Available	Online services are always available	There's an ability to be able to do business 24 hours a day. If people want to be up at three o'clock in the morning. This is our small businesses who might not have the staff to be able to do some of this work. Where they can come home from a hard day's work and stay up till 11 or get up at 2 am or whenever. They're doing this to make their application. The city becomes open for business, which I think is good for the citizens and for people who are applying for permits because they can do that and still communicate with us regularly in order to get their applications complete.

	Sub-Themes	Third Order Themes (Codes)	Representative Data
Lack of Supportive Resources	Accessing Supportive Information & Resources	Hesitancy, fear, or dissuasion towards applying for a permit due to challenges accessing resources	I think many people in this city are not getting a permit because it's such a difficult process. [..] you can't find any information. We filled [our application] out to the best of our ability, but without being able to get any information if we're filling it out correctly, if the drawing is correct, and what [information] needs to be on there.
		Challenges with the City of Lethbridge Website	Mainly navigating through the City of Lethbridge website. Finding the right information. The complaint form, for example, is in a really interesting spot. [Customers are]: "Well, I wouldn't have thought to go look at that." It's almost like it should be a button on the very main page. But then again, they may think it's for anything. We want it specific to our department, right. Sometimes they just get overwhelmed with the information they do find online too. So they want to talk to a building inspector or development officer. They just come down, hoping to talk to someone.
	New Responsibilities	Required to take on technical support	I think [the digital permit process] has streamline things but it's also changed my role in that [I've become a] technical support kind of person.
		Changes to positions, practices, and preferences over the course of digitization	The less I have to waste my hard earned wage. […] If I was paying me, what I pay me, to help somebody click buttons. I would say "Yeah, is that necessary? Is there somebody else who can do that?"
	First-time Applications	The digital system lacks the necessary supports and training opportunities for new users	Figuring out how to use the portal, there's always new challenges. The first time around, it seems it takes twice as long to do it the first time than the second time. And that's probably the case, being a construction company where I have somebody in my office that's making applications all the time.
		Repeat customers benefit more from the system due to familiarity	I think because of the way business operates nowadays, it made it logical for businesses to do online application. Homeowners. I don't know if you'll get a stronger buy in from homeowners in general, as you will from contractors. A lot of times, it's a one off, we're going to build a deck. To embrace an online application system for one thing, it's like... really? But if they're going to do a deck this year, then going to do the garage next year, then going to do an addition. They might be more open to the idea after the first one. After they walked through it said: "Oh, that's not bad, after all." It's just getting past that first one.

	Sub-Themes	Third Order Themes (Codes)	Representative Data
Loss of Humanity	Depersonalization and Disconnection	Depersonalization escalating conflict	I really do think there's a real disconnect with certain people down there. These are real businesses; these are real people who are trying to earn a living to feed their families and live a life.
		Process made more difficult without a personal connection	People that make one application […] That personal touch is a little bit different. Because in some part yes, I miss it, the ones that definitely generally enjoyed your help.
	Establishing and Maintaining Relationships	Importance and benefits of interpersonal relations in permitting	You would think permitting is a matter-of-fact process, but it's not. There's a lot of relationship pieces that come into play.
		Importance of establishing and maintaining personal connections between staff and customers	Just knowing and meeting the people personally, makes a big difference because you're building a relationship for the next little while, and so you depend on each other to get the job done.
	Lasting Preference for Human Interactions	Desire or need to bring back the human or personal connection	One of the pieces of feedback we got: "I know, you guys have introduced this thing, but I still like coming down to see you, I like the human interaction [..] don't take that away from me, don't push me out of the city hall, because this is a social trip as much as it is a business trip.
		Sense of loss regarding in-person interactions	I think that piece, if you go full digitalization, you're missing that whole human piece that is needed.

	Sub-Themes	Third Order Themes (Codes)	Representative Data
Legitimacy	Accountability	Accountability of the municipality and staff	I think it's easier to hold staff accountable when there's digital records on every project that's being touched.
		Holding clients accountable to reported values and permit fees	[Applicants] declare a construction value, and we had no tools to know whether they were reasonable or not. But now vetting that and having more accurate reporting for Stats Canada, it ultimately impacts our revenue. I think that we will probably… hopefully collecting more accurate revenue than what we did before… We're holding industry accountable for the value reported now. I don't think it was ever done before.
	Emerging Preferences	Preferences for digital systems	It's kind of funny, you tell them it's online and then they leave right away. They're like"sweet, I don't want to talk to you" and they leave.
		Preferences for digital systems	I still probably would have done it online. Just for the ease of doing it from home at whatever hours.
	Fairness & Transparency	Professional and straightforward feedback	For me, it's all the same people and getting review comments that are specific instead. There's no more reading between the lines, and there's no more "can't we just..." it's all just very laid out.
		Disputes and feedback are recorded	It's also nice because if there's misunderstandings, or whatever the situation may be, it's literally spelled out instead of "Oh, I happen to fail or get a partial. Why did I get a partial?"
	Thoughtfulness	Space to reflect and make decisions removes the pressure of making immediate decisions	Everybody feels like they're doing a better job… I'm not just standing in front of you being like "Hey, give me a solution for this." You can have until tomorrow or the next day to get back to people.
		The system creates a distance which benefits those who prefer to manage interactions digitally	I think some people work better digitally because it gives you that sort of cover. It's not like being in front of a person, you don't need to necessarily the same confidence to work behind a computer like you in front of somebody.