User Value Perception of Native Apps versus Mini Programs: A Means-End Theory Approach

By *Sunghan Ryu*, *Kathleen Cheng*, *Maximilian Schreieck**

This study examines the differences between native mobile applications (native apps) and mini programs (MPs) by identifying the attributes and consequences of both types of applications and comparing users' value perceptions of them. We employ the means-end theory approach, suggesting a hierarchical representation of attributes, consequences, and values. 11 in-depth qualitative interviews were conducted with experienced users of native apps and MPs in the tourism and travel context. The interviews generated two lists of attributes, consequences, and values from the coding processes: one for native apps and the other for MPs. Eight hierarchical value maps are created according to the association between the components at different levels, suggesting shared and unique values generated from using MPs in conjunction with native apps. Our study contributes to the pioneering literature on MPs and, more broadly, to the literature on mobile platform ecosystems in information systems and service research.

1. Introduction

Mobile applications (hereafter: mobile apps) have driven the growth of mobile operating systems (OS) platforms such as iOS and Android. They have also facilitated relevant business model development in service management domains through the respective app stores (e.g., Apple Store, Google Play Store; Hein et al., 2019, p. 90). Recently, however, users of mobile devices have exhibited an increasing reluctance toward downloading mobile apps (cf. comscore, 2017). Users have to download and install the apps and create an account on the app before using it in most cases. In addition, users often abandon the apps they install after using them only once (Perez, 2016). As a result, the growth of the number of apps has slowed down across marketplaces (Statista, 2021). In this case, it is questionable if the "native" mobile apps still offer sufficient value to their users.

A novel approach has been adopted to respond to this issue in China. Lightweight apps— named WeChat Mini Programs (MPs)—have been embedded into WeChat, China's largest mobile messaging platform. WeChat is a free application launched by Tencent in 2011 to provide instant messaging services. As of the second quarter of 2020, WeChat had 1.2 billion monthly active users.[1] WeChat released its MP feature in 2017, enabling third-party developers to create lightweight apps within

Sunghan Ryu is Associate Professor at USC-SJTU Institute of Cultural and Creative Industry, Shanghai Jiao Tong University, 800 Dongchuan Road, Shanghai, 200240, China, E-Mail: shryu@sjtu.edu.cn

Kathleen Cheng is M.Sc. Management of Information Systems Graduate from London School of Economics, E-Mail: cheng.kathleen@outlook.com

Maximilian Schreieck is an Assistant Professor for Information Systems, in particular Digital Services and Platforms at the Department of Information Systems, Production and Logistics Management at the University of Innsbruck, Innrain 52, 6020 Innsbruck, Austria, E-Mail: maximilian.schreieck@uibk.ac.at
* Corresponding Author.

Acknowledgment: This work was partially funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – 444990299 and the Shanghai Jiao Tong University (SJTU) Global Strategic Partnership Fund.

https://doi.org/10.5771/2511-8676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

WeChat's platform ecosystem. MPs offer an improved user experience as they do not require installation. They also do not consume any storage space in the devices. WeChat users can directly access the MPs within the WeChat app. Additionally, MPs are not subjected to the cumbersome procedures involved in developing native apps. As of 2020, more than 3.2 million MPs have been launched and used by nearly 840 million users. This trend is remarkable when comparing these numbers to the Google Play Store on Android, which hosted about 3.5 million apps, and the iOS App Store, which offered about 2.2 million apps, as of the second quarter of 2020. Many of the global companies operating their businesses in China have launched WeChat MPs to improve their online access to users and promote the native apps in the app stores. Similar MP ecosystems were also introduced by the other Chinese platform operators such as Baidu (Baidu Mini Programs), Alibaba (AliPay Mini Programs), and ByteDance (TikTok Mini Programs).

Since its launch, WeChat MPs have received significant attention from practitioners. Indeed, MPs have emerged as a new type of mobile app that provides increased value for mobile users and companies. However, the phenomenon of MPs so far has received limited attention in information systems and service research. This is surprising, given that a strand of literature has generated implicative knowledge on mobile platform ecosystems since the emergences of Apple's iOS ecosystem and Google's Android ecosystem in both IS research (e.g., Eaton et al., 2015; Ghazawneh et al., 2013; Karhu et al., 2018; Tiwana, 2014) and service research (e.g., Matzner et al., 2021; Benkenstein et al., 2017; Vargo et al., 2012). Pioneering literature on the topic has suggested that WeChat MPs retain most of the functionality of the original app and integrate the four advantages of authentication, payment, sharing, and communication (Cheng et al., 2020; Schreieck et al., 2022). However, theoretical arguments on which attributes of MPs may benefit end-users and limit them due to the reduced functional range are yet to be rigorously developed. More specifically, in conjunction with native apps, our understanding of how MPs enhance (or hinder) user experience and thus generate (or reduce) user value is still lacking. Addressing this gap in the mobile platform ecosystems literature, our study aims to examine the differences between native apps and MPs and how these differences affect their use cases. The focus is on identifying the attributes and consequences of both applications and comparing users' value perceptions of them, drawing on a value-based perspective. We intend to expand our knowledge on how MPs could potentially transform the mobile platform ecosystems.

For this study, we employ the means-end theory approach. The means-end theory seeks to explain how users' choice of service enables them to achieve their desired end-states (Gutman, 1982). The approach suggests a hierarchical representation of how users view service. This hierarchy consists of attributes, consequences, and values (i.e., desired end-states). Attributes describe the functions or features of the service. Consequences describe the benefits that users derive from the uses of a product or service. Finally, values are seen as the ultimate outcomes served by the service means.

We conducted 11 in-depth qualitative interviews with experienced users of native apps and MPs in the travel service context. Travel-related mobile apps and counterpart MPs serve as our research context because they are among the most popular mobile apps (Fang et al., 2017) but are well known to have a low frequency of use. These characteristics of travel-related apps will facilitate the acquisition of more meaningful implications by comparing users' value perceptions of mobile apps and MPs. All the interviewees actively used both types of applications for different travel purposes. A laddering interviewing technique was used for the data collection. It is a one-on-one semi-structured in-depth interviewing technique in which the respondent describes why something is important to them, and the researchers try to find linkages between the key perceptual elements across the range of attributes, consequences, and values (Reynolds et al., 1988).

Based on the analysis of the interviews, we identified six values that native apps offer (i.e., efficiency, convenience, accessibility, reliability, comprehensiveness, and informativeness) and five values that MPs offer (i.e., efficiency, convenience, accessibility, connectedness, and compendiousness). Three of the values—efficiency, convenience, and accessibility—are common to both native apps and MPs. Reliability, comprehensiveness, and informativeness are unique values offered by native apps, whereas connectedness and compendiousness are salient values offered by MPs. We also identified corresponding attributes and consequences for each value and conducted a mapping of hierarchical attributes–consequences–value relationships.

As one of the pioneering studies on MPs, our study contributes to three literature streams. First, it contributes to the IS literature on mobile platform ecosystems by examining how the emergence of MPs affects the user behavior as MPs and native apps compete for the users' attention. Second, it adds to the literature stream on service ecosystems by applying means-end theory to carve out how digital services with different characteristics create value for customers. Finally, it sheds light on the effect of digital services on travel service management by analyzing

1 https://daxueconsulting.com/wechat-mini-programs-2020-report/

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

how MPs address complement native apps by fulfilling specific requirements of tourists and travelers.

2. Related work

2.1. Mobile platform ecosystems and Mini Program ecosystems

Mobile platform ecosystems, particularly Google's Android ecosystem and Apple's iOS ecosystem, provide users of smart devices with an operating system that offers virtually limitless functionality through its huge variety of third-party applications (Tiwana, 2014). As of the second quarter of 2020, the Google Play Store on Android hosted about 3.5 million apps, and the iOS App Store offered about 2.2 million apps. With their abundance of third-party applications, mobile platform ecosystems have transformed end-users' manner of living and consumption. Popular apps allow users to easily stay in touch with friends and family (e.g., WhatsApp and WeChat), organize rides on short notice (e.g., Uber and Didi), monitor their health and fitness (e.g., Runtastic and Keep), or shop online (e.g., Amazon and Taobao). Compared to when mobile devices were not widely available, users benefit from the contemporary ubiquity of smartphones and apps, which facilitates convenience and efficiency (Siau et al., 2003).

Mobile platform ecosystems are a subtype of digital platform ecosystems, which comprise "a platform owner that implements governance mechanisms to facilitate value-creating mechanisms on a digital platform between the platform owner and an ecosystem of autonomous complementors and consumers" (Hein et al., 2019, p. 90). In the case of mobile platform ecosystems, the platform owner offers boundary resources such as application programming interfaces (APIs) (e.g., Google Maps APIs available for third-party developers on Android), a software development kit, and an integrated development environment (e.g., Apple's Xcode; Ghazawneh et al., 2013; Eaton et al., 2015), and brings third-party developers and end-users together in a marketplace (Tiwana, 2014). To govern the ecosystem (cf. Tiwana, 2014), platform owners apply mechanisms that grant some decision-rights to third-party developers (e.g., how to design their app) while controlling the quality of the apps (e.g., by conducting automated code checks before releasing an app) and sharing app revenue (e.g., keeping a certain percentage of the third-party developers' revenues).

Despite the huge success of mobile platform ecosystems, they have recently begun to face challenges. One challenge relates to the end-users' reluctance to install new apps (comscore, 2017). Due to the high number of apps available in the stores, it can be difficult to find suitable ones. Furthermore, users have to download and install the apps and, in many cases, create an account on the app before using it. A recent survey shows that most users are frustrated when a business requires them to install an application to place an order (Heady.io, 2021). For third-party developers, it has gotten difficult to get their apps noticed by end-users, particularly if they are not popular enough to be featured in one of the lists that platform owners curate for their marketplaces. 50% of users only download well-known apps, making it hard for newcomers to gain traction with their apps in the first place (App Annie, 2021). In addition, users often abandon the apps they install after using them only once (Perez, 2016). As a result, the growth of the number of apps has slowed down across marketplaces (Statista, 2021). While information systems (IS) research has studied the success of mobile platform ecosystems (e.g., Tiwana, 2014; Ghazawneh et al., 2013; Eaton et al., 2015; Karhu et al., 2018), the challenge of overcrowded app marketplaces and end-users' decreasing willingness to install and actively use apps have yet to be investigated.

As an alternative to native mobile apps, mobile web apps emerged in the early 2010s. Mobile web apps are websites that can be reached via mobile browsers and offer some functionality to the user, such as buying tickets or registering for an event. In particular, with the development of HTML5, mobile web apps became an alternative to native apps (Selvarajah et al., 2013; Jobe, 2013). However, mobile web apps have shortcomings as they require constant internet connectivity, are considered less secure than native apps and have difficulty accessing the hardware functionality of mobile devices such as the GPS sensor (Selvarajah et al., 2013; Jobe, 2013). The more recent progressive web apps (PWAs) provide solutions for most of these technical challenges. However, the goal of PWAs is to support developers in implementing apps that can be made available in the app stores of both Android and iOS (Majchrzak et al., 2018) rather than to address the challenges of end-users in finding and accessing apps.

A more recent response of platform owners to end-users' decreasing willingness to install apps is "mini program (MP) ecosystems." MPs are lightweight apps that run on a host app and do not require prior installation (Cheng et al., 2020). The most well-known example is the WeChat Mini Program ecosystem which has become popular in China (Schreieck et al., 2022). Since 2017, WeChat has offered third-party developers the opportunity to develop MPs that end-users can use through WeChat. Over 3.2 million WeChat Mini Programs have become available since then, covering use cases such as ordering food and purchasing tickets for public transportation. End-users can access MPs through different entry points such as through the host app, via sharing, and by using offline QR codes (for a comparison of mobile platform ecosystems and MP ecosystems, see Tab. 1).

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Besides WeChat, other Chinese platforms such as Baidu and AliPay have also rolled out MPs. In response to this development, Apple introduced App Clips in 2020—a feature similar to MPs that allows third-party developers to offer a small, distinct app functionality without requiring users to install the full app.

	Mobile platform ecosystem	Mini program ecosystem
Underlying host system	Mobile operating system	Host app
Integration with device functionality	High—device sensors can be accessed via APIs	Low—System APIs cannot be used directly (e.g., no push notifications)
Entry points	The platform's marketplace	Multiple entry points such as sharing, QR codes, and through the host app
Examples	Google Android Apple iOS	WeChat Mini Programs (by Tencent) Baidu Mini Programs AliPay Mini Programs (by Alibaba) TikTok Mini Programs (by ByteDance)

Tab. 1: Mobile platform ecosystems and mini program ecosystems

The phenomenon of MPs so far has received limited attention in IS research (e.g., Cheng et al., 2020; Schreieck et al., 2022). Thus, the use cases of MPs that benefit end-users and those that would limit them due to MPs' reduced functional range are yet to be identified. To address this question, we adopt a value-based perspective and compare native apps and MPs in the context of travel and tourism.

2.2. Digital services in the tourism and travel industry

The ubiquitous use of digital services has fundamentally reshaped the process of traveling. Given the increasing popularity of smart mobile devices, in particular, mobile apps have become an indispensable tool for travelers seeking information and a channel for purchasing tour-related products and services, such as accommodation and transportation tickets. On the one hand, mobile apps can be used for utilitarian purposes such as searching for accommodation-, transportation-, and destination-related information (Wang et al., 2014). People rely more on smartphones and tablets than other devices in the search process (Murphy et al., 2016). This enables them to be more flexible and less stressed during travel—increasing their control over their experience. On the other hand, mobile apps can also support hedonic purposes such as entertainment and content sharing. This can enhance positive feelings by facilitating online social interaction and improving the traveling experience (Lalicic et al., 2018).

Previous literature has examined: (1) user motivations for adopting mobile apps in the tourism and travel context and (2) the impact of digital services on travel patterns and behaviors. Concerning adoption, several studies applied IS adoption models, such as the technology acceptance model (TAM; Davis, 1989) and the unified theory of acceptance and use of technology (UTAUT) model (Venkatesh et al., 2003) to explain users' adoption of travel-related mobile apps (Choi et al., 2019). Concerning the impact of digital services, scholars have drawn on the notion of service-based logic (Vargo et al., 2009) and studied the potential of digital services to provide more differentiated offerings to customers (Davis et al., 2015) and the role of online customer reviews.

Users may plan less before their trips because they expect information to be readily available through mobile apps as long as they have Internet access (Wang et al., 2014). Relatedly, Kang et al. (2020) identified relationships between traveler characteristics and smartphone use for travel-related information searches. For example, the proliferation of digital services led to the emergence of "flashpackers," who frequently use mobile apps during travel (Paris, 2012). Compared to traditional backpackers, flashpackers are more independent and enjoy greater freedom and choices, which are enabled by mobile Internet access, such as online booking sites with customer reviews (Miguéis et al., 2017).

A growing body of literature has focused on travel-related mobile app users from various perspectives. For example, Kennedy-Eden et al. (2012) proposed seven types of travel-related mobile apps based on the main functions they provide, which include navigation, social engagement, mobile marketing, security, transactions, entertainment, and information. Specifically, users primarily use mobile apps during their trips for communication, social media, entertainment, and information acquisition (Wang et al., 2016). Additionally, instead of sharing their experiences after completing their trip, users are more likely to share their experiences while still traveling (Zhang et al., 2017). Moreover, with mobile apps, retrieving travel-related memories becomes easier and more convenient.

Previous literature helped researchers and practitioners understand the role of digital services in the context of travel and the available range of travel-related mobile apps. However, the studies have not considered users' value perceptions of travel-related mobile apps and their behavior related to such value perceptions. Moreover, previous literature has not addressed the emergence of MPs in the context of travel. Our study aims to address this gap in existing research.

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

3. Means-end theory

The means-end theory seeks to explain how consumers' choice of a product or service enables them to achieve their desired end-states (Jung, 2014). Means-end chain analysis is a goal hierarchy approach. The core concept of such an approach is the notion of a hierarchical goal system. A goal is the desired outcome of an action, and the goal exists within a hierarchical system (Reynolds et al., 1988). The approach suggests a hierarchical representation, from attributes to consequences and values (Woodside, 2004).

The means-end theory approach claims that attributes of the activity have a role in the means by which people achieve higher goals or values (Gutman, 1982). Attributes are the means that lead to consequences, which are also the means that realize values (Reynolds et al., 1988). Attributes are "perceived qualities or features of products or services" (Reynolds et al., 1988) and are tangible or intangible product characteristics. Consequences are "personal outcomes or results derived from usage or consumption" (Reynolds et al., 1988). (Desired) values are goals that represent governing drives and motivations (Reynolds et al., 1988). A means-end chain—consisting of attribute–consequence–value links—is typically expressed through a hierarchical map. It contains nodes of attributes, consequences, and values and their associations.

Most means-end chain analyses essentially consist of three steps: laddering interviews, content analysis, and generation of a hierarchical structure (Jung, 2014; Reynolds et al., 1988; Gutman, 1982). The analysis typically depends on a laddering interview technique to generate hierarchical constructs. The laddering technique has been extensively applied in consumer research to understand their preferences regarding products or services (Woodside, 2004; Reynolds et al., 1988). To help interviewees educe lower or higher levels of the concepts, researchers interview by asking three questions in the following order: "What attribute makes the product (or service) attractive to you?" (i.e., the attribute question), "Why is that attribute important or desirable to you?" (i.e., the consequence question), and "Why is that (the subject's response) important to you?" (i.e., the value question). In the first phase, interviewees are asked to provide the attributes of a product that affect their consumption decision. They are then asked to explain their consequential benefits from the aforementioned attributes. Finally, they are asked to elucidate why those benefits are important. Based on their responses, a hierarchical map is produced.

The means-end theory approach is widely utilized in various domains, such as marketing, organizational behavior, and information systems, for understanding individuals' decision-making processes (van Rekom et al., 2007). In the marketing field, researchers conceptually view consumers as goal-oriented decision-makers who choose behavior that will most likely lead to desired outcomes (Bagozzi et al., 1994; Woodside, 2004; Reynolds et al., 1988; Gutman, 1982). Recently, the means-end theory approach has been introduced into IS literature. For example, IS researchers applied it to explore the adoption of web-based document management systems (Chiu, 2005), online shopping (Lin et al., 2008), e-learning systems (Sun et al., 2009), users' goals in virtual worlds (Jung et al., 2010), and social networking sites (Jung et al., 2014).

Travelers can also be considered goal-oriented decision-makers. Since mobile apps and MPs are representative products of digital services, and the tourism and travel context is similar to other IS usage behaviors in terms of satisfying users' different desired outcomes (or values), the means-end theory can be applied to understand users' perceptions of and motivations for using mobile apps and MPs in the context of tourism and travel.

4. Methodology

4.1. Research context

For two reasons, we chose travel-related mobile apps and MPs as our research context. First, tourists extensively use mobile apps to book accommodations, transportation tickets, tourist attraction tickets, and much more. Travel-related apps are among the most popular downloads within app marketplaces (Fang et al., 2017). As of 2018, US travelers used approximately 7-8 mobile apps on average for their searching, booking, and in-destination activities.[2] Second, it is well known that travel-related apps have a low frequency of use (Choi et al., 2019). Additionally, travel apps often consume a lot of device memory. A mobile app analytics company reported that travel apps were used an average of only 2.6 times per week and retained 45% of the device's memory.[3] Thus, these apps' high popularity and low use frequency are expected to infer more meaningful implications when the users' value perceptions of mobile apps and MPs are compared.

4.2. Data collection

Due to the exploratory nature of our study, we adopted a qualitative research design and an inductive methodological approach (Sarker et al., 2018). We follow the means-end chain analysis to elicit user values and determine

2 https://www.travelagentcentral.com/running-your-business/stats-nearly-two-thirds-travelers-rely-mobile-apps-during-trip
3 https://www.marketingdive.com/ex/mobilemarketer/cms/news/strategy/18161.html

https://doi.org/10.5771/2511-6679-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

their relationship structures. The next section explains the three stages of the means-end chain approach used in the study—laddering interviews, content analysis, and drawing of hierarchical maps.

Empirical data was gathered from 11 semi-structured interviews in the predetermined research setting of China. Given our research objective to compare mobile apps and MPs based on users' value perception in the context of travel services, the sampling process was led by four criteria. First, participants needed to demonstrate a high degree of familiarity with travel-related mobile apps. We checked how often they traveled and what type of mobile apps they used during the different travel stages, such as information search, reservation, and activities in destinations. Second, sufficient user experience in the navigation of WeChat MPs was essential. To check that, we asked the interviewees to name the travel-related MPs on their WeChat accounts. Third, participants were asked to detail one recent experience with a travel-related MP that supported them on their last trip. Lastly, self-identified travel-enthusiasts were favored, but this was not a decisive criterion. 11 graduate students (7 women and 4 men) of a Chinese university aged between 23 and 26 were randomly recruited. The 11 interviews were completed across two rounds. In the first round, the first 7 participants were interviewed, which set the foundation for the second round of interviews conducted with the remaining 4 participants to fill any information gaps.

Informed by the laddering technique of Reynolds and Gutman (1988), an interview protocol was created in advance to guide the flow of conversation to align with the means-end approach. This method allowed us to derive associations between users' perceptions of digital services. Specifically, it enabled us to identify linkages between attributes, consequences, and values. The main section of the interview related to users' travel habits, which we separated into the following four stages: 1) information collection, 2) travel planning, 3) booking (e.g., transportation, accommodation, other tickets), and 4) in-destination activities. The respondents were asked to provide descriptive, perceptive, and reflective answers regarding their personal experiences with travel-related mobile apps and MPs. They were first asked to do so individually, then in comparison to one another. Probing questions were inserted throughout the interviews to explicitly determine why the attributes that they described were important to them.

The interviews lasted 30-60 minutes and were exclusively conducted via WeChat voice calls, which were audio-recorded and transcribed. Respondents were given the option to participate in either English or Chinese, thereby allowing them to respond in their language of preference. As a result, six interviews were conducted in Chinese, while five were held in English. The Chinese interviews were translated into English so that all the transcriptions were in the same language, facilitating consistent data analysis in the subsequent stages.

4.3. Content analysis and drawing hierarchical maps

Following the means-end theory, the evaluation process of the empirical data relied on a coding procedure. The first cycle of open coding produced 440 initial codes. In the next step, axial coding guided the elicitation of elements for native apps and MPs separately, further classified into the levels of attributes, consequences, and values (i.e., desired end-state). An example code for each level is presented in Tab. 2. Since the focus of the means-end theory is to concentrate on the linkages between the elements rather than on the elements themselves, a summary table was constructed from which dominant connections across levels of abstraction were obtained. We created hierarchical value maps to represent key linkages and depict unique pathways that represent users' perceptual attitudes concerning native apps and MPs to graphically visualize our findings. The most frequently detected linkages are summarized in the hierarchical value maps provided in the findings section.

5. Findings

5.1. Attributes, consequences, and values

The means-end analysis began once a list of attributes, consequences, and values was generated from the coding processes, specifically based on key content that emerged from the interviews. The initial content analysis extracted nine attributes, six consequences, and six values for native apps, and eight attributes, eight consequences, and five values for MPs.

First, among those components, four attributes (i.e., remotely available, instant completion of task online, no (or less) language barrier problem, and up-to-date information), two consequences (i.e., no need to carry around physical materials and avoid the hassle of preparation/booking on-site), and three values (i.e., efficiency, convenience, and accessibility) were common to both native apps and MPs. The findings show that native apps and MPs have explicitly shared components in attributes, consequences, and values, based on the mobile platform ecosystems, in comparison to offline or traditional online settings (e.g., websites).

Second, four attributes (i.e., high level of content quality and quantity, diverse functions, access to user-generated content and community, track and save the information digitally, restore browsing sessions), four consequences (i.e., no need to research from scratch, in-depth, multiple, longer sessions, later-stage actions, customized informa-

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

tion and service), and three values (i.e., reliability, comprehensiveness, informativeness) are unique components of native apps. Native apps provide richer and more comprehensive features than MPs, resulting in more reliable and informative outcomes for users.

Quotation	Level	Code
"The biggest difference for me is that I do not need to create a new account and that I don't need to download a new application in order to do something."	Attribute	Accessible without download
"The biggest difference for me is that I do not need to create a new account and that I don't need to download a new application in order to do something."	Attribute	Lightweight and fast
"If you plan a trip with your friends and you search for articles on these MPs you can easily share them with your friends via private chat making it more convenient to communicate with my friends."	Attribute	Easy to share/communicate content
"I think compared to native apps, I would prefer to use MPs because it's much easier for me to use and much more convenient. If I use a mobile application, first I need to know the name, and secondly, I will need to download the app through my app store, then create my account, have my ID and passport ready, etc."	Attribute	Less steps involved to achieve tasks
"I really like to compare the offerings on different platforms, but I obviously can't download all of these apps. I can only keep the most comprehensive ones I most frequently use on my phone. However, the advantage that MPs provide me with is that I can easily open up all these different platforms and cross-check and compare them to each other, which I find very useful and convenient."	Consequence	Increasing ability to cross-check platforms
"I can also comfortably delete certain apps when my storage becomes too full and still use their services through WeChat MPs."	Consequence	Saving storage space
"MPs on the other hand are very convenient—you can check them even if you don't have their apps installed on your phone; you can still receive information."	Value	Accessibility
"It definitely improved the efficiency of trip planning between friends. Previously, when you share certain content via an app, your friend had to first download the app before they could open and view the shared content."	Value	Efficiency

Tab. 2: Sample coding (mini programs)

Finally, four attributes (i.e., lightweight and fast, seamless process from opening to completing tasks, easy to share/communicate content, fewer steps involved to achieve something), six consequences (i.e., saving times for completing tasks, saving storage space, more content sharing, early-stage actions, increasing ability to cross-check platforms, better experience when planning with friends, and two values (i.e., connectedness, compendiousness) are the distinguished components of MPs in our analysis. Compared to native apps, MPs are designed to offer a unique set of functions on top of the fast and seamless processes, leading to more compendious experiences for users. In addition, the features of MPs promote content sharing among users, providing the value of connectedness.

All components of native apps and MPs across all three levels are presented in Tab. 3.

The next step was to generate a hierarchical map according to the association between the components at different levels. Responses regarding the three levels—attributes, consequences, and values—generate a means-end chain (Woodside, 2004). Answers to the attributes pertain to a means for answers to the consequences. Likewise, answers to the consequences correspond to a means for answers to the values. Based on this approach, we generated eight hierarchical maps in total, including three (i.e., efficiency, convenience, and accessibility) for both, three (i.e., reliability, comprehensiveness, informativeness) for native apps, and two (i.e., connectedness, compendiousness) for MPs, respectively.

5.2. Shared values between native apps and mini programs

Both native apps and MPs generate three values in common through different hierarchical routes from attributes to consequences and values. First, convenience is one of the most dominant values generated from native apps and MPs (Fig. 1). Some of the shared attributes (e.g., remotely available, no (or less) language barrier prob-

https://doi.org/10.5771/2511-6679-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Components	Native Apps (N)	Mini Programs (M)
Values (V)	NV1. Efficiency*	MV1. Efficiency*
	NV2. Convenience*	MV2. Convenience*
	NV3. Accessibility*	MV3. Accessibility*
	NV4. Reliability	MV4. Connectedness
	NV5. Comprehensiveness	MV5. Compendiousness
	NV6. Informativeness	
Consequences (C)	NC1. No need to carry around physical materials*	MC1. No need to carry around physical materials*
	NC2. Avoid hassle of preparing/booking on-site*	MC2. Avoid hassle of preparation/booking on-site*
	NC3. No need to research from scratch	MC3. Saving times for completing tasks
	NC4. In-depth, multiple, longer sessions	MC4. Saving storage space
	NC5. Later-stage actions (e.g., purchase)	MC5. More content sharing
	NC6. Customized information and service	MC6. Early-stage actions (e.g., search)
		MC7. Increasing ability to cross-check platforms
		MC8. Better experience when planning with friends
Attributes (A)	NA1. Remotely available*	MA1. Remotely available*
	NA2. Instant completion of tasks online*	MA2. Instant completion of task online*
	NA3. No (or less) language barrier problem*	MA3. No (or less) language barrier problem*
	NA4. Up-to-date information*	MA4. Up-to-date information*
	NA5. High level of content quality and quantity	MA5. Lightweight and fast - Accessible without download
	NA6. Diverse functions	MA6. Seamless process from opening to completing tasks
	NA7. Access to user-generated content and community	MA7. Easy to share/communicate content
	NA8. Track and save information digitally	MA8. Less steps involved to achieve something
	NA9. Restore browsing sessions	

Notes: *Shared components between native apps and mini programs

Tab. 3: Native apps vs. mini programs in the attributes-consequences-values hierarchy

lems) and consequences (e.g., no need to carry around physical materials, avoid the hassle of preparation/booking on-site) of both types contribute to generating the value of convenience. Also, other attributes and consequences are uniquely relevant to creating value. On the one hand, native apps' attributes, such as high content quality and quantity and tracking/saving information digitally, result in in-depth, multiple, longer sessions and more customized information services. The consequences could potentially promote the value of convenience. On the other hand, MPs' unique attributes, such as easy to share/communicate content, can lead to more content sharing and a better experience of planning with friends, enhancing the convenience of the process.

Second, efficiency is mostly driven by the attributes and consequences of using MPs, while a few attributes and consequences from using native apps are relevant (Fig. 2). Given that the origin of MPs in satisfying the needs of brevity, most of the attributes and consequences of MPs contribute to generating the value of efficiency. Native apps, remotely available, could result in favorable consequences (i.e., avoid the hassle of preparation/booking on-site), leading to a higher level of efficiency.

Finally, the value of accessibility can be generated by using both types, but in clearly different ways (Fig. 3). On the one hand, the lightweight and fast characteristic of MPs could generate some relevant consequences (e.g., saving time for completing tasks, saving storage), improving accessibility of users. On the other hand, native apps, with more access to user-generated content and community, could promote in-depth, multiple, and longer sessions.

5.3. Distinguished Values of Native Apps

The unique attributes of native apps could result in a set of favorable consequences, providing the values of reli-

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

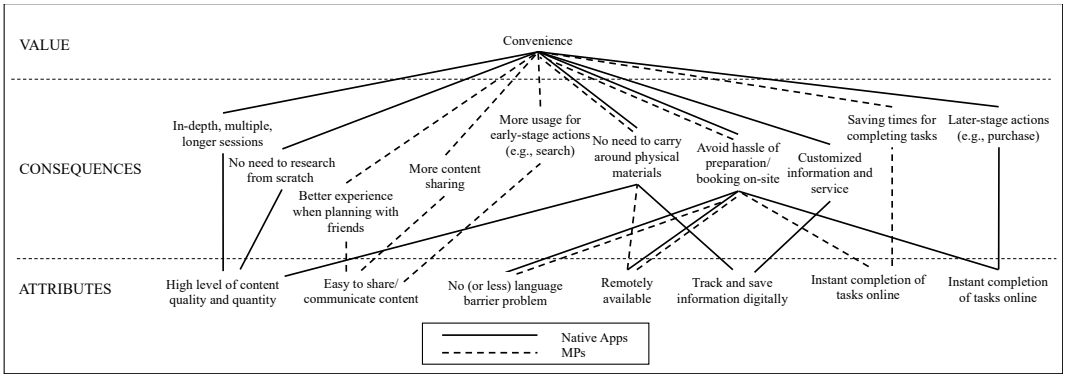

Fig. 1: Hierarchical value map: Convenience

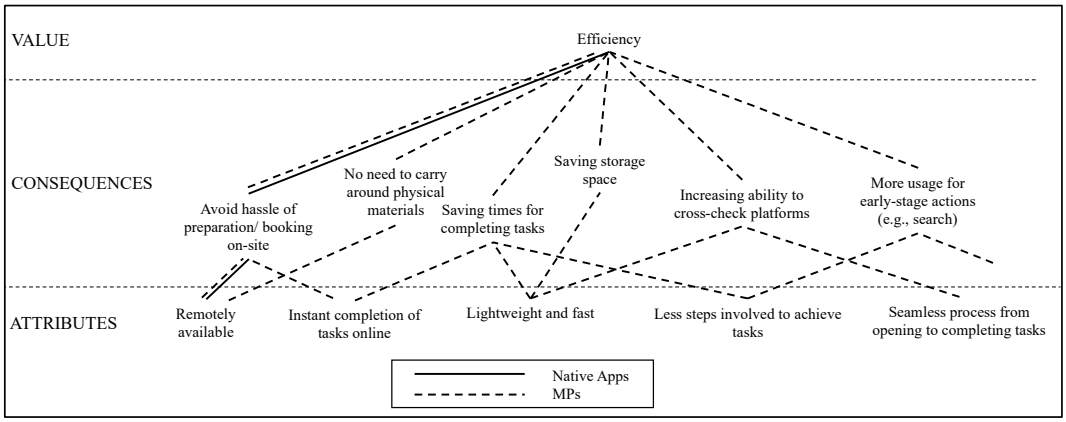

Fig. 2: Hierarchical value map: Efficiency

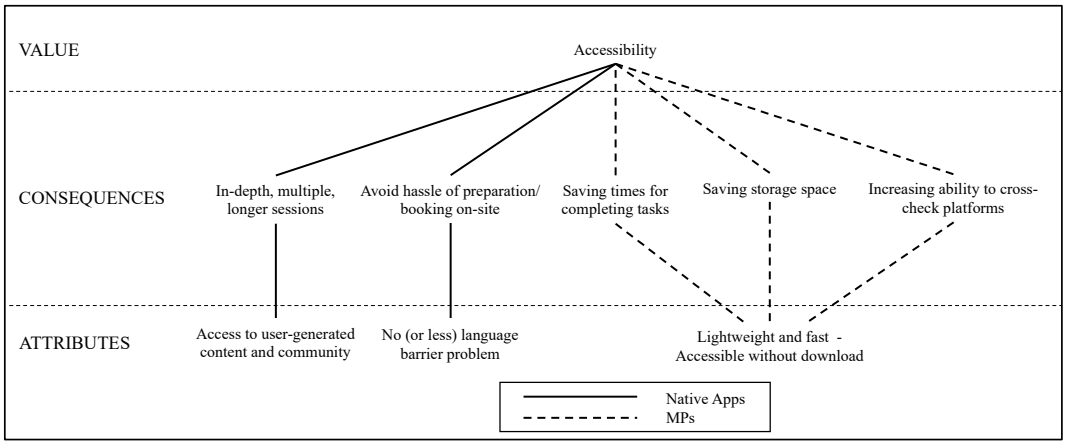

Fig. 3: Hierarchical value map: Accessibility

ability (Fig. 4), comprehensiveness (Fig. 5), and informativeness (Fig. 6). For the value of reliability, five attributes of native apps, including diverse functions, access to user-generated content and community, instant completion of tasks online, track/save the information digitally, restore browsing sessions, results in the set of consequences, such as in-depth, multiple, longer sessions, and customized information and service, later-stages actions (e.g., purchases). Those consequences may lead to generating higher reliability for users. Relatedly, the value of comprehensiveness could be obtained by a similar set of attributes (i.e., diverse functions, restore browsing sessions) and consequences (i.e., in-depth, multiple, longer sessions, and customized information and service, later-stage actions, no need to research from scratch). Finally, the value of informativeness is generated by the consequences, such as no need to carry around physical materials and no need to search from scratch, from using the features, including a high level of content quality and quantity, up-to-date information, and track/save the information digitally.

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

5.4. Distinguished values of mini programs

The last two values, generated from MPs, propose the unique characteristics of MPs, compared to native apps in the mobile platform ecosystems. On the one hand, the value of compendiousness is based on the two unique attributes of MPs, including a seamless process from opening to completing tasks and fewer steps involved to achieve the tasks (Fig. 7). The attributes result in increasing the ability to cross-check platforms (from the seamless process), saving time for completing tasks (from fewer steps involved) and being more useful for early-stage actions (from both). The consequences lead to increasing the value of compendiousness for users of MPs. On the

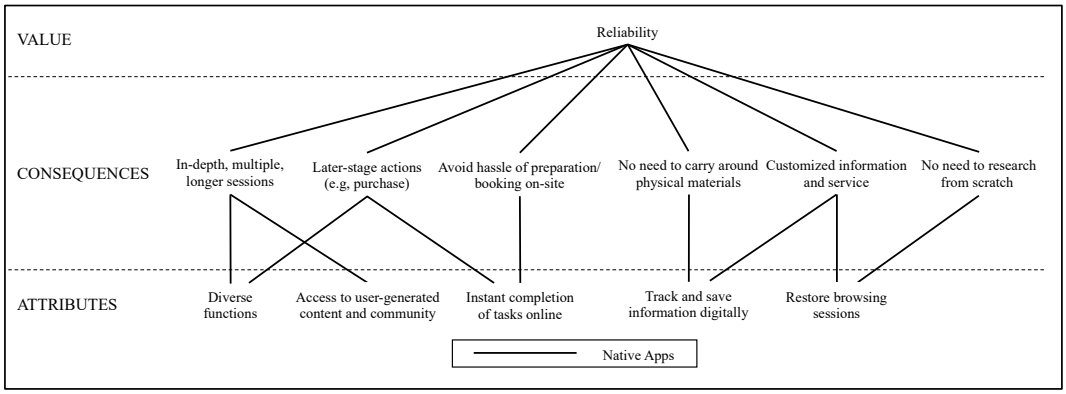

Fig. 4: Hierarchical value map: Reliability

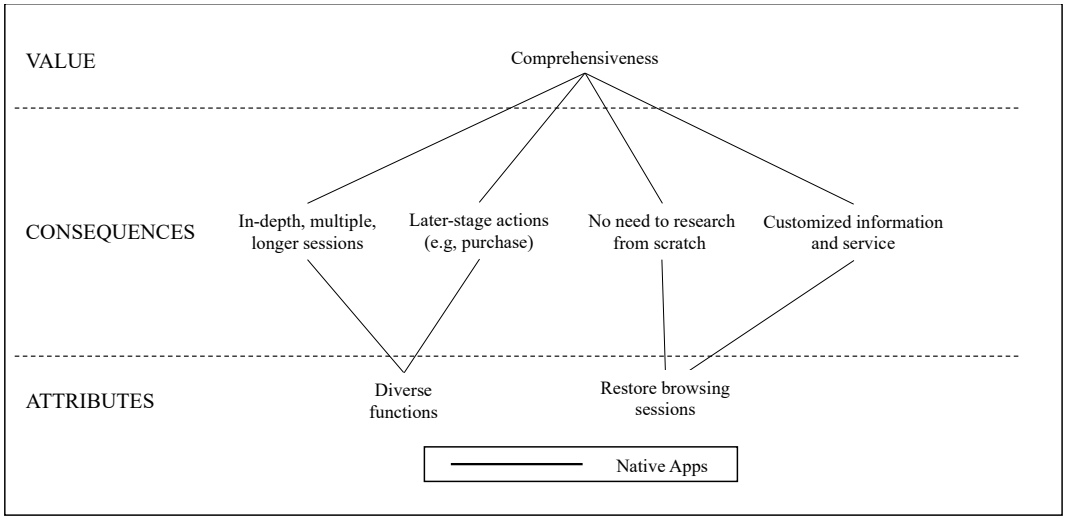

Fig. 5: Hierarchical value map: Comprehensiveness

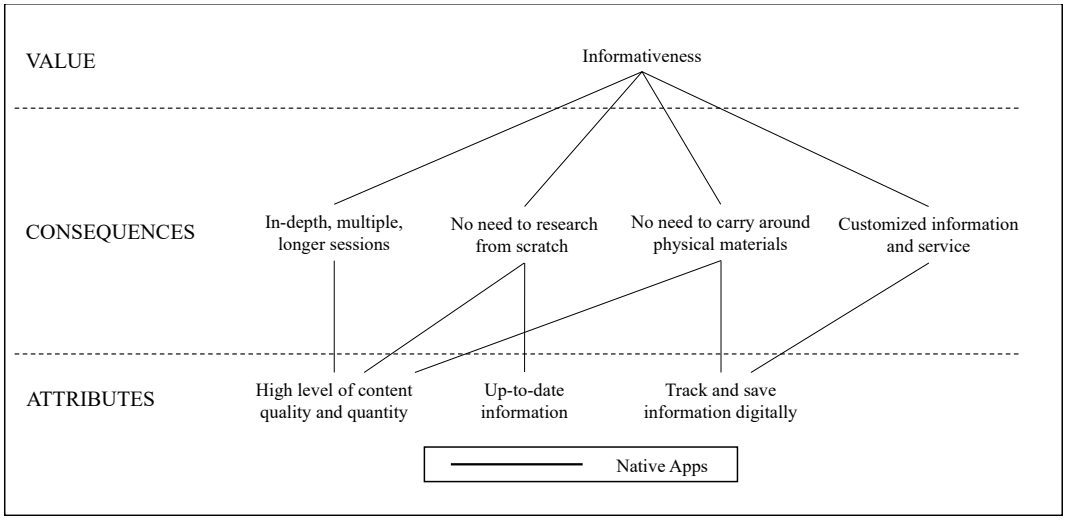

Fig. 6: Hierarchical value map: Informativeness

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

other hand, the value of connectedness is enhanced by one unique feature: easy to share/communicate content, resulting in three consequences, including more content sharing, better experiences for planning with friends, and more useful for early-stage actions (Fig. 8). The increased connectedness from MPs is mainly due to the mobile messenger feature of WeChat, where MPs are created and operated. The two values generated by the distinctive attributes of MPs and their consequences indicate that MPs provide comparative benefits and advantages over native apps in these aspects. The findings propose a foundation for understanding MPs' recent emergence in the mobile platform ecosystems and how they could supplement (or replace) native apps.

6. Discussion and contribution

Our study examines the differences between native apps and MPs and how these differences affect their use cases in the travel and tourism context. We identified the attributes and consequences of both types of applications and compared users' value perceptions of them based on a value-based perspective and the means-end theory approach. We identified six values that native apps offer (efficiency, convenience, accessibility, reliability, comprehensiveness, and informativeness) and five values that MPs offer (efficiency, convenience, accessibility, connectedness, and compendiousness). Three of the values—efficiency, convenience, and accessibility—are common to both native apps and MPs. Reliability, comprehensiveness, and informativeness are unique values offered by native apps, whereas connectedness and compendiousness are salient values offered by MPs. We also constructed corresponding attributes and consequences

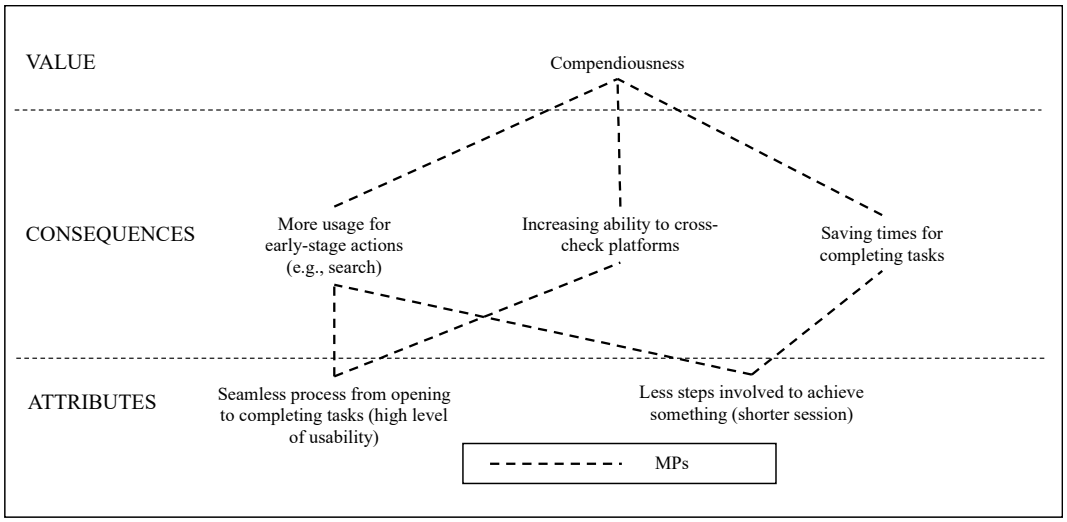

Fig. 7: Hierarchical value map: Compendiousness

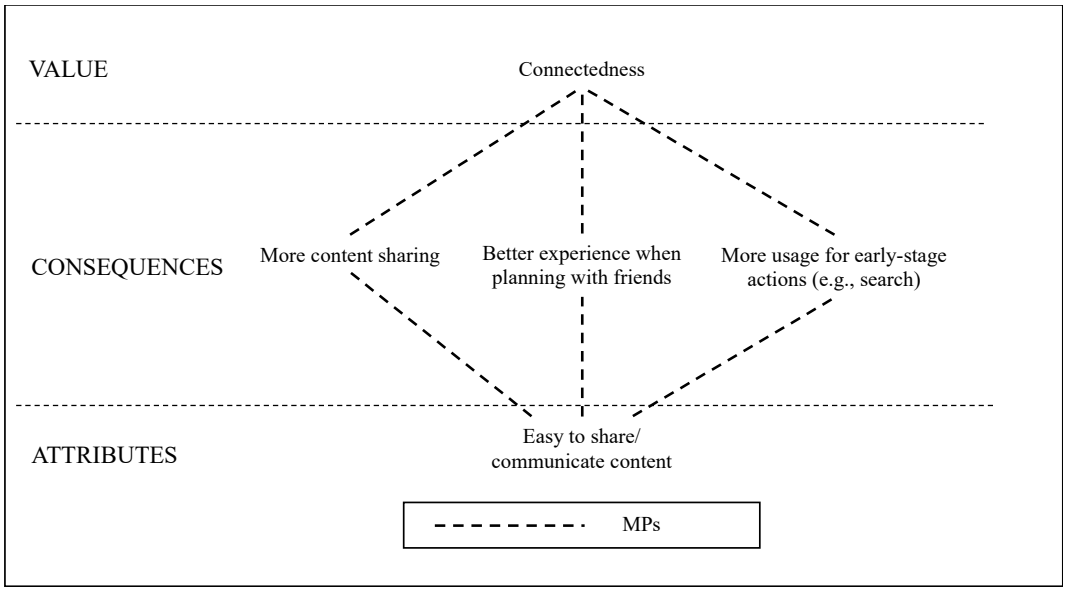

Fig. 8: Hierarchical value map: Connectedness

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

for each value and drew a mapping of hierarchical attributes–consequences–value relationships.

As one of the pioneering studies on MPs, this article provides a three-fold academic contribution that also represents starting points for future research. First, it contributes to the IS literature on mobile platform ecosystems by examining how the emergence of MPs affects the user behavior as MPs and native apps compete for the users' attention. The study identifies the value of MPs compared to native apps from a user perspective. Previous IS literature has addressed how mobile apps create value for customers as part of a digital platform ecosystem (Hein et al., 2019; Tiwana, 2014) but has rarely addressed the challenges that an ever-increasing number of apps create in mobile platform ecosystems. As customers struggle to find apps and are reluctant to invest time to download apps and create user accounts, MPs have emerged as a more lightweight solution. We show that, while native apps offer great value for their users, MPs can be an alternative whenever users want to quickly perform a small task while being connected to their peers. These findings show that complements, that is, apps, can differ significantly in mobile platform ecosystems. Rather than only distinct native apps, mobile ecosystems will need to provide seamless offerings that comprise one or more MPs. Previous work in IS on MPs focused on the third-party developer side (Cheng et al., 2020) or the platform owner side (Schreieck et al., 2022). We take on the end-user perspective and illustrate that MPs and native apps share certain similar valuable characteristics; they are efficient, convenient to use, and easily accessible. However, due to their lightweight nature, MPs also offer additional value, such as connectedness because they are easy to share and compendiousness because they provide a distinct, targeted functionality. Future work could draw on quantitative data on the usage of native apps and MPs to derive further insights into the conditions in which the different types of apps are preferred by end-users. In addition, future research could address how specific governance mechanisms such as control, provision of boundary resources, and revenue sharing evolves as MPs become more popular.

Second, this study adds to the literature stream on service ecosystems by applying means-end theory to carve out how digital services with different characteristics create value for customers. Previous work in the domain of service management has highlighted the potential of digital platforms to enable service ecosystems that not only provide a rich set of digital services to customers but are also a fertile ground for service innovation (Vargo et al., 2012). Digital platforms support the service-dominant logic (Vargo et al., 2009) as members of platform ecosystems co-create value, just as members of service ecosystems do. Thus, platform ecosystems can be seen as a specific type of service ecosystem. By applying the means-end theory, we show that digital services can be offered to end-users in different ways, for example, as native apps for smart mobile devices, or as more lightweight MPs. The means-end theory enabled us to derive attribute–consequence–value relationships that explain why different ways of service provisioning might be more attractive for end-users depending on the use case. Future research could strengthen the attribute–consequence–value relationships by conducting surveys with a larger number of participants and by conducting studies in contexts other than the tourism and travel industry. This would create a more comprehensive picture of the motivation of end-users to rely on native apps vs. MPs and vice versa.

Third, our work sheds light on the effect of digital services on travel service management by analyzing how MPs address complement native apps by fulfilling specific requirements of tourists and travelers. The tourism and travel industry is service-driven and heavily impacted by the increasing availability of digital services (Wang et al., 2014; Murphy et al., 2016). Tourists and travelers, who are per se mobile, benefit from the offerings of digital services, for example, to book accommodation and transportation more flexibly (Davis et al., 2015) and to consider online customer reviews. Our work shows that after the transition from offline to online services and the (ongoing) transition from services provision through websites to service provision through mobile apps, there is a further, early-stage transition towards ad-hoc service provision through lightweight MPs. These MPs provide opportunities for actors in the tourism and travel industry to provide use cases for short, on-the-spot interactions with customers and for use cases in which customers share content with others. Future research that focuses on digital services in the tourism and travel industry could derive a more systematic overview of the different stages of travel, the requirements users have in each stage, and how that can be addressed with different types of digital services. Furthermore, it is of interest how novel formats of digital services, such as MPs, influence the behavior of tourists and travelers—for example, whether they plan even less and rely on more spontaneous service provision.

Our study also provides practical implications for different service providers in the travel industry and, more broadly service industry. Our findings allow the other side of the platform ecosystem—the third-party developers—to understand what purposes would be served better by MPs instead of native apps. According to different service objectives and situations, they could interchangeably leverage either MPs or native apps. For example, if a service context is more relevant to connectedness between users, e.g., information sharing, utilizing MPs would be a more appropriate approach. In a situation

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

of comprehensive information search, bringing users into native apps could be a better option. We also provide practical knowledge for the tourism and travel industry by analyzing how MPs are used differently than native apps in the contexts. Most importantly, we have identified that users actively utilize both MPs and native apps in completing the tasks in different stages of traveling, from information search to planning, booking, and in-destination activities. Thus, it is important for the service providers in the tourism and travel industry to improve compatibility and transferability between their MPs and native apps, resulting in more seamless service experiences for users. While we conducted our study in the specific context of tourism and travel, we expect our value-level findings to apply to other service domains.

References

App Annie. (2021). *State of Mobile 2021*. https://www.appannie.com/en/go/state-of-mobile-2021/

Bagozzi, R. P., & Dabholkar, P. A. (1994). Consumer recycling goals and their effect on decisions to recycle: A means-end chain analysis. *Psychology & Marketing*, *11*(4), 313-340.

Benkenstein, M., Bruhn, M., Büttgen, M., Hipp, C., Matzner, M., & Nerdinger, F. W. (2017). Topics for Service Management Research - A European Perspective. *Journal of Service Management Research*, *1*(1), 4-21.

Cheng, K., Schreieck, M., Wiesche, M., & Krcmar, H. (2020). *Emergence of a Post-App Era – An Exploratory Case Study of the WeChat Mini-Program Ecosystem* 15th International Conference on Wirtschaftsinformatik, Potsdam, Germany.

Chiu, C.-M. (2005). Applying means-end chain theory to eliciting system requirements and understanding users perceptual orientations. *Information & Management*, *42*(3), 455-468.

Choi, K., Wang, Y., & Sparks, B. (2019). Travel app users' continued use intentions: it's a matter of value and trust. *Journal of Travel & Tourism Marketing*, *36*(1), 131-143.

comscore. (2017). *The 2017 U.S. Mobile App Report*. https://www.comscore.com/Insights/Presentations-and-Whitepapers/2017/The-2017-US-Mobile-App-Report, accessed on February 18, 2021.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340.

Davis, M. M., Field, J., & Stavrulaki, E. (2015). Using digital service inventories to create customer value. *Service Science*, *7*(2), 83-99.

Eaton, B. D., Elaluf-Calderwood, S., Sørensen, C., & Yoo, Y. (2015). Distributed Tuning of Boundary Resources: the Case of Apple's iOS Service System. *MIS Quarterly*, *39*(1), 217-243.

Fang, J., Zhao, Z., Wen, C., & Wang, R. (2017). Design and performance attributes driving mobile travel application engagement. *International Journal of Information Management*, *37*(4), 269-283.

Ghazawneh, A., & Henfridsson, O. (2013). Balancing Platform Control and External Contribution in Third-Party Development: The Boundary Resources Model. *Information Systems Journal*, *23*(2), 173-192.

Gutman, J. (1982). A Means-End Chain Model Based on Consumer Categorization Processes. *Journal of Marketing*, *46*(2), 60-72.

Heady.io. (2021). *Market Study: Mobile Customer Experience Issues Highlight Use Cases for iOS App Clips*. https://www.heady.io/blog/market-study-mobile-customer-experience-issues-highlight-use-cases-for-ios-app-clips

Hein, A., Schreieck, M., Riasanow, T., Setzke, D. S., Wiesche, M., Böhm, M., & Krcmar, H. (2019). Digital platform ecosystems. *Electronic Markets*, *30*(1), 87-98.

Jobe, W. (2013). Native Apps vs. Mobile Web Apps. *International Journal of Interactive Mobile Technologies*, *7*(4), 27-32.

Jung, Y. (2014). What a smartphone is to me: understanding user values in using smartphones. *Information Systems Journal*, *24*(4), 299-321.

Jung, Y., & Kang, H. (2010). User goals in social virtual worlds: A means-end chain approach. *Computers in Human Behavior*, *26*(2), 218-225.

Jung, Y., & Pawlowski, S. D. (2014). Virtual goods, real goals: Exploring means-end goal structures of consumers in social virtual worlds. *Information & Management*, *51*(5), 520-531.

Karhu, K., Gustafsson, R., & Lyytinen, K. (2018). Exploiting and Defending Open Digital Platforms with Boundary Resources: Android's Five Platform Forks. *Information Systems Research*, *29*(2), 479-497.

Kennedy-Eden, H., & Gretzel, U. (2012). A taxonomy of mobile applications in tourism. *e-Review of Tourism Research*, *10*(2), 47-50.

Lalicic, L., & Weismayer, C. (2018). Being passionate about the mobile while travelling. *Current Issues in Tourism*, *21*(8), 950-963.

Lin, C.-F., & Wang, H.-F. (2008). A Decision-Making Process Model of Young Online Shoppers. *CyberPsychology & Behavior*, *11*(6), 759-761.

Majchrzak, T. A., Biørn-Hansen, A., & Grønli, T.-M. (2018). Progressive web apps: the definite approach to cross-platform development? *51st Hawaii International Conference on System Sciences*.

Matzner, M., Pauli, T., Marx, E., Anke, J., Poeppelbuss, J., Fielt, E., Gregor, S., Sun, R., Maria Hydle, K., Helge Aas, T., Aanestad, M., Gordijn, J., Kaya, F., & Wieringa, R. (2021). Transitioning to Platform-based Services and Business Models in a B2B Environment. *Journal of Service Management Research*, *5*(3), 143-162.

Miguéis, V. L., & Nóvoa, H. (2017). Exploring online travel reviews using data analytics: An exploratory study. *Service Science*, *9*(4), 315-323.

Murphy, H. C., Chen, M.-M., & Cossutta, M. (2016). An investigation of multiple devices and information sources used in the hotel booking process. *Tourism Management*, *52*, 44-51.

Paris, C. M. (2012). Flashpackers: An emerging sub-culture? *Annals of Tourism Research*, *39*(2), 1094-1115.

Perez, S. (2016). *Nearly 1 in 4 people abandon mobile apps after only one use*. TechCrunch. https://techcrunch.com/2016/05/31/nearly-1-in-4-people-abandon-mobile-apps-after-only-one-use/, accessed on April 20, 2021.

https://doi.org/10.5771/2511-6676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Reynolds, T. J., & Gutman, J. (1988). Laddering theory, method, analysis, and interpretation. *Journal of Advertising Research*, *28*(1), 11-31.

Sarker, S., Xiao, X., Beaulieu, T., & Lee, A. S. (2018). Learning from First-Generation Qualitative Approaches in the IS Discipline: An Evolutionary View and Some Implications for Authors and Evaluators (PART 1/2). *Journal of the Association for Information Systems*, *19*(8), 752-774.

Schreieck, M., Ou, A., & Krcmar, H. (2022). Mini-App Ecosystems. *Business & Information Systems Engineering*, *Forthcoming*.

Selvarajah, K., Craven, M. P., Massey, A., Crowe, J., Vedhara, K., & Raine-Fenning, N. (2013). Native apps versus web apps: Which is best for healthcare applications? *International Conference on Human-Computer Interaction*.

Siau, K., Nah, F., & Sheng, H. (2003). Values of mobile applications to end-users. *European Research Consortium for Informatics and Mathematics (ERCIM) News*, *54*, 50-51.

Statista. (2021). *Number of mobile app downloads worldwide from 2016 to 2020*. https://www.statista.com/statistics/271644/worldwide-free-and-paid-mobile-app-store-downloads/, accessed on January 3, 2021.

Sun, P.-c., Cheng, H. K., & Finger, G. (2009). Critical functionalities of a successful e-learning system — An analysis from instructors' cognitive structure toward system usage. *Decision Support Systems*, *48*(1), 293-302.

Tiwana, A. (2014). *Platform Ecosystems: Aligning Architecture, Governance, and Strategy*. Morgan Kaufmann.

van Rekom, J., & Wierenga, B. (2007). On the hierarchical nature of means–end relationships in laddering data. *Journal of Business Research*, *60*(4), 401-410.

Vargo, S. L., & Akaka, M. A. (2009). Service-Dominant Logic as a Foundation for Service Science: Clarifications. *Service Science*, *1*(1), 32-41.

Vargo, S. L., & Akaka, M. A. (2012). Value cocreation and service systems (re) formation: A service ecosystems view. *Service Science*, *4*(3), 207-217.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425-478.

Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, *48*, 11-26.

Wang, D., Xiang, Z., Law, R., & Ki, T. P. (2016). Assessing Hotel-Related Smartphone Apps Using Online Reviews. *Journal of Hospitality Marketing & Management*, *25*(3), 291-313.

Woodside, A. G. (2004). Advancing means-end chains by incorporating Heider's balance theory and Fournier's consumer-brand relationship typology. *Psychology & Marketing*, *21*(4), 279-294.

Zhang, T., Abound Omran, B., & Cobanoglu, C. (2017). Generation Y's positive and negative eWOM: use of social media and mobile technology. *International Journal of Contemporary Hospitality Management*, *29*(2), 732-761.

Keywords: Mobile apps, mini programs, WeChat, mobile platform ecosystems, means-end theory

ISSN 2511-8676

SMR JOURNAL OF SERVICE MANAGEMENT RESEARCH

Managing Editors: Prof. Dr. Martin Benkenstein, Institute for Marketing and Service Research, University of Rostock, Ulmenstr. 69, D-18057 Rostock, Phone: +49 381 498-4376, Fax: +49 381 498-4378, E-Mail: martin.benkenstein@uni-rostock.de, Prof. Dr. Marion Büttgen, University of Hohenheim, Chair of Corporate Management, Schwerzstr. 42, D-70593 Stuttgart, Phone: +49 711 459-22908, Fax: +49 711 459-23288, E-Mail: buettgen@uni-hohenheim.de

Editorial Board: Prof. Dr. Dr. h.c. mult. Manfred Bruhn, University of Basel, Prof. Dr. Andreas Eggert, Paderborn University, Prof. Heiner Evanschitzky, Alliance Manchester Business School, Prof. Dr. Christiane Hipp, Brandenburg University of Technology, Prof. Dr. Joachim Hüffmeier, TU Dortmund University, Prof. Dr. Helmut Krcmar, Technical University of Munich, Prof. Dr. Martin Matzner, Friedrich-Alexander University Erlangen-Nürnberg, Prof. Dr. Friedemann W. Nerdinger, University of Rostock.

Manuscripts: We ask all authors who would like to submit a paper to use our submission system: https://www.openconf.org/smr. Neither the publisher nor the editors assume any liability for unsolicited manuscripts. The accteptance of a contribution has to be in writing.

Copyright: Upon acceptance for publication the author transfers to the Nomos Verlagsgesellschaft mbH & Co. KG the exclusive copy right of his or her contribution for the duration of the copyright as laid down by law. The copyright covers the exclusive right and licence to reproduce, publish, distribute and archive the article in all forms and media of expression now known or developed in the future, including reprints, translations, photographic reproductions, microform, electronic form (offline and online) or any other reproduction of similar nature. The author's second window right after the expiry of 12 months after first publication, as laid down in article 38/4) German Copyright Law, remains unaffected. All articles published in this journal are protected by copyright law. Without first obtaining permission from the publisher, no material published in this journal may be reproduced, distributed, performed or displayed publicly, or made accessible or stored in electronic databases or reproduced, distributed or utilized electronically, outside the narrow limitations of copyright law.

Publisher: Nomos Verlagsgesellschaft mbH & Co. KG, Postfach 100 310, D-76484 Baden-Baden, Tel.: +49 7221 2104-0, Fax: +49 7221 2104-27, E-Mail: nomos@nomos.de

Subscription: An annual subscription to the journal comprises four issues.

Subscription Rates 2022: 219,00 EUR (VAT incl.) annual subscription rate (print and online), campus licence (print and online) 399,00 EUR (VAT incl.). Single issue (print only) 61,00 EUR (VAT incl.), shipping charges have to be added to the rates. Subscription and rate include print issue and a licence for the online archive. The components cannot be cancelled separately. Complaints about copies not received must be lodged within 6 weeks starting at the end of the quarter.

Subscription Service: Please order with either the publisher or any book shop.

Customer Service: Phone: +49 7221 2104-666, Fax: +49 7221 2104-39, E-Mail: zeitschriften@nomos.de

Cancellation: The subscription may be cancelled in writing 3 months before the end of a calendar year.

Citation: SMR – Journal of Service Management Research, number of volume (number of issue), year, page.

https://doi.org/10.5771/2511-8676-2022-3-167 - Generiert durch IP 216.73.216.166, am 22.06.2026, 08:57:37. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.