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探究軟體即服務（SaaS）產品本地化：

以兩間線上旅行社為例

SaaS (Software as a Service) Localization: Online Travel

Agencies as a Case Study

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## Abstract

Localization has been shaping the translation landscape in the past two decades as a result of globalization and the advancement of information and communications technology (ICT) starting from the end of the twentieth century. As one of the phases in the globalization, internationalization, localization, and translation (GILT) industry, localization is beyond translation since it involves in a large-scale product development cycle adapting the product for target markets in different locales. Despite the wide array of studies on localization in various digital genres including software systems and websites, there is a sparsity of research focused on SaaS, a recent and burgeoning digital genre featuring a high level of interactivity with users, complexity of product design, and rapidly increasing normalization into people's daily life. Thus, this paper aims to examine SaaS localization, particularly on the production of the localized SaaS product to explore how translation landscape is reconstructed through this complex digital genre representative of the digital era nowadays. To this end, Airbnb and Expedia were taken as the research subjects since both are leading online travel agencies (OTAs), the web-based marketplaces that are also a type of SaaS, across the globe renowned for their mature localization network. Incorporating data from in-depth interview, documents, and texts and graphics on Airbnb and Expedia's user interface, this paper utilized the actor-network theory (ANT), the concepts from the user-centered translation (UCT) model, and the speech act theory as analytical frameworks. This paper found out that the coordination between humans and technologies is key to the success of SaaS localization and that the role of user determines translators' localization strategy since they not only translate as if they were users, but also translate for users. By exploring the SaaS localization network, this paper presents a holistic view of how SaaS contributes to the ever-changing translation landscape in the GILT industry.

*Keywords:* localization, software as a service (SaaS), online travel agencies (OTAs)

## 摘要

在過去的二十年中，全球化和資訊與通信科技（ICT）的發展帶動了本地化翻譯的崛起，重新塑造翻譯領域的樣貌。本地化翻譯（localization）為全球化、國際化、本地化和翻譯（globalization, internationalization, localization, and translation，簡稱 GILT）產業的一環，與傳統意義上的文字翻譯不同，還涉及全球經濟下的大規模產品開發週期，以適應不同區域目標市場的消費者習慣。

雖然已存在針對軟體系統和網站等不同數位型態（digital genre）的翻譯研究，但對於軟體即服務（software as a service，簡稱 SaaS）此一數位型態的研究仍相對缺乏。由於具有高度與用戶互動的特性、複雜的產品設計，以及融入人們日常生活的特性，SaaS 成為現今數位時代中的代表性型態。因此，本文旨在研究 SaaS 本地化翻譯，尤其是本地化 SaaS 產品的製作過程，以探究此數位型態如何重塑翻譯領域。

本文以 Airbnb 和 Expedia 作為研究對象，因兩者皆為全球知名的線上旅行社（online travel agency, 簡稱 OTA），亦為 SaaS 的一種，且其以成熟的本地化網絡而聞名。本研究分析深入訪談、相關文件，以及 Airbnb 和 Expedia 用戶界面上的文本和圖形資料，並採用行動者網絡理論（Actor-network Theory，簡稱 ANT）和用戶中心翻譯（User-centered Translation，簡稱 UCT）模型的概念作為分析框架。

研究發現，人類與科技間的協同是 SaaS 本地化產品成功的關鍵，且非人行動者包含語言服務供應商（language service provider，簡稱 LSP）和科技在網絡中具有關鍵作用。此外，SaaS 本地化的翻譯人員運用具有介面脈絡意識的心態和文化適應性的本地化策略，打造令人愉悅的使用者體驗。就貢獻而言，本研究不僅是 ANT 及 UCT 在翻譯產業的應用前導性研究，並提供從業人員適應 GILT 產業以用戶體驗為核心的本地化方向，以呈現日新月異的翻譯領域樣貌。

關鍵字：本地化、軟體即服務（SaaS）、線上旅行社（OTAs）

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## Chapter 1: Introduction



Translation has been an integral part of human societal development, impacting diverse realms such as the economy, politics, and culture. Whenever information exchange occurs, the necessity for translation arises to foster effective communication among individuals from varying cultural backgrounds. Within the realm of communication, translation activity is intricately connected to the mediums through which messages are conveyed. As the material nature of communication mediums undergoes evolution alongside technological advancements, the practice of translation can be executed through various technological devices. This evolution aims to enhance the quality and speed of communication, highlighting the indispensable role of translation in facilitating understanding across diverse cultural landscapes.

Since the late 1980s, the advent of the World Wide Web (WWW) and Information and Communications Technologies (ICTs) has brought about a profound transformation in the translation landscape. From ancient inscriptions on clay tablets and handwritten texts on paper, we have transitioned to digital texts displayed on screens (Folarnon, 2019). This evolution in the translation landscape is a direct consequence of the global and informational shift in the economy towards the end of the twentieth century, propelled by technological advancements. This transformation is evident in the globalization of economic activities, marked by the organization of production, consumption, and circulation on a global scale. This is exemplified by

multinational companies adopting mass-production models characterized by assembly-line processes, standardized production, and specialized manufacturing (Castells, 1996; Cronin, 2003). A notable illustration is Boeing, whose supplier network spans 12,000 suppliers worldwide (Boeing.com, 2016). Simultaneously, the progress in informational technology has further amplified this large-scale global economy by accelerating the exchange of information. This dual shift towards globalized economic structures and information exchange accelerated by technology development has significantly reshaped the translation landscape in response to the dynamics of the digital era.

In light of these changes, the field of translation studies has shown a growing interest in localization over the past two decades. Localization, a relatively recent research area within translation studies, delves into more than just the linguistic and cultural adaptation of digital content for foreign markets. It also encompasses the exploration of technologies employed in the localization process and the process itself, aimed at efficiently managing the "digital information flow" across “multilingualism” (Schäler, 2007). To go further, Pym (2014) emphasizes that localization, being closely intertwined with technology, is better defined through "products rather than texts." It involves the "process of product's preparation, tailoring, or adaptation for a new locale." From a practical standpoint, localization is a

pivotal phase within the GILT industry, which encompasses globalization, internationalization, localization, and translation. The globalization process entails the entire product cycle, with the internationalization phase focusing on designing, planning, and developing the product for future localization. The subsequent localization phase involves the cultural adaptation of the product to suit various target markets in different locales (Munday, 2008; Anastasiou & Schäler 2010 quoted in Kassawat 2021).

As mentioned earlier, technology plays a pivotal role in shaping the landscape of localization, given that digital content is intricately embedded in various technological mediums, such as the user interface (UI) on mobile phones. The localized texts and their corresponding mediums are often considered as an integrated whole, essentially forming a product. Products can manifest in diverse genres, including blogs, corporate or social networking sites, all with the aim of engaging with users. Scholars have endeavored to illuminate how localized texts are presented across various digital genres. For instance, Jiménez-Crespo (2012) delved into the prototypical superstructure of the non-profit website genre in the United States. Folaron (2019) highlighted the evolution of localization in three generations based on technological advancements. These encompass the first generation of software in the 1980s, the second generation of websites from the mid-1990s to the mid-2000s, and the third

generation of social media from around the mid-2000s to the present. This evolution underscores the emergence of new digital genres over time, driven by the ever-changing nature of technology. However, despite these advancements, most research has predominantly focused on the localization of software systems and websites.

Some of the latest digital genres, such as software-as-a-service (SaaS), metadata tagging, and applications, remain relatively uncharted, signaling the need for further exploration in these areas.

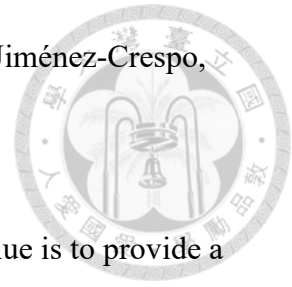
Among the new digital genres propelled by the advancements in cloud computing technology, such as Amazon Web Services and Microsoft Azure, Software as a Service (SaaS) stands out as a rapidly growing segment in the software industry. According to Deloitte (2021), "the global SaaS market size experienced significant growth over the past 10 years, with a compound annual growth rate of 25%." SaaS is characterized as a "software licensing and distribution model where software is hosted by service providers and made available to customers over the Internet." Furthermore, the SaaS model offers subscription-based remote access to software, diverging from traditional standalone licenses that require installation on local computers and servers (Saltanab & Smolander, 2021).

In essence, SaaS's amalgamation of cloud products and a business model centered around monthly or yearly subscriptions has positioned it as a burgeoning

digital genre in the global software market. For instance, Dropbox serves as a notable example of SaaS, providing cloud storage services via the Internet with various subscription plans. The onset of the COVID-19 pandemic in 2019 has further accelerated companies' adoption of SaaS, driven by the imperative for business agility and the facilitation of remote work through digitalization (Saltanab & Smolander, 2021).

Similar to other digital genres, such as the previously mentioned software systems and websites that have captured the interest of academia, SaaS also necessitates localization to cater to different locales globally. More precisely, SaaS presents a distinctive localization paradigm due to the involvement of multiple "actors" in the production of the localized product, responding to agile software product development. Three key aspects differentiate SaaS from other digital genres explored in translation scholarship (Jiménez-Crespo, 2013). Firstly, SaaS exhibits a high level of interaction between users and the product, given its task-oriented nature. For example, Uber Eats, an online food ordering and delivery platform, guides users through various interactive phases such as selecting food, placing orders, making payments, and communicating with the delivery person. In contrast, prior research on website localization often focused on "institutional, corporate, non-profit, and personal" sites, which have less task-oriented intentions as users primarily browse

through content without the intentions of accomplishing the goals (Jiménez-Crespo, 2013).



Secondly, SaaS product design is more complex, as its core value is to provide a service. SaaS can be considered a fusion of software systems, websites, and social media, representing the three main digital genres across the generations of localization proposed by Folaron (2019). For example, Zendesk, a customer-support SaaS, not only facilitates customer success through its online system but also engages potential clients with various web landing pages. Additionally, Zendesk has established a community for clients to discuss usage thoughts and address encountered issues. Lastly, SaaS has emerged as a significant driver of digitalization, accelerated by COVID-19, with increasing adoption by governments and companies (Gokarna, 2021). This indicates that SaaS has become intricately woven into people's daily lives, standing out prominently in all the aforementioned digital genres. For instance, the daily user count of Zoom, one of the largest SaaS video conferencing tools, is now thirty times higher than pre-COVID-19 levels (Gokarna, 2021).

In addition to SaaS's notable characteristics, including its high level of interactivity, complex product design, and growing normalization into people's lives, SaaS has also proved to be significant in corporate strategy. Beyond "traditional software vendors and tech companies such as SAP, Google, and Adobe," there is a

rising number of "new 'born-in-the-cloud' SaaS companies that typically offer a single flagship SaaS solution," such as Salesforce and Dropbox (Saltanab & Smolander, 2021). This signifies that SaaS holds a central position in a company's core business by driving revenue. Consequently, a company's business strategy becomes pivotal in the SaaS localization process, as the product is crafted for sale in diverse locales.

Considering these factors, this study recognizes the imperative of investigating SaaS localization, with a specific focus on the production of localized SaaS products. The aim is to unravel how the translation landscape undergoes transformation within this intricate digital genre of SaaS, which serves as a representative of the digital era. To achieve this objective, two research questions are proposed as follows: (1) How does the translator facilitate the process of digital product localization, especially on SaaS products, working with other human and non-human actors in the localization process to produce the localized product? (2) How does the translator localize for users within the context of digital product-user communication? Airbnb and Expedia are taken as the research subject since they are leading OTAs, a type of SaaS, with mature localization network that may offer insights into the questions raised above. By delving into the intricacies of how localized products are produced within OTAs' GILT operations, this paper offers a comprehensive perspective on the dynamic translation landscape shaped by technological advancements and business

innovations.

Having introduced the background and motivation of this study, its purpose and research questions, this section goes on to outline the structure of this dissertation.

Chapter 2 summarizes the previous studies and related theories to serve as the basis of this study, particularly on the development of localization studies and theoretical frameworks for translating under a digital product-user context. Chapter 3 focuses on the methodology, including detailed explanations on each step's data sourcing, compilation, and analysis, to clarify the research procedures for validation and reliability. The results generated are presented in Chapter 4, following with the discussions on the results and their implications found to be responding to the research questions. Chapter 5 concludes with a summary of findings, limitations of the present study, and suggestions for future research.

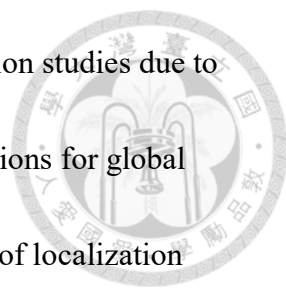
## Chapter 2: Literature Review



This chapter will first examine the literature regarding localization's position in translation studies, including its background and development, to identify the existing research gaps that this study aims to fill. Secondly, this chapter continues with reviewing the fundamental literature on primary theoretical frameworks, the ANT and key concepts in user-centered translation (UCT) model.

### 2.1 Localization in Translation Studies

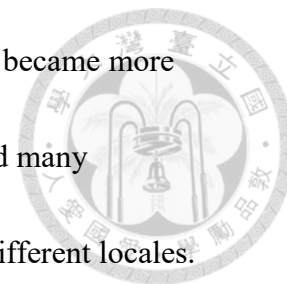
Localization, originating in software development in the late 1980s, is commonly defined as "the linguistic, cultural, and technical adaptation of digital content produced through modern ICTs so that it can be suitably used by end users in their own languages" (Folaron, 2020). This practice has evolved alongside economic globalization, fueled by companies expanding into foreign markets (Cronin, 2013). Cronin (2013) highlights that translation in localization involves significant word delivery, multilingual requirements, short delivery times, and the demand for content consistency across projects. Within this business context, clients' needs take precedence in localization practices to assist them in achieving their business goals. This dynamic gives rise to a "new translation economy" that values "volume, time, and cost," reflecting the characteristics of the contemporary digital global village (Cronin, 2013, p.6).



Localization has become a prominent academic topic in translation studies due to its close ties to technological advancements and its broader implications for global economic development. Folaron (2019) identifies three generations of localization from a historical perspective. The late 1980s marked the beginning of localization with the launch of the WWW, enabling massive and instant information exchange through computing and ICTs. This era saw a significant shift in technical translation practices and the emergence of a new translation field. Mainstream operating systems like Microsoft's office suite applications initiated localization efforts to penetrate foreign markets (Folaron, 2019). Translators played a vital role in the localization process during this period, collaborating with professionals such as engineers, marketing experts, and lawyers to deliver localized products (Pym, 2014). The texts subject to translation encompassed a wide range, including menus, dialogue boxes, help files, user contracts, and more (Pym, 2014). This evolution highlights the multifaceted nature of localization and its integration into the dynamic landscape of technology and global communication.

The second generation of localization, spanning from the mid-1990s to the mid-2000s, saw the localization of websites rise to prominence. This era witnessed the emergence of language service providers (LSPs), computer-assisted translation (CAT) tools, and industry standards like ISO 17100 (International Organization for

Standardization, 2015). During this period, the localization process became more established. The popularity of consumer electronics in the 1990s led many international companies to expand globally by selling products in different locales.



Companies such as Adobe, Cisco, Hewlett-Packard, IBM, and Xerox established the Localization Industry Standards Association (LISA, 1990-2011) to set standards for software localization in worldwide publishing. LISA developed international certificates, such as ISO 30042:2008 (now ISO 30042:2019), to regulate terminology management in content. The third generation of localization, from the mid-2000s to the present, is characterized by the rise of user-generated content, necessitating fast and efficient turnaround in localization productivity (Folaron, 2019). Text forms have diversified significantly, including videos, blogs, and more. This evolution reflects the dynamic nature of localization in response to changing technologies and user-driven content creation.

Understanding how localization operates requires examining it within the broader context of the industry map. Localization is a crucial phase in the globalization, internationalization, localization, and translation (GILT) industry, covering the entire product cycle. In the globalization process, the internationalization phase entails designing, planning, and developing the product with localization in mind. Subsequently, the localization phase focuses on culturally adapting the product for

specific target markets in various locales (Munday, 2008; Anastasiou & Schäler, 2010 as cited in Kassawat, 2021).



In the GILT industry, a "locale" refers to a specific market requiring product adjustments. Notably, a market isn't confined by country boundaries but signifies people in specific areas sharing similar cultural criteria (Pym, 2005). For example, Airbnb, an online travel platform, distinguishes Taiwan and China as different locales, despite both using Chinese as the official language. This difference stems from variations in language, with Taiwanese using traditional Chinese and Chinese using simplified Chinese, alongside differences in idiomatic language use. These cultural disparities not only influence divergent localization strategies but also impact varied marketing strategies.

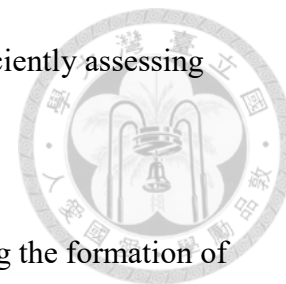
The three generations of localization highlight its deep integration into industry practices, evolving alongside advancements in ICTs across different periods. This historical trajectory emphasizes the critical role of content localization in corporate marketing strategies, enabling companies to enter international markets by tailoring content to resonate with local consumers' experiences (Singh, 2011, p.53). Bert Esselink, a pioneering localization expert, established the framework for localization studies based on industry analysis, technology application, and industrial production procedures, drawing from his experiences in the early 2000s. With the maturation of

the cloud environment in the third generation, a new digital product form called "software as a service" (SaaS) has become prevalent in the current information technology industry (Gartner, 2020). However, existing research has predominantly focused on websites, which were prominent in the second generation of localization. For example, Pym (2009) explored the localization process, constraints, actors, and purpose of websites with an exploratory intent. Consequently, there is a need for more research on new digital forms to comprehensively understand translation's role in the current localization landscape.

## **2.2 Actor-network Theory (ANT)**

Localization is not only a translation activity; rather, localizer-translators co-construct the localized product in cooperation with various stakeholders in “a hybrid and digital universe,” i.e. the GILT industry discussed in 2.1 (Folaron, 2019). Since localization operates within the GILT’s complex network, multiple stakeholders including human and non-human actors participate in the making of the final localized product. To name a few, the human actors include engineers, project managers (PMs), translators, etc., while the non-human actors include LSPs, CAT tools, translation management platforms, etc. In this case, localization showcases a distinct translation environment characterized by swift turnaround times and the integration of technology, in contrast to the more traditional, publisher-driven landscape. Therefore,

there is a requirement for an analytical framework capable of proficiently assessing the intricacies involved in the localization of digital products.



To this end, the ANT is introduced in this study for scrutinizing the formation of the localization network. ANT, proposed by Bruno Latour, Michel Callon, and John Law in the 1980s, is a “cross-disciplinary approach to technology studies and social science” and a “network-tracking activity,” which seeks to explore the heterogeneous networks created by dynamic relations filled with negotiations and tension between actors (Latour, 2017; Olohan, 2019; Wolf 2007 quoted in Kung 2017). These actors, including human and non-human actors, “act on the basis of their interests” that will be “translated” as the actors enroll other actors into the network, continuously “forming alliances and configuring actor networks” (Olohan, 2019). To clarify, “translation” in ANT refers to a process of “replication, imitation, and differentiation” that actors engage to form a heterogeneous and relational field as an increasing number of actors are involved into the production (Barry, 2013).

ANT has been widely used as an analytical framework in various disciplines in and beyond science and technology domains, including informatics, health studies, geography, sociology, anthropology, business, etc. This empirical approach relies on ethno-methodology of collecting rich and qualitative data of case studies, aiming to uncovering the trivialities that are often hidden and neglected when the process is

examined retrospectively (Buzelin, 2005; Law & Singleton, 2013). Ruming (2009) indicated that “following actors” is key to generate as much useful information for constructing the ANT network. For instance, Ruming (2009) traced the planning of residential development in Sydney by conducting key informant interviews with human actors, such as developers or council officers, and interpreting non-human actors’ related documents, such as that of squirrel gliders. In the case of translation studies, common methods include interviews of primary stakeholders and textual evidence, which Latour called inscriptions, such as materials regarding the translation projects like contracts, promotional brochures, correspondence, drafts, etc. (Buzelin, 2005).

ANT’s empirical approach is suitable to scrutinize the localization network of digital product formed by human and non-human actors due to its nature of heterogeneity and technoscience-orientedness. The localized SaaS product is driven by non-human actors, technologies, such as translation management software, collaboration between human actors like PMs and translators, and interactions between non-human and human actors such as translators utilizing translation memory (TM) and localization software to work. In such a sophisticated and collaborative network, any glitches occurring in or between actors will fail to deliver a localized product. Hence, ANT is applied in this study to understand how the

localized SaaS product is created in the localization network of Airbnb and Expedia.

### 2.3 User-centered Translation (UCT)

With the presentation of Airbnb and Expedia's localization network depicted by ANT, the dynamics between translators and other human and non-human actors have been fully revealed. However, since ANT's purpose is to map the constantly shifting networks of relations between actors in SaaS production, it fails to offer insights into how a translator, namely a single actor, translates under certain context. Moreover, the translated texts themselves are also overlooked in ANT's top-down perspective. To fill the gap, the concepts of UCT are therefore introduced into this study to explore how translations contribute to creating a localized user experience (UX) and to unboxing the mystery of translator's decision-making process in an interactive product-user context.

Ever since the technology revolution, i.e. the development of the WWW and ICTs in the late 1980s, a blossoming growth of digital genres such as blogs, corporate, and social networking sites have been normalized into people's daily life in the last two decades (see 2.1). In this context, translators in the new digital era have encountered the challenge of how to systematically and effectively taking users of these digital genres into consideration in the translation process (Folaron, 2019; Jiménez-Crespo, 2013; Suojanen et al., 2015). As mentioned earlier (See Chapter 1

and 2.1), I argue that SaaS stands out among all the thriving digital genres in the digital age due to its high level of interactivity, complexity, and normalization. In other words, SaaS is a digital product meant for use and is designed to help users achieve their goals.

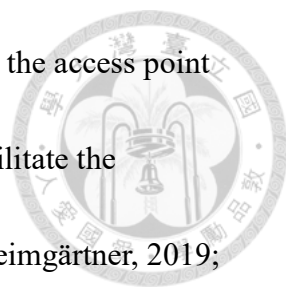


Against this backdrop, the role of end users has become significant in the translation process and thus concerned translators nowadays as to how translations can contribute to the digital product’s purpose of serving the users. The framework of “UCT,” proposed by Suojanen et al. (2015), offers methods with which end users can be taken into consideration during the translation process. More broadly speaking, UCT provides the translation industry with an innovative approach to cater to customers’ needs in the competitive and constantly-changing translation market (Suojanen et al., 2015, p2). UCT emphasizes “the central role of the user in the translation process by [iteratively] gathering information about users throughout the translation process” to create a “usable translation” (Suojanen et al., 2015, p4). Based on the iterative model aligned with software product development, UCT is particularly beneficial to “high in large and cyclical translation processes,” in which translations can be targeted to users’ needs after the refinement of user profiles from each iteration (Suojanen et al., 2015, pp. 4, 56). For instance, software localization, including that of SaaS, is suitable for the application of UCT since it demands a large

quantity of translation along with continuous product updates and delivery to international markets.

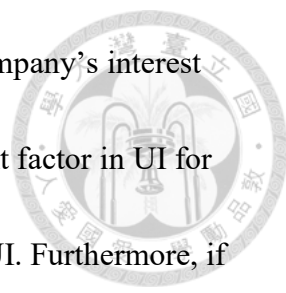


Among all the concepts proposed in UCT, this study is focused on the textual elements of usability and usability heuristics for answering the second research question (see Chapter 1). To begin with, the term UX should be elucidated since it denotes the overarching concept describing the way users interact with a product. In the field of human-computer interaction (HCI), UX is a relatively recent idea encompassing not only the traditional instrumental aspect of technology use but also the aesthetic, hedonic, and affective aspects (Hassenzahl & Tractinsky, 2006). Though being an elusive notion with many different definitions, UX can be generally considered a holistic concept covering “all the interactions that the end user has with a product” (Nielsen & Norman, 2016; Suojanen et al., 2015, pp. 14, 29). As such, UX is a result of the user's internal state, the system's unique characteristics, and the context in which the interactions between the both occur (Hassenzahl & Tractinsky, 2006). A product failing to provide users with satisfying UX may lead to users' frustration and thus results in losing users. Statistics (Forrester Research, 2016) show that a well-designed UI could increase a website's conversion rate by up to 200%. In short, UX is essential to a product's success by not only helping users reach their goals but also enjoy the process while navigating through a product.



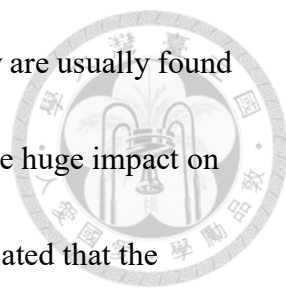
Effective UI is key to creating smooth UX for users since UI is the access point where HCI occurs and thus serves as a significant component to facilitate the communication between a user and a technical operating system (Heimgärtner, 2019; ISO 9241, 2020; Marcus, 2015). In terms of software, UI is specifically referred to display screens, such as an application or a website (Heimgärtner, 2019). Users can interact with a digital product to achieve their goals through textual and visual elements on UI. Take this study's research subject, Airbnb, for instance, the user has to click on the "confirm" button on its website to confirm the booking to proceed to the payment phase. In this case, the “confirm” text on the button is a textual element on the UI, while the button shape or form itself is considered as a visual element. Visual elements include spots, lines, shape, color, etc. that form graphs and videos on the UI (Liu & Ma, 2010).

Though there is a large amount of research on UI's visual elements for improving the UX in the field of information and design disciplines; however, there is a dearth of studies in how textual elements shape the UX. In practical applications, UX copywriting is perceived as part of product design that crafts the information for users' contexts, needs, and behaviors (Nielsen Norman Group, n.d.). Portmann (2022) pointed out that “little texts” such as cookie consent notices on a website written by UX writers are “agentful and influential” so that the texts can exercise a form of



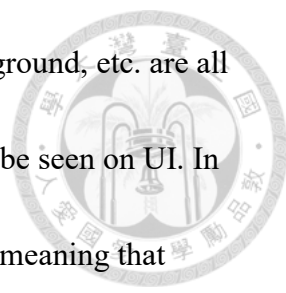
symbolic violence imposing a particular social order serving the company's interest onto users. Along the line of this discussion, if texts are an important factor in UI for creating a high-quality product's UX, so are the localized texts on UI. Furthermore, if the work of a UX copywriter is inevitably meant to be translated into other languages, there is a necessity to make clear the translator's significance in building the UX that the content strategist creates in the source text (ST). However, in translation studies, research on translation and UX mostly centers on website localization and machine translation (MT), such as exploring how MT or CAT tools assist in translators' workflow and the relations between translatability of a website's texts and its UX (Bowker, 2015; Daems & Macken, 2019; O'Brien, O'Hagan & Flanagan, 2010). There is a sparsity of research focused on how translated texts on UI participate in building UX for users in the target locale.

In UCT, textual elements of usability are crucial for understanding how a translator helps users interact with the product by creating a smooth UX journey. To clarify, UX is a broader notion including the pragmatic and hedonic aspects of product use as mentioned earlier in 2.3, while usability focuses on the pragmatic aspect referring to a user's task completeness (Hassan & Galal-Edeen, 2017). Usability is considered the “heart of UX” affecting the overall UX since a UI with attractive visual design cannot overcome a user's frustration while failing to get a task done



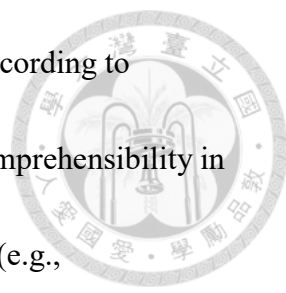
(Hassan & Galal-Edeen, 2017). Previous studies on textual usability are usually found in the field of technical communication, revealing that texts can have huge impact on readers' reading experience. For instance, Byrne (2010, p.171) indicated that the usability of texts on technical documents can decrease users' cognitive load and thus increase their motivation and satisfaction. Some scholars adopted mix-methods approaches to measure the usability of texts. For instance, usability is measured by three dimensions of effectiveness, efficiency, and satisfaction while users are conducting tasks with textual content. As for experiment design, eye tracking apparatus is often used for fixation duration, and questionnaires are used for user satisfaction (Rossetti, Cadwell & O'Brien, 2020). Suojanen et al. (2015, p.3) further investigated textual usability in a wider context not necessarily limited to certain text types or genres, proposing the principle textual elements of usability in UCT to incorporate the concepts of textual usability in translation studies.

Suojanen et al (2015, pp. 50-57) elucidated the four textual elements key to creating smooth usability, including legibility, readability, comprehensibility, and accessibility. Firstly, legibility concerns the “technical and visual aspects of reading” referring to the ease with which users can recognize textual content, which is often considered beyond the translator's control and responsibility (Colley, Huhtala & Häkkinen, 2013; Suojanen et al, 2015, p50). For instance, the feasibility of typeface, the



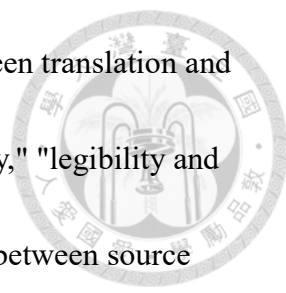
suitability of text size, the contrast between the texts and their background, etc. are all critical issues in legibility determining how prominent the texts can be seen on UI. In SaaS localization, translators should be able to grasp the contextual meaning that visual design embeds to fully present the message in the ST. Take Airbnb for example, a text string displayed as "Next/Next up" on screen can denote different meanings in various contexts such as "下一步" (BT: next step) on a button or "未盡項目" (BT: unfinished items) on a web page's heading for a host. Translators cannot deliver accurate translation without understanding the visual elements accompanying the text. Secondly, readability refers to the text's quality. Word choice, sentence length, text rhythm, cohesion, grammatical use, logical flow of text, terminology consistency, etc. are all important criteria assessing readability in UCT, and are thus also applicable to SaaS localization (Suojanen et al, 2015, pp.51-52).

Thirdly, comprehensibility emphasizes the text's situational and interpersonal context and is used to evaluate the extent to which a text realizes its communicative function (Suojanen et al, 2015, p.52). Comprehensibility can be regarded as a consequence of the interaction between a user's state of mind, the context of use, and subject matter, which is the element that is the most difficult to assess among the four elements of textual usability due to its complexity that is highly dependent on contexts. For instance, both legibility and readability can affect users'



comprehensibility towards the texts (Suojanen et al, 2015, p.56). According to Suojanen et al. (2015, p.55), common strategies used to enhance comprehensibility in UCT are pragmatic adaptations including explication and additions (e.g., supplementary explanations), omissions (e.g., removing “taboo elements”), and replacements (e.g., using a localized allusion rather than the original foreign one). Lastly, though partially overlapping with some concepts of comprehensibility, accessibility refers to the text’s availability and understandability for “as many targeted users as possible” (Suojanen et al, 2015, p.57). For instance, multilingual versions of a government’s website help offer equal rights for people speaking different languages to access first-hand information (Šarčević, 2013). In terms of SaaS, accessibility lies at the heart of product development since the purpose of localization is to eliminate linguistic barriers for as many target locales as possible.

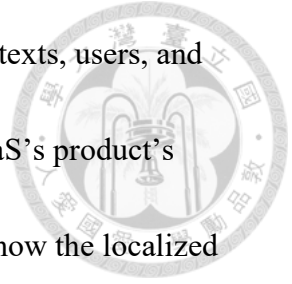
In addition, usability heuristics in UCT proposed by Suojanen et al. further complements to the textual-analysis approach of the aforementioned four textual elements of usability, expanding the notion of UX’s linguistic and visual aspects to comprehensive UX describing the process of using a product. Heuristics refer to a set of principles, rules, or guidelines that can be organized into a usable quality checklist for UI to follow (Suojanen et al., 2015, p.77-78). Suojanen et al. (2015, p.90) proposed the 10 heuristics for UCT, including "match between translation and



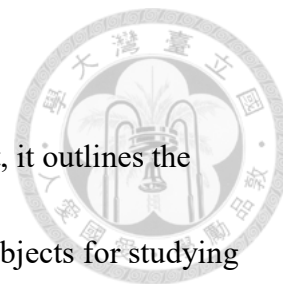
specification," "match between translation and users," "match between translation and the real world," "match between translation and genre," "consistency," "legibility and readability," "cognitive load and efficiency," "satisfaction," "match between source and target texts," and "error prevention." Given the overlap between some heuristics and the textual elements of usability, along with the limitations of this study, only a limited number of heuristics that contribute to the broader aspect of textual usability in SaaS have been considered. In this sense, the "match between translation and users," "match between translation and the real world," and "match between translation and genre" are selected in the analytical framework. The first heuristic inquires how translation supports different users' needs; the second one probes into how translation adapts to various culture; the last one examines how translation match certain genre's convention along with multimodal elements (Suojanen et al., 2015, p.90).

To conclude, the four textual elements of usability and usability heuristics in UCT offer a framework for investigating how translations contribute to a localized UX so that users can effortlessly interact with a product to accomplish their goals. In the context of product-user interaction, digital texts' nature of being embedded in UI calls for UCT's help to investigate how the localized texts go beyond translation and contribute to shaping a product's UX. It is believed that UCT can provide a refreshing

perspective for rethinking SaaS localization in a way that considers texts, users, and the context of use. Textual elements of usability help elucidate a SaaS's product's translation patterns, while usability heuristics help further examine how the localized texts develop the product's UX. This study adopts a comparative textual analysis employing a descriptive and explanatory approach. The aim is not only to observe the personality conveyed by translations but also to identify the strategies translators employ in shaping a product's UX. Further details regarding the application of UCT to this study will be elucidated in Chapter 3.



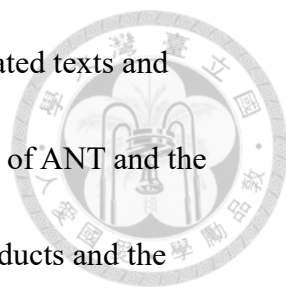
### Chapter 3: Method



This section begins by reiterating the research objectives. Next, it outlines the case study approach employed and describes the chosen research subjects for studying the localization network of SaaS products. Subsequently, the section elaborates on data collection, encompassing primary data such as interview results, UI texts, and graphics, as well as secondary data like documents, blogs, and websites. The sources and selection criteria for data are thoroughly explained, along with the design and implementation of interviews. Finally, the section discusses the analytical frameworks applied, including the ANT and the UCT model, briefly examining their suitability for this research (refer to Chapter 2 for more details).

This study aims to explore how the translation landscape is reconstructed through the production of the localized SaaS product, a complex digital genre representative of the digital era. The research questions as mentioned earlier in Chapter 1 include probing into (1) the actor-network of Airbnb and Expedia to understand the translator's relation with other human and non-human actors, and (2) how does the translator localize for users within the context of digital product-user communication?

This research focuses on examining the localization of SaaS products, with Airbnb and Expedia selected as case studies (refer to 3.1). Following the approach

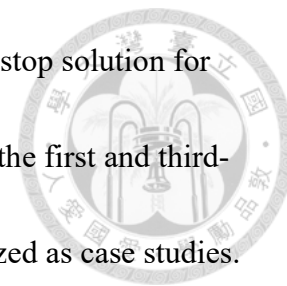


outlined in 2.2, data for analysis is collected from interviews, translated texts and graphics, and related documents, employing a combined framework of ANT and the UCT model (see Chapter 2). Given the emergent nature of SaaS products and the evolving translation industry they are associated with, little is known about how translation activity operates within the context of SaaS localization. Therefore, this case study aims to shed light on the "why and how" of SaaS localization, providing flexibility in interpreting qualitative analysis results from unstructured data. Additionally, the case study facilitates the generation of "descriptive reports for seeing the wood through the trees" to gain a holistic understanding of the localization landscape, which is instrumental in comprehending the contemporary translation landscape (Susam-Sarajeva, 2009; Cronin, 2013).

### **3.1 Research Subjects**

This study focuses on OTAs, which are SaaS products known for their extensive localization networks worldwide. According to Expedia, the third-largest OTA globally as of 2022, an OTA is described as "a web-based marketplace that enables consumers to research and book a wide range of travel products and services directly with travel suppliers." These services encompass hotels, flights, car rentals, tours, cruises, activities, and more, all accessible via a website or application over the Internet. This setup offers users, including travelers, hotel administrators, and

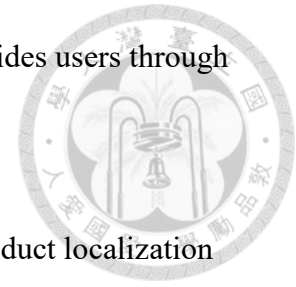
representatives from travel-related organizations, a convenient one-stop solution for their travel needs. For this study, Airbnb and Expedia, respectively the first and third-largest OTAs worldwide according to Statista (2022), will be analyzed as case studies.



These two OTAs serve as ideal case studies for exploring SaaS localization dynamics for three primary reasons. Firstly, OTAs operate as SaaS platforms characterized by intricate interactivity and complex product design. They aim to connect various stakeholders and streamline business processes through their comprehensive services (Airbnb, 2018; Expedia Group, 2022). For example, Expedia's goal of digitizing the entire travel industry requires addressing the diverse needs of stakeholders. Travelers engage in multiple phases, from searching for accommodations to confirming booking details, making payments, and finally, enjoying their stay. Conversely, hotel owners navigate through phases such as listing their accommodations, maintaining content on their pages, managing bookings, and hosting travelers. In some cases, communication between these parties occurs directly through Expedia's platform to clarify specific details.

Catering to the diverse needs of various users adds complexity to the product design of OTAs. Additionally, research indicates that "94% of leisure travelers switch between devices as they plan or book a trip," underscoring the importance of creating a seamless UX across different devices (Think with Google, 2016). Consequently,

Expedia is required to offer a sophisticated software system that guides users through their journey, step by step, to ensure their needs are met effectively.

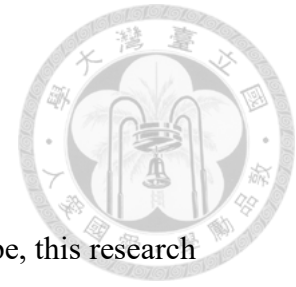


Secondly, both Airbnb and Expedia have developed robust product localization pipelines to facilitate seamless product delivery to international markets. Throughout the entire product cycle, from internationalization to localization, their networks involve not only in-house engineering and localization teams but also coordination with external partners such as multiple LSPs. For instance, in the case of Expedia, once a new feature is developed by the engineering team, a request for localization is sent to the headquarters' localization team. Subsequently, the localization process begins across various languages through collaboration between regional localization teams and external LSPs. LSPs then handle the translation tasks by assigning them to suitable translators. Ultimately, the translated texts are integrated into the localized product, ensuring readiness to serve the target locales.

Lastly, both Airbnb and Expedia recognize the significant impact of localization and are committed to investing resources in this area. For example, Airbnb provides services in 62 languages in total, reflecting the fact that two-thirds of its clients are from outside the United States and 61% of transactions originate from non-English speaking countries. The monthly translation cost for Airbnb alone can reach up to USD 100,000 (Product School, 2020, 4:58).

## 3.2 Primary Data Collection

### 3.2.1 Interview: Participants

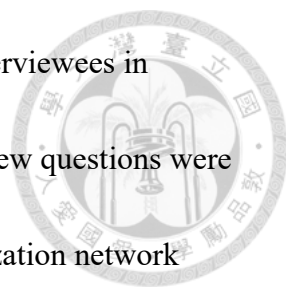


To comprehensively understand the SaaS localization landscape, this research engaged key stakeholders from both the companies and the commissioned LSPs. The roles involved in the localization process include in-house program managers, in-house translators, LSP language leads, LSP translators, and LSP PMs. By incorporating insights from each of these roles through interviews, the research aimed to construct a multi-faceted and detailed perspective of the SaaS localization process. The research involved four interviewees from the localization industry, comprising individuals currently or previously associated with Airbnb or Expedia, as well as professionals from LSPs in Taiwan servicing large-scale localization networks for international tech companies. Interviewees with direct ties to Airbnb and Expedia provided invaluable insights from the perspectives of in-house employees, crucial for understanding corporate localization practices. Insights from LSP interviewees complemented this understanding, offering a holistic view of complex digital product localization networks. Among the interviewees were one language lead from Airbnb, one localization specialist from Expedia Group, and three PMs from leading LSPs in Taiwan: Syzygy Information Services Company and WeastO. These LSPs specialize in traditional Chinese (Taiwan) localization. Syzygy boasts nearly 20 years of

experience, working with the top 100 global companies, particularly focusing on software localization and testing (Syzygy, 2022). WeastO offers Chinese localization services to major IT firms worldwide, encompassing websites, applications, software testing, cultural consultation, and more (WeastO, 2022). However, this research centers on the interviewees from Airbnb and Expedia. The PMs from Taiwan's LSPs serve as the complementing roles to support the understanding of the full picture of SaaS localization. All participants were assured that their data would be used solely for research purposes, with any potentially identifiable information removed.

### **3.2.2 Interview Design**

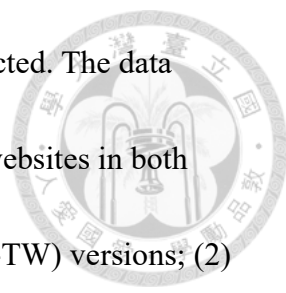
Interviews were conducted in a semi-structured approach to elicit detailed and rich information from multiple perspectives on SaaS localization. Although semi-structured interviews follow a series of prepared questions, the researcher needs to “be attuned to the ongoing discussion and ask pertinent follow-up questions” that help probe into the topics (Ahlin 2019). In this sense, the semi-structured interview helps the researcher to understand how SaaS product is localized and why is it localized in a certain way. The interview time for each interviewee took around 45 to 60 minutes and all interviews were conducted via Google Meet, a video conferencing tool for real-time meetings. Interviews were recorded to be transcribed in Chinese afterward for analysis.



To streamline the interview process, questions were provided to interviewees in advance, and the interviews were conducted in Chinese. The interview questions were divided into three parts, tailored for different roles within the localization network (refer to the Appendix A). The first part was designed for individuals from Airbnb or Expedia's localization departments, focusing on scrutinizing their localization processes and strategies. Sample questions included "What does the localization process entail in your company?" The second part targeted individuals from LSPs, aiming to explore how they collaborate with language service buyers. Questions in this section included "How do LSPs manage their relationships with language service buyers and translators?" The last part was intended for language leads/translators at Airbnb, Expedia, or LSPs, aiming to understand their interactions with other roles, their translation strategies, and how they utilize various resources to achieve translation goals. Sample questions in this section included "Which roles do translators interact with during the localization process, from task allocation to delivery?" By structuring the questions in this manner, the interviews were designed to elicit comprehensive insights from various perspectives within the localization network.

### **3.2.3 Texts and Graphics**

To understand the factors influencing translators' translation strategies, texts



along with graphics from Airbnb and Expedia's websites were collected. The data collection process involved: (1) browsing the Airbnb and Expedia websites in both United States English (en-US) and Taiwan's traditional Chinese (zh-TW) versions; (2) selecting parallel texts accompanied by graphic elements such as images, animations, and videos on the websites. The collected data includes main layers in a webpage's HTML structure, comprising the head, title, h1, and body. According to Mcgrath (2020), head contains meta-information about the HTML page; title specifies the HTML page's title, displayed in the page's tab; h1 defines a webpage's largest heading, typically the most prominent title on the page; body defines a webpage's contents, encompassing smaller headings, paragraphs, images, tables, lists, etc. There are two reasons for collecting the data according to the abovementioned categories. First, the position of text on the UI often correlates with its purpose, offering insight into how translators determine the most suitable translation. Second, compiling data with HTML structure facilitates convenient scraping directly from the website.

### **3.3 Secondary Data Collection: Documents**

In addition to primary data gathered from interviews and websites, secondary data is employed to complement the mapping of the complete process of companies' localization operations. Recognizing the practical limitations in covering all roles' perspectives within Airbnb and Expedia's localization networks, and acknowledging

potential biases in the information obtained from interviews, secondary data plays a crucial role in supporting the interpretation of existing primary data and filling gaps caused by information scarcity. This secondary data comprises blog posts from Airbnb and Expedia's official websites, employee interviews, and articles sourced from reputable localization-related organizations such as Multilingual Magazine and Translated, which serves as Airbnb's sole LSP.

| Interviewee   | Affiliated Institution                | Title                                     | Interview Date |
|---------------|---------------------------------------|-------------------------------------------|----------------|
| Interviewee A | Translated's Airbnb localization team | Language Lead                             | 2022/04/14     |
| Interviewee B | Expedia's in-house localization team  | Localization Specialist                   | 2022/05/05     |
| Interviewee C | Syzygy Information Services Company   | General Manager/<br>Localization Director | 2022/06/29     |
| Interviewee D | WeastO Localization Services          | General Manager                           | 2022/06/30     |

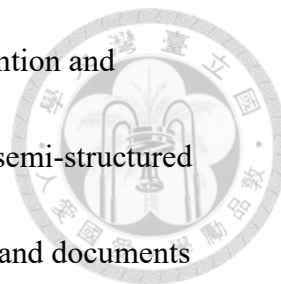
*Table 1.* Interviewee information

### 3.4 Data Analysis

To address the first research question regarding how Airbnb and Expedia's localized digital products are produced, qualitative data from interviews and documents were analyzed using the ANT framework, as discussed in 2.2. As previous research suggests, the "following the actors" approach, involving fieldwork, participant observations at production sites, and examination of relevant secondary

documents, is essential for uncovering the hidden aspects of intervention and interaction among actors (Buzelin, 2005; Latour, 2017). Therefore, semi-structured interviews with key informants involved in the localization process and documents related to localized products (e.g., blogs, secondary interviews, and third-party articles) serve as the analyzed data, interpreted through the lens of ANT. A typical data analysis session for this data involves: (1) transcribing interviews and organizing notes on interviewees' reactions and emotions; (2) coding and indexing transcriptions and notes; (3) organizing, describing, and classifying secondary documents; (4) interpreting coded transcriptions, notes, and documents collectively; (5) generating respective actor-networks for Airbnb and Expedia.

To answer the second research question concerning how translators navigate the interactive context of digital product-user communication, the English (en-US) and traditional Chinese (zh-TW) versions of Airbnb and Expedia were analyzed and compared based on primary data collected from texts and graphics on the products' UIs. A modified analytical framework was derived from UCT's textual elements of usability and UCT's usability heuristics to interpret the collected data and explore the role of translations in creating a localized UX, as discussed in 2.3 and 2.4. In this study, the principle of readability from UCT's four textual usability principles was employed to evaluate the products' textual usability, encompassing aspects of word



choice, text rhythm, sentence length, and terminology consistency. Additionally,

UCT's usability heuristics were adapted to investigate how texts influence the overall

UX comprehensively, as outlined in 2.3 and Table 2.



| Heuristics                               | Explanation                                                                                                                                                           |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Match between translation and users      | Who are the users of the translation and how do their characteristics affect translation solutions? Do the textual choices reflect the information needs of the user? |
| Match between translation and real world | Is the translation aligned with its cultural context? Is cultural adaptation required?                                                                                |
| Match between translation and genre      | Does the translation match the conventions of the genre?<br>Are the visual, auditory, and other multimodal elements appropriate for the new context?                  |

*Table 2.* Simplified usability heuristics for UCT (Suojanen et al, 2015, p.90)

A typical data analysis session for the mentioned data comprises two phases. The first phase evaluates the extent to which localized texts contribute to the product's UX using the modified framework of UCT's textual elements of usability. This involves examining the textual usability of selected texts' en-US and zh-TW versions based on the listed items of readability. The second phase seeks to understand how translators operate within the interactive product-user context. UCT's usability heuristics were employed to assess the overall UX created by the localized texts. Ultimately, the conclusions were drawn from the analysis.

## Chapter 4: Results and Discussion



This chapter examines Airbnb and Expedia's localization network to explore the following issues: (1) how the localized product is produced under the interactions between various actors; (2) how localization networks develop by involving an increasing number of actors, and (3) how the translator localizes in the SaaS localization context. Besides textual data, visual elements on the product's UI are also examined to understand how localizer-translators contribute to creating brand personalities. Primary data including in-depth interviews and textual as well as visual elements on UI, and secondary data of related documents, were analyzed using the framework of the actor-network theory and UCT's concepts of textual elements of usability and usability heuristics (see Chapter 2 and 3).

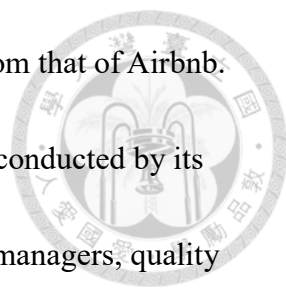
### 4.1 Actor-networks of Airbnb and Expedia

#### 4.1.1 Localization Networks Powered by Language Service Providers (LSPs)

To begin with, Airbnb's and Expedia's localization processes are explained in detail to understand the localized products' production. LSP was identified as one of the key non-human actors in both Airbnb and Expedia's localization network. LSP refers to a company that offers translation and linguistic services to other businesses, including language translation, localization project management, transcreation, interpretation services, etc. (Jiménez-Crespo, 2020) Airbnb has partnered with



Translated, a multi-language service provider offering a combined translation service of human translators and MT via Translated's ModernMT technology for translating contents on the platform into over 60 languages (Translated, 2021). Airbnb has fully outsourced its localization process to Translated, the sole LSP with which Airbnb cooperates, so that "there are almost no in-house translators in its localization department" (interviewee A, personal communication, April 14, 2022). Translated has established a team comprising a language lead and several translators to satisfy Airbnb's need for the product's localization of Taiwan's traditional Chinese. The team members in the Airbnb "task force" are all contractors freelancing for and hired by Translated. Once translation requests are initiated by Airbnb's in-house localization department, they will be delivered to Translated's localization PM. Each translation task undergoes the procedures of translating, reviewing, and linguistic quality assurance (LQA) for "functional, linguistic, and internationalization testing" in the task force (Airbnb, 2021; Slator, 2020). After the completion of tasks, the translated files will be handed over to the localization PM for delivery to Airbnb. Meanwhile, Airbnb's in-house localization team focuses on "improving the internationalization and localization process" such as leading the content flow renovation across functions like design, UX writing, and engineering rather than translating, reviewing, and LQA (interviewee A, personal communication, April 14, 2022).

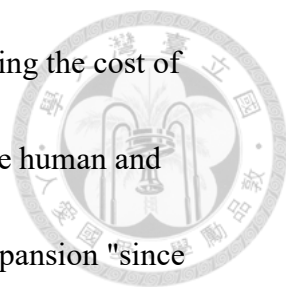


On the other hand, Expedia's localization process is distinct from that of Airbnb. Expedia tends to have the tasks of translating, reviewing, and LQA conducted by its in-house localization department consisting of "a director, regional managers, quality managers, and translators" (interviewee A, personal communication, April 14, 2022). Meanwhile, Expedia partners with external LSPs to deliver a large quantity of words up to approximately 200 million words per year, flaunting the company's high-performance localization achievement (Diño, 2017). Expedia's in-house translators are mainly responsible for translating marketing and UI texts while freelancing translators from external LSPs are in charge of content in large demand such as travel guides and legal documents.

According to interviewee B (personal communication, May 5, 2022), a typical in-house translation process undergoes the following phases: (1) the engineering or marketing department requests for the localization of product features or promotional materials; (2) the in-house PMs receive the requests, prepare task package containing supporting information, and assign the tasks to designated translator in different locales; (2) translators from the localization department start to translate texts ranging from product UI to marketing materials such as slogans and taglines on the website, emails, keywords for search engine optimization (SEO), etc.; (3) translators can directly communicate with PMs regarding any question about the STs or the use of the

product features for clarification; (4) after completion, the only translator responsible for Taiwan's traditional Chinese who is based in the Taipei office will deliver the translations to the quality manager based in Hong Kong for quality assurance; (5) the ready translations will be delivered to the engineering or marketing team for product or content update. As for the cooperation with the partnered LSPs, Expedia's quality manager serves as the contact person communicating the needs with LSPs, and reviews and rates the quality of translations delivered back from the LSPs.

In the cases of Airbnb and Expedia, LSP is a significant non-human actor connecting various actors such as translators, PMs, language leads, etc. to establish the actor-networks of the localized product's production. Although Airbnb and Expedia are both leading OTAs offering similar services, their operation of localization appears to vary greatly in the sense that Airbnb completely outsources the localization process to its partnering LSP, while Expedia keeps the responsibility of translating texts and maintaining translation assets such as writing style guides in its in-house localization department, leaving peripheral tasks that are considered not akin to product use or marketing contents to the LSPs. The reasons causing the two OTA's difference in the localization mode with LSPs can be understood from the perspective of a high-level corporate strategy. Airbnb's outsourcing of the entire localization process to Translated has enabled Airbnb itself to concentrate on developing the core



business of building a travel platform and attracting users. By reducing the cost of maintaining an in-house localization team, Airbnb can dedicate more human and financial resources to product design, development, and business expansion "since translation is not considered as its core business" (interviewee A, personal communication, April 14, 2022). Interviewee B commented that "Airbnb seems to entrust the LSP with what the in-house localization team is in charge of" (interviewee B, personal communication, May 5, 2022). As such, Translated has to constantly improve its service to take over what was originally within Airbnb's work scope such as writing and maintaining the style guide and offering consulting services regarding the product name's localization.

In short, Airbnb's complete outsourcing of the localization process implies that the company aims to focus on its central activity that generates profit, which echoes what Interviewee B has observed that "it is difficult to measure benefits that the in-house localization team brings, or translations generate, so that we are never mentioned in the CEO's quarterly talk to the whole company" (interviewee B, personal communication, May 5, 2022). In addition, Airbnb has been proactively utilizing its partnership with Translated as a means of branding and promotion.

Salvatore Giammarresi, the current Airbnb head of localization, has published several articles regarding Airbnb's localization strategy on Multilingual, a magazine providing

in-depth news on the language industry (MultiLingual Media LLC, n.d.). For instance, Giammarresi talked about how Airbnb made its product more user-centered by incorporating ModernMT into the localization process (*ModernMT* | Welcome, n.d.).

Giammarresi also attended Nimdzi Insights's (a leading market research and consulting company on localization) interview session talking about Airbnb's achievement of having the largest contract in the localization industry signed (Nimdzi Insights, 2021). This indicates that localization has been considered Airbnb's core business that helps optimize the existing product and increase the company's visibility.

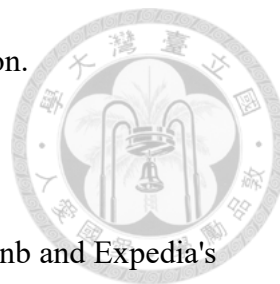
On the other hand, Expedia shows less reliance on LSPs compared with Airbnb, only entrusting certain text types to LSPs including travel guides, legal documents, etc. This allows for a conjecture that Expedia regards localization as akin to its core business of developing the digital traveling platform. As such, Expedia's in-house translators work on translating product UI and marketing materials that are respectively involved in product development and promoting the product. Whatever the level of reliance on LSPs, LSPs help Airbnb and Expedia process a considerable quantity of words to ensure that the products or contents can be updated instantly across the globe. Such accomplishment cannot be done without the LSPs' pool of freelance translators, flexible organization of the "task force," and familiarity with

their clients' localization process and expectations towards translation.

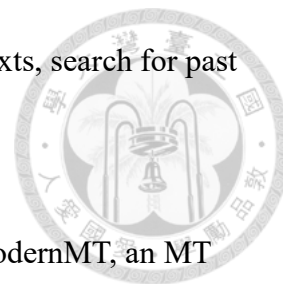
#### 4.1.2 Technology-driven Localization Networks

After exploring how LSP serves as a key actor in building Airbnb and Expedia's localization network, this section looks into another important non-human actor, technology, in the production of the SaaS localization network. Both Airbnb and Expedia's localization network feature a high degree of technology use, including CAT tools such as TM tools, translation management system (TMS) tools, MT tools, digital communication tools, and other translation tools.

Overall speaking, CAT tool enables translators to work in line with SaaS product development by boosting their translating efficiency. Not only beneficial to translators, but CAT tool is also fundamental in connecting various human and non-human actors in the SaaS localization network. Firstly, CAT is defined as the use of computer software to help a human translator translate texts (Bowker & Fisher, 2010). A CAT tool is a technology designed to support and facilitate the translation process, including TM tools, TMS tools, and MT. In Airbnb's case, translators from Translated's Airbnb team work on a web and artificial intelligence-based CAT tool called MateCat. MateCat was developed by the joint effort of the international research center FBK, Translated, the Université du Maine, and the University of Edinburgh. It is integrated with translation memories (TM) and MT, providing a one-



stop environment for translators to translate from source to target texts, search for past translations for reference, and edit and apply MT suggestions.



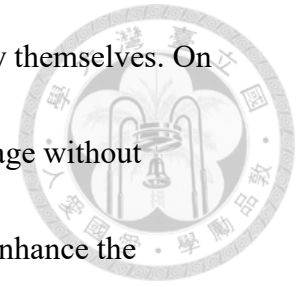
MateCat is powered by a neural machine technology called ModernMT, an MT service acquired by Translated in 2022 that “learns from translation memories and translators’ post-editing corrections” (Translated, 2022). Through the seamless integration between human translators and ModernMT in Airbnb's localization process, MateCat brings together the tools that translators need at work in one place, providing translators with context-aware suggestions of MT in real-time and thus improving productivity. Interviewee A, the language lead from Translated's Airbnb team, indicated that "we all work on MateCat and it is quite convenient even though sometimes the system is unstable due to the server’s instability.” However, “it is not a problem because Translated has its own IT team to fix bugs immediately,” interviewee A added. Furthermore, ModernMT enables Translated to cater to Airbnb's need for a well-rounded LSP by creating a customized translation service called Translation Engine based on Airbnb’s previous translations (see 4.1.1 and the following paragraph in this section).

Secondly, TranslationOS, Translated’s TMS, also serves as a key actor in Airbnb’s localization network. TMS is a technology designed for translation companies or individual translators to manage a large volume of content, aiming to

facilitate translation or localization projects by coordinating with various related actors in one place (Shuttleworth, 2014). Translated's PMs can use TranslationOS to manage a pool of freelance translators, assign translation tasks, and monitor key performance indicator (KPIs) such as financial projections and linguistic quality performance via the customizable dashboards (Translated, n.d.). Interviewee A pointed out that "TranslationOS is particularly important for me as a language lead since I am responsible for maintaining the style guide and training the translators to be familiar with style guide's standards" (interviewee A, personal communication, April 14, 2022).

Besides TMS, another key actor in Airbnb's localization network is Translation Engine, an MT engine created by Airbnb and Translated based on ModernMT technology to automatically translate listing descriptions and reviews on Airbnb according to the user's preferred language (Airbnb, 2021). Since the engine is trained with Airbnb's own traveling-specialized corpora, translations sound much more natural since the colloquial expressions can be correctly delivered. For instance, a listing with the original French title called "maison les pieds dans l'eau" will be translated into "beachfront house" rather than its back translation of "house feet in the water" (Airbnb 2022, 0:50). Thanks to Translation Engine, the quality of up to 99 percent of Airbnb's listings is improved and thus benefiting both hosts and guests. On

one hand, hosts no longer need to translate the contents of listing by themselves. On the other hand, guests can view the content in their preferred language without clicking on the "translate" button (Multilingual, 2022). This helps enhance the product's UX by streamlining the steps for viewing translations, creating seamless UX (see Figure 1). As such, all user-generated content is presented in the user's familiar language, improving the guest-host communication by showing hospitality in the user's preferred language. By eliminating language barriers in real-time, there is more likely that the transaction rate is increased. The seamless UX that Translation Engine creates was introduced in Airbnb's Winter Release, a public announcement of Airbnb's upgrades, as one of the most prominent features among over 50 upgrades (Airbnb 2021 Winter Release, 2021). As the customized solution for Airbnb, the development of Translation Engine is considered "the largest contract in the language industry," allowing a conjecture that the state-of-the-art technology and the ability of innovation are key to why Translated was chosen as the only LSP that Airbnb partners with (Multilingual, 2021).

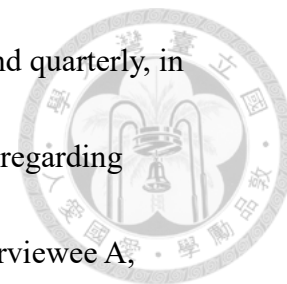




(Airbnb 2022, 0:50)

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mentioned that "the meeting with Airbnb is usually held monthly and quarterly, in which we can discuss on the progress of certain projects, questions regarding linguistic requirements, and any update from the headquarter" (interviewee A, personal communication, April 14, 2022).



As for CAT tools used in Expedia's localization process, XTM Cloud is one of the main platforms used by translators from the LSP and in-house localization team. XTM Cloud is a cloud-based TMS allowing integration with various TM tools, MT tools, and other third-party software programs for creating a productive translation environment (XTM International, 2018). Expedia centralizes the localization process in XTM Cloud to not only establish a convenient workplace equipped with CAT tools essential to translation but also save time for back-and-forth communication between different actors. Due to XTM Cloud's flexibility of integration, translators can even use a unique link to "review the translations on the real layout, which is particularly useful for marketing materials such as emails, helping me identify any newline or extra period before delivery," said interviewee B (interviewee B, personal communication, May 5, 2022). Furthermore, "XTM is integrated with Slack", a messaging digital tool specifically tailored to office workers, "for accelerating communication between staffs from Expedia's localization department and the LSP" (interviewee B, personal communication, May 5, 2022). With the integration combining

TMS and messaging tool, “translation requests initiated by Expedia’s in-house PMs on XTM Cloud can be automatically assigned to translators in Slack channels (dedicated spaces in Slack for organizing conversations),” saving time from switching between TMS and messaging tool and thus boosting the work efficiency (interviewee B, personal communication, May 5, 2022).

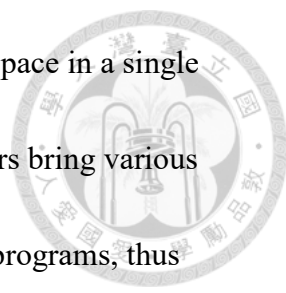
Finally, Expedia’s self-developed content creation tools and the third-party data visualization tool are also significant actors in the production of SaaS. The self-developed content creation tools are designed for specific projects such as short descriptions below accommodations. The tool offers many variables to match with a keyword and will generate 20 to 30 relevant short descriptions to be put on the website. For instance, common descriptions including “位於市中心” (“located in the city center”), “5 分鐘即可抵達機場” (“located 5 minutes from the airport”), “minutes from the airport” (“距離機場僅幾分鐘路程”), etc. provides users with an overview of the accommodation.

The tool is described as “powerful and convenient” by interviewee B since it streamlines the pipeline of design-to-translation by saving a content designer's (or UX writer's) effort to design English texts on UI from scratch. However, the tool is sometimes unstable while processing a large number of words. "We are asked to translate the contents, counted by the number of the sentence, within limited hours,

and the tool usually crashes when the deadline approaches. I have learned a lesson that I need to save each sentence during the translation process" (interviewee B, personal communication, May 5, 2022). In addition, Expedia utilizes Tableau, a data visualization software focused on business intelligence, to visualize in-house translators' productivity. With Tableau's integration with XTM Cloud, "each translator is equipped with his/her Tableau dashboard showing the time spent on each translation task and the overall accumulated translated words."

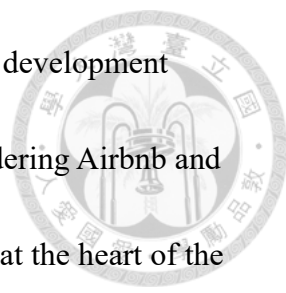
Moreover, since "the localization team sets up a monthly goal of translated words for each locale," Tableau is useful for translators to "view the progress through the bar chart showing the productivity by project, by period, and by text type" (interviewee B, personal communication, May 5, 2022). For instance, the average translation time for UI is 500 words per hour, while marketing content is measured at 200 words per hour.

In this way, translators' productivity is visualized and can be easily accessed by supervisors to monitor personal performance and manage the team. The aforementioned technological actors have been forming connections with other human actors, creating a unique SaaS localization network featuring a symbiosis of humans and technology. First of all, CAT tools improve translators' productivity by providing them with a convenient environment with resources for translation, while the data visualization tool helps translators keep up with the performance goal, such



as in the case of Airbnb's MateCat providing TM, MT, and editing space in a single window, and Expedia's use of Tableau. Next, the technological actors bring various human actors closer to TMSs and their integration with third-party programs, thus decreasing the turnaround time of the project's delivery to different actors, improving the efficiency of team management, and crystalizing the progress of localization projects so that stakeholders can stay informed anytime; this can be manifested by the case of Expedia where XTM is integrated with Slack. Finally, technological actors also facilitate communication between human actors so that the localization process can be operated at a global scale without the boundary of time and space, which is exemplified in Airbnb's case discussed earlier, where Skype is used to hold meetings for the language lead and localization PMs from the headquarter in the United States. The above results signify that technology has its agency to actively form connections with other human actors, subverting the traditional image that non-human actors are deprived of agency and usually neglected in the discussion of translation activity.

The technological actors not only solidify the formation of the SaaS localization network but also enhance and enlarge the network. Firstly, the technological actors solidify the network by making translation activity aligned with the process of agile software development. Agile software development is an approach widely adopted in the software industry since it offers flexibility for



adapting to changes in requirements at any stage during the product development cycle (Al-Saqqa, Sawalha & AbdelNabi, 2020). Additionally, considering Airbnb and Expedia's SaaS product is consumer-oriented, the role of the user is at the heart of the product development that prioritizes UX as the guiding principle. Thus, the features of the user-centered agile product development (UCASD) can shed light on how technological actors help make the localization process become agile and be blended into the existing SaaS product development. Two of the UCASD's principles are central to Airbnb and Expedia's process of product development, including “iterative and incremental design and development” and “continuous stakeholder involvement” (Brhel, Meth, Maedche & Werder, 2015). The former indicates that the development is conducted in a way that feedback gained in previous iterations is used to improve the potential product in future iterations. The latter shows that stakeholders should be actively involved during the entire development process for collecting feedback (Brhel, Meth, Maedche & Werder, 2015). In general, the new feature undergoes a series of iterative user interviews, usability testing, and quality assurance testing involving various roles such as developers, researchers, designers, etc. before its launch (Airbnb Design, n.d; Agarwal, 2011). Thanks to the technological actors, translation activity is imbued with flexibility that allows back-and-forth negotiation between various human actors. Moreover, updates of linguistic requirements, new

terminologies, feedback from the client's side or reviewers, etc. can all be efficiently completed through a combining use of CAT and digital communication tools. This echoes interviewee B's comment that "technology enables the smooth delivery of localization project by reducing turnaround, boosting the efficiency of integrating localization process into the agile product development" (interviewee B, personal communication, May 5, 2022).

In addition to the consolidation of the SaaS localization network, the technological actors also help expand the network by proactively connecting other human and non-human actors. As new technology emerges, the original technological actors might be replaced or updated via integration with more tools, leading to a change of interactions and forming new connections between the actors. For instance, XTM Cloud and Slack were originally used separately by Expedia's localization team. However, XTM Cloud's integration with Slack has changed how Expedia's staffs use the technology and interact with LSP. Simultaneously, the integration has also changed the relations between the technological actors, namely XTM Cloud and Slack, creating new connections in the localization network.

In sum, technologies are indispensable actors for producing localized products in response to SaaS's frequent updates for improving existing features, adding new features, fixing bugs, etc. The technological actors' participation in building and

expanding the SaaS localization network is key to Airbnb and Expedia's agile product development, which empowers the companies to adapt to the rapidly changing market with agile product updates in locales all over the world.

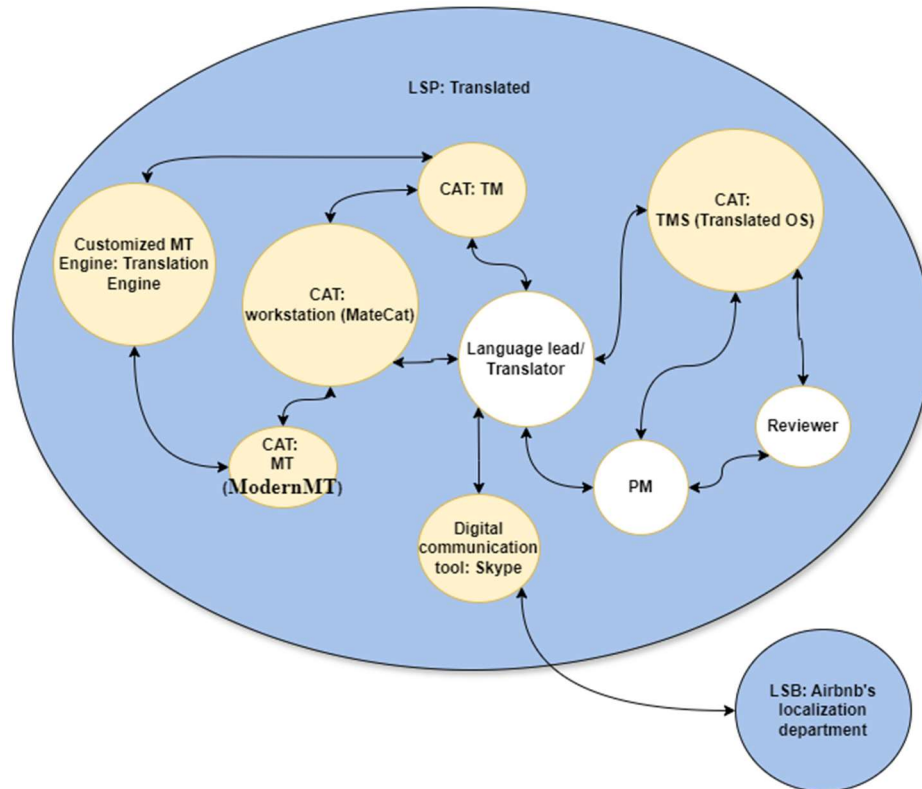


Figure 2. Airbnb's actor network

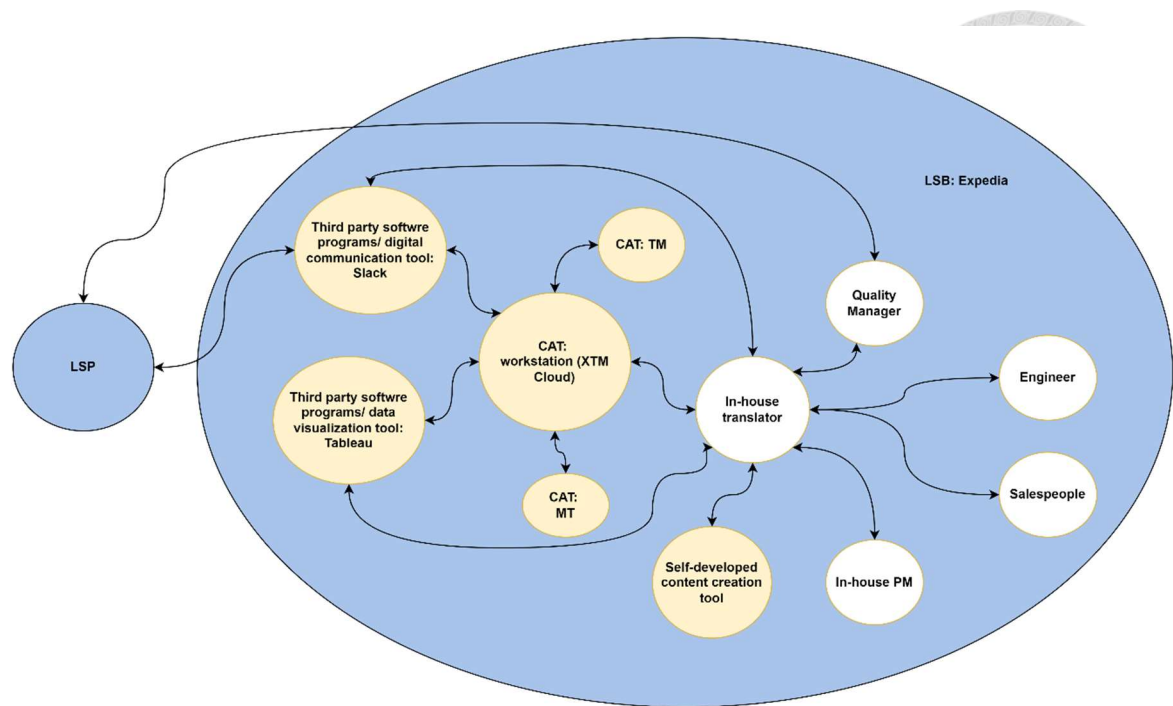


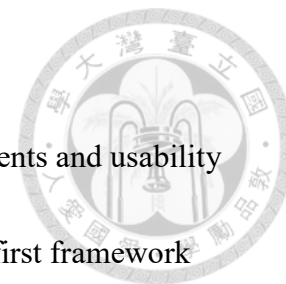
Figure 3. Expedia's actor network

*Description: fill color of yellow refers to non-human actors except for institutions; white refers to human actors; blue refers to institutions; two-way arrows indicates the dynamic relations between actors, which change overtime*

## 4.2 Translators Localize for Users

The exploration of the actor networks of Airbnb and Expedia in 4.1 has presented an overview of multiple actors producing a localized product as a final artifact. This section further examines the localized product as to how translators localize within the context of digital product-user communication. As mentioned earlier in 2.3, translators shape a product's UX through translating texts on the UI since UI is the touch point essential for users to interact with a product. In this section, an in-depth textual analysis of Airbnb and Expedia's translations on the UI will provide insights

into how texts create an engaging experience for users.



The two frameworks, the principles of textual usability's elements and usability heuristics, were used to conduct the textual analysis (see 3.4). The first framework focuses on a product's linguistic aspect including the principles of word choice, text rhythm, sentence length, and terminology consistency, while the second framework expands to investigate a product's comprehensive UX including the heuristics of matching between translation and users, matching between translation and real world, and matching between translation and genre. Each textual data is presented in a table format with the alignment of ST, target text (TT), and back translation (BT) for easier reading.

#### **4.2.1 The Principles of Elements of Textual Usability**

##### **4.2.1.1 Word Choice**

Airbnb features a selection of words expressing hospitality, including informal “you,” “we” and “expert,” and heartfelt expressions (see Tables 3, 4, and 5). As can be seen in examples 3.1 to 3.4 in the Table 3 below, Airbnb uses “你” (nǐ; informal use for communication between peers or elders to juniors) rather than “您” (nín; courteous use for communication between juniors to elders or subordinates to

superiors) when addressing “you” to customers<sup>1</sup>. Using the informal “you” helps

Airbnb talk to the customers as a close friend and reduce the distance between each

other. “你的旅程規劃專員” (BT: Your trip planner...), “為你安排” (BT:

Arrange...for you...), and “為你量身打造” (BT: ...tailored for you) in the following

examples were all translated with the informal “you” to create a friendly atmosphere.

|     | ST                                            | TT                           | BT                                                                          |
|-----|-----------------------------------------------|------------------------------|-----------------------------------------------------------------------------|
| 3.1 | Your trip designer can plan every last detail | <u>你</u> 的旅程規劃專員會安排所有細節      | Your trip planner will arrange all the details                              |
| 3.2 | a local team of professionals has you covered | 為 <u>你</u> 安排私人主廚和按摩師等各項貼心服務 | Arrange personal chefs and masseuses for you and other considerate services |
| 3.3 | Tools tailored to you                         | 為 <u>你</u> 量身打造的工具           | Tools tailored for you                                                      |

Table 3. The use of “你” in Airbnb's translated texts

In other cases of word choices, the addition of “我們” (BT: “we”) and “專人” (BT: “expert, specialist, or professional”) is prominent in Airbnb’s translation to create a welcoming ambiance as if the user were served by a real travel agent as seen in Table 4 below. “我們嚴選” (BT: We carefully select...) in example 4.1 has transformed the passive voice in the ST into an active tone with a first-person view in the TT. In example 4.2, the addition of professionals in “專人評估” (BT: Professionals evaluate...) provides a service the professionals giving the customers a peace of mind. This text appears on the landing page of Airbnb Luxe<sup>2</sup>, which serves

<sup>1</sup> Definitions of the Chinese words are from *Revised Mandarin Chinese Dictionary* by Ministry of Education, R.O.C.

<sup>2</sup> <https://www.airbnb.com.tw/luxury>

as a promotional site attracting users to click on the listed items. To meet the web page's goal, adding “professionals” into the text helps the customers rest assured that the service is reliable and trustworthy.



|     | ST                                                                            | TT                               | BT                                                                                                   |
|-----|-------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------|
| 4.1 | Each property is verified for pristine condition and meticulously maintained. | <u>我們</u> 嚴選所有房源，確保屋況良好，且經過精心維護。 | We carefully select all properties to ensure they are in good condition and meticulously maintained. |
| 4.2 | 300+ point inspection                                                         | <u>專人</u> 評估 300 多項細節            | Professionals evaluate more than 300 details                                                         |

Table 4. The use of “我們” and “專人” in Airbnb's translated texts

In the last few Airbnb's examples as seen in Table 5 below, heartfelt expressions were used to enhance a friendly climate. Heartfelt expressions refer to words that create a friendly, respectful, and welcoming place, with which Airbnb leverages to build its relationship with customers. Example 5.1 appears on the special landing page of Airbnb's product updates in the year 2020, where the company boasts the feat of releasing more than 50 updates at one time<sup>3</sup>. It is a promotional opportunity which Airbnb seizes to catch the public's attention and attract customers. In this sense, the addition of “誠意” (BT: “Sincerely”) to modify “推出” (BT: “introducing”) shows Airbnb's genuineness and ambition to promote the product. Furthermore, Airbnb

<sup>3</sup> <https://www.airbnb.com/release/2021-winter>

renders a warm image of home by using “家” (BT: “home”) to enhance the visualization of the description of “Belong anywhere.”



|     | ST                                                                                                | TT                                                | BT                                                                                                        |
|-----|---------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 5.1 | Introducing AirCover for Hosts                                                                    | <u>誠意</u> 推出專為房東提供的 AirCover                      | Sincerely Launching AirCover for Landlords                                                                |
| 5.2 | Find the perfect place to stay at an amazing price in 191 countries. Belong anywhere with Airbnb. | 以超棒的價格在 191 個國家找到完美的住處，跟著 Airbnb 一起 <u>家在四方</u> 。 | Find the perfect place to live in 191 countries at great prices, and make your home anywhere with Airbnb. |

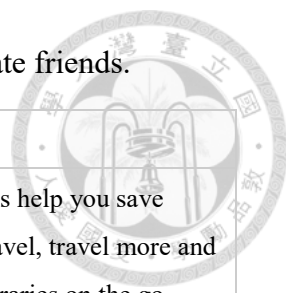
*Table 5.* The use of “heartfelt expressions” in Airbnb's translated texts

On the other hand, though Expedia shows a similar translation pattern as with Airbnb, it renders the hospitality in a different way. Instead of using the informal “you,” Expedia uses the courteous “您” (nín) when addressing “you” to customers (see Table 6 below). In examples 6.1-6.3, “you” is always expressed in the polite form no matter the text is on a promotional web page for attracting users as seen in 6.1<sup>4</sup> or in the process of booking the reservation as seen in 6.2 and 6.3<sup>5</sup>, which the goal of the web page is to provide clear instructions for users to complete the registration. Using the polite “you” creates a distancing effect between Expedia and customers by elevating the latter to a superior status like juniors speaking to seniors. In this sense, Expedia’s hospitality is displayed in a cordial and formal way, while Airbnb displays

<sup>4</sup> <https://www.expedia.com/Hotels>

<sup>5</sup> Since the links of web pages for the booking process are one-time, they are unattainable and thus are not listed in this study.

hospitality in a down-to-earth approach by regarding users as intimate friends.



|     | ST                                                                                          | TT                                                       | BT                                                                                         |
|-----|---------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 6.1 | Our app deals help you to save on trips so you can travel more and manage it all on the go. | 我們的 App 優惠可幫 <u>您</u> 節省旅行費用，讓 <u>您</u> 盡享更多旅行並隨時隨地管理行程。 | Our app deals help you save money on travel, travel more and manage itineraries on the go. |
| 6.2 | Make updates to your itinerary or cancel a booking                                          | 更新 <u>您</u> 的行程或取消預訂                                     | Update your itinerary or cancel a reservation                                              |
| 6.3 | We will process your payment in your local currency                                         | 我們將以 <u>您</u> 的當地貨幣向 <u>您</u> 收取住宿費                      | We will bill you for your stay in your local currency                                      |

*Table 6.* The use of “您” in Expedia’s translated texts

In other cases of Expedia’s word choice, the addition of “我們” (BT: “we”) and heartfelt expressions are also observed as in Airbnb (see Tables 7 and 8 below). As can be seen in examples 7.1-7.3, the addition of “我們” (BT: “we”) changes the imperative tone to the first-person perspective and thus highlights that the customers are served by “us,” a hospitable OTA like a real-person travel agent. Furthermore, Expedia also uses “家” (BT:home) to render the hotel as a welcoming place like home as seen in example 8.1’s “如同在家一般” (BT: “making you feel as comfortable as at home”). In this case, “賓至如歸” (BT: “making guests feel like at home”) and “貼心” (BT: “considerate”) also enhance a home-sweet-home image.

|     | ST                                                  | TT                             | BT                                                                                     |
|-----|-----------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------|
| 7.1 | Book cheap hotel deals now for your next vacation.  | <u>我們</u> 更提供旅客的真心評價，讓你預訂時更放心！ | We also provide sincere reviews from passengers, so you can rest assured when booking! |
| 7.2 | It's always a good idea to ensure that you can make | <u>我們</u> 了解計劃有時趕不上變化，提供可以     | We understand that plans can sometimes change, and having the option to change         |

|     |                                                     |                           |                                                                        |
|-----|-----------------------------------------------------|---------------------------|------------------------------------------------------------------------|
|     | changes to your travel plans, just in case.         | 變更的預訂選項能讓您訂得更安心。          | your booking can give you more peace of mind.                          |
| 7.3 | bring travelers to your door from around the world. | <u>我們</u> 讓旅宿可以觸及世界各地的旅客。 | we make accommodation accessible to travelers from all over the world. |

Table 7. The use of “我們” in Expedia’s translated texts

|     | ST                                                                                                                | TT                                                                                               | BT                                                                                                                                                                                                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.1 | Hotel is surrounded by shopping & dining options, connected to Metro and located in 10-minute walk to Taipei 101. | 飽覽窗外台北 101 都市夜景，將一切美好盡收眼底。W 提供 <u>賓至如歸的貼心服務</u> ，讓您 <u>如同在家一般</u> 的舒適自在；跳脫一般飯店框架，每個角落盡是設計巧思待你發掘。 | Enjoy the city night view of Taipei 101 outside the window, and have a panoramic view of all the beauty. W provides a homely and considerate service, making you feel as comfortable as at home; breaking away from the general hotel framework, every corner is full of design ingenuity waiting for you to discover. |

Table 8. The use of “heartfelt expressions” in Expedia’s translated texts

To sum up, both Airbnb and Expedia’s word choices help present the brands as the hospitable travel agencies with different personalities: the former is a customer’s close friend while the latter appears to be a courteous butler. According to Airbnb’s brand statement (2019), Airbnb is dedicated to capturing that feeling of relaxing at home in a familiar place with the excitement of travel. Similarly, Expedia’s tone of voice guide (n.d.) dictates the four pillars of executing its brand personality, including “unafraid to be human,” “respectful of the reader,” “casual not corporate,” and “animated.” The word choices have realized the abstract brand voices to tangible personalities, with which the translators leverage to infuse human touch into the

products by interacting with users like a unique person.



#### 4.2.1.2 Text Rhythm

In terms of text rhythm, both Airbnb and Expedia feature the use of three, four, or five-character expressions as can be seen in Tables 9 and 10 below.

|     | ST                                                                                                                                                                                         | TT                                                                         | BT                                                                                                                                                                                                       |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.1 | The Airbnb Luxe difference                                                                                                                                                                 | Airbnb Luxe <u>與眾不同</u>                                                    | Airbnb Luxe is different from the rest                                                                                                                                                                   |
| 9.2 | Your trip designer can plan every last detail and make sure everything is just right.                                                                                                      | 你的旅程規劃專員會安排所有細節，確保一切 <u>盡善盡美</u> 。                                         | Your trip planner will arrange all the details and make sure everything is perfect.                                                                                                                      |
| 9.3 | The Greatest Outdoors                                                                                                                                                                      | <u>走出戶外，回歸自然</u>                                                           | Get out of the house and back to nature                                                                                                                                                                  |
| 9.4 | Always included and always free.                                                                                                                                                           | <u>隨時提供，永久免費</u> 。                                                         | Always available, always free.                                                                                                                                                                           |
| 9.5 | One total price, up front                                                                                                                                                                  | <u>一個總價 一目了然</u>                                                           | One total price, clear at a glance                                                                                                                                                                       |
| 9.6 | Airbnb Plus hosts take the extra effort to ensure the home is extra clean, clutter-free, and fully functioning—from manicured outdoor spaces to tidy bathrooms with strong water pressure. | 不管是經過細心整理的戶外區域，還是水壓足夠的乾淨衛浴，Airbnb Plus 房東都會盡全力確保房源 <u>一塵不染、整齊美觀，功能完善</u> 。 | Whether it's a well-organized outdoor area or a clean bathroom with adequate water pressure, Airbnb Plus hosts go out of their way to make sure that their properties are spotless, tidy and functional. |

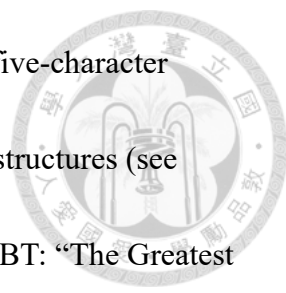
Table 9. The use of “four-character expressions” in Airbnb's translated texts

|      | ST                                  | TT                          | BT                                      |
|------|-------------------------------------|-----------------------------|-----------------------------------------|
| 10.1 | Discover new places and experiences | <u>新地點、新體驗</u>              | New location, new experience            |
| 10.2 | Save today on a trip for tomorrow   | <u>今天省，隨時走</u>              | Save today, go anytime                  |
| 10.3 | Discover how this helps you.        | 快來看看我們可以如何助旅宿 <u>一臂之力</u> 。 | Come see how we can help accommodation. |

|      |                              |              |                                                                        |
|------|------------------------------|--------------|------------------------------------------------------------------------|
| 10.4 | Because flexibility matters. | 行程有彈性，出遊沒煩惱！ | The itinerary is flexible, so you don't have to worry about traveling! |
|------|------------------------------|--------------|------------------------------------------------------------------------|

*Table 10. The use of “three or five-character expressions” in Expedia’s translated texts*

Four-character expressions have been commonly used as idioms (known as 成語 or chéngyǔ) in Chinese, which conveys complex meanings or metaphors in a concise and poetic manner based on historical lore or classical literature (Ho et al., 2014). The use of chéngyǔ not only evokes readers’ senses to keep the texts engaging but also adds the musicality to the texts with “pleasing rhythm to reading” (Ho et al., 2014). As can be seen in examples 9.1, 9.5, 9.6 and 10.3, “與眾不同,” (yǔ zhòng bù tóng, meaning different from the rest) “一目了然,” (yī mù liǎo rán, meaning be clear at a glance) “一塵不染,” (yī chén bù rǎn, meaning spotless) and “一臂之力” (yī bì zhī lì, meaning to give someone a hand) are all chéngyǔ to make the texts catchy and rhythmic. In addition, the parallel structure, the pattern deeply rooted in Chinese literature, of some four-character idioms found in this study features the use of symmetry and antithesis (Zhang, 2021). Using the idiomatic expression with parallel structure makes the translation read and sound like authentic Chinese. For instance, in example 9.2, “盡善盡美” (jìn shàn měi, meaning as good as it gets) is composed of two similar pairs, “盡善” and “盡美,” both referring to reach perfection.



Though not being considered as *chéngyǔ*, other three, four, or five-character expressions grab readers' attention with their parallel and rhythmic structures (see Tables 9 and 10). As can be seen in examples 9.3 and 9.4, a phrase (BT: "The Greatest Outdoors") and a sentence (BT: "Always included and always free.") are rendered as symmetric pairs. "走出" (zǒu chū; BT: get out of) and "回歸" (huí guī; BT: go back to) are verbs following with the nouns of "戶外" (hù wài; BT: outdoor) and "自然" (zì rán; BT: nature). Similarly, "隨時" (suí shí; BT: anytime) and "永久" (yǒng jiǔ; BT: permanently) are adverbs following with a verb of "提供" (tí gong; BT: provide) and "免費" (miǎn fèi; BT: free).

Moreover, a similar pattern can also be observed in examples 10.1, 10.2, and 10.4. "地點" (dì diǎn; BT: location) and "體驗" (tǐ yàn; BT: experience) share the same adjective modifier of "新" (xīn, back translation: new). "今天" (jīn tiān; BT: now or today) and "隨時" (suí shí; BT: anytime) are followed with the verbs of "省" (sheng; BT: save) and "走" (zǒu; BT: go). Lastly, "行程有彈性" (xíng chéng yǒu tán xìng; BT: The itinerary is flexible) and "出遊沒煩惱" (chū yóu mò fán nǎo; BT: travel without worry) are presented with the same sentence structure comprising a noun, a verb, and an object. To sum up, these three, four, or five-character expressions observed in Airbnb and Expedia's translation have made the products sound authentic like a native Mandarin speaker. This corresponds to the account of interviewee C that

“all translations in localization should sound like they are written by local Taiwanese”

(personal communication, June 29, 2022).



#### 4.2.1.3 Sentence Length

Sentence length can influence the users' comprehensibility of texts since lengthy texts increase users' cognitive load (Suojanen et al., 2015, p56). Byrne also pointed out that enhancing cognitive ergonomics by avoiding long sentences is found as one of the pillars of writing technical texts (Byrne, 2006, p.163). This principle of concise writing is also applied in crafting words on the UI since “there is limited space and attention for words” on the restricted space (Podmajersky, 2019). In other words, concise sentence length is key to textual usability for polishing a digital product's UX.

To create effective UX content for smooth interactions with users, Podmajersky (2019) suggested that English texts on buttons should be three or fewer words and that all texts on the UI are suggested to be shorter than 50 characters wide. Moreover, Wang and Qin (2010) pointed out that the sentence in translated Chinese texts (28.27 words) is longer than English STs (18.23 words) by an average of 10.04 words, meaning that translated Chinese texts are approximately 1.55 longer than that of English (Xiao & Hu, 2015). It can thus be deduced from the above that Chinese translated texts on the UI's buttons are suggested to be four characters or less and that

all Chinese translated texts are advised to be approximately 77.5 characters wide.

Though Chinese translation has more characters than the English ST, an English word usually occupies more space on the UI than a Chinese word does, causing the source and TTs appear to be the similar length on the UI (see Figures 4 and 5).

Keeping the space of TTs aligned with that of the ST is particularly important in SaaS localization since texts in any language have to fit in the UI formed by the same visual elements. Characters too long or too short will result in a mismatch between texts and the genre, leading to UX glitches that frustrate users.

Although not all of the translations sampled in this study comply with the above-mentioned guidelines of UX contents, these concise writing criteria can still be observed in Figures 4 and 5 below. In Figure 4, sub-headings of “Find answers & get inspired along your hosting journey” and its Chinese counterpart, “為自己舉辦體驗時遇到的問題找到解答，同時汲取靈感” (BT: “Find answers to the questions you have about organizing an experience and get inspired!”) occupy the same space on the UI. Moreover, the translation is shorter than 77.5 character wide with only 24 characters.

On the other hand, Expedia’s English text of “You can enjoy access to perks like Member Prices, saving an average of 15% on thousands of hotels. Terms may apply.” and its Chinese counterpart of “把握會員價超值禮遇，享受數萬間飯店平均 15%

折扣優惠！須遵守相關條款。” (BT: “Take advantage of the member rate and enjoy an average 15% discount on tens of thousands of hotels! Terms and conditions apply”) also show a similar translation pattern as that of Airbnb (see Figure 5). The translation is shorter than 77.5 character wide with only 37 characters. However, the weight of the two versions on the UI is not aligned with the Chinese one that is shorter with only two lines, while the English texts are three lines. Lastly, the Chinese texts on buttons in Figure 5 are more than four characters, which fails to comply with the concision rule for effective UX content.

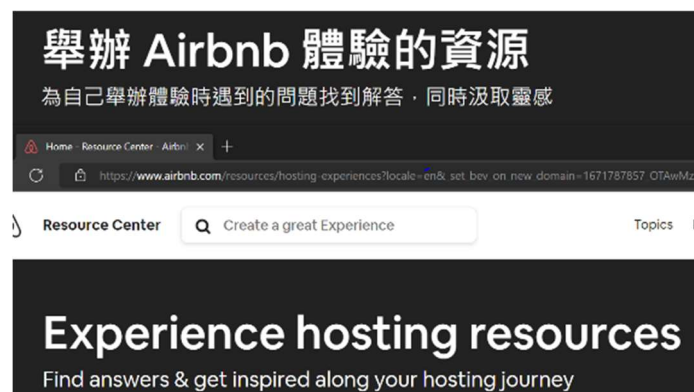
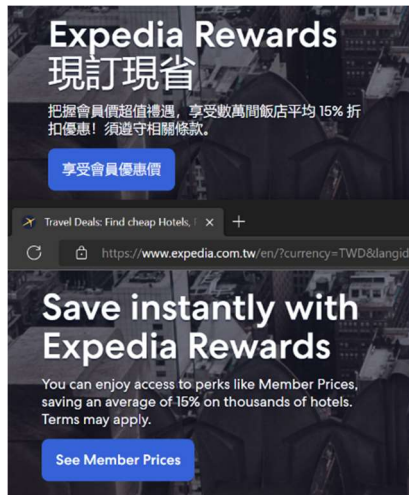


Figure 4. Airbnb's English and Chinese texts



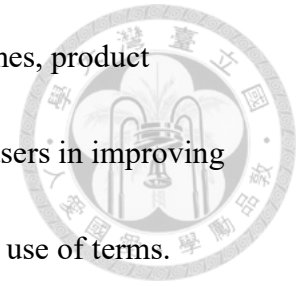
*Figure 5. Expedia's English and Chinese texts*

To sum up, the TT's aligned space with its ST and limited characters of the ST are conducive for Airbnb and Expedia to create textual usability for effortless UX. However, to reach optimal UX, translators need to pay more attention to make texts on buttons more concise with less than four characters.

#### **4.2.1.4 Terminology Consistency**

Terminology consistency is another significant element of textual usability. The terminology refers to special terms used in specialized fields such as technology, law, medicine, etc., which is often incorporated into a glossary for translation (Cabr , 2010). A translation glossary is a list of approved translations for specific terms in the source and target languages used in translation projects, aiming to ensure accuracy, consistency, and productivity (Guerberof Arenas, 2014). Common items in a glossary

may include terminology, acronyms or abbreviations, company names, product names, company slogans, etc. (see Table 11) A glossary can assist users in improving their comprehension and avoiding confusion through the consistent use of terms.



| English             | Chinese |
|---------------------|---------|
| Activision Blizzard | 動視暴雪    |
| Adaptive reuse      | 建築活化再利用 |
| default risks       | 違約風險    |

*Table 11. An example of translation glossary adapted by the author from the chart from Ju & Wu (2019, p. 113)*

Thanks to the glossaries, both Airbnb and Expedia comply with the rule of consistency to ensure certain terms are translated in the same way throughout the products. As interviewee A pointed out, “There is an official glossary documenting Airbnb’s commonly used terms. [It is required for translators] to follow the glossary” (personal communication, April 14, 2022). As previously mentioned in 4.2.1, “you” is translated as informal “你” in all Airbnb’s content while “you” is translated as formal “您” in Expedia. In addition, “home” and “stay” are translated as “房源” (BT: “room listing”) in Airbnb, while “stay” is translated as “飯店” (BT: “hotel”) or “住宿” (BT: “accommodation”) in Expedia regardless of the position that these terms

appear (see Figures 6-10). As can be seen in Figures 6 and 7, “stay” appears on a promotional landing page while in Figure 8, it serves as a navigational button for directing the hosts to list their accommodation. On the other hand, Expedia never translates “stay” as “房源” (BT: room listing) as can be seen in Figures 9 and 10.



## 100+ filters for tailored stays

Pick your price range, the number of rooms you want, and other key amenities to find the stay that fits your needs.



## 超過 100 項篩選條件，方便你搜尋符合需求的房源

選擇價格範圍、所需房間數量以及其他重要的設備與服務，搜尋符合需求的房源。

Figure 6. Airbnb's texts in English and Chinese

## Trending stays in Page

These homes have great reviews and get lots of attention on Airbnb.



**Earthen home in Page** ★ 4.93 (464)  
Hogan 2 Glamping at Shash Dine'  
Viewed 530 times last week  
Oct 24 – 29  
€ 236 night · € 1,179 total



**Condo in Page** ★ 4.94 (311)  
Powell Beachwood Bungalow  
Viewed 204 times last week  
Oct 28 – Nov 2  
€ 143 night · € 713 total



**Tent in Page** ★ 4.96 (102)  
Bell Tent SUITE Glamping at Shash...  
Viewed 168 times last week  
Oct 11 – 16  
€ 249 night · € 1,244 total



**Home in Page** ★ 4.96 (96)  
2 Bedroom 1 Bath Duplex with Free...  
Viewed 112 times last week  
Oct 29 – Nov 4  
€ 137 night · € 819 total

## Page的搶手房源

這些房源不但廣受好評，在 Airbnb 上更是人氣爆表。



**位於Page的生態屋** ★ 4.93 (464)  
哈斯狄恩 ( Shash Dine ) 的...  
上週有 530 次瀏覽量  
10月24日至29日  
€ 236 晚 · 總計 € 1,179



**位於Page的私有公寓** ★ 4.94 (311)  
Powell Beachwood Bungalow  
上週有 204 次瀏覽量  
10月28日至11月2日  
€ 143 晚 · 總計 € 713



**位於Page的帳篷** ★ 4.96 (102)  
哈斯狄恩 ( Shash Dine ) 的鐘形帳篷...  
上週有 168 次瀏覽量  
10月11日至16日  
€ 249 晚 · 總計 € 1,244



**位於Page的房源** ★ 4.96 (96)  
2臥室1浴室複式公寓，免費停車...  
上週有 112 次瀏覽量  
10月29日至11月4日  
€ 137 晚 · 總計 € 819

Figure 7. Airbnb's texts in English and Chinese

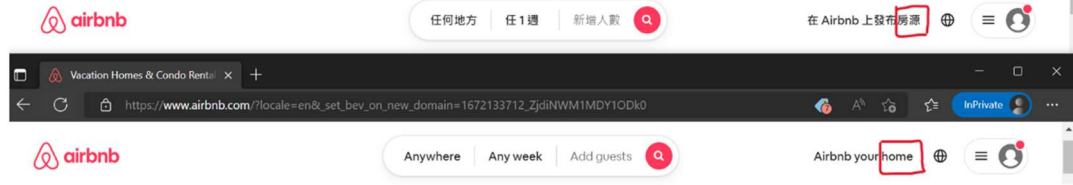


Figure 8. Airbnb's texts in English and Chinese



Figure 9. Expedia's texts in English and Chinese

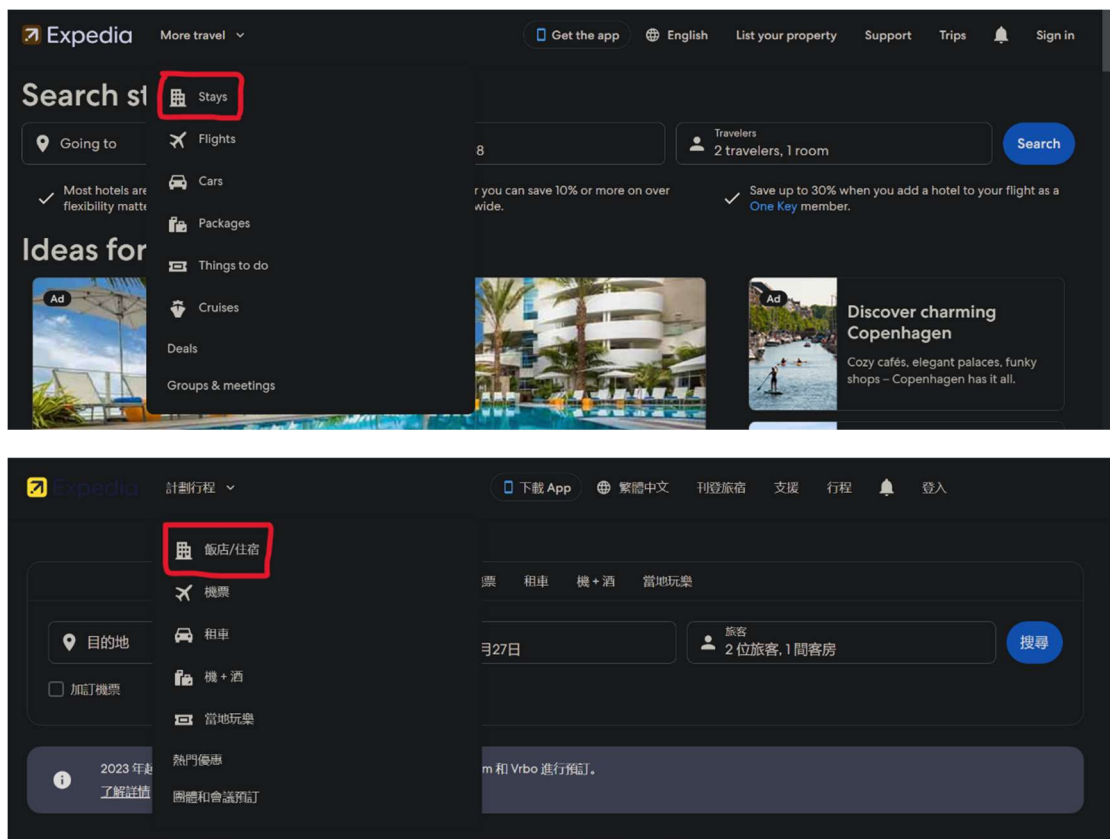


Figure 10. Expedia's texts in English and Chinese



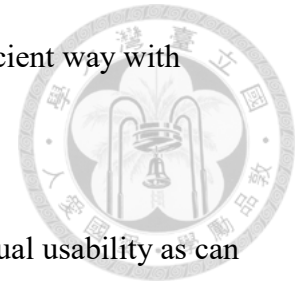
Since “stay” is prevalently repetitive in the OTAs, term consistency not only boosts translators’ productivity by decreasing the time choosing the word but also improves users’ comprehension by reducing the glitches while looking for the same things across the websites.

## 4.2.2 Usability Heuristics

### 4.2.2.1 The Heuristic of Matching between Translation and Users

After examining Airbnb and Expedia’s textual usability from a linguistic aspect in the previous section, this section continues to investigate how translated texts influence a product’s comprehensive UX. The first heuristic, “matching between translation and users,” scrutinizes how the texts support different users’ needs and how users’ characteristics affect the translation strategy. OTA’s target users use OTAs since the services offer functional values (monetary and quality-of-benefits), such as reasonable pricing, the facility to compare prices, promotional offers, the convenience of use, consistency in offering benefits, et cetera. (Talwar, Dhir, Kaur, & Mäntymäki, 2020) In other words, users of OTAs aim to seek useful information to achieve their goals of either finding or renting accommodation as soon as possible at a reasonable

price. To this end, texts on UI should give users solutions in an efficient way with clear instructions.



Airbnb and Expedia have reached this goal with excellent textual usability as can be seen in 4.2.1. Firstly, the three, four, or five-character expressions make the translations sound authentic, accelerating their reading speed and enhancing users' comprehensibility (see 4.2.1.2). Secondly, to decrease users' cognitive load while achieving their goals in the products, both companies keep translations' occupying space on the UI similar with that of their STs and limit translations' characters on the UI (see 4.2.1.3). Lastly, terminology consistency ensures that users are not confused with the same things rendered in different ways, decreasing the glitches while they are navigating through the products (see 4.2.1.4)

#### **4.2.2.2 The Heuristic of Matching between Translation and the Real World**

The second heuristic, "matching between translation and the real world," explores how translations adapt to various cultures to engage users from different cultural backgrounds. Substitution, amplification, and rewriting are the three strategies observed to make the translations match with the real world. This can be seen in Figure 11 below.

### How to book a hotel?

When you book through Expedia, the entire process is simple. You'll find a wide range of accommodation options and destinations to choose from, as well as a variety of search filters to help you find exactly what you're looking for. That means you can search exclusively for hotels with a pool, pet-friendly policies, or family-friendly amenities. [Las Vegas hotels](#) and [New York hotels](#) are especially popular, but you'll also find options for other destinations like [Myrtle Beach](#).



### 如何預訂飯店?

上 Expedia 智遊網預訂飯店，過程輕鬆又簡單。不但有多樣化的住宿選擇、目的地齊全，更有多項搜尋篩選條件，幫助您找到心目中最理想的飯店。例如，您可依需求找到附泳池的飯店、可攜帶寵物入住的飯店，或是適合全家大小一起入住的飯店。[台北飯店](#)和[台中飯店](#)是目前最熱門的選擇，其他像[礁溪飯店](#)也相當受到歡迎。

*Figure 11. Expedia's texts*

In this example, the copy says: “When you book through Expedia, the entire process is simple...Las Vegas hotels and New York hotels are especially popular, but you'll also find options for other destinations like Myrtle Beach.” However, its translation shows no signs of foreign place names and landmarks, instead described as follows:

“上 Expedia 智遊網預訂飯店，過程輕鬆又簡單.....台北飯店和台中飯店是目前最熱門的選擇，其他像礁溪飯店也相當受到歡迎<sup>6</sup>。(BT: “Booking a hotel on Expedia is easy and simple ..... Taipei hotels and Taichung hotels are currently the most popular choices, while others like Jiaoxi hotels are also quite popular.”). The strategy of substitution seen in this example creates the image of bustling cities for Taiwanese users with Taipei and Taichung, which is similar to what Las Vegas and New York offer to American users. In a similar vein, Jiaoxi, a township in northern

<sup>6</sup> <https://www.expedia.com.tw/Hotels>

Taiwan famous for vacation, delivers a sense of relaxation resembling Myrtle Beach.

In the case of 13.2, “台北城中的世外桃源” (BT: “Xanadu in Taipei City”) enhances the attractiveness of the hotel by metaphorically comparing its mountain-view room to Xanadu, referring to “a very impressive and beautiful place” according to the Cambridge Dictionary (see Table 13 and Figure 13).

In addition to substitution, amplification strategy is adopted to incorporate cultural elements into the TT, making the translations relevant to Taiwanese users. Expedia’s several pieces of TTs were found to be vested with additional details that did not exist in the STs, including local information such as landmarks, hotel names, and administrative area names. This can be seen in Table 12 and its corresponding image, Figure 12, below:

|      | ST                                                                                                                | TT                                                                                             | BT                                                                                                                                                                                                                                                                                                                               |
|------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12.1 | Luxury Getaway in Buzzing District                                                                                | 在 <u>台北信義區最潮的五星飯店</u> ，盡享豪華 <u>國外度假感</u>                                                       | In the trendiest five-star hotel in Taipei's Xinyi District, enjoy a luxury foreign vacation                                                                                                                                                                                                                                     |
| 12.2 | Hotel is surrounded by shopping & dining options, connected to Metro and located in 10-minute walk to Taipei 101. | 飽覽窗外 <u>台北 101</u> 都市夜景，將一切美好盡收眼底。 <u>W</u> 提供賓至如歸的貼心服務，讓您如同在家一般的舒適自在；跳脫一般飯店框架，每個角落盡是設計巧思待你發掘。 | Enjoy the night view of the Taipei 101 city outside the window, and have a panoramic view of all the beauty. W Hotel provides a homely and considerate service, making you feel as comfortable as at home; breaking away from the general hotel framework, every corner is full of design ingenuity waiting for you to discover. |

Table 12. Expedia’s text

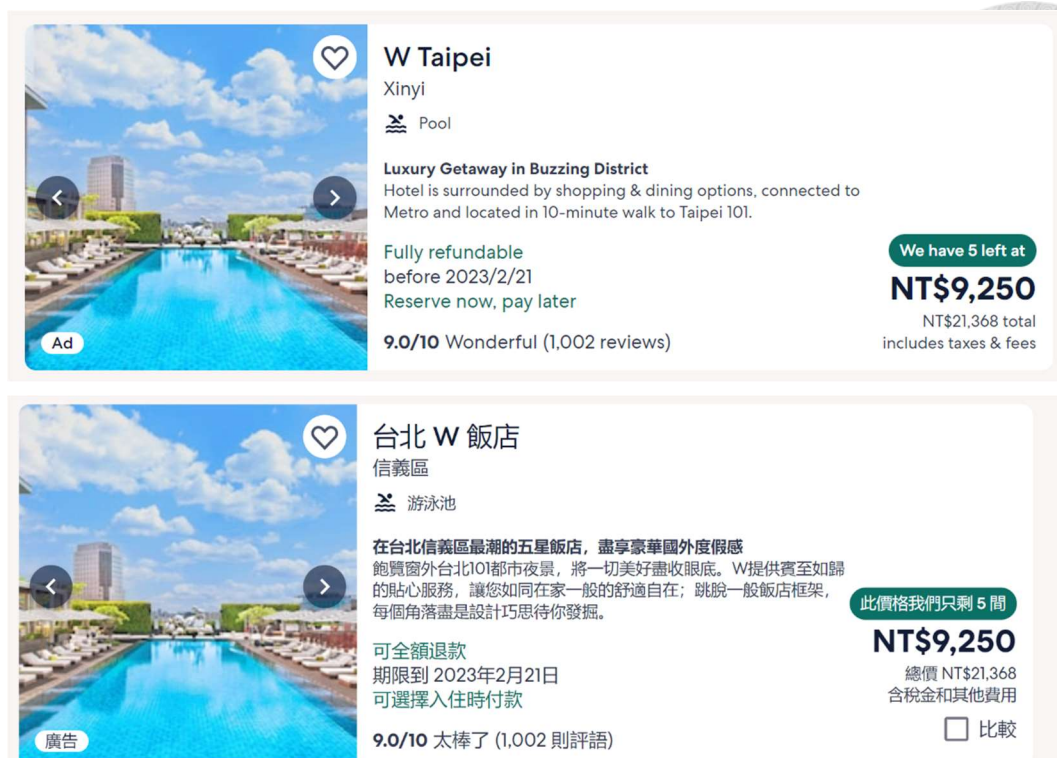
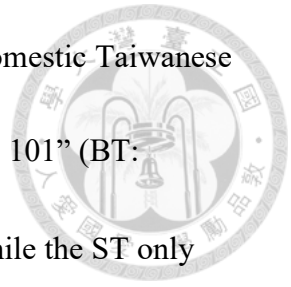


Figure 12. Expedia's text

In the example of 12.1, the translator explicated the “Getaway” in the ST by describing the hotel as “最潮的五星飯店” (BT: “the trendiest five-star hotel”) which is situated at “台北信義區” (BT: “Taipei's Xinyi District”), namely the “Buzzing District” in Taipei city. Since the implied users of the ST are foreigners who might have no idea where Xinyi District is located, this information is simply rendered as a buzzing place. However, it is common sense for Taiwanese that Xinyi District is a lively area in Taipei. With this addition, the text can easily engage Taiwanese users with the help of their prior knowledge of the Xinyi District. Furthermore, “國外度假感” (BT: “foreign vacation”) is added to delineate a dreamy overseas holiday that the

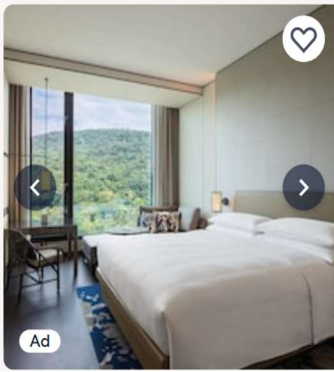
“trendiest five-star hotel in Taipei's Xinyi District” can bring to a domestic Taiwanese traveler seeking for exotic vacation vibes. In the case of 12.2, “台北 101” (BT: “Taipei 101”) and “W” (BT: “W Hotel”) are specified in the TT, while the ST only vaguely refers them as “Hotel” and “shopping & dining options.”



In a similar vein, as can be seen in Table 13 and Figure 12 below:

|      | ST                                                                                                      | TT                                                                                                       | BT                                                                                                                                                                                                                                                                                                                          |
|------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13.1 | Great Mountain View with Relax Ambience                                                                 | 最佳視野景觀，輕度假首選的 <u>五星國際品牌酒店</u>                                                                            | The best view and landscape, the first choice for light holidays five-star international brand hotel                                                                                                                                                                                                                        |
| 13.2 | 500 meters to MRT. Gracious Shihlin Residence Garden and Yangming Mountain View. Close to Night Market. | 距離捷運士林站步行僅約五分鐘，緊鄰台北著名觀光景點—士林官邸及 <u>士林夜市</u> 。 <u>尊貴</u> 山景客房可坐擁眺望整片士林官邸與陽明山美景，擁有「 <u>台北城中的世外桃源</u> 」之美稱。 | It is only about a five-minute walk from MRT Shilin Station, and it is close to the famous sightseeing spots in Taipei - Shilin Official Residence and Shilin Night Market. The Premier Mountain View Room can overlook the entire Shilin Mansion and Yangming Mountain, and has the reputation of "Xanadu in Taipei City". |

Table 13. Expedia’s text





**Renaissance Taipei Shihlin Hotel**  
Shilin  
 Pool

**Great Mountain View with Relax Ambience**  
500 meters to MRT. Gracious Shihlin Residence Garden and Yangming Mountain View. Close to Night Market.

Fully refundable  
before 2023/2/21  
[Reserve now, pay later](#)

**8.8/10** Excellent (177 reviews)

We have 5 left at

**NT\$5,490**  
NT\$12,682 total  
includes taxes & fees



Figure 13. Expedia's text

In the example of 13.1, “五星國際品牌酒店” (BT: “five-star international brand hotel”) is indicated in the TT to elaborate on the “Relax Ambience” in the ST. In the case of 13.2, the "Night Market" in the ST is expressed as "士林夜市” (BT: “Shilin Night Market”) in the TT to enrich the image of lively surroundings since it is a famous spot well known to Taiwanese.

Besides making texts relevant to target users, translators leverage the rewriting strategy based on the context where the texts are situated on the UI to grab users' attention or induce them to click on the texts. Figures 14 and 15 both appear in the “Search Hotel” webpage as can be seen in Figure 14, where users can search for accommodations by filtering the period of stay, date, number of people, budget, and rating. The "Search Hotel" webpage is full of hotel listings striving to attract users' attention, prompting them to click on the listings to view the details and eventually book the reservation. In this sense, texts on each listing are rendered as captivating as

possible to catch users' attention.

To this end, a sentence was added in the TT that does not have its counterpart in the ST in the example 12.2: “W 提供賓至如歸的貼心服務，讓您如同在家一般的舒適自在；跳脫一般飯店框架，每個角落盡是設計巧思待你發掘。” (BT: “W Hotel provides a homely and considerate service, making you feel as comfortable as at home; breaking away from the general hotel framework, every corner is full of design ingenuity waiting for you to discover.”). This added sentence illustrates the details of W Hotel, stimulating users’ imagination, and arousing their curiosity to click on the image. Rewriting the ST thus creates a homely, welcoming, and sophisticated accommodation.

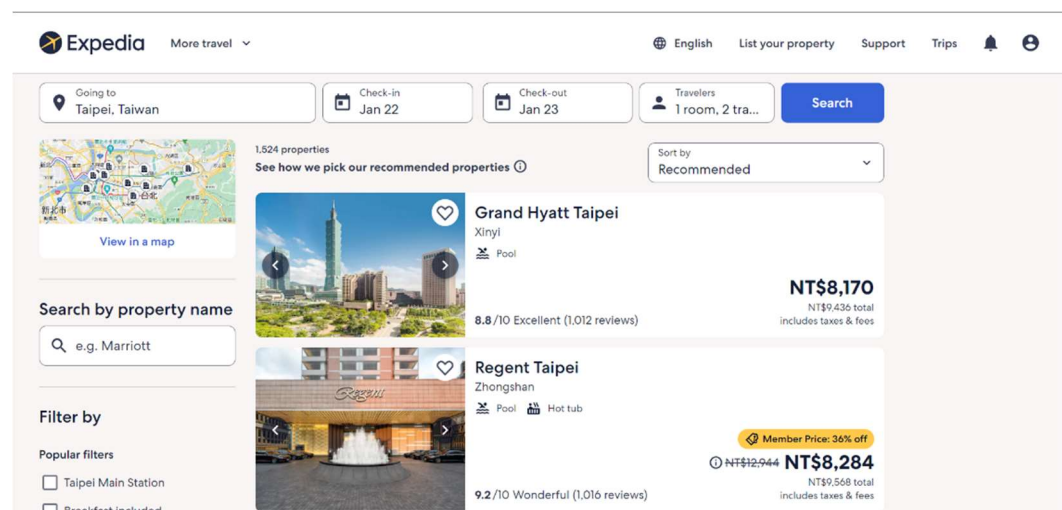


Figure 14. Expedia's "Search Hotel" webpage

#### 4.2.2.3 The Heuristic of Matching between Translation and Genre

The third heuristic, “matching between translation and genre,” explores how

translations match the genre's conventions of visual elements. As mentioned earlier in 2.1 (see Chapter 2), SaaS is a digital genre synthesizing multiple multimodal elements, and users' interactions with the product are determined by the holistic effect co-created by different elements on the UI. Having a context-aware mentality is significant in localizing a SaaS product since the same texts might appear in various locations on the UI given the interactive nature of SaaS.

This can be seen in Figures 17 and 18, in which “I’m flexible” shows up twice. In Figure 15, “I’m flexible” is rendered as “彈性日期” (BT: “flexible date”). The translator can extrapolate that the text’s meaning is opposite of a fixed time session since it is placed on the same hierarchy as “Choose dates” under the search bar of “Check in/Add dates,” where users are required to choose either “Choose dates” or “I’m flexible.” On the other hand, the same text is delivered as “隨心所欲” (BT: “whatever you want”) in Figure 16 since it is located under the search bar of “Where/Search destinations” along with the maps of the globe, suggesting that the text means that users can choose anywhere to travel as opposed to the neighboring maps of Europe and Japan.

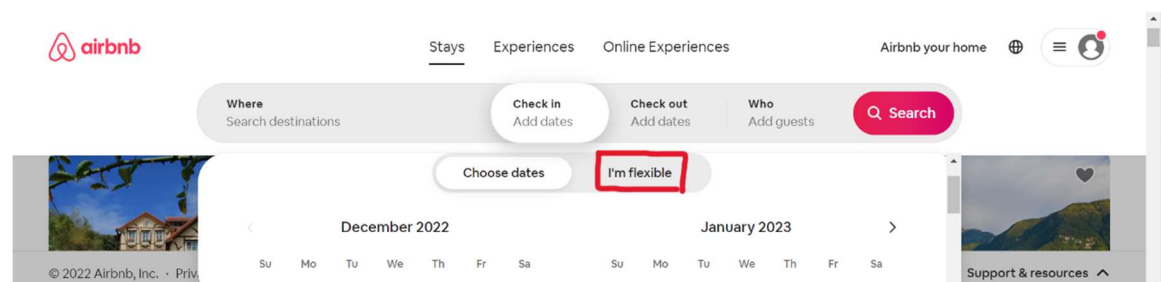




Figure 15. Airbnb's text

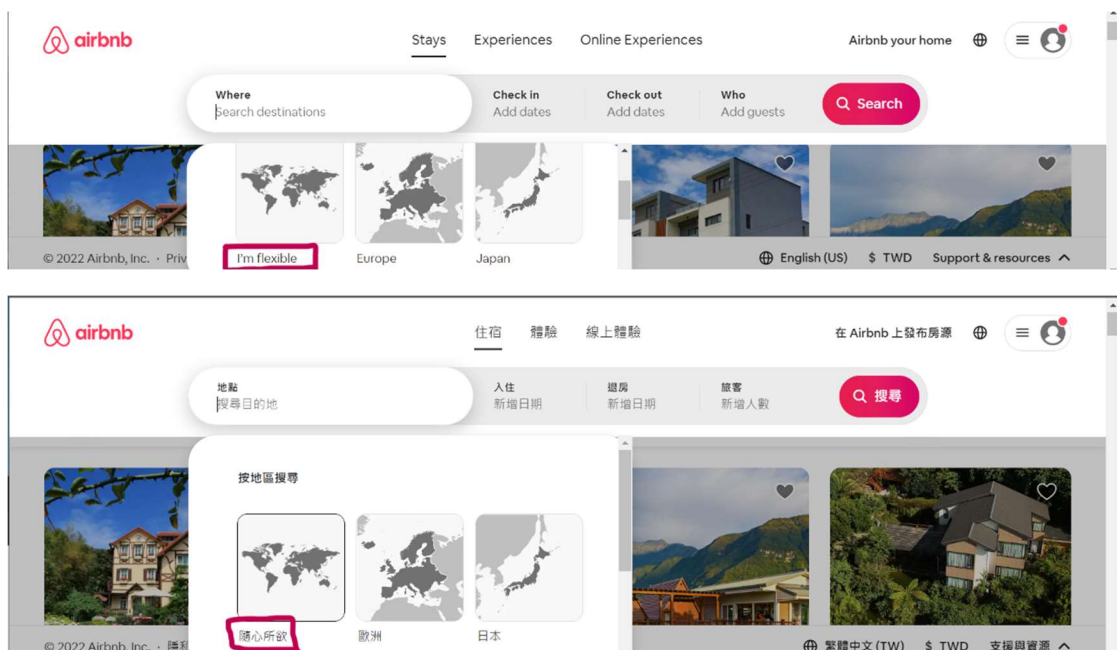


Figure 16. Airbnb's text

In general, Airbnb and Expedia's translated texts manifest UCT's spirit that advocates prioritizing users' needs and thinking from their shoes. Usability, as mentioned in section 2.3 (see Chapter 2), refers to users' perception and emotions toward a product, while enjoyability refers to a product's ease of use (Nielsen and Norman, 2016). The OTAs not only demonstrate high-quality textual usability as can

be seen in 4.2.1 but also make the products enjoyable to users by catering to their needs, tailoring to their cultural conventions, and creating UX that match with the SaaS genre as can be seen in 4.2.2. For users, using OTAs is beyond finding satisfying accommodations; rather, it is an enjoyable journey to interact with a hospitable human-like travel buddy or agent.



## Chapter 5: Conclusion

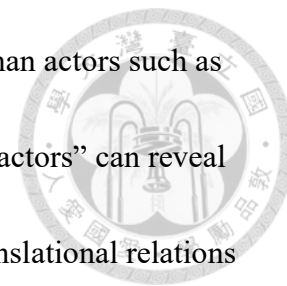


The present study examines the operation of OTAs' SaaS localization in the global-scale GILT industry, exploring how translators participate in localized products' production and the texts' impact on UX. This study utilized the qualitative approach with interviews and comparative textual analysis to address the two research questions (see Chapter 1). This chapter sums up the major findings of this study by concluding the results discussed in the previous chapter, followed by the discussion of contributions, limitations, and recommendations for further research.

### 5.1 Summary of Findings and Implications

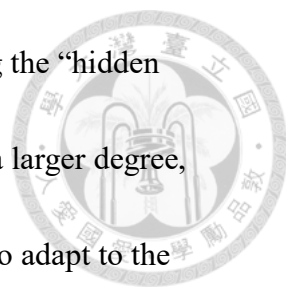
In answering the first research question, i.e., how does the translator facilitate the process of SaaS localization with other human and non-human actors to produce a localized product, this study applies the ANT to explain how the translator participates in the production of the localized SaaS product. The actor networks of OTAs reveal that a SaaS product is produced through various actors' "translation," and that the relations between actors are uncertain and unfolding due to constant change in their relations (see Figures 4 and 5). The ever-evolving networks' instability results from the cooperation between LSPs and the OTAs, the development of technology such as CAT and digital communication tools, the interaction between

human actors and technology, and the communication between human actors such as translators, PMs, reviewers, etc. As Latour pointed out, “following actors” can reveal the hidden processes of a phenomenon, which helps unravel the translational relations between human and non-human actors in SaaS localization (2017).



To expound, firstly, without LSPs' help in processing a large number of words, the OTAs would not be able to integrate their translation workflow into SaaS's constant release for product improvement. Secondly, technology not only solidifies the networks by bringing various human actors in one place to facilitate communication but also expands the networks due to its ever-innovating advancement. Subsequently, the evolution of technology further affects the way human actors use technological tools. For instance, the one-stop workstation provides a friendly UI for translators to work with TM, MT, and finalized layouts for linguistic quality assurance. Lastly, interpersonal relationship between human actors determines if translation tasks can be delivered smoothly and efficiently to a large extent. Despite the cutting-edge technology in place, inadequate communication might adversely affect the quality of translation tasks.

As the research result shows, LSP and technology are the two crucial drivers that proactively enroll other human and non-human actors in the formation of the OTAs' actor networks. The identification of these two non-human actors reveals the techno-



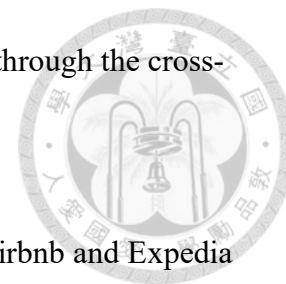
science-orientedness of SaaS localization' heterogeneity, identifying the “hidden processes” neglected in the translation process (Buzelin, 2005). To a larger degree, human actors' behaviors are determined by their use of technology to adapt to the quick-turnaround GILT industry. For instance, Expedia's in-house translators need to familiarize themselves not just with XTM Cloud, the cloud-based workstation they use for work, but also with Tableau, a data visualization tool essential for monitoring both personal and team performance. When new third-party tools are added to the current workstation, every person involved in the process will need to adapt and incorporate these tools into their existing workflow. In this context, non-human actors play a relatively significant role in driving network development. However, this does not imply a reduction in the power of human actors. In others words, technology should not be seen as overpowering humans and relegating them to mere passivity. Take translators, for instance; they should not be relegated to mere editors for machine-translated texts, but rather as artisans conveying cultural nuances through their skillful use of language with improved productivity of MT's help. They can completely focus on transcreation without being disturbed by paying attention to terminology consistency and compliance with glossary. Instead, the OTAs have showcased an illuminating partnership between humans and technology. This underscores that creating a large-scale SaaS product necessitates tightly-knit

relationships between various actors. Each participant plays a crucial role in fortifying, expanding, and innovating these ever-evolving actor networks.



In answering the second research question, i.e., how does the translator localize for users within the context of digital product-user communication, the concepts of UCT were employed to scrutinize the translator's localization strategy in the digital and interactive product-user context. In 4.2.1 (see Chapter 4), it was initially revealed that both Airbnb and Expedia's translated texts demonstrate friendly textual usability. This is evident through their carefully chosen words, natural text rhythm, succinct sentence length, and consistent use of terminology. First, Airbnb and Expedia utilize certain words to render their brand personalities: the former is a close friend while the latter is a courteous butler, both serving as hospitable travel agents who engage with users in an amiable way. With this improvement in textual usability, the translator creates an enjoyable UX for users which Hassenzahl and Tractinsky (2006) refers as the "aesthetic, hedonic, and affective" aspects of using a product. Second, the translators of Airbnb and Expedia have rendered the texts in natural Chinese of Taiwan with the use of three, four, or five-character expressions, enhancing textual readability and thus contributing to the overall textual usability. Third, the space of localized texts on the UI are observed to be aligned with that of their source-text counterparts. This, along with the term consistency, relieve user's cognitive effort by

reducing the unnecessary information and making navigation easy through the cross-platform and device products.



The abovementioned principles reveal that the translators of Airbnb and Expedia have created smooth textual usability that helps translation reach the goal of serving the users, i.e., finding or listing accommodations. This “matching between translation and users” shows that localized texts play a significant role in building a product’s UX along with the visual and user flow design. In this sense, translation is empowered to be able to proactively participate in digital product design with its user-centered approach. With user at heart, the translators of the OTAs leverage the strategies of substitution, amplification, and rewriting to adapt to users from various cultural backgrounds. This “matching between translation and the real world” has driven the adoption of digital products to customers all over the world, showing that translation is key to the business’ success. To implement smooth UX, the translators keep “matching between translation and genre” as the core localization strategy, using context-aware mentality in decision-making process according to the text’s position on UI. The mindset has enabled the translators to create UCT in the context of SaaS’ high interactivity. In sum, the translators of SaaS localization utilize a context-aware mentality and cultural-adaptive localization strategy to create an enjoyable UX highlighting smooth textual usability. In this way, they are able to contribute to the

success of a product in the complex SaaS localization networks consisting of various human and non-human actors.

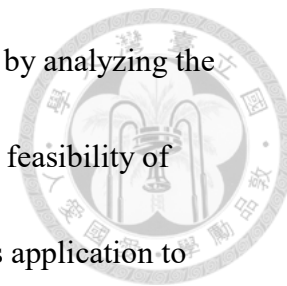


## **5.2 Contributions, Limitations, and Future Research**

With particular reference to theoretical frameworks from sociology, information studies, and applied linguistics, this study endeavors to deal with interconnections between translation and technology in the digital era in an interdisciplinary manner. As early as the 2010s, Cronin (2013) pinpointed that translation scholarship was in an urgent need to investigate the change of translation phenomenon in the digital sphere as the emerging digital technologies had been influencing the society, culture, and politics in all aspects. This study corresponds with Cronin's observation that technologies are continuously shaping the translation landscape with emerging technological tools. Since SaaS is a representative digital genre and the fruit of the ICTs' development nowadays, the investigation of SaaS localization contributes to the translation studies' scant research in the industry and artifact-orientated aspects.

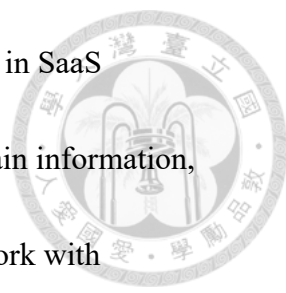
In the respect of theoretical contribution, this study enriches the application of ANT to translation scholarship, especially in the study of burgeoning digital genres that have been normalized into people's daily life. This enables the scholars of the translation field to explore the topics in a sociological approach, scrutinizing the intricate structural issues in the translation practice. Furthermore, this study serves as

a pilot study of applying the concepts of UCT to translation studies by analyzing the real-life cases of OTAs. The study therefore not only testifies to the feasibility of UCT's concepts on the GILT industry's practice but also expands its application to digital products for handling digital texts' nature of interactivity.



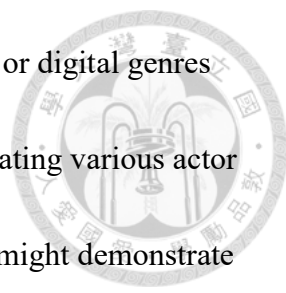
On the practical side, this study has provided both an industry professional and the translation industry with insights into maintaining competitiveness in the GILT market. Firstly, the OTAs' actor networks have revealed that a digital product is the fruit of multiple human and non-human actors. A translator should be equipped with the ability to manage the relationships with other stakeholders to ensure smooth communication. For instance, a translator has to proactively keep the PMs posted regarding the work progress to avoid any risks incurred during the task delivery. Having access to engineers and salespeople is also important in understanding the product for better translation. Additionally, a translator should be tech-savvy to work in a digital environment in that the technologies are ever-advancing.

Secondly, a translator in SaaS localization deals not only with texts but also with a product's experience design process, which requires an interdisciplinary knowledge of translation, design, and technology. This corresponds with Del Rey and Vázquez's discovery that a professional's localization competence lies at the intersection of "translation, human-computer interaction (HCI) and advanced computer literacy, and



engineering competence" (2016, pp. 971-978). For any professional in SaaS localization, it is crucial to be able to utilize online resources to obtain information, being capable of validate the information, and use digital tools to work with stakeholders. As the era of artificial intelligence advances, translators must embrace a growth mindset, leveraging diverse digital resources to enhance their skills and accuracy. This involves employing advanced translation tools, online dictionaries, and linguistic databases to broaden their knowledge base and improve operational efficiency. Furthermore, rigorous content verification through multiple sources is essential to ensure precision and reliability. This approach highlights the critical need for continuous learning and adaptation, emphasizing the dynamic nature of the translation profession in a rapidly evolving technological landscape. As for insight for the GILT industry, it is recommended that cutting-edge translation and productivity technologies should be integrated into the existing workflow to keep up with the agile product cycle. In addition, the translation agencies are advised to realize the mindset of UCT into their workflows by introducing suitable quality assurance methods to meet different clients' needs.

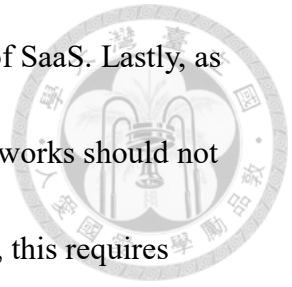
Despite the contributions, this study is subject to certain limitations and therefore indicates the directions for future research. Firstly, the research subject is focused on OTAs in this study, which might not be able to represent the whole GILT industry.



Future research is thus suggested to incorporate other types of SaaS or digital genres to construct a comprehensive picture of the GILT industry by delineating various actor networks. For instance, a business-to-business (B2B) SaaS product might demonstrate different characteristics than a business-to-consumer (B2C) SaaS product. In terms of research method, the interviewees participating in this study include an in-house translator from Expedia and a language lead from Airbnb's LSP. Besides these two actors, however, the OTAs' actor networks in this study have informed us that there are multiple human actors significant in building the networks. In this sense, more stakeholders can be considered in the research to embellish the networks with information from diverse perspectives, especially the in-house PMs and even people from the GILT's internationalization phase, such as designers and engineers, to understand the localization phase's relation with other GILT phases.

As a pilot study using the concepts of UCT, this study adopted a qualitative approach to collect and analyze textual data. It is recommended to explore a more quantitative approach in future studies, building upon the evidence provided by this research that validates the applicability of the previously mentioned analytical frameworks. Since SaaS is an utter cloud-based digital genre, its textual data can be obtained in large quantities through web crawling technology. In this way, the crawled data can be analyzed with a corpus-oriented approach, i.e., a quantity-oriented

method, to understanding the macro-descriptive linguistic patterns of SaaS. Lastly, as mentioned in 5.1, the prominent role of non-human actors in the networks should not be interpreted as the suppression of human actors' agency. However, this requires further research to inquire into how a translator's agency, for instance, is performed in the networks. In addition, it is further hoped that this study will draw more translation research in the interdisciplinary settings focused on UX, or information design to a broader extent, to enrich the practical research that can benefit not only an industry professional but also the translation industry as a whole.



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## Appendices

### Appendix A: List of acronyms used in this paper

| Acronym | Full Form                                                          |
|---------|--------------------------------------------------------------------|
| ANT     | actor-network theory                                               |
| BT      | back translation                                                   |
| CAT     | computer-assisted translation                                      |
| GILT    | globalization, internationalization, localization, and translation |
| HCI     | human-computer interaction                                         |
| ICT     | information and communications technology                          |
| LISA    | Localization Industry Standards Association                        |
| LSP     | language service provider                                          |
| MT      | machine translation                                                |
| OTA     | online travel agency                                               |
| PM      | project manager                                                    |
| SaaS    | software as a service                                              |
| ST      | source text                                                        |
| TM      | translation memory                                                 |
| TMS     | translation management system                                      |
| TT      | target text                                                        |
| UCASD   | user-centered agile product development                            |
| UCT     | user-centered translation                                          |
| UI      | user interface                                                     |
| UX      | user experience                                                    |
| WWW     | World Wide Web                                                     |



## Appendix B: Interview Questions



### General Questions

1. How long have you been working in the localization industry?
2. How did you enter the localization industry?

*For people from company's localization department*

### Operation of Company's Localization Process

1. What is the localization process in your company like? What is translation's role in the localization process?
2. What are the expectations your company has towards translation?
3. What are the localization department's accountability and responsibility? What roles are working in this department? Does it work closely with any other department in the company to facilitate the localization process?
4. How does the headquarter's localization department cooperate with Taiwan's localization department to manage the localization process on a global scale?
5. Please describe your company's brand personality and style.
6. How does the company keep its brand personality and style consistent across different locales while conducting localization?
7. How does the company manage its relationship with language service providers and translators?
8. Please rate the localization's level of importance from 1 to 10 in your company's corporate strategy. Please explain why.
9. Following the previous question, how does the company evaluate the impact that localization brings, including aspects other than translation? What is the outlook of localization in your company?

*For people from language service providers*

### Establishing Localization Network with Language Service Providers

1. How do language service buyers search for ideal language service providers in different locales to work with?

|                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. What are LSPs' accountability and responsibility? What roles are important in LSPs to facilitate the localization process?                                                                                   |
| 3. How do LSPs manage their relationships with language service buyers and translators?                                                                                                                         |
| 4. How does the localization process in LSPs work?                                                                                                                                                              |
| 5. How do LSPs ensure that translated texts are in line with buyers' brand personalities and styles?                                                                                                            |
| 6. What resources or tools do LSPs utilize to facilitate the localization process?                                                                                                                              |
| 7. Following the previous question, what challenges do LSPs encounter when using these resources or tools? In addition, how do LSPs tackle the challenges?                                                      |
| 8. Following the previous question, what deficiencies do your current tools have that decrease productivity and quality of work?                                                                                |
| 9. What are the challenges of localization that LSPs encounter?                                                                                                                                                 |
|                                                                                                                                                                                                                 |
| <i>For language leads/translators in the localization industry</i>                                                                                                                                              |
| <b>Translator's Role in the Localization Network</b>                                                                                                                                                            |
| 1. What roles do translator interact with during the localization process from task allocation to delivery?                                                                                                     |
| 2. Following the previous question, what roles have bigger impact on translation strategy?                                                                                                                      |
| 3. What resources or tools does the translator utilize during the localization process?                                                                                                                         |
| 4. Following the previous question, what challenges do you encounter when using these resources or tools? In addition, how do you tackle the challenges?                                                        |
| 5. Following the previous question, what deficiencies do your current tools have that decrease productivity and quality of work?                                                                                |
| 6. How does the translator embody the company's voice and style in the translation?                                                                                                                             |
| 7. What are the challenges of localization for translators?                                                                                                                                                     |
| 8. If you happen to be a freelancer who is simultaneously juggling translation tasks from various companies, how do you adapt to their different expectations regarding translation, tone of voice, and styles? |