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The Role of Culture on the Usability Testing of Financial Service Technology

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CERTIFICAT D'APPROBATION ÉTHIQUE

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Maurice Lemelin

Abstract

This thesis investigates how cultural dynamics influence the user experience of financial service technologies. The thesis is presented in two interconnected parts: an empirical study article and a managerial article. The empirical study article introduces a novel approach to measuring culture's role in user experience with the variable cultural fit. This variable assesses the alignment between a user's personal identity and values and the organization behind the system. This individualized measurement approach to culture challenges the traditionally homogenous national-scale cultural comparisons. The study examines how cultural fit impacts both user performance on and perceptions of usability of mobile banking interfaces. The findings reveal a negative relationship between cultural fit and task performance, and a mixed influence on perceived usability, such that cultural fit positively impacts perceived performance but has no significant effect on perceived effort. These results highlight the nuanced and complex role of culture in shaping user experience with information technology. Building upon these findings, the managerial article examines practical implications for recruiting representative users in usability testing, using the Quebec-based financial institution as a case study. The managerial article highlights the importance of understanding cultural nuances, particularly between Francophone and Anglophone users, and emphasizes the need for strategic recruitment to capture diverse user experiences. The article highlights the challenges cultural fit poses for user performance and offers actionable recommendations for improving recruitment and testing practices. Together, these studies contribute to a growing body of knowledge on cross-cultural usability and offer practical guidance for designing and testing systems in increasingly globalized markets.

Keywords : usability testing, technology acceptance, language, culture, perceived usability, performance, banking

Research methods : The study was conducted in a laboratory setting at Tech3Lab in Montreal. The study employed a between-subjects design, comprising two conditions: test session in French or test session in English. This simplistic experiment design allows for the sole

experimental factor of the role of language and culture to become immediately apparent. This experiment was conducted on the mobile website and application of a major financial institution operating in Quebec. Over 100 participants were recruited: 75 francophone and 25 anglophone. Tasks consisted of both transactional and information-search nature. Objective measures of performance and subjective measures of perceived usability were captured to assess the effects of culture on usability testing.

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Introduction

1.1 Research Context

The rapid evolution of financial service technologies presents new challenges for usability research, especially in culturally diverse markets. As mobile banking applications and digital personal finance management platforms become essential touchpoints for financial service providers, understanding how different cultural groups interact with these technologies and how cultural factors influence user behavior becomes critical. Existing usability testing methods often assume uniform cognitive and behavioral patterns across a target user group, overlooking the nuanced ways in which cultural backgrounds shape user experience. This study aims to investigate an emerging issue in usability research methods: the inherent role of culture in influencing users' interactions with financial technology.

Research shows that culture and language profoundly shape cognition, decision-making, and user behavior. First language and cultural context play a critical role in shaping an individual's cognitive processes and perceptions of interfaces, directly affecting usability. Rau et al. (2008) found that usability issues in computing systems often stem from a mismatch between cultural expectations and interface design. Fraternali and Tisi (2008) further argue that interface preferences differ across cultures, as users from distinct backgrounds tend to seek familiar design patterns that align with their mental models. Thompson and McGill (2012) observed that when these interfaces are not intuitive or require steep learning curves, the user experience suffers. Culturally tailored website designs, on the other hand, enable users to complete tasks more efficiently and with higher satisfaction. Research by Nantel and Glaser (2008) suggests that users perform better on culturally adapted interfaces, as the cognitive effort required to process familiar information decreases. Localization refers to adapting content and design to meet cultural expectations. It is often recommended as best practice for websites serving multilingual or multicultural user bases.

This study takes place in the highly multicultural user base of Canada. The nation notably has two official languages: French and English, with each language representing a distinct cultural group and heritage: francophones and anglophones. As a result, Canadian organizations often

provide digital services in both languages. However, these translations are not often localized to reflect regional linguistic nuances. For example, an anglophone web designer from Ontario may rely on an automated French translation, believing it to be sufficient, though it may read noticeably Metropolitan French to a Quebecois francophone. Similarly, a francophone designer might select a British English translation, which auto-translates terms that an anglophone Quebecer would typically use in French. These subtle discrepancies can accumulate, creating feelings of disconnect, frustration, or neglect among users, as it becomes evident that the interface was not designed with their specific linguistic and cultural context in mind.

1.2 Research Questions

This gap in the literature raises important questions:

RQ1: What is the role that language and culture play in user performance and perception?

RQ2: Is localization beyond translation necessary to improve the adoption of mobile banking technology?

While there is extensive research exploring the relationship between usability, culture, and language among culturally different and distant groups, there is limited research on how cultural factors influence usability among groups with closer cultural ties, such as Quebec's francophones and anglophones. Given the cultural diversity in Canada, particularly in regions such as Quebec, where francophones and anglophones coexist, how can we measure the cultural distance between these two groups? How do we account for cultural fit when conducting usability testing for financial service technologies? This challenge is not unique to Quebec's bilingual population. As global financial markets expand, interfaces must become increasingly adaptive to accommodate a multicultural audience. Globalization has made it imperative for usability designers to consider cultural inclusivity as part of their strategy, especially as the line between cultural groups blurs in multilingual and diverse communities. Companies that integrate cultural adaptation into their interface design gain a competitive advantage by enhancing user engagement and satisfaction. However, the degree to which cultural adaptation is necessary remains uncertain, as multiculturalism and technology continue to shape user expectations.

The current body of literature in usability and culture has focused largely on comparing the experiences of users from vastly different cultural backgrounds. Studies often draw on Hofstede's (1980) Cultural Dimensions framework, analyzing attributes such as uncertainty avoidance or power distance between users from contrasting nations, such as comparing individuals from China and Spain (Alcántara-Pilar et al., 2018). However, this framework is often used to prescribe characteristics to an entire nation, assuming the majority of users from that nation will possess similar traits, failing to capture the nuances of autonomous regions and multiculturalism within a nation, particularly in nation's of multiple official languages or cultural heritages. Hofstede's framework, though widely used, has faced criticism for assuming cultural homogeneity within nations and failing to account for diversity within nations (McSweeney, 2009). This limitation is particularly relevant to our study, which focuses on two groups within Canada but maintain distinct linguistic and cultural identities. Despite Quebec's unique cultural landscape, the extent to which cultural values differ between Quebec's anglophones and francophones remains underexplored, especially in the context of usability testing.

Furthermore, most studies in this field focus on national cultures rather than addressing how individual values or personal identification with a brand's culture might influence user experience. Additionally, research on bilingual or multicultural usability testing remains scarce, leaving a gap in understanding how these factors influence technology adoption and user satisfaction in everyday interactions with digital financial services. One limitation of traditional cross-cultural usability studies is the assumption that users will behave according to broad cultural stereotypes. For instance, we may assume that a Chinese user and a Spanish user will engage with technology differently due to their countries' contrasting positions on cultural dimensions. However, personal values and cultural fit, the alignment between a user's identity and the brand or product culture, may play a more influential role in usability outcomes. A Chinese user's personal values could, for example, align more closely with a French brand's cultural identity, leading to a more positive user experience than expected.

1.3 Research Objectives

This study aims to bridge three areas of interest: culture, usability testing, and banking technology adoption. Specifically, we investigate how culture influences individual user performance and perceptions of usability when interacting with financial service technologies. Unlike prior studies developed from Hofstede's model, this study is adopting a theoretical lens to measuring culture, focusing on individual cultural fit rather than relying on the national cultural dimensions. This approach builds upon the Two-Sided Cultural Fit theory by Lu et al. (2023), which suggests that person-organization cultural fit compromises both personal values and perceptions of prevailing values. Drawing from this theory of cultural fit, this study defines cultural fit between the user and the brand as congruence with the brand's values (perceptions of prevailing values) and personal identification with a brand's culture (personal values).

Quebec presents a unique setting for studying the intersection of culture and usability. While language is often assumed to be a primary factor in usability outcomes, our preliminary findings suggest that language alone does not account for the differences in user experience between francophones and anglophones. Instead, cultural affinity with the brand's identity and technology appears to have a stronger influence on task performance, user satisfaction, and adoption intentions. Users who feel culturally aligned with the brand are more likely to have positive perceptions of the interface, regardless of the language in which it is presented.

1.4 Implications

This insight raises important implications for usability testing: cultural bias may influence usability outcomes if designers and researchers do not account for cultural fit. Financial service providers need to move beyond language localization and consider how personal identification with their brand culture affects user behavior. This has practical significance, as companies striving to enhance usability must ensure their testing samples accurately represent the intended user population, especially in diverse and bilingual markets.

This study was conducted in collaboration with a Quebec financial institution that serves a large, diverse clientele across Canada. The organization's brand presence in Quebec is much more significant than in other provinces due to the organization's background in Quebec's cultural history. For certain Quebecois clients, the relationship with this organization may extend beyond

the norm of a customer-bank relationship due to the rich history and cultural affiliation with the independence of the region. However, it is important to note that the general public likely do not share this sentiment. Nevertheless, the organization's social presence, as a major bank, public brand, and financier is notable in Quebec society, particularly in the city of Montreal. Recruited participants consisted of clients and non-clients varying in age and backgrounds, controlling for affinity towards the brand. Participants were invited to Tech3Lab in downtown Montreal to test the bank's mobile website and personal banking application. The study aimed to address the differences in the user experience between French and English users with respect to their performance and perceptions.

1.5 Thesis Structure

This thesis by article consists of two articles: the first empirical and the second managerial, to explore this phenomenon. The empirical article will present a review of the literature on culture, usability testing, and financial technology adoption, focusing on the theoretical models relevant to each area, and synthesizing prior research to formulate hypotheses regarding cultural fit and its impact on user experience. Following, the research framework and the methodology detailing the experimental design used to test these hypotheses. The study examines and compares the user experience between French and English users on a bank's mobile website and personal banking application, focusing on user task performance and perceptions of usability. Key differences between these groups are analyzed to provide recommendations for usability research, financial service providers, and future studies. The managerial article builds upon the key findings from the empirical study article and its practical implications to designers, managers, and other financial organizations. By demonstrating how cultural fit influences usability, this study aims to contribute to the development of more inclusive and adaptive financial technologies, ensuring better alignment with user expectations in increasingly globalized markets.

1.6 Contribution

Stage in the process	Contribution
Research Question	Given experiment design and fundamental goal of project, contextualized this information in scientific literature and came up with relevant research questions [50%]
Literature Review	Conducted the relevant search and thorough scan of scientific articles to understand the current body of academic knowledge on the role of language and culture on usability. [100%]
Experimental Design	The study is a continuation of previous studies but focused on a different user sample. Introduced new measurement scales to measure new variables. Given broad direction, designed the tasks and wrote all participant instructions. [50%]
Data Collection	Shared responsibility of collecting observational data with project partner. Present for half of the test sessions. [50%]
Statistical Analysis	Analyzed data with SAS code and interpreted results [90%] with validation by lab statistician.
Redaction	Wrote initial draft of entire thesis [100%], with supervisors providing edits, comments and actionable feedback.

Article 1: The Role of Culture on Usability Testing of Financial Service Technology

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Abstract

This study explores the role of culture in shaping user experience with mobile banking interfaces. By building on cross-cultural usability research and introducing a new approach to capturing cultural nuance, it advances the understanding of how cultural factors influence UX. The study introduces the construct of cultural fit, which measures the extent to which a user's personal identity and values align with those of the organization or brand behind the system. This individualized approach moves beyond traditional national-level definitions of culture to offer a more user-centered perspective. The study examines how cultural fit impacts both objective user performance and subjective perceptions of usability. Results reveal a surprising negative relationship between cultural fit and task performance, indicating that users with higher alignment to the brand's cultural identity performed less effectively and less efficiently. Meanwhile, cultural fit positively influenced perceptions of performance but had no significant effect on perceived effort or ease of use. These findings offer practical and managerial implications, particularly around user recruitment in usability testing. They highlight the need to balance cultural alignment with actual performance and to prioritize universal design principles that serve a diverse user base effectively.

2.1 Introduction

The rapid evolution of financial service technologies presents new challenges for usability research, particularly in culturally diverse markets. As mobile banking applications and digital personal finance management platforms become essential touchpoints for financial service providers, understanding how different cultural groups interact with these technologies is critical.

Research shows that culture and language profoundly shape cognition, decision-making, and user behavior. First language and cultural context play a crucial role in shaping an individual's cognitive processes and perceptions of interfaces, directly affecting usability. Studies have found that usability issues often stem from a mismatch between cultural expectations and interface design, with users performing better on culturally adapted interfaces.

This study takes place in the highly multicultural user base of Canada, focusing on the distinct cultural groups of francophones and anglophones. While Canadian organizations often provide digital services in both French and English, these translations are not always localized to reflect regional linguistic nuances, potentially creating feelings of disconnect or frustration among users.

While extensive research exists on the relationship between usability, culture, and language among culturally distant groups, there is limited research on how cultural factors influence usability among groups with closer cultural ties, such as Quebec's francophones and anglophones. This study aims to investigate:

1. The differences in perceptions of usability between these two language groups
2. The necessity of localization beyond translation to improve user satisfaction and adoption
3. The impact of cultural factors on the usage of banking interfaces

Unlike prior studies that rely solely on national cultural dimensions, this research adopts an innovative approach to measuring culture, focusing on cultural fit. Drawing from the Two-Sided

Cultural Fit theory, this study defines cultural fit between the user and the brand as congruence with the brand's values and personal identification with a brand's culture.

This study bridges three areas of interest: culture, usability testing, and banking technology adoption. By demonstrating how cultural fit influences usability, this research aims to contribute to the development of more inclusive and adaptive financial technologies, ensuring better alignment with user expectations in increasingly globalized markets.

The findings have practical significance for financial service providers, suggesting the need to move beyond language localization and consider how personal identification with their brand culture affects user behavior. This insight is crucial for enhancing usability testing methods and ensuring that testing samples accurately represent the intended user population, especially in diverse and bilingual markets.

2.2 Literature Review

This section aims to dissect the relevant literature pertaining to this study in two main areas of focus:

1. An exploration into cross-cultural studies with the goal to introduce the two main constructs of this thesis - value congruence and cultural identification.
 - a. Introduction to Cross-Cultural Studies
 - i. Hofstede's Cultural Dimensions
 - ii. Hofstede's Model in Usability Studies
 - iii. Defining Usability Determinants
 - iv. Limitations of Hofstede's Model
 - b. Theories of Cultural Fit
 - i. Two-Sided Approach
 - ii. Defining Cultural Fit
2. A review into technology acceptance models where we derive our main dependent variables - perceived performance and perceived effort, and how these variables specifically apply to mobile banking.
 - a. Introduction to Technology Acceptance Models
 - i. TAM
 - ii. UTAUT
 - iii. Mobile Banking Technology Adoption

2.2.1 Introduction to Cross-Cultural Studies

Culture played a major role in shaping our cognitive processes during early childhood development. This influence persists in our everyday behavior and choices made as adults and perceptions of the external world we interact with, particularly technology (D'Andrade, 1992; Clemmensen, 2012). Understanding culture's influence on human behavior is essential in the design process for improving technology in increasingly globalized contexts (Shi, 2007; Daniel et al., 2011). Culture affects how users respond to, perceive, and adopt digital tools (Nantel & Glaser, 2008). In the world of user experience, we often compare users of different backgrounds to better address diversity in changing needs.

Prior to comparing experiences between user groups, we must first establish how to effectively define their differences. It can be difficult to measure a concept as nuanced as culture. In the current body of literature, the most common framework used to measure and compare cultures is Hofstede's Cultural Dimensions.

Hofstede's Cultural Dimensions

The majority of studies addressing cultural differences in technology adoption and usability identify culture using Hofstede's Cultural Dimensions Model. Originating in the late 1960s and early 1970s, Hofstede used data from over 116,000 IBM employees representing over 60 countries to come up with the first four cultural dimensions (Roy, 2020). The fifth dimension was introduced in 1988, and the final sixth dimension was introduced as recently as 2010. Today, this widely accepted model classifies culture into six dimensions:

1. Power Distance: The degree to which less powerful members of society accept inequality in power.
2. Individualism vs Collectivism: Whether people prioritize individual achievement or group cohesion.
3. Uncertainty Avoidance: A society's tolerance for ambiguity and uncertainty.

4. Masculinity vs Femininity: The preference for competitiveness versus care and quality of life.
5. Long-Term vs Short-Term Orientation: A focus on future rewards versus present gratification.
6. Indulgence vs Restraint: The degree to which people enjoy life and satisfy desires.

Countries are often placed by high to low ratings on each of these six dimensions based on general universal perceptions of that nation's culture. For instance, Japan is often referred to as an example of a high power distance culture, due to the strict formality in which greetings and communications are expressed and respect is visually displayed, contrastingly to the United States, where employees and managers are referred to on a first name basis and casual attire in the workplace is not out of the ordinary (Hofstede, 2001; Roy, 2020).

Hofstede's model is the most widely used framework in cross-cultural studies. This model has its limitations and is built upon some assumptions that may render it relatively dated in the realm of information systems and designing technology for increasingly globalized users. However, the vast majority of the literature on culture's impact on usability have all utilized this framework to differentiate user groups from different cultural backgrounds. Prior to addressing this model's shortcomings, we must see it mobilized in usability testing.

Hofstede's Model in Usability Studies

Culture plays a crucial role in the creation and use of digital products and technologies. Websites from inception are created under the influence of the designer's culture. As Hillier (2003) emphasized, web designers draw on their cultural norms while creating the original website, which makes a simple language translation insufficient. The usability of a website changes with its language as the users of the translated website will have different culturally based expectations (Hillier, 2003).

Previous studies have addressed the impact of culture on usability. Most usability studies using Hofstede's model focus on cross-national comparisons to understand how cultural attributes affect user interactions.

To evaluate the moderating effect of language on website information-processing, Alcántara-Pilar et al. (2018) conducted a cross-national study, comparing British and Spanish users. Alcántara-Pilar et al. (2018) explored the moderating effect of language on the relationship between online perceived risk and perceived usability. British and Spanish users were selected due to the divide in uncertainty avoidance in English and Spanish languages, as well as the two languages being the most commonly used languages for websites worldwide. Each group tested on their own and each other's culturally specific websites: Spanish users tested on their native website then the British website, and British users tested on their native website then the Spanish website. Significant differences were found between perceived risk and perceived usability in both samples, however, the moderating effect of language as a conveyor of cultural values could not be confirmed. This may suggest that language alone is insufficient in representing differences in culture.

Alexander et al. (2021) explored the relationship between culturally specific design elements and user performance and satisfaction. The study evaluated four usability attributes: effectiveness, efficiency, errors, to encompass performance, and satisfaction between Australian and Chinese users on Australian or Chinese culturally specific website designs to assess the impact of user culture on web usability. These two cultures were chosen due to their distinct cultural distance in Hofstede's Cultural Dimensions such as uncertainty avoidance and time orientation. Alexander et al. (2021) emphasized the importance of accommodating different information presentation and interaction styles in improving performance and satisfaction in culturally diverse users.

These studies similarly use Hofstede's to differentiate culture between user groups from different national origins. Both of these studies establish significant relationships between culture and usability providing managerial implications to offer culturally adapted versions of websites for each translation to better accommodate different language users.

Defining Usability Determinants

While these studies are similar in their attempts to measure the role of culture on usability, and share the use of Hofstede's model in determining culture, these studies vary in the usability determinant they aim to measure. Usability is a broad concept encompassing many attributes. Alcántara-Pilar et al. (2018) focused on perceived risk and perceived usability. Meanwhile, Alexander et al. (2021) used performance, consisting of effectiveness, efficiency, errors, and satisfaction to represent usability. This study aims to address how culture specifically influences usability testing. Sonderegger and Sauer (2009) narrowed down main determinants of usability testing to performance and perceived usability when evaluating the effects of design aesthetics.

Usability is defined as “the effectiveness, efficiency and satisfaction with which specified users can achieve specific goals in a particular environment” (ISO, 2018). Effectiveness refers to the extent a task goal is achieved successfully. Efficiency refers to the amount of resources a user expends to reach a task goal, which may be measured by the deviation from the optimal usage behavior. Both effectiveness and efficiency represent different kinds of performance measures. Considering this definition, this study will use user performance, and perceived usability as determinants of usability testing.

Limitations of Hofstede's Cultural Dimensions

While these studies demonstrate the importance of culture in usability, they rely on broad national cultural categories that may not capture the nuanced cultural diversity within multicultural regions (McSweeney, 2009; Sun et al., 2014). In contrast, this study focuses on personal cultural fit within a bilingual, multicultural setting by investigating the experience of francophone and anglophone users interacting with a Quebec financial institution.

While this model has been influential in cross-cultural research, it is built on the assumption of homogeneity within a nation and fails to address diversity within nations (McSweeney, 2009). Many usability studies draw from Hofstede's dimensions to compare user behavior between cultures with notably different national origins. However, few studies explore subcultural differences within a multicultural nation, which is critical in highly diverse environments such as Montreal.

One of the main criticisms of Hofstede's framework is the development at the national level rather than at the individual level (Sun, D'Alessandro et al., 2014). This collective approach has led some researchers to adapt Hofstede's framework with scales that apply to individuals. This study adapts the approach to culture by introducing a new variable to be applied at the individual level: cultural fit.

2.2.2 Theories of Cultural Fit

In the current body of literature, most theories addressing cultural fit are person-organization in the context of an employment relationship, rather than a client or customer-organization relationship such as the one prevalent in banking services. However, the underlying psychological mechanisms that validate these theories are similarly applicable in both contexts. At the organizational level, individuals of high cultural fit are found to likely be more committed, productive, and less associated with turnover (Kristof-Brown et al., 2005; Chatman & O'Reilly, 2016). Transferring similar mechanisms to the customer context, these positive outcomes of high cultural fit may translate as positive associations with the brand and the performance, perception, or adoption of its technology (Lu et al., 2023). Hillier (2003) examined the relationship between language, cultural context, and usability and proposed a model to evaluate the role of cultural context on multilingual websites. This model emphasizes the cultural fit between the user and the designer. This study's model emphasizes the cultural fit between the user and the brand, encompassing the larger organization as a whole, beyond a single web designer. The cultural fit variable consists of two factors: the user's personal alignment with the brand's values and the user's cultural identity or background, given that the brand is historically Quebecois.

Two-Sided Cultural Fit

The model providing the most relevant framework of cultural fit to this study is the Two-Sided Cultural Fit theory by Lu et al. in 2023. The study addressed the construct of cultural fit as a two-sided approach consisting of personal values and perceptions of prevailing values:

1. Value Congruence: The match between a user's personal values and the organization's core values.

2. Perceptual Congruence: The degree to which a user understands and aligns with the organization's norms and identity.

Using this two-sided approach to defining cultural fit, this study identifies two variables of cultural fit: value congruence, representative of personal values, and cultural identification, representative of perceptions of prevailing values.

The study found that these two types of congruence lead to different behavioral outcomes:

1. Perceptual congruence is positively related to linguistic conformity in routine interactions, meaning that employees who accurately perceive the organization's cultural norms are more likely to adapt their communication style to fit in with the prevailing organizational culture.
2. Value congruence is negatively related to voluntary exit from the organization. Employees whose personal values align with the organization's values are less likely to leave the company voluntarily.

The study proposes two distinct mechanisms through which cultural fit manifests:

1. Group attachment: This relates to value congruence, where employees internalize and embrace the prevailing organizational values¹.
2. Interpersonal coordination: This relates to perceptual congruence, where employees correctly decipher and adapt to the group's dominant values and norms

Defining Cultural Fit in Banking

While this theory focuses on how cultural fit manifests in the person-organization employment relationship, these implications are relevant and similarly applicable to the customer-bank relationship. Value congruence, which relates to the alignment between an individual's personal values and those of the organization, could be particularly relevant in banking in customer retention such that users whose personal values align with their bank's values are likely to be more loyal and less likely to switch banks. Another way value congruence in banking may

manifest is in product adoption as customers may be more inclined to adopt new products or services from a bank that shares their values. Meanwhile, perceptual congruence, which refers to the alignment between an individual's perception of organizational norms and the actual norms, can also apply to the bank-customer relationship. Customers who accurately perceive a bank's cultural norms and values are more likely to engage with the bank's communications effectively. This could lead to higher promotion and social influence. Social identification refers to the perception of connectivity or oneness with a group of people (Ashforth & Mael, 1989; Bhattacharya et al., 1995). Researchers believe that people identify with groups partly to boost their self-esteem by associating with groups that have positive traits (Abrams & Hogg, 1990; Hogg & Turner, 1985; Tajfel 1978). In a manner most relevant to this study, users who correctly interpret a bank's cultural cues may have an easier time navigating the bank's systems and processes, leading to a smoother overall user experience.

In this study, value congruence reflects how well users' personal values align with the brand's Quebecois roots. Meanwhile, cultural identity captures their perceptions of the brand's values given the assumption of the reputation of the organization as a historically Quebecois brand. This two-sided approach enables the measurement of cultural fit beyond surface-level comparisons of language or nationality, focusing instead on individual alignment with the brand.

2.2.3 Introduction to Technology Acceptance Models

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a framework used to explain and predict how users come to accept and use new technologies (Davis, 1989). TAM states that a person's decision to use a technology is influenced by two main factors:

1. Perceived Usefulness (PU): This is the degree to which a person believes that using the technology will enhance their performance or productivity. If a user positively perceives a new technology as helpful, they are more likely to accept it.
2. Perceived Ease of Use (PEOU): This refers to the degree to which a person believes that using the technology will ease their effort. If a technology is easy to use, users are more

likely to adopt it. Complex or challenging technologies tend to deter acceptance and regular use.

These two factors together influence user attitude toward using the technology, which affects their behavioral intention to use it.

Unified Theory of Technology (UTAUT)

TAM has evolved into the Unified Theory of Acceptance and Use of Technology (UTAUT). Developed by Venkatesh et al. in 2003, UTAUT combines elements from eight previous acceptance models, including the Technology Acceptance Model (TAM), Theory of Reasoned Action, and Social Cognitive Theory, making it a comprehensive tool for studying technology acceptance. UTAUT proposes four key factors that influence technology acceptance and use:

1. **Performance Expectancy:** The degree to which a user believes that using the technology will help them achieve better performance. This is similar to Perceived Usefulness in TAM. If users think a technology is valuable in completing tasks, they're more likely to adopt it. In this study, this construct is referred to as Perceived Performance, to reflect users' evaluations after completing tasks rather than anticipations.
2. **Effort Expectancy:** The level of ease associated with using the technology. This factor resembles Perceived Ease of Use in TAM. If a technology is easy to learn and operate, users are more inclined to use it. UTAUT measures this as an expected ease of use. In this study, however, the construct is referred to as Perceived Effort, to reflect post-task perceptions rather than expectations.
3. **Social Influence:** The extent to which users perceive that their peers or others in society believe they should use the technology. Social influence reflects the role of peer pressure or organizational expectations in technology adoption.
4. **Facilitating Conditions:** The user's perception of the resources and support available to use the technology. If users feel they have the necessary tools, support, or infrastructure, they are more likely to adopt the technology.

These models have been widely applied to understand mobile banking technology adoption. In this study, perceived performance and perceived effort, adapted from performance expectancy and effort expectancy, respectively, are used to measure attitudes towards technology and technology acceptance. Perceived performance corresponds to perceived usefulness, and perceived effort corresponds to perceived ease of use, as originally conceptualized in TAM. These two variables are the most representative of both models, TAM and UTAUT. This study investigates whether users with high cultural fit perceive the system as more useful and easier to use. By adapting UTAUT constructs to reflect post-use user perceptions, this study operationalizes UTAUT to address user experiential evaluations of technology.

Mobile Banking Technology Adoption

This study focuses on mobile banking. TAM and UTAUT have been used in usability studies exploring the adoption of mobile banking technologies.

Raza et al. (2017) explored the relationships between numerous factors influencing mobile banking adoption in Pakistan, where mobile banking is still in early adoption. Focusing on perceived ease of use and perceived usefulness, this study extended on the TAM framework. Both perceived ease of use and perceived usefulness were found to play critical roles in shaping attitudes and intentions towards mobile banking usage. The findings suggest that banks should focus on reducing resistance, managing perceived risks, increasing compatibility, and raising awareness to promote mobile banking adoption in Pakistan.

Singh and Srivastava (2020) developed a theoretical framework based on TAM, introducing the model's utility in identifying the willingness of an individual to use technology specific to the information system consisting of five constructs: perceived usefulness, perceived ease of use, attitude, intention to use and actual use. Singh and Srivastava (2020) identify mobile banking as the new information system and extend TAM to study the application of the constructs: perceived ease of use, self-efficacy, social influence, perceived security, and customer support on the behavioral intention to use a mobile banking information system. The study found perceived ease of use is important for encouraging banking customers to try out mobile banking and mobile self-efficacy plays a crucial role as it relates to their confidence in having the necessary technical

skills to do so. The study highlights the importance of addressing customer experiences in digital banking channels to prevent losing customers to competitors like mobile wallet providers. Singh and Srivastava (202) conclude the study by urging banks to focus on making mobile banking apps easy to use, secure, and well-supported to encourage adoption and leverage social influence by encouraging satisfied customers to share their experiences. This research contributes to understanding mobile banking adoption in developing countries, particularly India, and provides practical implications for the financial sector to accelerate the use of mobile banking services.

Defining Perceptions towards Mobile Banking

These studies identify numerous critical factors in mobile banking technology adoption. The commonly occurring constructs of perceived usefulness and ease of use. Developing upon the UTAUT framework, this study uses two main constructs: perceived performance, equivalent to perceived usefulness in TAM, and perceived effort, equivalent to perceived ease of use in TAM. While other UTAUT determinants are explored, these two variables play the most critical role in shaping the overarching theme of attitude in the user.

2.3 Research Framework and Hypotheses

Figure 1 illustrates the proposed research model leading this study. The model aims to address the effect that the user’s cultural fit with the brand behind the technology has on the objective task performance while navigating the interface and the subjective perceived usability of the interface they just interacted with. These two dependent variables represent both an objective and subjective indicator of the usability of the system. Performance indicators are recorded by observation which isolates for an objective outlook on system usage and user behavior. Meanwhile perceived usability is a subjective self-reported measure by survey. Collecting these user impressions of the current system is critical in predicting future usage behavior and evaluating behavioral intent to adopt the technology. Financial literacy and client status are included as control variables in the relational diagram as these variables may influence performance or perceptions of the system.

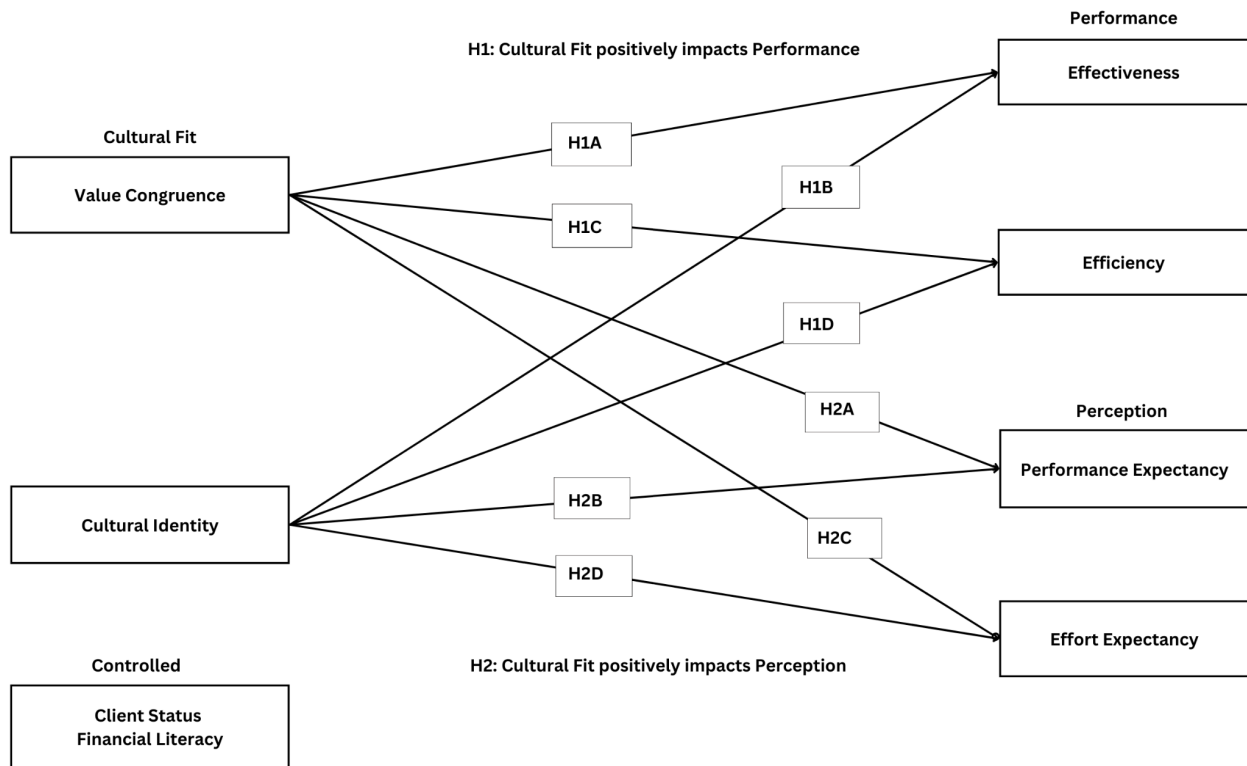


Figure 1: Proposed Research Model

Including both objective and subjective evaluations of usability allows for a balanced view on the role cultural fit plays on global usability. This model provides the opportunity to identify misalignment and explore reasons for variance in user experience. For example, we may find francophones may rate the system more positively but actually perform worse than their anglophone counterparts indicating levels of difficulty. Then, in this case, this proposed model sets the framework to explore causes in future studies.

2.3.1 Cultural Fit as the Independent Variable

In this study, we aim to measure the impact of culture on user experience at the individual level with the variable, cultural fit. The variable cultural fit in this model represents the variance in cultural identity and values among francophone and anglophone residents of Montreal. Cultural fit is composed of two components: value congruence to represent personal values, and cultural identity to represent perceptions of prevailing values according to Lu et al.'s Two-Sided Cultural Fit Theory (2023). Value congruence refers to the extent to which the user believes their own personal values align with the values of the organization. Meanwhile, cultural identity refers to the extent to which the user self-identifies as a Quebecois francophone. This is due to the brand's significance in Quebecois francophone culture. The test interface is created by a major Quebec financial institution representing the brand to which each individual participant will relate their association with and perceptions of. The brand's history is heavily ingrained in Quebecois, particularly francophone independence, history. This brand's cultural affiliation is more significant than competitor organizations operating in the region. Factoring this into the measurement of culture at the individual level, the cultural identity measure should be representative of the user's self-perception relative to the brand's prevailing values as a Quebecois organization.

With this definition of cultural fit as the independent variable, the following hypotheses are operationalized upon the framework established in the Two-Sided Cultural Fit Theory (Lu et al., 2023), and hypothesized that a stronger cultural fit will positively influence the user experience.

2.3.2 Performance as a Dependent Variable

This study aims to address how cultural fit specifically influences usability testing. The International Standardization Organization (ISO) defines usability as “the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in a particular environment” (ISO, 2018). Effectiveness refers to the extent to which a task goal is successfully achieved (e.g., proportion of users that are able to complete a given task). Efficiency refers to the amount of resources a user expends to reach a task goal. It can be measured by the deviation from the optimal user behavior (e.g., task completion time, number of user actions to complete a task). Both effectiveness and efficiency represent different kinds of performance measures. Considering this definition, this study identifies user performance as a key determinant of usability testing. This study defines performance, consisting of efficiency and effectiveness, as the dependent variables responding to varying levels of cultural fit, consisting of brand value congruence and cultural identification, to develop the following hypotheses:

H1A: Value congruence positively impacts effectiveness.

H1B: Cultural identity positively impacts effectiveness.

H1C: Value congruence positively impacts efficiency.

H1D: Cultural identity positively impacts efficiency

2.3.3 Perception as a Dependent Variable

The next category of dependent variables encompasses the perceptions of usability. In this study, perceived performance and perceived effort represent how users evaluate the mobile banking system after using it. Perceived performance is adapted from the UTAUT construct performance expectancy, originally defined as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003). Although performance expectancy is typically framed as an expectation, this study assesses post-use evaluations, therefore, the construct is referred to as perceived performance. It conceptually derives from perceived usefulness in TAM (Davis, 1989). Prior studies (e.g., Eriksson et al., 2005; Wang et al., 2003) confirm that performance expectancy is a substantial

determinant of banking technology adoption. To assess the effects of cultural fit on perceived performance, the following hypotheses were developed:

H2A: Value congruence positively impacts perceived performance.

H2B: Cultural identity positively impacts perceived performance.

Perceived effort is adapted from the UTAUT construct effort expectancy, originally defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003). While effort expectancy is typically used to refer to anticipated ease of use, this study captures user evaluations after interacting with the system. Therefore, the construct is more appropriately referred to as perceived effort. It is conceptually rooted in perceived ease of use from the Technology Acceptance Model (Davis, 1989). Prior research supports this association: Raza et al. (2017) found that users’ perceptions of technology are influenced by the belief that minimal time and effort will be required. Similarly, Singh and Srivastava (2020) found that customers were more inclined to try new digital banking channels when the interfaces were simple and user-friendly. To assess the effects of cultural fit on perceived effort, the following hypotheses were developed:

H2C: Value congruence positively impacts perceived effort.

H2D: Cultural identity positively impacts perceived effort.

2.4 Method

2.4.1 Experimental design

This experiment was completed in a laboratory setting at the Tech3Lab in downtown Montreal. A laboratory experiment was selected for this study due to its ability to control variables and directly observe the effects of specific manipulations on participants' behaviors or responses. This study received approval from the Ethical Review Board at HEC Montreal, under project number 2024-5932.

The study employed a between-subjects design, comprising two conditions: test session in French or test session in English. This simplistic experiment design allows for the sole experimental factor of the role of language and culture to become immediately apparent. Although French-English bilingualism is on the rise in Quebec, there tends to be one language a bilingual user more often uses and is exposed to in their personal daily life. This language is how we categorized if the user would conduct testing in French or English rather than simply proceeding with the user's self-identified first language.

This experiment was conducted on the mobile website and application of a major financial institution operating in Quebec. The organization as a brand has a significant presence in Quebec society. It has rich historical roots in Quebecois francophone independence culture and heritage. However, this cultural alignment may not be at the forefront of the brand association for most users representative of the general public, particularly in younger users or non-native Quebecer users, who may be less familiar with the brand's history. The recruited users range in backgrounds and client status.

2.4.2 Participants

Participant recruitment was critical to this study, as the primary manipulation lies in differences in user background rather than in test conditions. The aim was to explore how Francophone and Anglophone users differ in their experience of usability testing within a bilingual region. A

purposive sampling approach was used to reflect the linguistic distribution of Quebec residents, where Anglophones represent approximately 19.2% of the population. A 1:4 ratio between Anglophones and Francophones was therefore adopted in the sampling design.

A power analysis was conducted using G*Power (Version 3.1.9.5), based on the assumption that linguistic background, used here as a proxy for broader cultural dimensions, would have a medium-to-large effect on user experience (Cohen's $d = 0.65$). The analysis was specified for a two-tailed Wilcoxon-Mann-Whitney test (appropriate given the smaller size of the Anglophone group), assuming a normal parent distribution, an alpha error probability of 0.05, and power ($1 - \beta$) set to 0.80. With an allocation ratio (N_2/N_1) of 4, the required sample size was estimated at 25 Anglophone participants and 99 Francophone participants. Increases in effect size would improve statistical power; for example, with a large effect size ($d = 0.85$), the power would increase to 0.95 under the same parameters.

Participant recruitment was completed by a third-party firm in Montreal, Quebec. The final target sample size was 100 participants: 75 Francophone and 25 Anglophone, balancing practical constraints with population representativeness and power analysis requirements. As Montreal is a primarily French-speaking city, this majority Francophone sampling aligns with the region's demographics and the financial institution's target user base.

During recruitment, participants completed a screening questionnaire identifying demographic attributes such as language preference, age, educational background, and client affiliation with the financial institution. First language and language most commonly used in daily life were assessed to categorize participants. All participants were long-term residents of Montreal (minimum five years) and were either native French or native English speakers. Each cohort was balanced across age, gender, and education levels, and included clients, non-clients, and former clients of the financial institution.

Prior to testing, participants completed a pre-test survey to assess their self-reported proficiency in both French and English, as well as financial literacy. These variables were collected to control for potential confounding effects. Participants completed a 1-hour usability test session

and were compensated for their time. This recruitment strategy allowed for the collection of over 100 completed evaluations over a two-month period.

2.4.3 Set-Up and Procedure

The experiment set-up consists of a participant room, as displayed in Figure 2, and on the other side of one-way glass, a moderator room, as displayed in Figure 3. In the participant test room, the test iPhone is propped up just below participant eye level with the Tobii Nano eye tracker technology, adapted for mobile, measuring participant gaze just above the iPhone setup. The iPhone setup is on a desk and the chair is locked in place. To the participant's right-hand side, there is a computer screen displaying the Qualtrics questionnaire and task instructions. The participant is asked to complete the tasks on the iPhone, referring to the instructions displayed on the computer during the task, and return the computer upon completing the task to complete the post-task questionnaire. There are mics and speakers to facilitate communication between the research assistant and the participant through the one-way glass. On the moderator side, there are multiple monitors displaying various live measures during the experiment, primarily, one screen mirroring the participant's iPhone screen, and another mirroring the participant's computer screen.

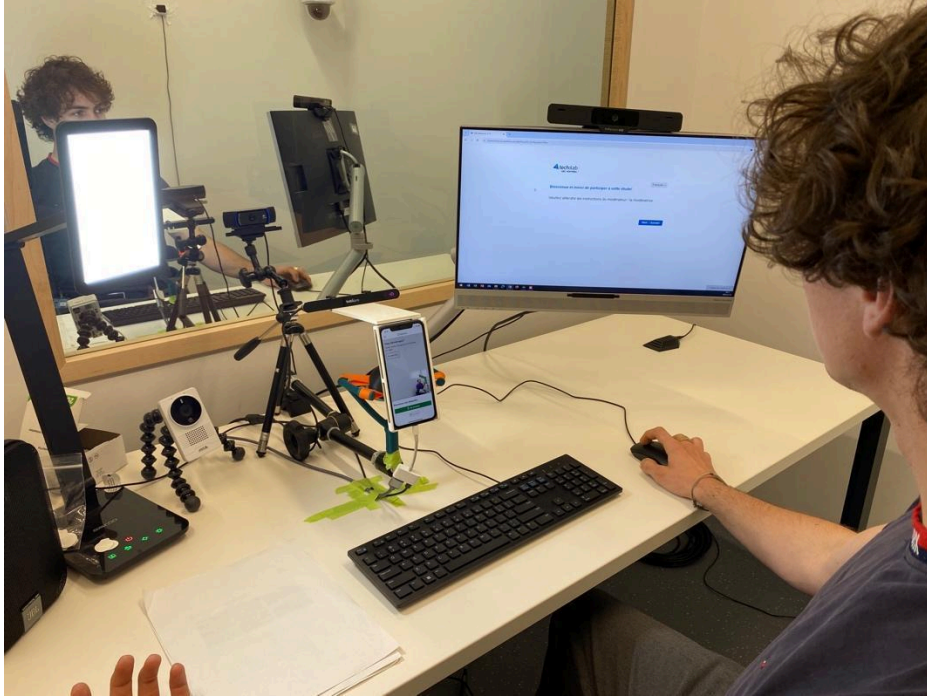


Figure 2: Lab setup from participant side

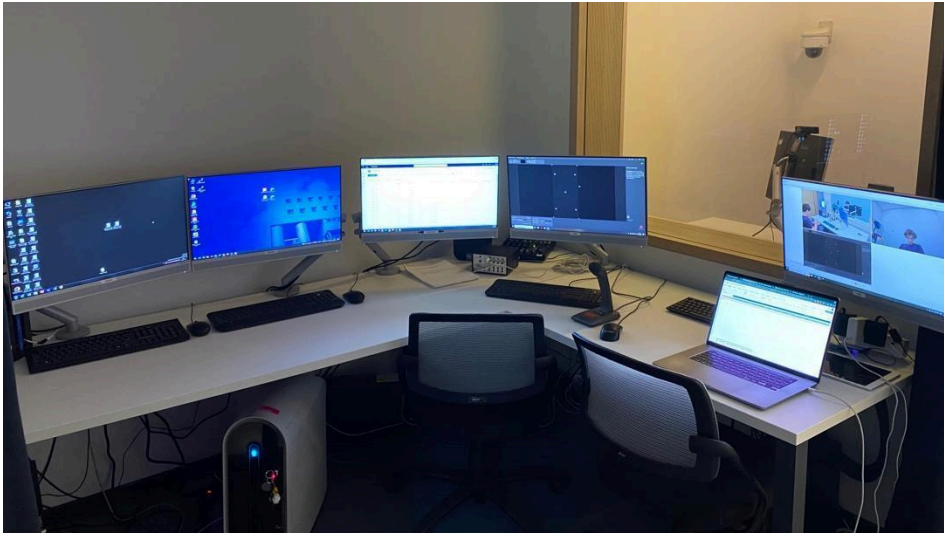


Figure 3: Lab setup from moderator side

Upon arrival, the participant is sat in the test room to complete a consent form and introduced to the study by the student moderator. The participant begins the evaluation by completing a pre-evaluation questionnaire on Qualtrics. This questionnaire covers basic demographics and identifies control variables such as client status and financial literacy. The cultural fit assessment occurs in the pre-evaluation section of the study with scales capturing the participant's prevailing perceptions of the brand and its culture, and identification of their own values and cultural identity relative to the brand, prior to beginning the experiment.

Once the experiment begins, each task instruction is displayed on the Qualtrics screen, with the first three requiring a typed response from the participant. During the task, the moderator is measuring performance indicators: task completion time, success rate, and path. After each task, the participant is asked to complete a post-task questionnaire indicating their subjective satisfaction and cognitive load.

After all tasks, participants complete the post-evaluation questionnaire composed of subjective scales like perceived performance and UTAUT, evaluating their perception of the interface they've just interacted with. Participants are thanked, escorted out, and compensated for their time.

2.4.4 Experiment Stimuli

The experiment stimulus is the financial institution's commercial website, adapted to mobile, and the organization's personal banking application. Table 1 displays all the tasks users were to complete during the evaluation session. The experiment was completed on iPhone with the interface adapted to mobile. The study comprises 6 tasks: 3 informational to complete on the financial institution's mobile website and 3 transactional to complete on the financial institution's mobile banking application. The organization has its own log-in system used for the latter half of the tasks. A test log-in was provided for all users regardless of client status. Client status is controlled for in the analysis to account for familiarity with the interface usage and its effect in effectiveness and efficiency in task completion. Each task has an associated timeframe restriction in which successful task completion must occur to record the event as a success.

Table 1: Task organization

Task Type	Task Number	Order Randomized	Interface	Instructions	Response Required
Informational	1	Yes	Mobile website	Find a specified financial calculator and complete a calculation	Yes, multiple choice selection
Informational	2.1	Yes	Mobile website	Find a credit card with lowest interest rate	Yes, typed answer
Informational	2.2	Yes	Mobile website	Find a credit card with lowest interest rate on competitor site	Yes, typed answer
Informational	3	Yes	Mobile website	Find the contact number to replace a lost credit card	Yes, typed answer
Transactional	4	No, sequence required	Mobile banking app	Log into the portal using provided credentials	No
Transactional	5	No, sequence required	Mobile banking app	Add a new Interac contact	No
Transactional	6	No, sequence required	Mobile banking app	Send an Interac e-transfer	No

Mobile Website

The first three tasks are information search tasks on the financial institution's website, adapted to mobile. The homepage of the mobile website displayed by Figure 3, acted as the landing page from which these informational tasks would commence. The mobile adaptation of the website had a sidebar menu with drop-down display and search bar, as displayed by Figure 4, which participants often used to navigate the website. Task 1 asks users to locate and use the mortgage

affordability calculator to solve an affordability scenario-based question. Task 2 comprises two parts: the first in which users are asked to compare credit cards on the financial institution's website and select the one with the lowest interest rate, and part two is the exact same instruction but on a competitor bank's website. Task 3 asks users to find contact information given the scenario of a lost credit card. The order of these tasks were randomized but required a response from the user prior to moving onto the next task. Users select or type their response directly on the Qualtrics screen under the instructions, shown in Figure 5.

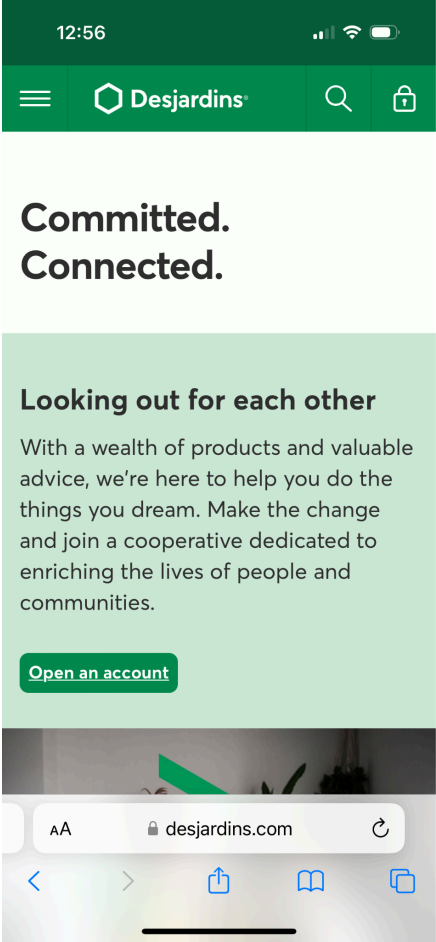


Figure 4: The homepage of the website adapted to mobile

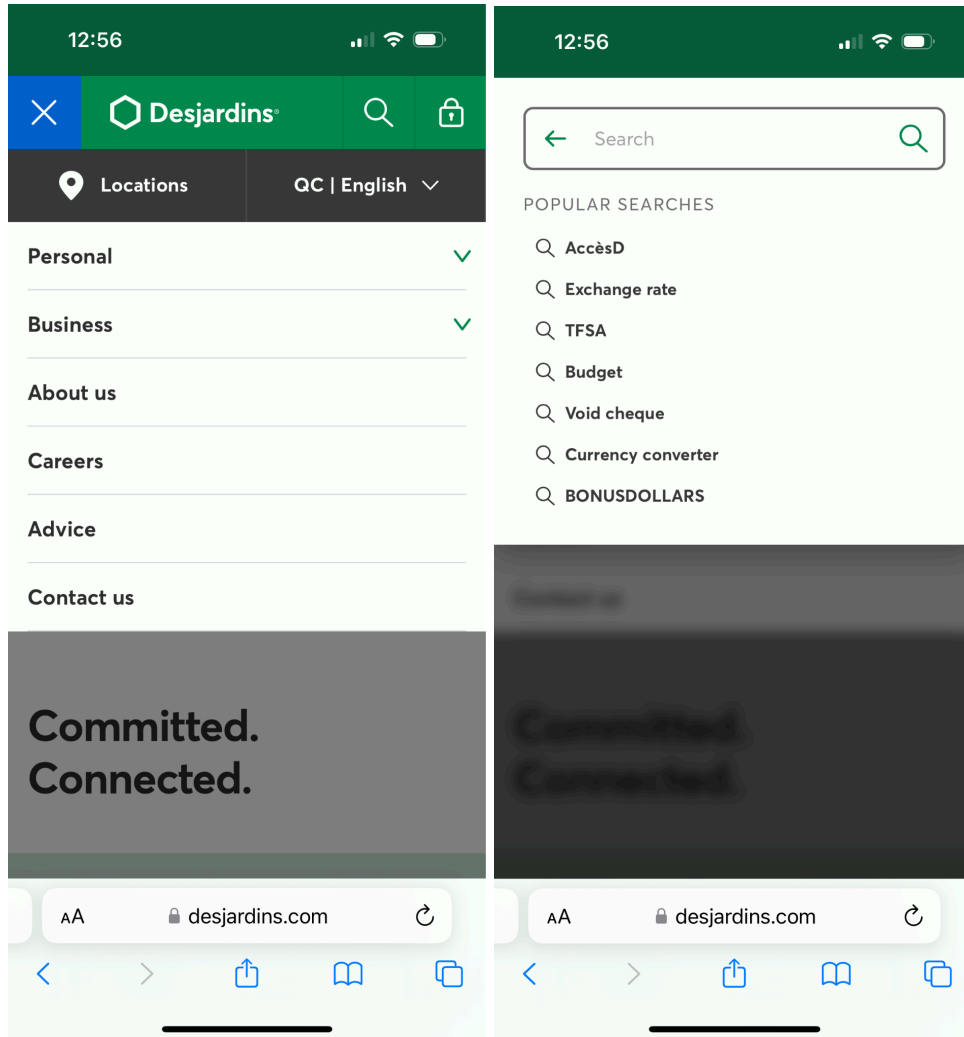


Figure 5: The sidebar drop-down menu and search bar

tech3lab
HEC MONTRÉAL

English ▾

T1

Context:
You are interested in purchasing a new property. You have budgeted \$80,000 for a down payment and \$2000 for monthly mortgage payments.

Instructions:
From the Desjardins homepage, please find the **mortgage payment calculator**. Using a closed fixed rate 7 year mortgage, determine if you are able to afford the property listed on the printed document.

When you are ready to begin, please say it **out loud**.

Can you afford the monthly payments for this property?

Yes, my budget is sufficient

No, I cannot afford it at this time

Previous / Précédent Next / Suivant

Figure 6: Qualtrics task instruction screen with required response

Mobile Banking App

The final three tasks are transactional following a sequential order on the bank's mobile application called AccèsD. Task 4 commenced on the app's login screen, as displayed by Figure 6, and invites users to log into the personal banking portal using the provided test login credentials. After successful login, the following tasks commenced from the app's home screen

as displayed by Figure 7. Task 5 asks users to add a new contact on Interac while Task 6 asks users to complete an Interac transfer to this new contact.

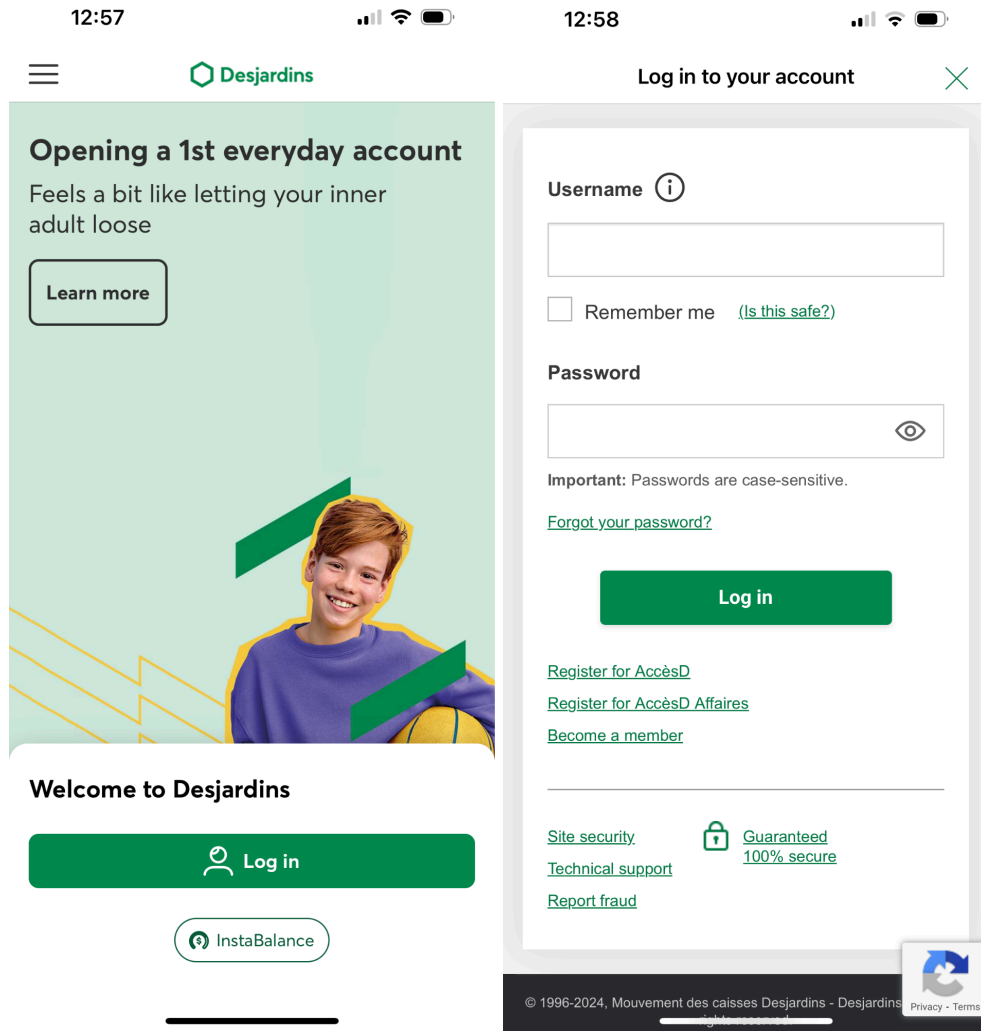


Figure 7: The login screen of the personal banking application

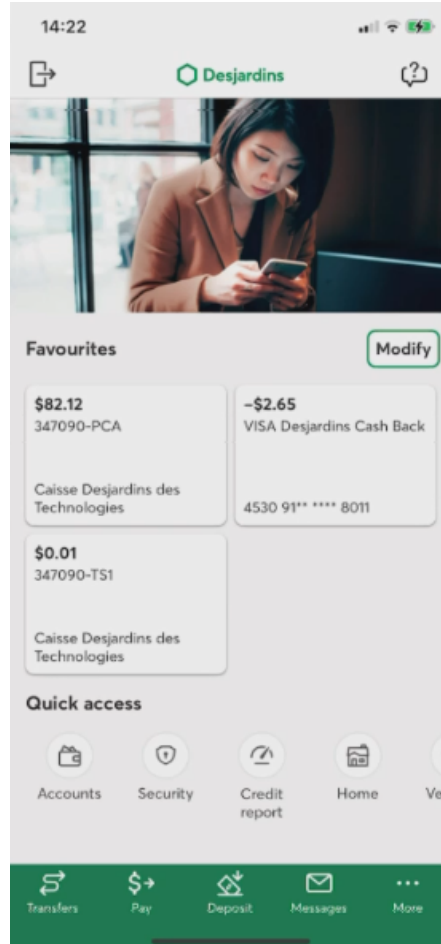


Figure 8: The home screen of the personal banking app

2.4.5 Measures

Objective measures of performance, task success rate and task duration time, were recorded by observation during the tasks. Effectiveness is represented by the average success rate across all 6 tasks per subject. At the task level, it was indicated by a 0=Fail, 0.5=Partial, and 1=Success. Efficiency is represented by the average task duration time across all six tasks per subject, in seconds.

Measures of cultural fit, value congruence and cultural identity, were recorded with scales administered prior to the introduction of tasks. Value congruence score is an average of four scale items scored on a 7-point Likert scale. The user was to indicate their level of agreement with each statement from 1 = Extremely disagree to 7 = Extremely agree. Cultural identity was a single score out of 100. The user was to place himself on a sliding scale from identifying as 0% Quebecois Francophone to 100% Quebecois Francophone. The distinction from “French Canadian” to “Quebecois Francophone” was made in pre-testing to more accurately distinguish this cultural group from “French” and “Canadian”.

Client status was recorded in the pre-evaluation demographics survey. Objective financial literacy was scored by the number of correct responses to a three-question general financial knowledge quiz administered (see Appendix 2).

After completing all tasks in the evaluation, perceived effort and perceived performance were measured through the adapted scales of effort expectancy and performance expectancy (Venkatesh et al., 2003). Note that in the case of Effort Expectancy, even though the construct is labeled as ‘Effort’, the scale effectively measures Ease of Use, as the items are oriented positively and phrased along ease rather than effort or difficulty.

Table 2: Measurement Scales and Items

Construct	Scale Name	Item description	Rating	Source
Value Congruence	Brand value congruence	The values of [financial institution]’s brand are very similar to my own. I would like to have these values myself. These values reflect how I think others see me. These values reflect how I would like others to see me.	1 = Extremely Disagree to 7 = Extremely Agree	(Voorn et al., 2020)
Cultural Identity	Social Identification	Please indicate how you identify from a scale of 0 (not Quebecois francophone) to 100 (Quebecois francophone).	0% to 100%	(Gwinner & Bennett, 2008)

Perceived Performance	UTAUT	<p>[Financial institution]’s online services are useful to carry out my banking activities</p> <p>[Financial institution]’s online services enable me to conduct my banking activities more quickly.</p> <p>Using [financial institution]’s online services increases my productivity in my banking activities.</p> <p>[Financial institution]’s online services improve my performance in my banking activities.</p>	<p>1 = Extremely Disagree to</p> <p>7 = Extremely Agree</p>	(Venkatesh, 2003)
Perceived Effort	UTAUT	<p>My interaction with [financial institution]’s online services is clear and understandable</p> <p>I expect to become skillful in using [financial institution]’s online services</p> <p>I find [financial institution]’s online services easy to use</p> <p>Learning to use [financial institution]’s online services is easy for me</p>	<p>1 = Extremely Disagree to</p> <p>7 = Extremely Agree</p>	(Venkatesh, 2003)

1.4.5 Statistical Approach

Although over 100 participants completed the evaluation, the post-processing total was 98 participant data sets available for statistical analysis. Processed data was used at the subject level for statistical analysis. Subjective variables recorded by questionnaire remain consistent as one score per subject. Variables related to task performance were converted to averages to represent performance across the entire test per subject. Each subject’s success score per task is averaged across the 6 tasks to a rate of effectiveness per participant. Each subject’s time to complete a task is averaged according to the number of tasks each participant completed, providing a rate of efficiency per participant.

Statistical analysis was conducted on SAS Studio. All analyses were assessed at a significance level of 5%. Histograms and normality tests were conducted to examine the distribution of each dependent variable. Performance variables, effectiveness and efficiency, were retained as

continuous variables. Effectiveness representing the average task success rate, and efficiency representing log-transformed average task duration per participant. Perceptual variables, perceived performance and effort, were also treated as continuous variables. Linear regression models were used to test the effect of value congruence and cultural identity on each dependent variable. The procedure “proc reg” was used for continuous variables with normally distributed residuals, and “proc glm” was used for cases where assumptions of homoscedasticity or normality were violated but linearity could still be assumed. Client status and financial literacy were included as covariates in all models.

2.5 Results

2.5.1 Descriptive Statistics

Table 3 illustrates participant demographics. Post-processing, a total of 98 participants' data were utilized for statistical analysis. As intended in recruitment, francophone participants made the majority with 76%. Users covered a wide age range from 18 to over 80 years old, with the majority of users falling between 25 to 45 years old. This is representative of the age range in which the bank currently recruits for user testing. Over half of the recruited participants are current clients. This is a critical control variable as it represents user familiarity with the system and affinity towards the system. Education level was relatively evenly distributed across secondary to post-graduate studies, with the majority of users having completed some level of post-secondary education. Most users had a strong understanding of general financial knowledge with 53% of users scoring all three questions correct.

a total of 98 participants's data (24:74 anglophone to francophone split) were utilized for statistical analysis. This was sufficient as the only change in the proportion of the two groups meant that the assumed effect size of Cohen's d equal to 0.686 (instead of 0.65).

Table 3: Demographic profile of participants

Variable	Category	Frequency	Percentage
Language	French	74	76%
	English	24	24%
Age group	18-25	14	14%
	26-35	25	26%
	36-45	22	22%
	46-55	14	14%
	56-65	9	9%

	65-80	14	14%
Client status	Client	60	61%
	Non-Client	38	39%
Client type	Personal Finance	34	35%
	Insurance	7	7%
	Both	19	19%
Education level	Secondary	24	24%
	CEGEP (College)	32	33%
	Undergraduate studies	26	27%
	Graduate or Postgraduate studies	16	16%
Financial literacy score	No correct responses	4	4%
	1 correct response	19	19%
	2 correct responses	23	23%
	All correct responses	52	53%

Table 4 displays the descriptive statistics for the variables operationalized in the hypotheses. Mean value congruence with the brand among all participants was 4.32 out of 7 (SD=1.19). From 0% representing completely not to 100% Quebecois francophone, mean identification with Quebecois francophone culture was 74% (SD=32.21). Performance was measured by effectiveness and efficiency. The mean task success rate per participant was 79% (SD=0.28). Effectiveness followed an irregular distribution. The mean task completion time per participant was 128 seconds or 2 minutes and 8 seconds (SD=47.28). Efficiency followed an exponential distribution. Subjective variables measuring attitudes are continuous and were recorded on a Likert scale ranging from 1 to 7. Mean perceived performance score was 5.22 out of 7 (SD=1.45). Mean perceived effort score was 4.79 out of 7 (SD=1.014). Both of these dependent

variables followed an irregular distribution. Objective financial literacy and client status are categorical variables.

Table 4: Descriptive statistics

Variable	Mean	Standard Deviation	Minimum	Median	Maximum
Value Congruence	4.32	1.19	1.25	4.25	7.00
Cultural Identity	74.07	32.21	0.00	90.00	100.00
Effectiveness	0.79	0.28	0.00	0.86	1.00
Efficiency	128.42	47.28	55.86	120.14	301.33
Perceived Performance	5.21	1.45	1.00	5.25	7.00
Perceived Effort	5.67	1.13	2.50	6.00	7.00
Financial Literacy	2.25	0.91	0.00	3.00	7.00
Client Status	1.45	0.61	1.00	1.00	3.00

2.5.2 Hypothesis Testing

Figure 9 depicts the results of hypothesis testing on the proposed research model. All p-values were divided by two as directionality was indicated in the hypotheses and two-tailed tests were conducted.

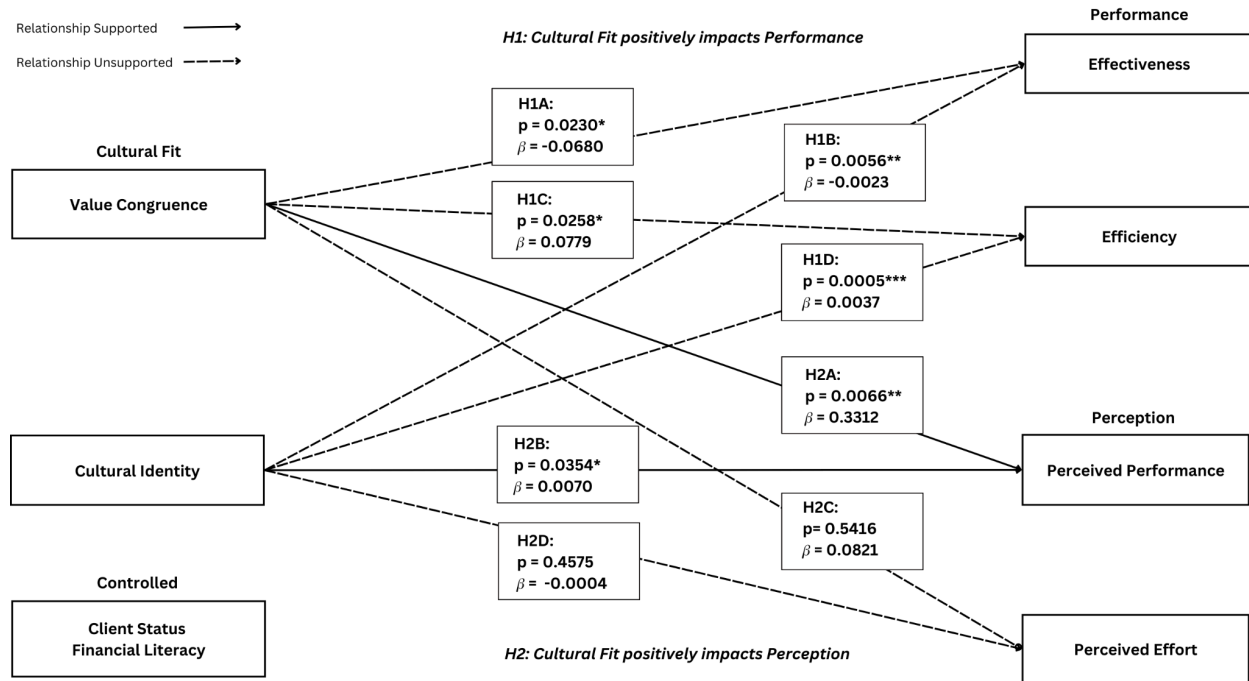


Figure 9: Research model by level of significance

2.5.3 Cultural Fit on Performance

H1A: Value Congruence positively impacts Effectiveness

A linear regression analysis was used to examine the impact of value congruence with the brand on effectiveness, measured as the average task success rate. Contrary to the original hypothesis, value congruence was found to be a statistically significant negative predictor of effectiveness ($\beta = -0.068$, $SE = 0.0336$, $p = 0.030$). H1a is not supported. The inverse direction of the relationship suggests that users with higher value congruence tend to perform worse. Additionally, client status also had a significant effect on task success ($\beta = 0.175$, $SE = 0.088$, $p = 0.0248$), with

clients demonstrating higher success rates compared to non-clients. These results indicate that users who are closer to the brand, either by identifying with its values or through client status, may be experiencing friction in task performance.

H1B: Cultural Identity positively impacts Effectiveness

A linear regression analysis was conducted to examine the impact of cultural identity on effectiveness, measured as the average task success rate. Similar to value congruence, cultural identity was found to be a statistically significant negative predictor of effectiveness ($\beta = -0.0023$, $SE = 0.0009$, $p = 0.0056$). H1b is not supported. The inverse direction of this relationship suggests that users who identified more strongly with the Quebecois francophone cultural context were slightly less successful in completing the tasks.

H1C: Value Congruence positively impacts Efficiency

A linear regression analysis was conducted to examine the impact of value congruence on efficiency, measured as log-transformed average task duration. Value congruence was a statistically significant predictor of efficiency ($\beta = 0.0779$, $SE = 0.0392$, $p = 0.0258$), but with the inverse directionality of the hypothesis. H1c is not supported. The positive coefficient indicates that users with higher value congruence took longer to complete their tasks, suggesting lower efficiency. Client status and financial literacy were not significant predictors of task duration.

H1D: Cultural Identity positively impacts Efficiency

A linear regression analysis was conducted to examine the impact of cultural identity on efficiency, measured using log-transformed average task duration. Cultural identity was found to be a statistically significant predictor of efficiency ($\beta = 0.0037$, $SE = 0.0011$, $p = .0005$). However, this result is in the inverse direction of the hypothesis. H1d is not supported. The positive coefficient indicates that as cultural identification with Quebecois Francophone culture increases, average task completion time increases, reducing efficiency.

2.5.4 Cultural Fit on Perceptions

H2A: Value Congruence positively impacts Perceived Performance

A linear regression analysis was conducted to examine the impact of value congruence on perceived performance, measured as participants' perceived usefulness of the interface. Value congruence was found to be a statistically significant positive predictor of perceived performance ($\beta = 0.3312$, $SE = 0.1296$, $p = 0.0066$). H2a is supported. Users who felt more aligned with the bank's values were more likely to perceive the interface as useful and effective in helping them complete their tasks. Client status also had a highly significant effect ($p < .001$), with current clients reporting higher levels of perceived performance than non-clients.

H2B: Cultural Identity positively impacts Perceived Performance

A linear regression analysis was conducted to examine the impact of cultural identity on perceived performance, defined as the user's perceived usefulness of the interface. Cultural identity was found to be a significant positive predictor of perceived performance ($\beta = 0.0070$, $SE = 0.0038$, $p = 0.0354$). H2b is supported. Participants who more strongly identified with Quebecois Francophone culture tended to perceive the system as more useful. Similar to H2a, client status is a significant predictor of perceived performance ($p < .001$), with clients reporting greater perceived usefulness than non-clients.

H2C: Value Congruence positively impacts Perceived Effort

A linear regression analysis was conducted to examine the impact of value congruence on perceived effort, measured as users' perceived ease of use. Value congruence was not a statistically significant predictor of perceived effort ($\beta = 0.0821$, $SE = 0.1338$, $p = 0.2708$). H2c is not supported. These findings suggest that a user's alignment with the brand's values does not influence how easy they perceive the interface to be.

H2D: Cultural Identity positively impacts Perceived Effort

A linear regression analysis was conducted to examine the impact of cultural identity on perceived effort, measured as the user's perceived ease of use. Cultural identity was not a statistically significant predictor of perceived effort ($\beta = -0.0004$, $SE = 0.0036$, $p = 0.4575$). H2d is not supported. The effect was not only non-significant but also in the opposite direction of the

hypothesis. Identification with the brand’s cultural context does not appear to influence how easy users perceive the system to be.

Table 5 summarizes all findings pertaining to each hypothesis and displays the standardized coefficient, standard error, and one-tail p-values, found dividing the output two-tail p-value by two to incorporate the directionality mentioned in the hypotheses. The table also includes the interpretation of the test results as it pertains to each hypothesis and its implication which is further explored in the section.

Table 5: Summary of hypothesis testing results

Hypotheses		Coefficient	Standard Error	P-Value	Interpretation	Implication
H1A	Value congruence positively impacts effectiveness.	-0.0680	0.0336	0.0230	Not supported; a statistically significant inverse relationship was observed	Value congruence negatively impacts effectiveness.
H1B	Cultural identity positively impacts effectiveness.	-0.0023	0.0009	0.0056	Not supported; a statistically significant inverse relationship was observed	Cultural identity negatively impacts effectiveness.
H1C	Value congruence positively impacts efficiency.	0.0779	0.0392	0.0258	Not supported; relationship not significant	Value congruence does not impact effectiveness.
H1D	Cultural identity positively impacts efficiency.	0.0037	0.0011	0.0005	Not supported; a statistically significant inverse relationship was observed	Cultural identity negatively impacts effectiveness.

H2A	Value congruence positively impacts perceived performance.	0.3312	0.1296	0.0066	Supported	Value congruence positively impacts perceived performance.
H2B	Cultural identity positively impacts perceived performance.	0.0070	0.0038	0.0354	Supported	Cultural identity positively impacts perceived performance.
H2C	Value congruence positively impacts perceived effort.	0.0821	0.1338	0.5416	Not supported; relationship not significant	Value congruence positively does not impact perceived effort.
H2D	Cultural identity positively impacts perceived effort.	-0.0004	0.0036	0.4575	Not supported; relationship not significant and inverse	Cultural identity positively does not impact perceived effort.

2.6 Discussion

2.6.1 Interpretation of Results

The results revealed unexpected but rich insights as many of the findings indicated the inverse of the original hypotheses to be true. In particular, all relationships in the first hypothesis pertaining to objective task performance were not supported due to directionality, and not a lack of statistical significance. These findings challenge the intuitive assumption that cultural fit would enhance usability and suggest a more nuanced relationship.

Cultural Fit negatively impacts Performance

It was originally hypothesized that users with higher cultural fit, defined by stronger value congruence with the brand and stronger identification with the Quebec francophone culture, would perform at a higher success rate and more efficiently. However, the results indicate the opposite to be true; higher levels of cultural fit were associated with lower effectiveness and longer task completion times. All four objective performance hypotheses (H1a–H1d) were statistically significant but featured negative coefficients, indicating that cultural closeness may introduce friction rather than fluency in task performance. This may point to unaccounted cognitive or emotional expectations, a mismatch between perceived brand familiarity and actual interface functionality, or even heightened scrutiny among users who care more about the brand. These dynamics will be explored further in the theoretical contributions section.

Cultural Fit positively impacts Perceived Performance

In contrast to the performance outcomes, perceived performance (H2a and H2b) outcomes generally aligned with expectations. Value congruence and cultural identity had a significant positive effect on perceived performance. These findings suggest that users who feel more aligned with the brand and its cultural messaging tend to see the system as more useful in helping them complete their tasks. Even if actual performance did not improve, cultural fit appears to positively influence user perception of system performance, reinforcing the idea that brand alignment impacts expectations and interpretations of success.

Cultural Fit does not significantly impact Perceived Effort

Neither value congruence nor cultural identity significantly predicted perceived effort. This indicates that perceptions of interface simplicity are relatively stable across user groups. Interestingly, the mean perceived effort rating scored relatively high overall (M = 5.67 on a 7-point scale), suggesting that this particular interface may already be well-designed and intuitive across a broad user base. The lack of variation tied to cultural fit suggests that this construct may be more closely linked to interface design quality and interaction flow, rather than user-specific cultural or brand identification factors.

2.6.2 Theoretical Contributions

These findings contribute to the theoretical understanding of culture's role in usability and technology acceptance in various ways. These findings highlight the complexity of cultural alignment in digital experiences and challenge the common assumption that stronger cultural fit universally leads to better outcomes.

Inverse Relationship between Cultural Fit and Performance

The discovery of the inverse relationship between cultural fit and performance has a few implications. This challenges the notion of higher cultural alignment always results in improved outputs and introduces the potential dangers of excessive cultural fit. It appears that, under certain conditions, the presence of excessive cultural fit may result in biases that hinder task performance. This unexpected relationship may be arising from numerous factors.

1. Cognitive Load - The Cognitive Load Theory (Sweller, 2011) suggests that task performance can be impaired when cognitive resources are overloaded. Users with stronger connection to the organization might experience higher cognitive load arising from the pressure to perform well. The phenomena "choking under pressure" refers to the disruption in the automatic nature of task execution and subsequent decreased performance due to the increase in conscious attention (Baumeister, 1984).

2. Overconfidence - Users with high cultural fit may become overconfident or complacent when interacting with a familiar interface which leads to decreased attention to task details and lower performance (Dale et al., 2018).
3. Evaluator Effect - Shi (2007) discovered the difference in cultural backgrounds between the user and evaluator have an impact on the usability testing results. This factor may cause certain usability issues to be masked or overlooked resulting in lower performance. Our study did consider this effect and employed both francophone and anglophone evaluators, however, his effect may have compounded with the addition of other factors.
4. Mediating Variables - The relationship between value congruence and performance is often mediated by factors such as job satisfaction and organizational commitment (Leung, 2018). In our study, job satisfaction may translate to satisfaction with the bank's services and organizational commitment may be represented by client status. Mediating factors like these may be manipulating the direct relationship between value congruence and performance.

Highlighting these potential negative outcomes of cultural fit may enrich cross-cultural theories, particularly, the Two-Sided Cultural Fit theory used to formulate the hypothesis in this study. Relating to organizational behaviour literature, this finding identifies culture-related variables as potential areas of conflict in task-specific adaptability or flexibility.

Partially Supported Relationship between Cultural Fit and Perceptions

The second hypothesis was partially supported, as cultural fit was found to positively impact perceived performance but have no significant impact on perceived effort. These findings suggest that users who feel more aligned with the brand and its cultural messaging tend to see the system as more useful in helping them complete their tasks. Even if actual performance did not improve, cultural fit appears to positively influence user perception of system performance, reinforcing the idea that brand alignment impacts expectations and interpretations of success.

These results also contribute to the distinction between perceived usefulness and ease of use in the UTAUT model. While cultural fit appeared to enhance performance expectancy, it had no significant effect on ease of use, suggesting that these constructs are influenced by different

factors. These findings help to further define the role of cultural variables in technology acceptance models and suggest directions for integrating culture into UTAUT-based frameworks.

Contextualization of Results

The inconsistent results found in this study, such as cultural fit enhancing perceptions but hindering performance, highlights the context-specific nature of culture's effect on digital usability. The study was conducted within a unique context, centered around a financial institution with a strong regional brand identity. User expectations and emotional connections may have been shaped by prior experiences with the organization, particularly in the context of personal banking tasks. Future research could investigate the role of moderators such as task complexity or organizational culture to better understand when and how cultural fit becomes beneficial or counterproductive.

These findings challenge existing assumptions that cultural fit is uniformly advantageous and contribute to broader theories of person-organization fit and technology acceptance. They highlight the importance of context in shaping usability outcomes and point to new leads to understanding how culture influences human-computer interaction.

2.6.3 Practical and Managerial Implications

Addressing Usability Challenges among Francophone Users

Why are francophone users struggling with performance? This misalignment poses a real concern for managers who need to explore the underlying factors contributing to these user difficulties. Addressing this issue is important not only for improving user satisfaction but also for ensuring equitable access and usability across all user groups. To tackle these challenges, organizations might prioritize continued research efforts, similar to this study, to identify additional pain points and usability barriers that may not yet be apparent. Ongoing studies will help ensure that the organization remains responsive to evolving user needs and effectively supports all users in achieving their goals.

Recruiting for Usability Testing

An overemphasis on cultural fit may lead to rigidity or resistance to innovation, impacting effectiveness and efficiency. Usability testing environments should support cultural nuances while encouraging adaptability and novel perspectives. When recruiting test samples around cultural alignment, managers might be aware of potential performance skews and balance this by including users with a broader range of experiences and viewpoints. Including both culturally aligned and less-aligned users helps to create more well-rounded feedback and thus, leading to design solutions that better reflect the diversity of real user needs. In the context of banking technology, it may help to segment users based on habits, digital experience, and preferences, not only demographics. This approach ensures that usability testing captures the full spectrum of user experiences and supports the design of universally accessible and effective systems

Testing for Linguistic Usability

To effectively compare the francophone and anglophone user experiences in Quebec, usability testing must evaluate language accessibility and comprehension, particularly for technical financial terminology. This entails testing the same interface in both French and English with distinct user groups consisting of those who are monolingual in either French or English and those who are bilingual. This approach will help identify potential linguistic friction points and specify areas where the interface may fall short in accommodating language-specific nuances. Ensuring clarity and ease of understanding in both languages is critical as these factors may directly influence effort expectancy and overall user satisfaction. By tackling these specific linguistic usability challenges, organizations are better equipped to create interfaces that are equally intuitive and effective for all users, regardless of their linguistic background.

Designing for Universal Usability

While cultural fit was found to positively influence the perceived usefulness of the system, it did not necessarily lead to improved usability outcomes. While system interfaces and features should aim to align with users' cultural preferences and values where appropriate, usability efforts are often better served by prioritizing universal design principles over cultural customization. The findings suggest that cultural factors may not necessarily lead to better usability as anticipated,

reinforcing the importance of designing intuitive, accessible experiences that cater to a wider audience, regardless of cultural background.

2.6.4 Limitations and Future Research

The study aimed to assess the differences in user experience of different language and culture groups on the same mobile banking interface and address the effects of this on usability testing.

Limitations

The first challenge was definitively measuring the difference between the user groups, which consisted of Francophone and Anglophone users in Montreal. Originally, the study focused on evaluating the French and English versions of the banking website and how users interacted with and perceived the interface in their respective languages. However, since Francophone participants only tested the French interface and Anglophone participants only tested the English interface, the manipulation turned out to be more about the user's personal cultural and linguistic profile than that of the interface itself. If the study had aimed to isolate interface language, the design would have needed to expose both user groups to both language versions, resulting in four distinct testing conditions, similar to the experimental designs used in studies by Alcántara-Pilar et al. (2018) and Alexander et al. (2021). This would have allowed for a clearer comparison of how the same users react to different interface languages.

To measure the difference between the user groups, rather than using Hofstede's model to generally define Francophones and Anglophones, we opted for a more individualized approach by attempting to capture cultural fit at the individual level. This is a new approach and the way we measure cultural fit could alter depending on the goals of the study. In this case, the study assumed that the bank's history as a Quebecois Francophone brand would align with user perceptions of that culture. However, this assumption may not apply to all participants; in particular, younger users or those raised outside Quebec may be unaware of the brand's cultural positioning. To apply the Two-Sided Cultural Fit theory more accurately in future studies, the scale items measuring cultural fit could be refined for greater contextual relevance. Additionally, comparing cultural differences between users through Hofstede's dimensions might offer a more consistent basis for future analysis.

In this study, there was an overrepresentation of Francophone users in the participant makeup of the experiment. The distribution of Francophone to Anglophone participants was three times more. While this distribution may be more reflective of the population in Quebec, it reduces the generalizability of findings beyond this regional context. The uneven distribution might have reduced the statistical power to detect certain effects in the Anglophone group, potentially minimizing important differences between the two user groups. A more balanced sample might provide unique insights to form a stronger comparative study between the two linguistic groups.

Future Studies

Given the adverse effect on performance uncovered in this study, it may be in the best interest for the bank to address these unexpected findings with further research. From the organization's perspective, it is suggested to gather qualitative user feedback or conduct targeted usability testing to identify potential contributors to this performance hindrance.

Continuing comparative research like this one can help uncover hidden pain points in user experience and highlight areas for improvement. Similar studies that isolate a key demographic or cultural variable can be useful tools for organizations looking to improve the accessibility and inclusiveness of their digital services. Future work might also explore moderating factors such as user expectations, brand familiarity, or task complexity to better understand under what conditions cultural fit enhances or hinders usability outcomes.

2.6.5 Synthesis of Findings

Taken together, the results of this study offer a more complex view of how cultural fit shapes user experience in digital banking environments. While cultural alignment with the brand positively influenced users' perceptions of usefulness, it did not lead to better task performance or efficiency. In fact, the opposite was observed, with stronger cultural fit associated with slower task completion and lower success rates. This unexpected dynamic suggests that cultural closeness may introduce new pressures or biases that interfere with performance, even as it improves overall user satisfaction with the system. These findings contribute to a growing understanding that culture's role in usability is highly context-specific and not always

straightforward. They highlight the need for organizations to balance cultural resonance with universal usability principles and to remain cautious in assuming that shared identity alone will drive better outcomes. As digital experiences continue to globalize and diversify, understanding when and how cultural fit becomes an asset or a barrier will remain an important area for future research and practice.

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Article 2: **Speaking the Customer's Language: How Cultural Fit Impacts UX**

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Abstract

This article explores the role of cultural fit in usability testing, focusing on the performance and perceptual differences between Francophone and Anglophone users in Quebec's financial services sector. Cultural fit was found to positively influence perceived usefulness, but negatively impact task performance. This unexpected finding challenges traditional assumptions about cultural alignment in system interaction. These findings highlight the nuanced relationship between culture and usability emphasizing the importance of universal design principles and inclusive recruitment strategies. Practical recommendations are provided for managers to address performance gaps, leverage cultural fit for improved user feedback, and design digital banking interfaces that meet the needs of diverse user bases. The study highlights the value of continuous user testing to identify pain points and optimize user experiences in multicultural contexts.

3.1 Background: Culture, Language, and Usability

The influence of culture on user experience has long been recognized as a critical factor in designing effective digital systems. Cultural models shape how individuals perceive, interpret, and interact with information, influencing everything from navigation preferences to trust in digital interfaces (Clemmensen, 2012). In multicultural environments, usability challenges arise not solely from language barriers, but from deeper, culturally rooted cognitive frameworks that affect how users engage with technology (Daniel et al., 2011).

An important concept in understanding these dynamics is cultural fit, defined as the degree to which individuals perceive their own values, behaviors, and norms as congruent with those of an organization (Ashforth & Mael, 1989; Lu et al., 2023). Cultural fit has been linked to user satisfaction, trust, and loyalty in digital interactions (Voorn et al., 2020). However, while cultural alignment may strengthen emotional and cognitive engagement with a brand or system, its effects on objective usability measures, such as task performance or perceived ease of use, remain an area for further exploration.

Language accessibility further complicates usability in bilingual or multilingual contexts. Research shows that linguistic differences can moderate how users process information and evaluate website usability, even when translations are available (Alcántara-Pilar et al., 2018). Subtle inconsistencies in terminology, tone, or design elements between language versions can lead to usability gaps (Nantel & Glaser, 2008), particularly in sensitive sectors like financial services where clarity and trust are critical to user adoption.

Given these complexities, there is a pressing need to better understand how cultural and linguistic variables intersect to shape user experiences, especially in regions like Quebec where bilingualism is widespread but cultural nuances persist.

3.2 Bridging Culture and Usability

Building on these considerations, in the realm of financial services, the recruitment of representative users for usability testing becomes particularly critical (Shi, 2007). Firms today operate in increasingly globalized markets and serve regions characterized by diverse linguistic

and cultural demographics. Consequently, adapting digital services to the nuances of these audiences has shifted from being a competitive advantage to a fundamental necessity.

When designing digital products, particularly in multicultural regions, organizations must ensure their services meet the needs of their diverse users, and utilize usability testing as a method to collect actionable user feedback. Recruiting a representative sample for usability testing is the critical first step to designing culturally adaptive services and providing digital products accessible to all members of the user base (Ouellet et al., 2021; Nantel & Glaser, 2008). This approach is vital in identifying the nuances in user experience stemming from cultural and linguistic differences (Daniel et al., 2011).

This article explores findings from a study conducted in Quebec, aiming to uncover how cultural and linguistic differences shape user experiences with digital banking interfaces and provide actionable recruitment strategies for the future of usability testing.

3.3 The Case in Quebec

This study sought to identify performance and perceptual differences between Francophone and Anglophone users in Quebec with a focus on how their background impacted their interactions with digital banking systems. While Francophone and Anglophone labels suggest these users differ by language preference, however, the distinction extends beyond language. In Montreal, which represents nearly half of Quebec's population, the majority of residents are bilingual in French and English (Government of Canada, 2019). Yet user interaction with interfaces is not governed solely by language fluency. Research shows that the way individuals process and contextualize digital information is rooted in deeply embedded cultural schemas that are developed in early life (D'Andrade, 1992).

This study aimed to explore how cultural cues and contexts differ between these particular language users to shape user experience and identify any pain points in their respective journeys navigating digital banking interfaces. To examine this, the study introduced a cultural fit variable defined as the degree to which users identified with the organization and perceived value alignment (Ashforth & Mael, 1989; Lu et al., 2023). This variable helped to place users along a

spectrum of cultural fit with the organization. Participants completed a series of banking and information search tasks on the website and personal banking app of a prominent Quebec financial institution. The study monitored how cultural fit influenced performance measures like task completion and efficiency, and perceptual factors like perceived usefulness and ease of use, building on frameworks like the Technology Acceptance Model (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003).

3.4 Unexpected Findings

Contrary to expectations, the findings revealed that cultural fit positively influenced perceived usefulness but had minimal effect on perceived ease of use. Users who felt aligned with the organization's culture believed the interface supported their goals, yet this alignment did not improve their navigation or task completion experience. Surprisingly, users with strong cultural fit exhibited worse task performance: they were less successful and took longer to complete tasks. This unexpected inverse relationship suggests the presence of other factors inadvertently hindering performance.

One potential explanation is overconfidence bias, where culturally aligned users may assume the system is intuitive and require less mental effort, leading to lower engagement or mistakes (Lu et al., 2023). Another possibility is choking under pressure, where higher cognitive load or emotional attachment results in impaired performance under stress (Baumeister, 1984; Sweller, 2011). These findings challenge the assumption that cultural alignment inherently improves usability and instead reveal a more nuanced relationship between user perception, cultural fit, and system interaction.

3.5 Key Implications

These findings shift the focus from cultural alignment to broader issues in usability and task design. For managers, this highlights two critical considerations. First, cultural affinity does not necessarily guarantee improved performance. While users with higher cultural alignment may feel a stronger connection to the brand's identity (Lu et al., 2023), their struggles with task performance indicate the need for targeted support to address their specific challenges. Second,

the performance difficulties observed may point to deeper usability issues within the system that affect all users, regardless of their cultural fit. Addressing these systemic pain points is essential to ensure that the interface meets the needs of a diverse user base and supports effective task completion for all.

For the financial institution in this study, the results present clear avenues for improvement. The positive influence of cultural fit on perceived usefulness suggests that users who feel aligned with the organization's culture can offer valuable qualitative feedback on how they feel the current system aligns with their goals (Voorn et al., 2020). Engaging these users in future usability studies focused on identifying their expectations for digital banking features could help guide future designs to better support their needs.

At the same time, the negative relationship between cultural fit and performance highlights the importance of addressing usability challenges that disproportionately affect culturally aligned users (Daniel et al., 2011). Managers might investigate whether users' struggles stem from overconfidence, increased cognitive load, or hidden complexity in system design (Baumeister, 1984; Sweller, 2011). Managers might further consider introducing tailored support mechanisms, such as guided task flows or enhanced instructional prompts, to bridge the gap in performance.

Optimizing bilingual interfaces remains a crucial step forward. Research has shown that linguistic inconsistencies in translation or terminology can increase user friction even among bilingual users (Alcántara-Pilar et al., 2018; Nantel & Glaser, 2008). Ensuring clarity and consistency in both French and English versions can help reduce additional barriers, enhance user trust, and decrease cognitive load (Davis, 1989).

3.6 Rethinking Recruitment

Recruitment for usability testing should extend beyond assessing cultural fit. While cultural alignment is one factor that influences user experience, it is not a strong determinant of performance or user perception alone (Lu et al., 2023; Voorn et al., 2020). Organizations must ensure they recruit a diverse sample of users, considering factors such as technological proficiency, banking habits, and linguistic diversity (Ouellet et al., 2021).

When sampling for specific user groups or when studying moderators like cultural fit, recruitment managers should anticipate potential sampling biases and mitigate them by incorporating counterbalancing user profiles. This approach enables a more comprehensive understanding of user needs and identifies a broader range of usability issues. For example, involving users with varying levels of comfort with smartphone usage can help identify barriers that might otherwise go unnoticed. Similarly, testing participants with a range of banking behaviors, from simple everyday email transfers to more complex long-term mortgage planning, can provide insights into how different user needs shape interactions with digital banking tools.

3.7 Focus on Language Accessibility

Language accessibility also plays a critical role in usability testing, particularly in regions like Quebec where bilingualism is common. Research shows that even small discrepancies in language presentation, such as financial terminology differences or translation inconsistencies, can lead to significant usability issues (Nantel & Glaser, 2008; Alcántara-Pilar et al., 2018). To better assess the system's accessibility, organizations might evaluate the interface's efficacy in communicating technical and financial terms in both French and English. Recruitment might include monolingual Francophone and Anglophone users alongside bilingual participants to uncover potential friction caused by linguistic differences or inconsistencies in translation. This approach ensures that usability testing captures the full spectrum of user experiences and supports the creation of universally accessible and effective systems. By designing and testing with language inclusivity in mind, organizations can better meet the needs of all users and create systems that are not only functional but welcoming across linguistic lines (Daniel et al., 2011).

3.8 Design for Universal Usability

Designing for universal usability remains a priority, regardless of cultural or linguistic differences. While cultural fit positively influences performance expectancy, it does not guarantee improved usability outcomes. Systems and features may strive to align with users' cultural preferences and values where appropriate, however, usability efforts should prioritize universal design principles over cultural customization. The findings suggest that cultural factors

may not significantly impact usability as anticipated, reinforcing the importance of designing intuitive, accessible experiences that cater to a wider, more diverse audience at large

Organizations might strive to simplify navigation and reduce cognitive load for all users, ensuring that the interface is intuitive and accessible. Segmentation by user profiles encompassing behaviours and preferences alongside demographic characteristics enables a more holistic understanding of user design needs and highlights how different factors such as prior digital experience, banking habits, or other personal values shape user interaction with the system (Shi, 2007). By incorporating additional considerations such as digital proficiency, frequency of use, and task complexity, designers can create systems that meet the needs of a broader audience.

The study underscores the need for inclusive recruitment strategies that capture the full spectrum of user experiences. While cultural fit plays a role in shaping perceptions, it is just one piece of a larger puzzle. For organizations designing for multicultural audiences, balancing cultural considerations with universal usability principles is essential. By broadening recruitment criteria and focusing on intuitive design, businesses can create systems that serve their entire audience effectively and inclusively.

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Chapter 4 - Conclusion

This study set out to investigate the role of cultural fit in usability testing, specifically within the context of financial service technologies. It aimed to uncover how users from diverse cultural backgrounds, in particular, francophone and anglophone communities in Quebec, perform and perceive digital banking systems. The broader objective was to provide actionable insights to improve recruitment strategies for usability testing and to inform the design of universally accessible and intuitive interfaces.

RQ1: What is the role that language and culture play in user performance and perception

Early on, there was a realization that language alone may be an insufficient differentiator between francophone and anglophone user groups in Quebec, where bilingualism is common. The focus shifted towards how cultural context and cues, beyond language preferences, have a measurable impact on usability determinants of performance and perception. As the experiment was contained in a banking context, variance in cultural fit with the organization became the central variable guiding the investigation.

The findings challenged the initial hypothesis. Cultural fit was discovered to only positively influence performance expectancy, or perceived usefulness, while carrying a negative impact on task performance, consisting of effectiveness and efficiency. This inverse relationship highlights the complexity of cultural dimensions in usability and highlights the need for organizations to reevaluate assumptions about the role of cultural alignment in shaping user experiences.

The observed negative relationship between cultural fit and performance may be explained by contextual factors specific to the study. Banking tasks are inherently complex and require users to navigate unfamiliar or high-stakes scenarios, which might exacerbate performance difficulties for those who feel a stronger connection to the organization. It is possible that users with higher cultural affinity experienced overconfidence which hindered their task performance. External factors such as the evaluator effect or unidentified mediating variables may be compounding to influence this relationship.

This study also acknowledges the limitations in how cultural fit was operationalized and measured. While it provided a framework to quantify alignment between users and the organization, cultural fit is a multifaceted construct influenced by personal values, prior experiences, and societal norms. Future research should refine these measurement tools to capture the nuances of cultural alignment more comprehensively.

For the bank and similar organizations operating in Quebec, these findings reveal an unexpected challenge: users with stronger cultural alignment may experience performance difficulties that skew usability outcomes. This highlights the need for organizations to identify and address the specific struggles faced by these users. Offering differential support mechanisms, such as guided task flows or contextual help features, could help bridge this performance gap

Despite these findings, recruiting users of diverse cultural backgrounds remains the key to effective usability testing. Organizations should aim for representative samples that reflect the full spectrum of their user base, considering not only cultural background but also other variables such as banking habits and proficiency with digital technologies. A comprehensive recruitment strategy ensures that usability testing captures a wide range of user experiences, pain points, and expectations.

RQ2: Is localization beyond translation necessary to improve the adoption of mobile banking technology

From a design perspective, the results of this study emphasize the importance of creating user interfaces that prioritize universal usability over investing in cultural adaptivity for designated groups. In regions like Quebec, where cultural distinctions between francophone and anglophone users are less pronounced due to shared national and linguistic influences, a unified design approach is likely more effective. Designers should focus on creating smooth, intuitive experiences that cater to all users rather than over-customizing for specific groups.

For multinational organizations, the matter is more complicated and less decisive. These organizations must balance to what extent their brand's interfaces should adapt to cultural differences versus striving for global usability. As society becomes more interconnected and

technology adoption grows increasingly uniform, the trend may lean toward designing for a universal, multicultural user experience.

The findings from this study reinforce the need for a user-centric approach to design and usability testing. While cross-cultural factors should be considered, the focus should shift toward understanding individual user preferences and behaviors, especially as globalization blurs traditional cultural boundaries. Comparative studies between diverse demographic groups should continue to identify pain points and areas for improvement in user experience design. Ultimately, the goal should be to create digital systems that are both inclusive and adaptable, ensuring accessibility for all users while addressing context-specific challenges. This balance will enable organizations to thrive in an increasingly globalized and technologically advanced world.

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Appendices

Appendix 1: Key Constructs and Variables

Independent Variable	Controlled Variables	Dependent Variables
Cultural Fit <ul style="list-style-type: none">• Value Congruence• Cultural Identification	Client Status	Performance <ul style="list-style-type: none">• Effectiveness• Efficiency
	Financial Literacy	Perceived Usability <ul style="list-style-type: none">• Perceived Performance• Perceived Effort

Appendix 2: Financial Literacy Scale

FIN_LIT_OBJ_1

x→

Suppose you had **\$100 in a savings account** and the **interest rate was 2% per year**. **After 5 years**, how much do you think you would have in the account if you left the money to grow?

- More than \$102
- Exactly \$102
- Less than \$102
- Do not know, refuse to answer

FIN_LIT_OBJ_2

x→

Imagine that the **interest rate on your savings account was 1% per year** and **inflation was 2% per year**. **After 1 year**, would you be able to buy?

- More than today
- Exactly the same as today
- Less than today with the money in this account
- Do not know, refuse to answer

FIN_LIT_OBJ_3

x→

Do you think that the following statement is **true or false**? "Buying a single company stock usually provides a safer return than a stock mutual fund."

- True
- False
- Do not know, refuse to answer

Appendix 3: SAS Results

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H1A	Value Congruence	Success	Client Status Financial Literacy
Code	proc reg data=df_babouche3; model success = Value_Congr client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value
Value Congruence	-0.0680	0.0336	0.0230 *
Client Status	0.1754	0.0875	0.0496 *
Financial Literacy	0.0452	0.0389	0.2497

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H1B	Cultural Identity	Success	Client Status Financial Literacy
Code	proc reg data=df_babouche3; model success = ID_QC_FR client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value
Cultural Identity	-0.0023	0.0009	0.0056 **
Client Status	0.0687	0.0586	0.2442
Financial Literacy	0.0155	0.0309	0.6162

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H1C	Value Congruence	Average Duration	Client Status Financial Literacy
Code	proc glm data=df_babouche3; model log_dura_avg = Value_Congr client2 fin_lit_obj; run;		

Parameter	Estimate	Standard Error	P-Value
Value Congruence	0.0779	0.0392	0.0258 *
Client Status	-0.1351	0.1059	0.2068
Financial Literacy	0.0265	0.0461	0.5681

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H1D	Cultural Identity	Average Duration	Client Status Financial Literacy
Code	proc glm data=df_babouche3; model log_dura_avg = ID_QC_FR client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value
Cultural Identity	0.0037	0.0011	0.0005 ***
Client Status	-0.0768	0.0732	0.2970
Financial Literacy	0.0184	0.0385	0.6335

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H2A	Value Congruence	Performance Expectancy	Client Status Financial Literacy
Code	proc glm data=df_babouche3; model UT_perf = Value_Congr client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value
Value Congruence	0.3312	0.1296	0.0066 **
Client Status	1.7446	0.3459	<.0001 ***
Financial Literacy	0.0403	0.1509	0.7903

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H2B	Cultural Identity	Performance Expectancy	Client Status Financial Literacy
Code	proc glm data=df_babouche3; model UT_perf = ID_QC_FR client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value
Cultural Identity	0.0070	0.0038	0.0354 *
Client Status	1.6038	0.2549	<.0001 ***
Financial Literacy	0.0111	0.1334	0.9336

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H2C	Value Congruence	Effort Expectancy	Client Status Financial Literacy
Code	proc glm data=df_babouche3; model UT_effort = Value_Congr client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value
Value Congruence	0.0821	0.1338	0.5416
Client Status	0.6702	0.3570	0.0653
Financial Literacy	0.0501	0.1557	0.7486

<u>Hypothesis</u>	<u>Independent</u>	<u>Dependent</u>	<u>Control</u>
H2D	Cultural Identity	Effort Expectancy	Client Status Financial Literacy
Code	proc glm data=df_babouche3; model UT_effort = ID_QC_FR client2 fin_lit_obj; run;		
Parameter	Estimate	Standard Error	P-Value

Cultural Identity	-0.0004	0.0036	0.4575
Client Status	0.5645	0.2429	0.0223 *
Financial Literacy	0.0323	0.1270	0.7996