Getting buyers on board

A quantitative study to explain the effect of system- and platform-specific characteristics on buyers' decision to adopt B2C and C2C e-marketplaces

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ABSTRACT

E-marketplaces represent a large and growing category of platform businesses that increasingly determine how products and services are traded world-wide. Their success largely dependents on their capabilities to attract both buyers and sellers. However, only a few e-marketplaces are able to reach a critical mass of adopters. In order to enrich the understanding of factors influencing e-marketplace adoption, this thesis aims to explain the impact of platform- and system-specific characteristics on buyers' decision to adopt B2C and C2C e-marketplaces. Based on a review of extant literature, a TAM-based research model is developed. The model is empirically validated via an online survey questionnaire administered on a sample of 237 respondents. The proposed hypotheses are tested with PLS-SEM. The results show that the four system-specific characteristics content, navigability, responsiveness, and interactivity, as well as the two platform-specific characteristics network size and price competitiveness influence the buyers' decision to adopt B2C and C2C e-marketplaces. Furthermore, the thesis demonstrates that their impact is mediated through the beliefs perceived usefulness, perceived ease of use, and perceived playfulness. The study makes strategic and operational implications on how to build and leverage B2C and C2C e-marketplace businesses. The primary value of this paper lies in providing a comprehensive and interdisciplinary model to explain and predict buyers' decision to adopt B2C and C2C e-marketplaces.

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LIST OF ABBREVIATIONS

API	Application Programming Interface
B2B	Business-to-Business
B2C	Business-to-Consumer
BI	Behavioral Intention
C2C	Consumer-to-Consumer
CB-SEM	Covariance-Based Structural Equation Modeling
e-marketplace	electronic marketplace
ICT	Information and Communication Technologies
IS	Information Systems
MSP	Multi-Sided Platform
PEOU	Perceived Ease of Use
PLS-SEM	Partial Least Squares Structural Equation Modeling
PP	Perceived Playfulness
PU	Perceived Usefulness
SEM	Structural Equation Modeling
TAM	Technology Acceptance Model
TCE	Transaction Cost Economics
TRA	Theory of Reasoned Action
UX	User Experience
WTA	Winner-Takes-All
WWW	World Wide Web

1 Introduction

"You don't need to look far to see examples of platform businesses, from Uber to Alibaba to Airbnb, whose spectacular growth abruptly upended their industries"

(van Alstyne, Parker & Choudary, 2016, p. 56).

In fact, in 2019 the world's five most valuable companies by brand value were platforms (Badenhausen, 2019). From an economic perspective, platforms are considered as multi-sided markets in which platform businesses act as intermediaries to enable interactions between two distinct sides (Rochet & Tirole, 2003). Globally, platform businesses have been around for as long as there has been commerce (Son, Kim & Riggins, 2006): for example, Yellow Pages have been helping buyers and sellers to find each other, and shopping malls have been bringing together retail stores and consumers (Evans, 2003; Hagiu, 2009). Popular examples of digital platforms and the groups of users they bring together include Amazon Marketplace (buyers and sellers), Airbnb (accommodation owners and renters), Uber (drivers and passengers), Facebook (users, advertisers, third-party game or content developers), and Apple's App Store (application developers and users). As these examples demonstrate, platforms embody some of the largest and fastest-growing companies of the past decade and thus illustrate the central role of platform-based businesses in today's economy (Hagiu, 2013). However, the relevance of platforms has increased only recently. The widespread diffusion of information and communication technologies (ICT), as a consequence of a rapid decline in computing costs and an increase in technological advancements, has given rise to a digital economy (Carlsson, 2004). Due to these developments, the opportunities for building economically, easily accessible, and scalable platforms have been expanded (Bakos, 1998; Ngai & Wat, 2002; Bharadwaj, El Sawy, Pavlo & Venkatraman, 2013; Tan, Pa & Lou, 2015).

The increasing importance of platform businesses and how they shape the global economy can be further illustrated in the rapid growth of e-marketplaces, which represent a large and growing category of platforms (e.g. Evans & Gawer, 2016; Cennamo, 2019). E-marketplaces can be defined as commercial sites that connect buyers and sellers to exchange information about products and/or services and conduct transactions using the technology of the internet (Pavlou & Gefen, 2004). In 2019, e-marketplaces accounted for 57% of global e-commerce transactions, which is equivalent to the sale of goods and services worth $1.7 trillion according to a report by Digital Commerce 360 (2020). Moreover, the share of e-marketplace revenue is forecasted to grow significantly over the next years, as new e-marketplaces are entering the market and incumbent e-commerce companies are expected to adopt a platform-based business model (Duch-Brown, 2017; Digital Commerce 360, 2020). One major reason for the success of these e-marketplaces is the existence of network effects, which occur when a growing user base is an incentive for more users to adopt and join the platform (Evans, 2003; Rochet & Tirole, 2003, 2006; Armstrong, 2006). Therefore, it is crucial for e-marketplaces to attract users to join the platform which, due to network effects, will subsequently attract more users. However, because of various challenges identified by platform literature such as the chicken-and-egg problem and winner-take-all (WTA) dynamics (Eisenmann, Parker & van Alstyne, 2006; Evans & Schmalensee, 2013), only a few e-marketplaces reach a critical mass of buyers and sellers to achieve sufficient network effects and to stay competitive in the market (Duch-Brown, 2017). Thus, the understanding of e-marketplace adoption, which is the attraction and retention of both buyers and sellers, poses a fundamental problem to e-marketplace businesses and plays a critical role in determining their success or failure in the market (Wei, Zha & Sun, 2014).

1.1 Research focus and scope

Based on the established relevance of e-marketplace adoption, the thesis focuses on e-marketplace adoption of the buyer side in the business-to-consumer (B2C) and consumer-to-consumer (C2C) context. For this investigation the thesis takes on the theoretical lens of technology acceptance which constitutes a research stream in information systems (IS) that seeks to explain and predict end user technology adoption (Hsiao, Tang & Liu, 2015). A large volume of studies has shown that Davis' (1989) Technology Acceptance Model (TAM) presents a parsimonious, yet robust model to explain and predict end user adoption (e.g. Pavlou, 2003; Gefen, Karahanna & Strau, 2003; Ahn, Ryu & Han, 2004). As previous studies have validated the TAM in the context of e-marketplace adoption (e.g. Chien, Chen & Hu, 2012; Wei et al., 2014), the model depicts a suitable and robust foundation for the present investigation of B2C and C2C e-marketplace adoption.

When examining e-marketplace adoption, it is necessary to account for the manifold nature of e-marketplaces. In fact, scholars have recognized that in order to understand the adoption of technologies it is important that the determinants of adoption include the characteristics of the respective technology (Venkatesh & Morris, 2000; Green & Hevner, 2000; Van Slyke, Comunale & Belanger, 2002). Thus, to determine which characteristics are significant in influencing B2C and C2C e-marketplace adoption decisions, it is essential to take on multiple perspectives to account for the nature of the subject of analysis in question. The current study takes on three main perspectives to examine e-marketplace adoption.

Firstly, an e-marketplace is an IT-based system that acts as an intermediary to facilitate transactions between buyers and sellers via a web interface. As system-specific characteristics have shown to be important features that determine the quality of the end user experience with IT-based systems, the study depicts them as important factors to consider in buyers' e-marketplace adoption (e.g. Ahn et al., 2004; Chen &

Tan, 2004; Green & Pearson, 2011). Secondly, an e-marketplace is based on a platform business model and as such is subject to platform-specific dynamics. In the past three decades, several researchers have sought to determine factors that influence platform adoption from an economic perspective (e.g. Caillaud & Jullien 2003; Rochet & Tirole, 2006; Hagiu, 2007). Especially the issues of network externalities and pricing have received considerable critical attention with regards to platform adoption (Rochet & Tirole, 2003; Eisenmann et al., 2006; Evans & Schmalensee, 2007). Thus, in light of an e-marketplace's platform nature, network externalities and pricing are considered for the examination of buyers' adoption behavior. Thirdly, research on IT-based consumer systems stresses the importance of the end user's dual role as IT-users and online shoppers (Childers, Carr & Peck, 2001; Ahn, Ryu & Han, 2007). Hence, consumer behavior aspects such as the underlying motivations that drive an IT-user and online shopper are considered for the investigation.

1.2   Research gap

Although the challenge of attracting and retaining both buyers and sellers is widely recognized within e-marketplace literature, the majority of studies have examined B2B e-marketplaces and thus adopted a firm-level adoption perspective rather than an end user level perspective (e.g. Hsiao, 2003; Joo & Kim, 2004; White, Daniel, Ward & Wilson, 2007). In other words, little attention has been given to the adoption of B2C and C2C e-marketplaces.

Furthermore, while previous research in technology acceptance emphasizes system characteristics (e.g. Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011) and consumer behavior aspects (e.g. Childers et al., 2001; Ahn et al., 2007) to be considered in the adoption decision of IT-based consumer systems, they have been barely recognized and tested in the context B2B and C2C e-marketplaces. To illustrate, there have only been a few empirical investigations into consumers' adoption

behavior for B2C or C2C e-marketplaces, which limited their analysis on the impact of trust and risk (Pavlou & Gefen, 2004; Kim & Ahn, 2007; Chien et al., 2012; Wei et al., 2014). Thus, examining the significance of system-specific characteristics as well as consumer behavior aspects for buyers' decision to adopt an e-marketplace leaves abundant room for further research. Moreover, platform-related variables have been considered in IT-based platforms such as instant messaging (Wang, Ya & Fang, 2005; Lin & Bhattacherjee, 2008) and smart speakers (Park, Kwak & Lee, 2018), these factors have found limited application in B2C and C2C e-marketplaces. In fact, only Liang, Choi & Joppe (2018) explored the effect of price sensitivity in the context of C2C e-marketplace adoption. Therefore, further work is required to establish the impact of platform-specific variables on buyers' decision to adopt an e-marketplace.

Against this backdrop, research attempts on the buyer adoption of B2C and C2C e-marketplaces have not accounted for the manifold nature of e-marketplaces and have been aimed at investigating single aspects. In contrast, this thesis stresses the importance of a holistic view on buyers' decision to adopt B2C and C2C e-marketplaces to account for the specific nature of e-marketplaces. Despite extant literature that has increased the understanding of specific aspects to be considered in e-marketplace adoption, the current status quo indicates that buyers' adoption of B2C and C2C e-marketplaces has not been investigated in a comprehensive way.

1.3 Research motivation and research question

To address this gap, the main purpose of this study is to develop a comprehensive TAM-based research model that explains buyers' adoption of B2C and C2C e-marketplaces by building on existing theory within platform, IS and consumer behavior literature. The study thus seeks to contribute to the academic discourse on B2C and C2C e-marketplace adoption and enhance the currently limited understanding by identifying important system- and platform-specific characteristics that affect buyers' adoption behavior of e-marketplaces. Moreover, due to the consideration of platform-

related aspects derived from platform literature, the thesis proposes a novel, interdisciplinary view on B2C and C2C e-marketplace adoption. In light of the prominent role of e-marketplaces in the global economy, the study aims to provide managers with an enhanced understanding of e-marketplace adoption that helps them to launch or leverage an e-marketplace business successfully. Therefore, the underlying research question of the thesis is:

How do platform- and system-specific characteristics affect buyers' adoption of B2C and C2C e-marketplace platforms?

1.4 Thesis structure

To answer this question, the remainder of the thesis is structured as follows. Chapter 2 starts by establishing an understanding of e-marketplaces as platform-based businesses. Thereupon, the authors introduce technology acceptance and the study's baseline model TAM. Subsequently, previous B2C and C2C e-marketplace adoption studies in the context of technology acceptance are reviewed to establish the current knowledge of the topic. What follows is an outline of the role consumer behavior related aspects, and system- as well as platform-specific characteristics play in buyers' decision to adopt B2C and C2C e-marketplaces. Chapter 3 constructs an e-marketplace adoption research model with testable hypotheses. In particular, the study extends the TAM by incorporating both system- and platform-specific characteristics as critical antecedents of e-marketplace adoption. Chapter 4 outlines an empirical study to verify the hypothesized relationships within the proposed research model. At first, the authors' research philosophy and approach to theory development are presented. Following the methodological choice and research strategy, the study's data collection techniques and procedures are described. In Chapter 5, the hypotheses put forward are reviewed and the results are presented. Chapter 6 presents a discussion that answers the research question and highlights the insights that can be drawn from this study for launching or leveraging an e-

marketplace. In addition, the authors point out possible limitations and propose probable avenues for further research. Chapter 7 summarizes the study, its central results, and its implications tying up the various theoretical and empirical strands.

2 Theoretical background

The following chapter shall put extant research into perspective and provide a theoretical foundation for this study. The first section begins by introducing the concept of e-marketplaces and their origin. Furthermore, the platform nature of e-marketplaces is explained by outlining the underlying platform business model. Moreover, e-marketplaces are set into the context of e-commerce and are distinguished from e-commerce resellers. The second section starts by establishing an understanding of the present study's baseline model TAM as well as its underlying theoretical foundation of the theory of reasoned action. Within the third section, previous B2C and C2C e-marketplace adoption studies in the context of technology acceptance are reviewed to establish the current knowledge of the topic. Subsequently, the authors outline the role consumer behavior related aspects, and system- as well as platform-specific characteristics play in buyers' adoption decision of B2C and C2C e-marketplaces.

2.1 E-marketplaces

In various industries, marketplaces have risen to economic and business prominence enabling and assisting transactions between independent entities on supply- and demand-side (Gawer, 2014; McIntyre & Srinivasan, 2016). To trade goods and services either for money or for other goods is fundamental to the idea of human socialization (McMillan, 2002). Thus, the presence of marketplaces has a long history starting from before the Agora of Ancient Greece (Stockdale & Standing, 2004). The most common example of a marketplace is probably the ubiquitous shopping mall (Li, Liu & Bandyopadhya, 2010).

Following the developments of ICT, which has expanded the opportunities for building economically, easily accessible and scalable businesses (Bakos, 1998; Tan, Pan, Lu & Huan, 2015; Ngai & Wat, 2002; Bharadwaj et al., 2013), electronic marketplaces (also referred to as e-marketplaces or online marketplaces) are growing at an unprecedented rate (European Commission, 2019). Through the adoption of IT, organizations are enabled to supply information, allow transactions, and share cost reductions (Sharma & Sheth, 2004). E-marketplaces make use of these possibilities. They build on the same principles as marketplaces (Stockdale & Standing 2004) but use information technology to match buyers and sellers with global reach (Bockstedt & Goh 2011) and lower transaction costs, which consequently leads to a more efficient marketplace (Bakos, 1998; Rask & Kragh, 2004). Pavlou & Gefen (2004) define an e-marketplace as a commercial site that connects buyers and sellers in order to exchange information about products and/or services and conduct transactions using the technology of the internet. The e-marketplace's main role is to provide the infrastructure and rules necessary for the buyer and seller side to interact and conduct transactions (Eisenmann et al. 2006; Zhu & Iansiti 2012). In today's world, e-marketplaces have become omnipresent. According to CB Insights (2020), more than 30 private e-marketplaces are currently valued at more than a billion dollars. As a consequence, many entrepreneurs are launching new e-marketplaces claiming to be "the new Airbnb for X" or "the new Uber for Y" (Täuscher & Laudien, 2018).

Depending on the types of buyers and sellers involved, e-marketplaces can be broadly categorized into business-to-business (B2B) marketplaces, business-to-consumer (B2C) marketplaces, consumer-to-business (C2B) marketplaces, and consumer-to-consumer marketplaces (C2C) (Pavlou & Gefen, 2004). A considerable amount of literature has been published on internet-enabled marketplaces since the late 1990s (e.g. Bakos, 1998; Brunn, Jensen & Skovgaard, 2001). However, early studies primarily focused on B2B marketplaces (e.g. Choudhury, Hartzel & Konsynski, 1998; Dai & Kauffman, 2001; Jensen & Skovgaard, 2001). Only recently, with the

development of marketplace business models that address different consumer markets such as transportation (e.g. Uber) or accommodation (e.g. Airbnb), particular attention has been drawn to B2C and C2C marketplaces (e.g. Brunn et al., 2002). The present study follows the recent trend focusing its research efforts on B2C and C2C marketplaces.

2.1.1 E-marketplaces - a platform business view

E-marketplaces represent a large and growing category of platforms (e.g. Evans & Gawer, 2016; Cennamo, 2019). Even though the term "platform" which also has been referred to as "two-sided platform" and "multi-sided platform" (MSP) has become pervasive, appearing in different streams of academic literature such as product development and operations management (e.g. Meyer & Lehnerd, 1997; Simpson, Siddique & Jiao, 2006), technology strategy (e.g. Cusumano & Gawer, 2002; Eisenmann et al., 2006), and industrial economics (e.g. Evans, 2003; Rochet & Tirole, 2003), the importance of platforms to the new global economy is unambiguous (Adner & Kapoor, 2010; Gawer & Cusumano 2014). In this paper, the authors adopted the terms "platform", "two-sided platform" and MSP to relate to a product, service, firm, or institution which mediates interactions between two or more distinct groups of entities (Hagiu, 2013; Zhu & Furr 2016).

Due to their platform nature, e-marketplaces differ from traditional product and service offerings. In traditional one-sided markets, value usually moves from left to right, that means from the supplier to the operator and further to the end user. The revenue moves in the opposite direction, from the end user to the operator further to the supplier. Due to the premise that in platform markets, value and revenue can move both ways, platform-based business models possess special characteristics that distinguish them from other business models (Eisenmann et al., 2006). To better understand the success and prominence of e-marketplaces, an in-depth understanding of the underlying platform-based business model is needed. According

to Teece (2010), a business model depicts the design or architecture of how the business (1) creates, (2) delivers and (3) captures value.

(1) Value creation refers to the company's mechanisms, architecture and activities that enable the foundation of the company's value proposition (Johnson, Christensen, & Kagermann, 2008; Teece, 2010, Chesbrough, 2007). Platform businesses create value primarily by solving a transaction cost problem that makes it difficult or impossible for entities of different groups to interact (Evans & Schmalensee, 2013). Transaction costs are based on the Transaction Cost Economics (TCE) and refer to the costs that occur during the process of trading (for) a product or service (Williamson, 1975, 1979). Whereas in classical economic theory, information symmetry is assumed to be the dominant premise and thus a transaction can be proceeded without any costs, in reality, however, the markets are often less efficient. Consumers, for example, have to search for information, negotiate specific terms, and monitor the transaction to ensure a favorable deal (Coase, 1937; Liang & Huang, 1998). The implicated costs of these transaction-related activities are commonly referred to as transaction costs (Liang & Huang, 1998). The central principle of TCE is that people are rational, risk-neutral and often opportunistic. Therefore, people like to execute transactions that minimize their transaction costs (Williamson, 1975; Geysken, Steenkamp & Kumar, 2006). E-marketplaces such as eBay, in particular, reduce search costs and/or shared transaction costs among its groups of buyers and sellers (Hagiu, 2009). Search costs are the costs that occur when the different groups of agents try to determine who the best trading partner is (Hagiu, 2009). For example, in a multi-sided market where a group of entities wants to sell furniture and another group of entities wants to buy furniture both buyers and sellers are searching for each other. Reducing these search costs leads to a decline of asymmetric information which in turn makes the pursuit of a transaction candidate easier. In addition, many platforms further reduce asymmetric information by providing a quality certification of at least one side. This quality certification can take many forms. E-marketplaces often provide

rating tools that allow buyers and sellers to rate each other post the performed transaction (Hagiu, 2009). Hagiu (2009) also emphasizes the second fundamental element of value creation which is the reduction of costs that occur during the transaction itself, i.e. when the search is done, and the transaction parties have found each other. E-marketplaces such as eBay usually provide an infrastructure that facilitates transactions between the different parties by eliminating the need for bargain. A classic example is eBay's payment system which, in addition to traditional credit card payment options, also includes eBay's PayPal.

(2) Value delivery refers to the elements that provide the value to the target group (Teece, 2010). Platforms deliver value by providing the infrastructure and services (e.g. hardware, software) that enable interactions between the different groups of agents participating on the platform (Eisenmann et al., 2009). E-marketplaces usually provide websites and mobile applications to connect buyers and sellers in order to facilitate transactions between them (e.g. Amazon, 2020; Kleiderkreisel, 2020). In addition, to supplement the infrastructure and services, platforms establish rules that coordinate network activities and govern transactions (Boudreau & Hagiu, 2009; Baldwin & Clark, 2000). These rules cover standards that ensure compatibility, policies that restrain user behavior, protocols that manage information exchange, and contracts that define terms of trade and the network participants' rights and responsibilities (Eisenmann et al., 2006). For example, to ensure that only drivers with a valid driver's license can register, Uber limits the access to the platform by requiring an ID verification for its users (Uber, 2020).

(3) Value capture or profit formula (Baden-Fuller & Mangematin, 2013) refer to the means a company uses to transform the delivered value into monetary return (Teece, 2010). Without earning profit from its activities, the business cannot sustain to create and deliver value over time (Chesbrough, 2007). Platforms can capture value by directly collecting revenue from any if not all groups of agents participating on the platform. However, it is within the platform owner's discretion to decide whom to

capture revenue from. This implies that revenue does not necessarily have to come from all sides (Zhu & Furr, 2016). Common revenue stream options for e-marketplaces entail commission, subscription, advertising, and service sales models (Schlie, Rheinboldt & Waesche, 2011). For example, to advertise the sellers' products on Amazon's website, Amazon charges placement and referral fees (Leschly, Roberts & Sahlman, 2003).

2.1.2 E-marketplaces - an e-commerce view

E-marketplaces have emerged as an efficient and important vehicle for transactions between sellers and buyers in the e-commerce industry (Jiang, Jerath & Srinivasan, 2011). According to a report by Digital Commerce 360 (2020), e-marketplaces accounted for 57% of global e-commerce transactions in 2019, which is equivalent to the sale of goods and services worth $1.7 trillion. The term e-commerce is generally used when referring to the online buying and selling of information, products, and/or services (Kalakota & Whinston, 1996). In essence, an e-marketplace's core service is to provide an online market space where online transactions can be conducted. Thus, e-commerce is a fundamental aspect of e-marketplaces (Brunn et al., 2002). From this, it can be concluded that an e-marketplace is always an e-commerce site, but not all e-commerce sites are e-marketplaces. Therefore, from a platform perspective, it is important to distinguish between e-marketplaces and traditional e-commerce systems such as online resellers and retailers (Hagiu & Wright, 2015). The distinction between an online e-marketplace and an online reseller rests on whether the value delivery from seller to buyer is entirely controlled by the intermediary (reseller) or the intermediary comprises a direct interaction between seller and buyer (platform). In the e-marketplace, seller and/or buyer retain residual control rights over what is traded (e.g. eBay, Amazon Marketplace) while in contrast, a pure reseller possesses the residual control rights over the products traded to buyers (Hagiu & Wright, 2015). In recent years, shifts of organizations from one business model to another can be

observed. For example, Amazon started as a pure retailer of books but then adopted a platform model for its marketplace now offering goods such as electronics, apparel, furniture, food, and software. Zappos, on the other hand, initially started as a platform where users could buy and sell shoes, but quickly shifted to a pure retailer model selling shoes and clothes out of their own inventory. Of course, it is also possible for organizations to adopt a hybrid model in which for some products the e-commerce system acts as a reseller, and for others they serve as an e-marketplace (Tian, Vakharia & Tan, 2018).

2.2 Technology acceptance

Technology continues to shape users' private and professional life. As a result of the ever-increasing technological development, the question of a technology's acceptance or rejection remains a prevalent question to this date (Taherdoost, 2018). According to Dillon & Morris (1996) acceptance in the context of information technology can be defined "as the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support" (p. 4). Technology acceptance is thus characterized by the voluntariness of the user to use the technology in question (Dillon, 2001). That said, user acceptance is considered to be a key determinant of the success or failure of new information systems (Davis, 1993; Dillon & Morris, 1996). Therefore, researchers and practitioners have a strong interest in seeking to understand the determinants of technology acceptance. The technology acceptance and adoption literature field is broad and a multitude of theories and models from distinct disciplines have been developed to explain user acceptance and adoption in various contexts (Taherdoost, 2018; Venkatesh, Morris & Davis, 2003). In his review of the technology acceptance and adoption research field, Taherdoost (2018) provides an overview of prominent technology adoption models as presented in Figure 1, which illustrates the multiplicity of the research field.
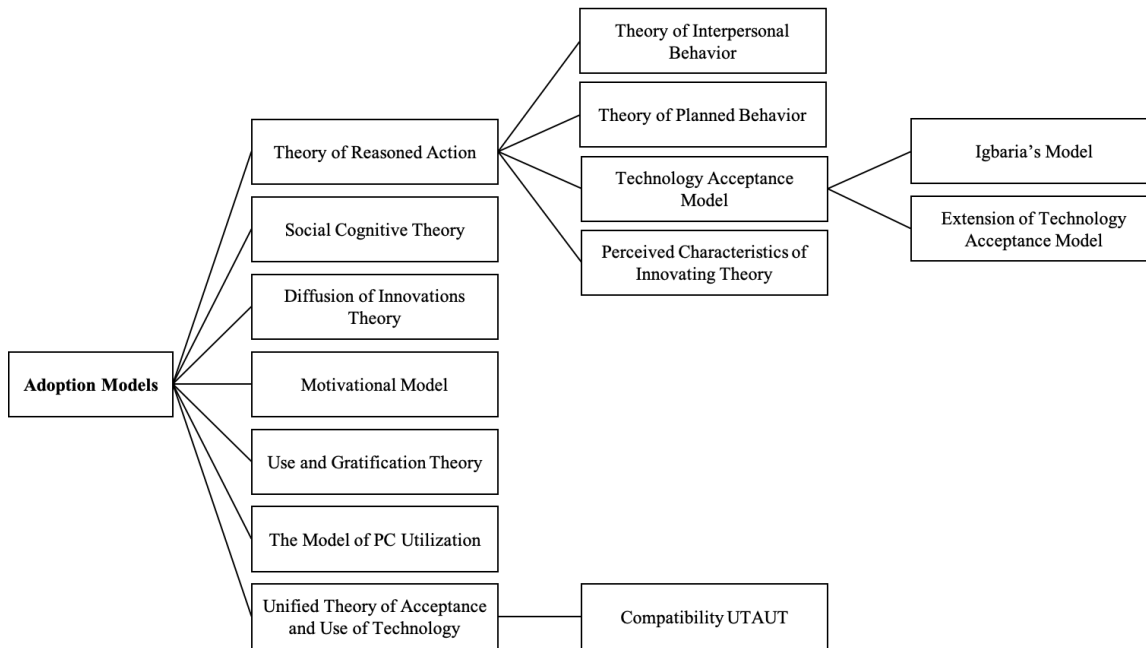
Figure 1: An overview of technology adoption models (Taherdoost, 2018)

To a large extent, models and theories depicted have been adopted and refined by researchers in subsequent studies to derive new acceptance models (Taherdoost, 2018). A full discussion of each theory, however, lies beyond the scope of this study. Therefore, the study focuses on Davis' (1989) technology acceptance model (TAM), which can be considered as the most influential and dominant theoretical model (Lee, Kozar & Larsen, 2003; Marangunić & Granić, 2015), as well as Ajzen & Fishbein's (1980) theory of reasoned action (TRA), which constitutes the theoretical foundation of the TAM. In order to establish a comprehensive understanding of TAM and its origin, TRA is briefly investigated prior to a closer look into TAM.

2.2.1 Theory of Reasoned Action

The first theories to address the question of technology acceptance or rejection originated in the field of social psychology (Marangunić & Granić, 2015). One of these theories is the TRA by Ajzen and Fishbein (1980), which forms the theoretical foundation for Davis' (1989) original TAM model. The TRA aims to explain and predict

volitional behaviors among a wide multitude of settings and is expressed in a causal model, as presented in Figure 2 (Ajzen & Fishbein, 1980). In this model it is assumed that humans act rationally and base their decision to perform a specific behavior upon available information and expected implications of the action in question (Ajzen & Fishbein, 1980).
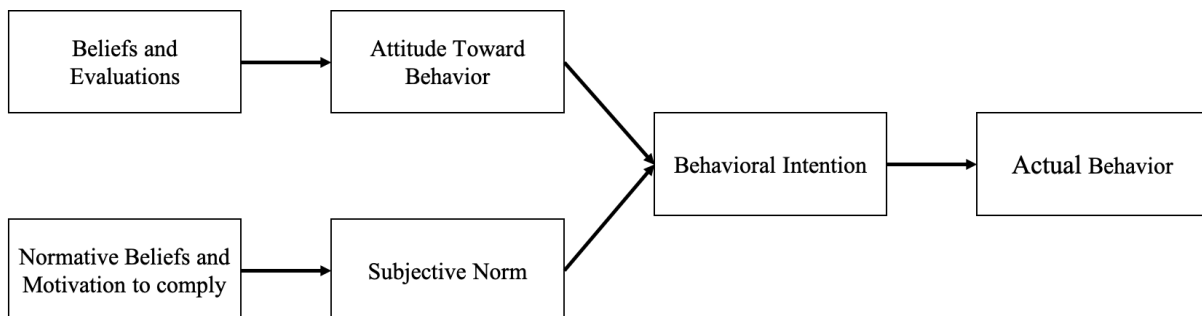
Figure 2: Theory of Reasoned Action (Ajzen and Fishbein, 1980)

According to TRA, behavioral intention is the main predictor of a human's actual behavior (Ajzen & Fishbein, 1980). Ajzen & Fishbein (1980) suggest that "most behaviors of social relevance are under volitional control and are thus predictable from intention" (p. 41). In other words, the theory assumes that behavioral intention is the most influential predictor of actual behavior. Thus, the stronger the intention to perform a behavior, the higher the likelihood of the actual performance of the specified behavior (Fishbein & Ajzen, 1975). The strength of behavioral intention is jointly determined by the individual influence and normative influence. The former relates to the individual's attitude towards performing the behavior. In other words, it refers to the extent of an individual's positive or negative feelings towards the behavior in question (Fishbein & Ajzen, 1980; Fishbein & Ajzen, 1975). The theory further assumes that attitude toward behavior is the function of a person's salient beliefs with regards to the potential consequences of the performed behavior and the evaluation of the outcomes. However, TRA is a general model and does not specify which beliefs

are salient for a given context, and thus, it is in the power of the researchers utilizing the model to identify and select such (Fishbein & Ajzen, 1975). Normative influence, on the other hand, refers to the subjective norms associated with the act, which can be defined as the degree to which the individual's perception of relevant others may influence his or her performance of the behavior (Ajzen, 1985). Similarly, subjective norms are affected by normative beliefs. The latter refers to the pressure for the individual to comply with the perceived expectations of relevant others for the specific behavior (Ajzen, 1985). To further illustrate the model with an example, one could suppose that a person wants to persuade his roommate to use an e-marketplace website such as eBay to buy a specific product. According to TRA, the person could target the roommate's attitudes or subjective norms to enhance his or her willingness to perform the specific behavior (buying the product on eBay). Thus, persuasive messages could, for instance, entail targeting the assumed positive attitude of the roommate toward shopping on eBay ("eBay is good for finding products.") by enhancing his or her belief strength ("Everyone says eBay is great for shopping, no doubt.") or evaluation ("eBay is not just good, it's great!") of that attitude.

With regards to the suitability of TRA as a paradigm for his original TAM model, Davis (1985) points out that key advantages of the model are that the model not only "integrates a number of previously disjoint theories concerning the relationships between beliefs, attitudes, intention, and behavior" (p. 21), but finds broad acceptance in different research streams as well. Considering Davis' (1989) context of computer usage, the author posited that the actual use of a technology is a behavior and thus the author considered TRA to be suitable to explain and predict technology acceptance. Moreover, Davis, Bagozzi & Warshaw (1989) specifically point out that TRA incorporates so-called "external variables", which influence behavioral intention indirectly through attitude and subjective norm. From an IS perspective this bears the opportunity to take into account relevant influential variables such as system design characteristics, user characteristics and organizational structure to explain and predict

technology acceptance (Davis et al., 1989). Considering this mediating effect, the authors stress that the model can help to identify variables that may lead to system rejection and ways to take corrective measures (Davis et al., 1989).

However, the model is also faced with criticism. One of the main limitations of the TRA is the circumstance that people do not always have full control of their attitude and behavior (Ajzen, 1985). Nevertheless, TRA requires that behavior must be under volitional control and thus the model reveals limitations for situations in which persons have little control over their attitude and behavior. Furthermore, the causal link between intention and behavior could be highly correlated in some instances such as when the expression of intention is tightly scheduled with the actual behavior (Yousafzai, Foxall & Pallister, 2010). However, the TRA is more concerned with the prediction of behavior, rather than the actual outcome of behaviors. Thus, the model's predictive power is limited in cases in which intention and behavior are measured synchronously (Yousafzai et al., 2010).

2.2.2 Technology Acceptance Model

Among all the acceptance models, the TAM, which was introduced by Fred Davis in 1989 to specifically explain computer usage, can be considered the most influential and dominant theoretical model (Lee et al. 2003; Marangunić & Granić, 2015). According to Davis (1989) "the goal of TAM is to [be] [...] capable of explaining user behavior across a broad range of end user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (p. 985). In other words, TAM seeks to provide an explanation of human behavior toward technology use and investigates external variables that affect the process (Marangunić & Granić, 2015). In contrast to the technological (Roger, 1962) and psychological variables (Ajzen & Fishbein, 1980; Ajzen, 1985) used in models emerged from social psychology, TAM linked both aspects into a unified theory. Davis (1989) adapted the TRA by Ajzen & Fishbein (1980) as a theoretical foundation.
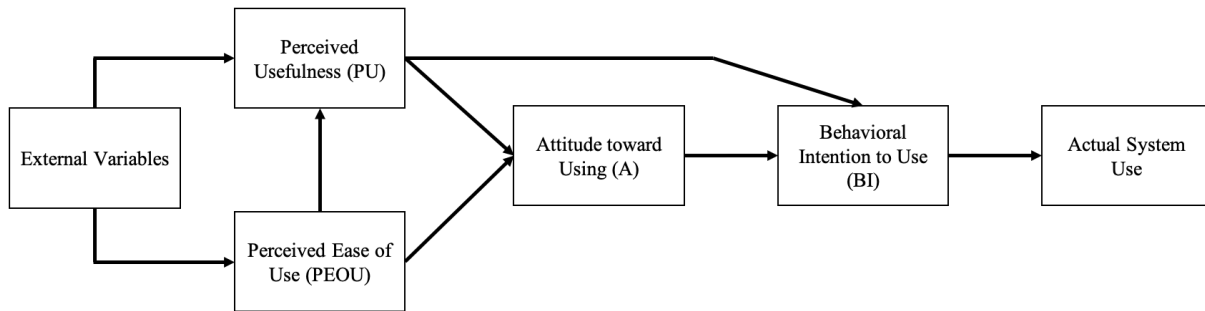
Figure 3: Technology Acceptance Model (Davis et al., 1989

2.2.3 Traditional Technology Acceptance Model

For his original TAM model, Davis (1989) made adaptations to TRA as a theoretical framework to fit its purpose for the user acceptance of information systems. In general, the model theorizes that user acceptance of information systems is explained by three factors: perceived usefulness (PU), perceived ease of use (PEOU), and attitude toward use (A) (Davis, 1989). Davis (1989) excluded subjective norm and only considered the attitude of an individual toward using (A) a technology as presented in Figure 3. Similarly to TRA, this attitude is formed by beliefs. As mentioned earlier, in the TRA model, beliefs have to be identified and selected by researchers adopting the model. By drawing on previously explored cognitive and affective determinants of computer acceptance, Davis (1989) identified the two distinct beliefs, PU and PEOU as of utmost importance for computer acceptance behavior. PU is derived from the word useful and is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Davis et al. (1989) found that PU exerts both direct effect on BI and an indirect effect on BI by being mediated through A. Davis et al. (1989) theorize that the belief of PU is, however, also influenced by the second belief of PEOU. PEOU is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). Davis (1989) argues that even in case a user believes a

system is useful, the person may have to put in excessive effort to use it, which in turn could outweigh the performance benefits derived from usage. Nevertheless, a number of TAM studies propose that the weight of the relative importance of PU is higher than of PEOU (e.g. Davis et al., 1989; Venkatesh, 1999). However, it has to be acknowledged that findings from other TAM studies suggest contradicting findings on the role of PEOU in TAM. For instance, Agarwal and Prasad (1997) report that PEOU has a direct and equal effect on BI, and Gefen & Straub (2000) argue that the importance of PEOU is dependent on the intrinsic or extrinsic nature of the task. Thus, many authors argue that the role of PEOU is ambiguous (Gefen & Straub, 2000; Yousafzai et al., 2007; Marangunić & Granić, 2015).

Furthermore, TAM postulates that an individual's actual system usage or acceptance, respectively, is influenced by his or her behavioral intention (BI) to use that technology (Davis et al. 1989). In turn, the intention is jointly determined by A and PU of the technology in question. Similarly to the reasoning in the TRA, the A-BI relationship was considered fundamental by Davis (1989). The PU-BI relationship is based on the hypothesis that individuals shape direct BIs to use a technology when they believe it will enhance their job performance, detached from what feelings they experience toward the technology usage (Davis et al., 1989). However, following a longitude study by Davis et al. (1989) to empirically test the original TAM, a revision of the model was suggested. The study found that the attitude construct only partially mediated beliefs on adoption intention and thus suggested to omit the construct from the final TAM (Davis et al., 1989). Moreover, Davis et al. (1989) reported a weak relationship between PU and A and found further support for their hypothesized direct link between PU and BI. The findings resulted in the TAM model by Venkatesh and Davis (1996) as presented in Figure 4, which eliminated the attitude construct and hypothesized a direct link of PU and PEOU with BI. The view that TAM's explanatory power is equally good without the mediating attitude construct is supported by an empirical study by Venkatesh et al. (2003).
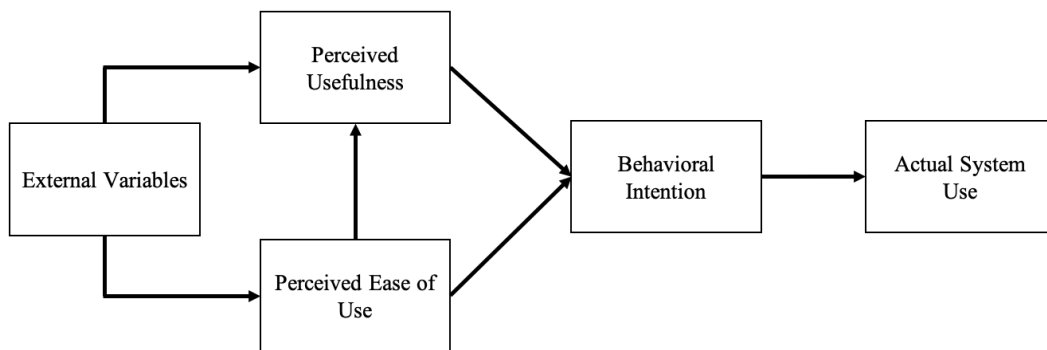
Figure 4: Revised Technology Acceptance Model without the attitude construct (Venkatesh & Davis, 1996)

2.2.4 Modifications of the Technology Acceptance Model

As mentioned earlier, Davis (1989) postulated that the possibility of tracing the impact of external factors on beliefs is a key advantage of TRA. Similar to TRA, TAM also posits that external variables might influence the person's two beliefs PU and PEOU (Davis et al., 1989), which provides the basis to explicate the causal links among beliefs and their antecedents. Thus, practitioners and researchers are able to set corrective measures in order to improve the acceptance of technology in question. Since Davis, Bagozzi & Warshaw (1992) added output quality as the first external variable, researchers have applied and proposed a multitude of extensions to TAM in the form of external predictors of PU and PEOU such as technology anxiety and experience, factors derived from other theories from technology acceptance such as expectation and user participation, as well as contextual factors such as gender and age (Marangunić & Granić, 2015). TAM was initially defined in an organizational context and a person's job performance. However, the model has also been validated as a robust and parsimonious framework to explain and predict technology acceptance in non-organizational settings such as the world wide web (e.g. Gefen & Straub, 2000), instant messaging services (e.g. Wang et al., 2005), or e-commerce (e.g. Pavlou, 2003). Thereby, researchers have expanded upon the TAM by incorporating

components from a multitude of theories to cover a variety of contexts. Notably, Venkatesh & Davis (2000) suggested a modified model of TAM to better explain reasons why an individual would perceive a system in question useful by incorporating the social forces of subjective norm, voluntariness, and image, as well as the cognitive process factors of job relevance, output quality, result demonstrability, and PEOU as antecedents of the PU construct. Referred to as TAM2, the authors reported that in the proposed model both factor groups significantly influenced users' perception of the usefulness of a system. With regard to social factors of technology acceptance, TAM research has also been influenced by the motivational theories of intrinsic and extrinsic motivation of individuals' behavior (e.g. Igbaria, Parasumaran & Baroudi, 1996; Moon & Kim, 2001). Extrinsic behavior refers to the performance of an activity to achieve external rewards distinct from the activity itself such as salary or attention, while intrinsic behavior relates to the performance of an activity for the sake of the process itself for pleasure and satisfaction (Deci, 1975; Vallerand, 1995). TAM studies had mostly an extrinsic stance by considering extrinsic motivation with the PU construct (Davis, 1989; Davis et al., 1992; Venkatesh & Davis, 2000). No special attention was given to intrinsic motivations of technology acceptance and only PEOU was proposed as related to the intrinsic motive (Venkatesh, 2000). However, the field soon echoed the duality of motivations by incorporating intrinsic aspects in the form of TAM constructs such as perceived enjoyment, perceived fun, cognitive absorption, and perceived playfulness (PP) (Davis et al., 1992; Igbaria et al., 1994; Agarwal & Karahanna, 2000; Moon & Kim, 2001). A considerable amount of technology acceptance literature has adopted this sentiment and found that intrinsic motivational aspects can be considered a key factor in technology acceptance (e.g. Koufaris, 2002; Sun & Zhang, 2006; Cyr et al, 2006).

2.2.5 Limitations of the Technology Acceptance Model

Albeit being a leading model for explaining and predicting technology acceptance and consolidating an impressively broad and deep TAM research area, it is important to understand the main critiques and limitations of the model raised by authors in the field (Lee et al., 2003).

One field of critique is concerned with the methodology of TAM. According to a TAM literature review by Lee et al. (2003), the most reported limitation of TAM is the use of self-reported use data, instead of actual objective usage. However, several authors argue that self-reported use data represents a subjective measure and thus could distort research findings for actual use of a system by, for instance, being subject to common method bias or socially desirable answers (Agarwal & Karahanna, 2000; Legris, Inham & Collerette, 2003; Yousafzai, Foxall & Pallister, 2007). A further point of critique is the dominance of heterogeneous sample groups used, predominantly students, which limits the generalizability of the findings (Lee et al., 2003; Legris et al., 2003; Yousafzai et al., 2007). Student subjects in controlled environments might have different motivations for participating in the study such as getting bonus points for exams (Lee et al., 2003). Moreover, TAM studies predominantly follow a cross-sectional approach according to Lee et al. (2003). However, Lee et al. (2003) argue for the use of longitudinal studies to warrant causality of the research results, because user's perception and intention may vary over the course of time. Furthermore, Bagozzi (2007) argues in his widely cited TAM analysis, that parsimony is not only one of TAM's main strengths, but also its weakness. The author claims that it is "unreasonable to expect that one model, and one so simple, would explain decisions and behavior fully across a wide range of technologies, adoption situations, and differences in decision making and decision makers" (p. 245). Furthermore, Bagozzi (2007) proposes two critical gaps in the theoretical foundation of the TAM. Firstly, the author argues that behavior, which is essential in TAM's assumed intention-behavior link, might only be a means to achieve a more fundamental goal rather than the

behavior as an end to itself. Secondly, BI to use might not adequately represent actual use, because the individual could be affected by further steps to overcome possible uncertainties of adoption in the time gap between forming the intention and actual use.

2.3 B2C & C2C e-marketplace adoption

The success of B2C & C2C e-marketplaces is closely linked to their capabilities to take advantage of network effects. These occur when a growing user base is an incentive for more users to adopt and join the platform (Evans, 2003; Rochet & Tirole, 2003, 2006; Armstrong, 2006). Thus, it is crucial for e-marketplaces to attract buyers and sellers to join the platform which, due to network effects, will subsequently attract more buyers and sellers. However, only few e-marketplaces reach a critical mass of buyers and sellers to achieve sufficient network effects and to stay competitive in the market (Duch-Brown, 2017). Therefore, the understanding of e-marketplace adoption, which is the attraction and retention of both buyers and sellers, poses a fundamental problem to e-marketplace businesses and plays a critical role in determining their success or failure in the market (Wei et al., 2014). The purpose of this chapter is to establish an understanding of B2C and C2C e-marketplace adoption from a buyer's perspective.

The e-marketplace adoption section is divided into four parts to build a theoretical foundation for e-marketplace adoption. In order to establish the current knowledge about e-marketplace adoption in academia, the first part gives a brief overview of the recent research on e-marketplace adoption from a technology acceptance perspective. The forthcoming parts were conceptualized to account for various perspectives on e-marketplace adoption. Firstly, with a website as a focal point for buyers and sellers, e-marketplaces represent IT-based consumer systems. A general notion in IT-based consumer system literature is that system characteristics are playing a crucial role in the acceptance decision of an end user (e.g. Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011). The main role of an e-marketplace is to provide an IT-infrastructure to facilitate transactions between buyers and sellers. Thus,

system-specific characteristics are likely to influence the transaction process in multiple ways since it dictates how the search for products or services is presented to the end user. Therefore, e-marketplace adoption is considered to be similarly affected by the buyer's perception of e-marketplace system characteristics. Therefore, by drawing on previous TAM research, system-related factors are outlined and contextualized for e-marketplace adoption. Having established the integral role of platform dynamics for e-marketplaces, the second part draws on fundamental concepts related to platforms to theoretically derive how the underlying platform characteristics of an e-marketplace should be considered when investigating e-marketplace adoption. Within platform literature, the issues of network externalities and pricing have received considerable attention in the adoption of platforms (Rochet & Tirole, 2003; Eisenmann et al., 2006; Evans & Schmalensee, 2007) and are therefore placed in the context of the adoption of electronic marketplaces. Thirdly, consumer behavior related aspects have shown to influence technology acceptance decisions in the online shopping context (Childers et al., 2001; Koufaris, 2002). Thus, factors from consumer behavior literature are outlined and their role for e-marketplace adoption established.

2.3.1 Status quo of e-marketplace adoption research

Recent attention has focused on the examination of e-marketplace adoption from a technology acceptance view (e.g. Pavlou & Gefen, 2004; Kim & Ahn, 2007; Wei et al., 2014), as it provides a rich variety of models and theories to explain and predict end user technology adoption (Taherdoost, 2018). Much of the current literature on e-marketplace adoption pays particular attention to B2B e-marketplaces and thus adopted a firm-level adoption view rather than an end user level view (e.g. Hsiao, 2003; Joo & Kim, 2004; White et al., 2007). On the contrary, B2C and C2C e-marketplace adoption has received rather scarce attention. In regard to empirical studies on B2C and C2C e-marketplace adoption, a preliminary literature review

suggests that scholars have focused on single factors of investigation. In fact, previous technology acceptance studies predominantly explored the role of trust and risk for buyers' adoption decision of e-marketplaces (Pavlou & Gefen, 2004; Kim & Ahn, 2007; Wei et al., 2014). Both Pavlou & Gefen (2004) and Kim & Ahn (2007) found that trust is positively related and perceived risk is negatively related to transaction intention on e-marketplaces. The authors argue that trust is especially salient in e-marketplaces because in e-marketplaces buyers often transact with a range of new and unknown individual sellers they have few familiarities with. Therefore, both studies argue that the buyer's trust in the market-maker, in other words, the platform owner, and in the platform's web interface, referred to as institution-based trust, are important factors besides the trust towards the seller. However, drawing on these findings, a recent study by Wei et al. (2014) extended the TAM model by perceived risk as an external variable and found that market-maker trust and institution-based trust are not significant for buyers' intention to transact on an e-marketplace. Interestingly, this contradicts withheld beliefs of the importance of trust in e-commerce adoption (e. g. Pavlou, 2003; Gefen et al., 2003). Wei et al. (2014) argue that this could be explained by the shopping savvy sample of buyers used in the study.

Against this backdrop, the preliminary e-marketplace adoption literature review suggests that there has been little discussion about determinants of e-marketplace adoption behavior other than trust and risk. This indicates room for further research to explore determinants of e-marketplace adoption. To take a case in point, even though Wei et al. (2014) and Kim & Ahn (2007) stress the importance of network externalities for e-marketplaces, the concept has not been further examined in their studies.

2.3.2 Relevance of system-specific characteristics for e-marketplace adoption

A general notion in IS research is that system characteristics play a crucial role in the e-commerce adoption behavior of end users (e.g. Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011). Because e-commerce is a fundamental aspect of e-

marketplaces (Brunn et al., 2002), a similar relevance of system-specific characteristics is expected. In fact, e-marketplaces use IT-enabled web interfaces to facilitate the transactions between buyers and sellers. To account for factors related to the IT experience of consumers, many TAM-based studies that draw on web interface quality or usability literature to derive antecedents for e-commerce acceptance (e.g. Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011). Overall, several proposed concepts show overlapping tendencies, which suggests that some concepts are more established and salient than others.

Several studies show that the system-related variables navigability and interactivity are perceived as important to e-commerce users. Navigability, which has been found to be significant for e-commerce users, encompasses whether the web interface and its webpages have a uniform layout and thus provide a high navigable interface (Green & Pearson, 2011). In the same vein, Chen & Tan (2004) found that, when navigability, design and layout were rated positively by the user, acceptance of the e-commerce system increased. Turning to interactivity, advancements in web technologies help e-commerce businesses to provide more user-centric, interactive solutions to their web interface design such as web interface customization, web interface personalization, and hypermedia presentation (Ahn et al., 2007). In fact, Green & Pearson (2011) found that the interactivity of an e-commerce system is key to a good online shopping experience. Another dimension that has been widely employed and validated as a crucial factor in e-commerce acceptance is information (Ahn et al., 2004, 2007; Green & Pearson, 2011; Chen & Tan, 2004). In the web context, information refers to the report and presentation of information itself. Information quality is predominantly assessed by the content or content quality of a web interface (Ahn et al., 2004). Mostly, the authors drew on information richness theory by Daft & Lengel (1986). According to this theory, information is considered rich if it is able to timely improve understanding of problems and clearing out uncertainties (Daft & Lengel, 1986). Furthermore, Ahn et al. (2004) found that communication mechanism for the end user to reach the e-

commerce provider plays an important role in e-commerce acceptance. This finding is supported by Green & Pearson (2011) and Chen & Tan (2004), who identified the availability of feedback features and functions in e-commerce web interfaces to play a vital role in e-commerce adoption.

In view of all that has been mentioned so far, previous TAM-based research offers a wide variety of system-specific variables that may similarly impact an end user's adoption of an e-marketplace. There are several dimensions that received more attention and have more overlapping tendencies than others and thus may be regarded as most salient due to their great support in literature. That is, information or content related constructs, feedback mechanisms, navigability, and interactivity (Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011).

2.3.3 Relevance of consumer behavior aspects for e-marketplace adoption

Previous research in e-commerce has shown that technology acceptance not only depends on the IT as a viable means to shop online, but also on other factors related to online consumer behavior. Two key variables derived from consumer research received strong interest from IS research: enjoyment and trust (e.g. Childers, 2001; Pavlou, 2003; Koufaris, 2002; Ahn et al., 2007). Thus, the following part firstly establishes an understanding of enjoyment and trust and sets them in relation to the e-marketplace context.

Firstly, numerous consumer research studies suggest that consumption encompasses both utilitarian and hedonic motivations (e.g. Hirschmann & Holbrook, 1982; Babin, Darden & Griffin, 1994). Utilitarian motivation refers to attaining the desired outcome, purchasing a good, efficiently, and with minimum effort (Babin et al., 1994), while hedonic motivation means that consumers derive emotive and multisensory benefits from the shopping experience itself (Hirschmann & Holbrook, 1982). Similarly, as discussed earlier, technology acceptance literature incorporated the notion of intrinsic

motivation to account for pleasure and satisfaction derived from using a technology (e.g. Davis et al., 1992; Agarwal & Karahanna, 2000; Moon & Kim, 2001). With regards to e-commerce acceptance studies, Childers et al. (2001) argue in their seminal paper that online shopping also encompasses both utilitarian and hedonic motivations, because e-commerce sites provide "an expanded opportunity to create a cognitively and aesthetically rich shopping environment" (p. 511). In other words, the adoption of e-commerce may be influenced by the consumer's need for an enjoyable experience that caters to entertainment and fun. Childers et al. (2001) found that, while being distinct, both utilitarian and hedonic dimensions play an equally salient role in determining a customer's attitude toward online shopping. In the same vein, by drawing on the construct of PP, Ahn et al. (2007) have been able to show that playfulness is an important aspect in consumers' intention to visit an online retailing site. Ha & Stoel (2009), on the other hand, found that enjoyment positively influenced PU and A in the e-commerce context. The recognition of hedonic aspects in e-marketplace adoption not only seems to be warranted by the theoretical and empirical support provided but would reflect the importance of experience in today's society. To further illustrate this from a sociological perspective, Schulze (1992, 2005) argues that contemporary society strives for goods and services that cater an individual experience that helps to live "nicely" and "experience" life in the best way possible, rather than goods and services that provide general usability and functionality. Schulze (1992, 2005) refers to this transformed society as "the experience society", which term can be ascribed to our contemporary society in developed countries and at the same time is the eponym of his respective seminal book. Thus, e-marketplaces should not only be able to cater for utilitarian needs, but also should have capabilities to create a multitude of experiences for users of, for instance, sensory, affective, and creative nature to inspire a holistic consumption experience.

Secondly, similar to e-marketplace adoption research (Pavlou & Gefen, 2004; Kim & Ahn, 2007; Wei et al., 2014), several e-commerce acceptance studies have shown

that consumers' trust in e-commerce retailers and in the IT can be considered a key determinant in the B2C context (e.g. Pavlou, 2003; Gefen et al., 2003; Chen & Tan, 2004; Ha & Stoel, 2009). Trust is determined by the belief of safety, which consumer experience when conducting business over the internet (Pavlou, 2003; Gefen et al., 2003). When shopping virtually, consumers are limited to the web interface and thus are not able to examine the product with all their senses or engage in face-to-face interactions with a store employee. Hence, there are higher levels of perceived uncertainty and risk involved when making an online transaction (Ha & Stoel, 2009). Playing an important role in mitigating uncertainty and risks, trust is considered a key measure to generate a belief of safety among consumers (Pavlou, 2003). However, research on trust in the e-commerce environment, while being researched extensively, is dated to the early days of online shopping. At that time, e-commerce was not well adopted and consumers still needed to build general trust in making transactions online. In other words, trust was considered as a critical foundation for the diffusion and acceptance of e-commerce (Grabner-Kraeuter, 2002). Since then, online shopping diffusion has radically changed. To illustrate, 84% of Danish and 79% of German citizens aged 16 to 75 years old purchased at least once a good or service online in 2019 according to Statista (2019). This indicates that consumers are more online shopping savvy in general and thus are likely to know how to reduce the risk involved in making transactions online. This reasoning is corroborated by recent findings by Wei et al. (2014) that neither the trust in the seller nor in the e-marketplace provider are significant for buyers' intention to transact on a C2C e-marketplace. Thus, the role of trust is considered to play a subordinate role in the e-marketplace context and is therefore not considered in this present research.

2.3.4 Relevance of platform-specific characteristics for e-marketplace adoption

With respect to the integral role of the platform-based business model for e-marketplaces, the last part outlines incremental theories and challenges related to

platforms such as network effects and pricing together with winner-take-all (WTA) dynamics to establish an understanding on how the underlying platform characteristics of an e-marketplace might affect its adoption by a buyer.

2.3.4.1 Network effects

As discussed earlier, the main role of an e-marketplace is facilitating value-exchange by providing the infrastructure to connect sellers that provide goods and services with buyers (e.g. Rochet & Tirole, 2003; Cennamo, 2019). For e-marketplaces buyers benefit from the platform by getting access to a great selection of products or services by independent sellers. In turn, sellers derive benefits from the platform by gaining access to a broad market of buyers that are represented by the end users, which helps them to increase the economic value they can realize from the platform (Cennamo, 2019). According to the economic definition of platforms, the main value of a platform such as an e-marketplace is thus derived from its network benefits it generates for both sides (Rochet & Tirole, 2003; Hagiu, 2009). In other words, buyers and sellers derive more benefits the more participants are on each side. Thus, a growing user base is an incentive for more users to adopt and join the platform. This phenomenon is commonly referred to as network effects (Evans, 2003; Rochet & Tirole, 2003; Armstrong, 2006). Conceptually, platform research adopted this reasoning from the concept of network externalities (Katz and Shapiro, 1984, 1985), which present determinants that drive network effects, such as the size of the network or the number of available complementaries (Economides, 1996; Lin & Bhattacharjee, 2008). In multi-sided platforms, network effects can be distinguished in either same-side or cross-side network effects (Rochet & Tirole, 2003; Eisenmann et al., 2006; Evans & Schmalensee, 2007). Network effects can either have a positive and self-reinforcing outcome or a negative and congestive outcome (Liebowitz & Margolis, 1994). Same-side or direct network effects refer to the phenomenon that the platform value for one side increases as the number of users located on the same side grows (Evans &

Schmalensee, 2013). For example, more and more users become attracted to Facebook as access to the number of friends and friends of friends grows. This is due to the increased size of people to potentially connect and interact with (Gawer & Cusomano, 2014). In the case of e-marketplaces, same-side network effects can have both positive and negative outcomes. On the one hand, some consumers cherish the possibility to obtain feedback as well as appreciation from peers who share similar interests and backgrounds (Chen, Hsu & Lin, 2010). Therefore, these consumers may feel attracted to a larger network size. Kleiderkreisel, a German C2C e-marketplace for used clothes, constitutes a popular example for an e-marketplace that emphasizes community exchange (Kleiderkreisel, 2020). On the other hand, if the number of offerings is limited, more buyers might also increase the competitive pressure on the buying side, because more demand is created, which is also referred to as negative network externalities (Katz & Shapiro, 1985). For instance, e-marketplaces such as Uber may be exposed to such negative network externalities when the number of drivers is limited and end users might not be able to hail a ride due to high demand. Thus, users may not feel attracted to a larger network size. Cross-side or indirect network effects refer to the phenomenon that the platform value for one side increases as the number of users on the other side grows (Katz & Shapiro, 1994; Gawer & Cusomano, 2014). To take a case in point, buyers become more attracted to join Amazon Marketplace as the access to the number of sellers grows, which consequently increases the product variety being offered (Cennamo, 2019). Thus, cross-side network effects may have a critical impact on a buyer's decision to use an e-marketplace. There have been attempts to investigate network effects in TAM studies (Hsu & Lu, 2004; Wang et al., 2005; Lin & Bhattacherjee, 2008). In a survey study with 437 students, Wang et al. (2005) demonstrated that same-side network effects have a positive impact on the adoption of instant messaging platforms. Lin & Bhattacherjee (2008) showed that network benefits, a construct which consists of the perceived number of same-side and cross-side users, is positively linked to the IT usage intention of instant messaging platforms. In an investigation into internet-of-

things (IoT) platform services, Hsu & Lu (2004) found perceived critical mass to be positively correlated to the attitude towards playing an online game. However, as far as the authors know, TAM research has not yet researched the effect of network effects on B2C and C2C e-marketplaces adoption. While there have been studies recognizing the effect of network effects in other contexts mentioned above, this part highlights the need to examine the impact of network effects on e-marketplace adoption.

2.3.4.2 Pricing

As mentioned before, one major challenge for multi-sided platforms is to obtain enough users on each side to secure a critical mass to facilitate network effects (Rochet & Tirole, 2003; Hagiu, 2009). In the case of e-marketplaces, no buyers are interested in joining the platform if there are no sellers and vice versa (Brunn et al., 2002). In fact, overcoming this so-called "chicken-and-egg problem" (Caillaud & Jullien, 2003) has been the major interest of analysis in platform research (e.g. Rochet & Tirole, 2003; Parker & Van Alstyne, 2005; Hagiu 2005, 2009). Platform literature suggests several strategies such as pricing strategies, product design, marketing, and other strategic efforts to motivate both sides onto the platform (Evans & Schmalensee, 2013). However, pricing strategies have been identified as the predominant strategy (Rochet & Tirole, 2006). Providing transfers or low prices to one side of the market facilitates the benefited group's participation which consequently, due to cross-side network effects, reinforces the non-benefited group's participation. Therefore, a common strategy to overcome the chicken-and-egg problem is to obtain a critical mass of users on one side of the market by offering the service either for free or even paying them to use it (Evans, 2003). Multi-sided platforms thus use pricing strategies as a coordination mechanism, which helps them to maximize platform value by providing greater benefits to its two sides (Rochet & Tirole, 2003; Parker & Van Alstyne 2005; Cennamo, 2019). For example, Caillaud & Jullien (2001) emphasize "divide and

conquer" strategies which entail subsidization of users in the most price-sensitive group whose participation, in turn, can be used to attract users on the other side. For e-marketplaces, the targeted side should ideally be buyers and sellers that trade the most to build actual transaction volume rather than just increasing the number of members (Sculley & Woods, 2000). However, to reduce entry barriers e-marketplaces usually refrain from charging a fee for access to the platform for the buyer side, but rather capture value by charging transaction-related fees where the seller pays a certain percentage of the sale value to the platform owner (Kambil and van Heck, 2002). Moreover, pricing strategies are also used to manage so-called WTA dynamics (Eisenmann et al., 2006). To any given user, the value of a platform is contingent on the number of users on the other side of the network. Thus, as the network of a platform, such as an e-marketplace grows, the platform becomes more and more valuable in comparison to its e-marketplace competitors. This leads to WTA competitive dynamics (Lee, Lee & Lee, 2006), for which an e-marketplace is expected to dominate the entire market it caters. For e-marketplaces, WTA dynamics also tend to be the prevalent competition logic. That is, the more sellers participate on the platform the more attractive the e-marketplace becomes for buyers and vice versa (Eisenmann et al., 2006). As a consequence of high network effects on one e-marketplace, competing e-marketplaces become less attractive for both buyers and sellers. This results in high intensity of platform competition and escalation into so-called WTA battles (Eisenmann et al., 2006; Lee et al., 2006). To take a case in point, in the US ride-hailing market, this WTA battle is fought between Uber (71% market share) and Lyft (29% market share), which combined account for 100% of the market share in April 2020 (Statista, 2020). This led to a price war in this e-marketplace sector, in which both e-marketplaces tried to underbid each other (McArdle, 2019). In view of all that has been mentioned so far, it is evident that the role of pricing is crucial for any kind of e-marketplace. Depending on the specific nature of the e-marketplace, e-marketplaces can either directly or indirectly influence the pricing structure of the products or services offered by the supplier side. For the former case, Uber and its

dynamic pricing is exemplary. On Uber's platform, it is not the independent drivers that set the price for a ride, instead the price is set by Uber by using a pricing algorithm that is based on the surrounding traffic and the rider demand (Uber, 2020). For the latter case, Amazon Marketplace serves as an example. On the one hand, Amazon Marketplace does not charge any price for buyers to use the e-marketplace, thus subsidizing the buyer side, while charging buyers to list products on the website (Leschly et al., 2003). However, Amazon Marketplace used to underbid its competitors by making price agreements with sellers, who agree to sell their product on Amazon Marketplace at the best price (Bond, 2019). Consequently, e-marketplaces are able to influence the buyers perceived price fairness compared to rivaling e-marketplaces.

Together, these studies outline that for buyers the prices offered on a specific e-marketplace compared to the price of a competing e-marketplace may decide, which e-marketplace, if any, the end user eventually adopts. Thus, this perception of price competitiveness is considered to play a critical role in e-marketplace adoption and bears important implications for e-marketplace providers.

3   Research model development & hypotheses formulation

Having established an understanding of the theoretical background of the TAM in the previous chapter, this study extends the TAM to provide a comprehensive model that explains and predicts buyers' adoption behavior of B2C and C2C e-marketplaces. The TAM is considered a suitable theoretical foundation for the underlying research objective for the following reasons. Firstly, it presents a parsimony, yet robust model to explain and predict end user technology adoption. In fact, TAM depicts the preeminent model to examine technology acceptance in the IS field and has been found to be highly predictive of technology adoption in various contexts such as interactive TVs, digital libraries, and e-commerce (Gefen et al., 2003; Lee et al., 2003; Yousafzai et al., 2007). Secondly, several studies have demonstrated the TAM's applicability in the B2C and C2C e-marketplace context (e.g. Chien et al., 2012; Wei

et al, 2014). Thirdly, the TAM provides room for modifications to apply a research to a specific context (Marangunic & Granic, 2015). Thus, it allows the researchers to modify TAM to account for the unique characteristics of B2C and C2C e-marketplaces, which is considered essential for the purpose of this research to examine e-marketplace adoption.

While the overarching theory to build a comprehensive research model to explain e-marketplace adoption is the original TAM and its two salient beliefs of PU, PEOU, the present research extends the TAM by constructs derived from IS, consumer behavior and platform literature to better account for the specific characteristics of e-marketplaces. In order to provide a more holistic perspective on the buyers' motivations for e-marketplace adoption, the present study incorporates the PP construct by Moon & Kim (2001) as an additional intrinsic. Ahn et al. (2007) validated PP by Moon & Kim (2001) as a significant determinant for e-commerce acceptance. Based on the findings in the literature review on system-specific characteristics, the study proposes the constructs of perceived navigability, perceived content, perceived interactivity, and perceived responsiveness as antecedents of PU, PEOU, and PP. Thirdly, the research model draws on two fundamental aspects of platform literature that are proposed to play a critical role in e-marketplace adoption: network externalities and pricing. That said, the research model extends the TAM by incorporating the construct of perceived network size to account for the role of same-side network effects, and the construct of perceived complementor size accounts for the role of cross-side network effects. Furthermore, based on the strong support in the literature review, the perceived price competitiveness is proposed as a further platform-specific variable. Figure 5 shows the proposed research model. A more detailed overview of the constructs, their definition and the respective measurement items is provided in Appendix 1.
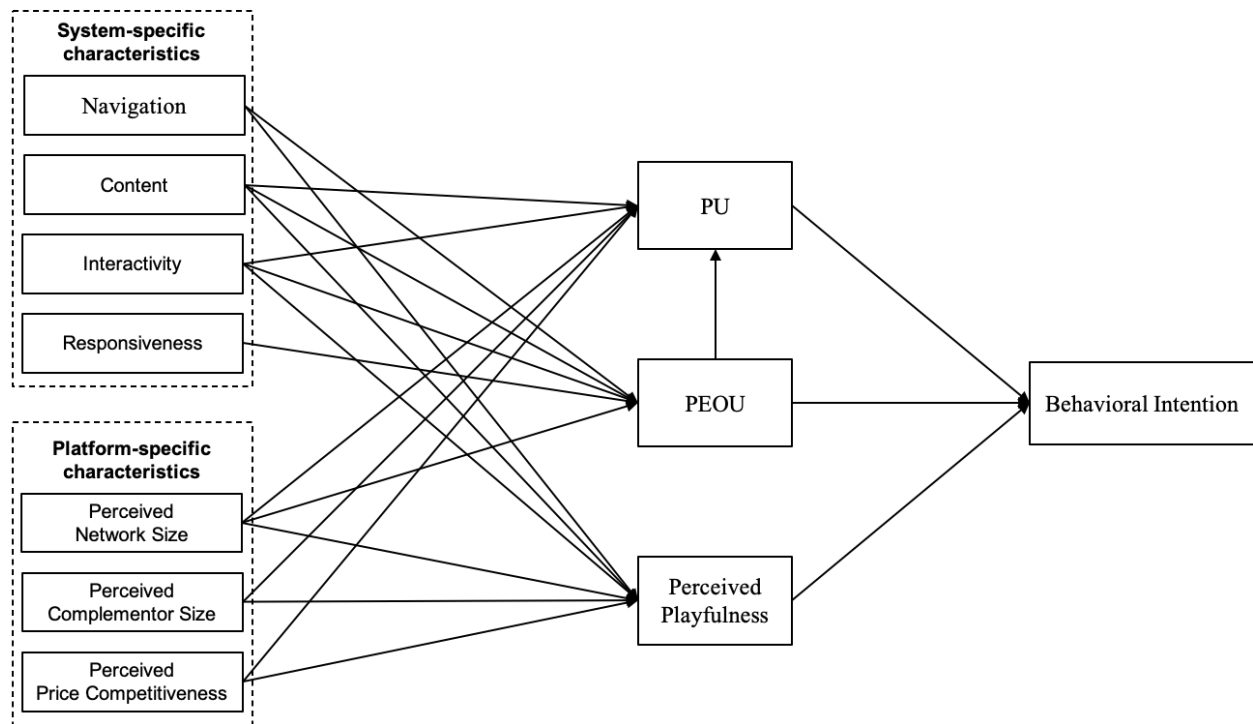
Figure 5: Proposed e-marketplace adoption research model

3.1 TAM related hypotheses

Considering that the TAM is used as a baseline model, also the traditional TAM relationships in the context of e-marketplaces are tested. As pointed out in the theoretical background of this thesis, TAM posits that technology acceptance is determined by two key beliefs regarding the technology - PU and PEOU (Davis et al., 1989; Davis et al., 1989). Davis (1989) defined PU as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320) and PEOU as "the degree to which a person believes that using a particular system would be free of effort" (p. 320). Even though, the original context considered a person's job performance (Davis, 1989), a growing body of literature examined the impact of PU and PEOU in non-organizational settings, including e-commerce acceptance (e.g. Gefen & Straub 2003, Pavlou, 2003; Chen & Tan, 2004; Ahn et al., 2004). Applied to the context of this study, a buyer would perceive an e-marketplace

as useful, if it facilitates his or her performance in the transaction process and supports the buyer to make effective decisions about products or services offered (Pavlou, 2003; Islam, Jebarajakirthy & Shankar, 2019). PEOU is defined as the degree to which a buyer of the e-marketplace believes that using a particular e-marketplace would be free of effort (Pavlou, 2003). Furthermore, drawing on findings by Davis et al. (1989) and Venkatesh et al. (2003), the research model does not include the attitude construct. The authors argue that TAM's explanatory power is equally good without the mediating attitude construct and leaving out the construct helps to "better explain the intention parsimoniously" (Venkatesh et. al, 2003, p. 428; Davis et al., 1989). Following TAM studies that applied this relationship setting reported mixed results. While many found a direct relationship of PU on BI, not all validated a direct relationship of PEOU on BI (e.g. Szajna, 1996; Pavlou, 2003; Gefen et al., 2003; Islam et al., 2019). Nevertheless, the present research model tests both relationships. In other words, the model hypothesizes direct effects of PU and PEOU on BI. Against this backdrop, the study proposes the following traditional TAM relationships in the context of e-marketplaces:

H1a: The perceived usefulness of an e-marketplace is positively related to the behavioral intention to use an e-marketplace.

H1b: The perceived ease of use of an e-marketplace is positively related to the behavioral intention to use an e-marketplace.

With regards to PEOU, a considerable amount of TAM studies reported a positive relationship between PEOU and PU (e.g. Gefen & Straub, 2000; Legris et al., 2003; Yousafzai et al., 2007). In other words, that high PEOU leads to an increased PU. What is more, this relationship has been validated in previous e-commerce acceptance studies (e.g. Pavlou, 2003; Ahn et al., 2004; Green & Pearson, 2011). Applying this to the e-marketplace context, a buyer would perceive the e-marketplace

to improve their overall performance in the transaction process, if operating the e-marketplace is perceived as free of effort. Hence, the research model hypothesizes:

H1c: The perceived ease of use of an e-marketplace is positively related to perceived usefulness.

3.2 Playfulness as a factor in e-marketplace adoption

As previously established in the literature review, a considerable amount of technology acceptance literature proposes a holistic view on technology acceptance and found that besides extrinsic motivations, intrinsic motivations can be considered a key factor in technology acceptance as well (Davis et al., 1992; Agarwal & Karahanna, 2000; Moon & Kim, 2001). In the same vein, Childers et al. (2001) argue in their seminal paper that online shopping also encompasses both utilitarian and hedonic motivations, because e-commerce sites provide "an expanded opportunity to create a cognitively and aesthetically rich shopping environment" (p. 511). In other words, the acceptance of e-commerce may be influenced by the consumer's need for an enjoyable experience that caters to entertainment and fun. Since an e-marketplace buyer presents both IT-user and online shopping consumer, the research model posits that besides the utilitarian TAM belief about PU, also hedonic beliefs play an important role in e-marketplace adoption. Following this reasoning, the concept of playfulness according to Moon & Kim (2001) is incorporated in the research model, which was designed to represent a user's intrinsic belief about his or her subjective experience with the world wide web (WWW). Based on Csikszentmihalyi's (1975) flow theory, Moon & Kim (2001) suggested playfulness as an interdependent three-dimensional concept which describes the extent to which a user: "(a) perceives that his or her attention is focused on the interaction with the WWW; (b) is curious during the interaction; and (c) finds the interaction intrinsically enjoyable or interesting." (p. 219). In essence, the study by Moon & Kim (2001) showed that users who perceive high playfulness when interacting with WWW rate the interaction more positively and are

more likely to accept the WWW. Applying the concept to the e-marketplace context, this study defines playfulness as "the degree to which a user experiences concentration, curiosity, and enjoyment when interacting with an e-marketplace". Flow theory suggests that a positive subjective experience plays a decisive role in whether someone is performing an activity (Csikszentmihalyi, 1975). If the individual enjoys an activity, intrinsic motivation is involved and thus engaging in the activity becomes an end to itself for the person. That said, users that have a good experience when interacting with an e-marketplace are likely to be more absorbed by the activity. Building on flow, Moon & Kim (2001) found that PP positively influences BI to use WWW. In the same vein, studies by van der Heijden (2003) and Lin, Wu & Tsai (2005) reported that playfulness positively impacted web interface usage. Thus, when looking at e-marketplaces from a web interface perspective, PP is expected to directly influence BI. Moreover, as online shopping also produces hedonic and utilitarian outcomes (Childers et al., 2001), an enjoyable and fun shopping experience may reward the end user with purchasing-derived pleasure. This further suggests that PP may determine a buyer's BI to use an e-marketplace. Hence it is hypothesized:

H2: The perceived playfulness of an e-marketplace is positively related to the behavioral intention to use an e-marketplace.

3.3 System-specific characteristics

As a second extension of the TAM, the study incorporates system-specific characteristics. Drawing on the theoretical discussion of system-specific antecedents of e-marketplaces, the study proposes the constructs of perceived content, perceived interactivity, perceived navigability and perceived responsiveness as antecedents of PU, PEOU, and PP. The following parts outline the constructs' significance for e-marketplaces and develop their respective linkages to the three key beliefs.

3.3.1 Content

Several studies suggest that content plays a critical role for web interface's usability and success (e.g. Palmer, 2002; Agarwal & Venkatesh, 2002). In general, a web interface should be able to provide comprehensive and complete information with relevant use of visuals (Palmer, 2002). According to Green & Pearson (2011), content can be defined as "the amount, variety, and relevance of product text, graphics, and multimedia" (p. 186). In the same vein, the aspect of content has been identified as critical in IT-based consumer system acceptance (e.g. Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011). The relevance of content for end users has been established by consumer behavior literature that identified content as crucial for a positive online shopping experience (e.g. Jarvenpaa & Todd, 1996; Liao, Tsou & Shu, 2008). As e-marketplaces depict web interfaces to shop online, content is considered to play an important role in e-marketplace adoption. Satisfactory content is likely to help e-marketplace users to quickly acquire information about products or services and get information on shopping-related tasks to clear our problems and uncertainties. Thus, content is likely to impact the PU and PEOU of an e-marketplace. This is corroborated by several e-commerce acceptance studies that reported a positive impact of content on PU and PEOU (Ahn et al., 2004; Green & Pearson, 2011). Hence, it is hypothesized:

H3a: A user's perception of an e-marketplace's content is positively related to the user's perceived usefulness.

H3b: A user's perception of an e-marketplace's content is positively related to the user's perceived ease of use.

However, content has also been linked to catering for hedonic aspects of online shopping. To illustrate, Koufaris (2002) argues that a website can provide value-added information such as reviews of other customers or detailed product information, which

cannot be retrieved in physical stores. Value-added information may help users to make enhanced purchase decisions and to increase enjoyment by providing interesting and helpful information. Indeed, scholars found that high levels of content quality can have a positive impact on enjoyment (Koufaris, 2002) and playfulness (Ahn et al., 2007). Thus, the following hypothesis is proposed:

H3c: A user's perception of an e-marketplace's content is positively related to the user's perceived playfulness.

3.3.2 Interactivity

Prior research has proposed interactivity on web interfaces as an important concept to consider for web interface design and usability (e.g. Jarvenpaa & Todd, 1996; Shneidermann, 1998; Palmer, 2002). Interactivity can be described as the ability of the web interface to offer personalized and customized interaction for the user by allowing to alter the web interface's look, feel, as well as the content (Palmer, 2002). As such, website interactivity helps to provide a dynamic web experience and entertainment for the user but also helps the user to make effective decisions about their purchase (Islam et al., 2019). Thus, interactivity may comprise both hedonic and utilitarian elements. Notably, the capability to offer great interactivity for the user is considered a main advantage of the internet (Lee et al., 2006). Several studies investigated website interactivity within the online shopping context and found that it has positive effects on important factors such as revisiting motivations, purchase intention, and satisfaction (e.g. Gehrke & Turban, 1999; Fiore & Jin, 2003; Lee et al., 2006; Islam et al., 2019). Due to the importance of website interactivity for online shopping environments, the concept is assumed to play a similarly crucial role in e-marketplace adoption. With nowadays technological advanced tools for web interface design, online shops can utilize website interactivity to resemble a physical store experience, without the need for the user to physically go there (Lee et al., 2006). This is supported by several studies that users found website interactivity useful for their

online shopping experience (Childers et al., 2001; Lee et al., 2006; Li & Yeh, 2010; Islam et al., 2019). An interactive e-marketplace web interface is likely to provide useful features to facilitate the decision process of selecting a seller and product or service, which likely affects the PU of the respective users (Islam et al., 2019). Hence the following hypothesis is presented:

H4a: A user's perception of an e-marketplace's interactivity is positively related to the user's perceived usefulness.

Furthermore, the user is given more control over their shopping experience by individualizing and manipulating their e-marketplace's web interface. Examples to realize individualized online shopping include zoom view technology, product rotation, electronic shopping carts, and search filters (Li & Yeh, 2010). As a result, the effort to purchase products or services may be reduced and the shopping experience is characterized by ease and comfort. Hence, PEOU is likely to be positively affected by an interactive e-marketplace web interface (Islam et al., 2019). Thus, it is hypothesized:

H4b: A user's perception of an e-marketplace's interactivity is positively related to the user's perceived ease of use.

Lastly, several studies suggest that interactive website elements have a positive influence on hedonic aspects of the online shopping experience (Fiore, Jin & Kim, 2005; Lee et al., 2006; Jiang & Benbasat, 2007). Jiang & Benbasat (2007) found that interactivity, in the context of online product presentations, evokes positive affections towards the online shop due to two reasons. Firstly, aforementioned enhanced control of the shopping experience can lead to a sense of fulfillment. Secondly, interactive elements offer stimuli by allowing for an exploratory shopping experience, which may lead to emotional arousal. To further illustrate, Fiore et al. (2005) found that image interactivity for apparel considerably enhanced the online shopping pleasure. In the

same vein, Lee et al. (2006) found a positive effect of image interactivity on perceived enjoyment. Considering the above, interactivity is assumed to have analogous effects on the PP of e-marketplaces. The study thus proposes the following hypothesis:

H4c: A user's perception of an e-marketplace's interactivity is positively related to the user's perceived playfulness.

3.3.3 Navigability

Several authors proposed navigability as a dimension to evaluate web interfaces in the business context (e.g. Gehrke & Turban, 1999; Palmer, 2002; Lee & Kozar, 2004). Navigability can be defined as "the sequencing of pages, well-organized layout, and consistency of design protocols" (Green & Pearson, 2011, p. 187). Palmer (2002) found that users who perceive a web interface as easy to navigate, are more likely to use it more often, are more satisfied, and have a higher intention to return. Similarly, Lee & Kozar (2004) found that navigability in web interface design is pivotal for consumer behavior in the e-commerce environment. That said, good navigability helps users to find and acquire the information they are seeking on e-commerce websites more easily. Moreover, consistency in web interface design, for instance in the design of menu bars and links, is argued to influence consumer behavior positively by improving the user's performance through decreasing error rates and learning time (Nielsen, 2000). In regard to its prescribed characteristics, studies in the online shopping context by Pearson & Green (2011) and Childers et al. (2001) found that navigability positively influences PEOU. Considering the above, the same link is assumed to be true for e-marketplace web interfaces as well. Thus, it is hypothesized:

H5a: A user's perception of an e-marketplace's navigability is positively related to the user's perceived ease of use.

Furthermore, in an exploratory study, Chung & Tan (2004) found that easy navigability allows users to experience playfulness when interacting with general information-

searching websites. The same reasoning could be applied to e-marketplaces. When e-marketplace users navigate through product and service offerings with ease, it is expected that they enjoy the interaction and are more absorbed in the process. Therefore, the two following hypotheses are presented:

H5b: A user's perception of an e-marketplace's navigability is positively related to the user's perceived playfulness.

3.3.4 Responsiveness

Responsiveness of a web interface is an often-suggested metric for web interfaces (e.g. Shapiro & Varian, 1999; Palmer, 2002; Green & Pearson, 2011). According to Palmer (2002), responsiveness comprises "the presence of feedback to users and the availability of response from the site managers" (p. 155). In regard to online shopping, responsiveness depicts a key point of interest for users (Jarvenpaa & Todd, 1996). To further illustrate, the concept of responsiveness represents an integral dimension in electronic service quality research, which has been introduced by Santos (2003) to deal with the evaluation of electronic service execution in the online environment. With regards to responsiveness, service quality research emphasizes the timely and helpful reply of an online retailer to consumer requests (Santos, 2003; Lin, 2007). Considering the duality of e-marketplaces as an IT-enabled web interface and shopping means, responsiveness is assumed to play a critical role for e-marketplace users. Responsiveness elements on e-marketplaces can include, among others, the provision of FAQ's and feedback mechanisms to reach the e-marketplace operator or seller to solve cases of unusual experience and problems for the consumer (Green & Pearson, 2011). The availability of feedback mechanisms to resolve buyer requests is likely to enhance the shopping experience by providing a convenient way to decrease possible uncertainties about the product or service in question. Moreover, valuable feedback may increase the buyer's understanding of the e-marketplace and thus it helps the user to become more competent in using the web interface (Kim et al., 2009).

Green & Pearson (2011) found a positive link between responsiveness and PEOU for e-retailers. Thus, high responsiveness of an e-marketplace's web interface is likely to increase the buyer's perception of the e-marketplace's ease of use. Based on the discussion above, the study proposes the following hypothesis:

H6: A user's perception of an e-marketplace's responsiveness is positively related to the user's perceived ease of use.

3.4 Platform-specific characteristics

Platform literature has identified several factors that influence platform adoption. Especially the issues of network externalities and pricing have received critical attention in the adoption of platforms (Rochet & Tirole, 2003; Eisenmann et al., 2006; Evans & Schmalensee, 2007). However, previous TAM-based research in the context of B2C and C2C e-marketplaces has not yet examined platform-related variables as determinants for e-marketplace adoption. Trying to fill this research gap, the authors propose a research model that incorporates platform-specific variables to better explain e-marketplace adoption. The platform-specific variables are namely perceived network size, perceived complementor size and perceived price competitiveness. In the following, platform-specific variables are incorporated as antecedents of e-marketplace adoption and possible relationships are explicated.

3.4.1 Network size

Firstly, direct or same-side network effects describe the phenomenon that the platform value for one side increases as the network size of participants located on the same side grows (Evans & Schmalensee, 2013). Since the present study identifies e-marketplace buyers as the target population, the authors define network size as the number of buyers on the consumer side. Scholars have associated network size with the adoption of platform-based technologies such as instant messaging (Wang et al.,

2004; Zhou & Lou, 2011), personal computer operating system (Pae & Hyun, 2002), web server software (Gallaugher & Wang, 1999), and communication technology (Strader, Ramaswami & Houle, 2007, Lu, Deng & Wan, 2010). For example, when the user base of an instant messaging platform expands, individual users are able to connect and interact with more peers (Gawer & Cusomano, 2014). Scholars, therefore, suggested that the individual user's utility increases as the network size grows (e.g. Wang et al., 2004; Strader et al., 2007). Several studies found this link to be true as they proved a positive and significant effect of perceived network size on PU (Wang et al., 2004; Strader et al., 2007, Lu et al., 2010; Zhou & Lou, 2011). In the case of e-marketplaces, buyers with common interests, backgrounds, and goals may engage with peers both directly (e.g. through chats or blogs) and indirectly (e.g. through product reviews or recommendations such as "other users also bought…"). The resulting communities enable buyers to obtain feedback as well as appreciation from peers (Chen et al., 2010). Numerous studies have established the link between online reviews and product sales (e.g. Godes & Mayzlin, 2004; Chevalier & Mayzlin; 2003). In a study that surveyed 5,500 web consumers, 59% considered reviews generated by consumers more valuable than reviews generated by experts (Piller, 1999). Based on the discussion above, the authors posit that a larger network size may provide more product reviews and recommendations, more opportunities to directly engage with peers, and thus is likely to support the individual buyer to make effective decisions about products or services offered. Therefore, the authors hypothesize:

H7a: A user's perception of an e-marketplace's network size is positively related to the user's perceived usefulness.

Secondly, scholars found perceived network size to have a positive and significant effect on PEOU in the context of instant messaging (Wang et al., 2004; Van Slyke et al., 2007) and communication technology (Lu et al., 2010). On the one hand, a large user base may lead to the perception that the technology is relatively easy to use (Van

Slyke et al., 2007; Lou, Luo & Strong, 2000). In other words, if many peers are using a particular e-marketplace (e.g. eBay), a potential adopter may perceive eBay and its auction system as not so complex to learn and to use. On the other hand, a large user base may provide some assurance that a potential adopter who requires assistance may be able to get help from multiple sources. Existing adopters may be willing and able to share their experience which, as a consequence, encourage learning curve effects that are associated with the platform use (Van Slyke et al., 2007; Lou et al., 2000). In other words, potential eBay users may feel encouraged to use the e-marketplace because they know that they can either ask the community or their network for assistance in case they need help. Thus, the effort to use the e-marketplace is likely to be perceived as lower. Based on the discussion above, the authors hypothesize:

H7b: A user's perception of an e-marketplace's network size is positively related to the user's perceived ease of use.

Thirdly, Arnold & Reynolds (2003) identified several categories of hedonic shopping motivations that contribute to consumers' enjoyment. The hedonic shopping motivation of social shopping "refers to the enjoyment of shopping with friends and family, socializing while shopping, and bonding with others while shopping" (Arnold & Reynolds, 2003, p. 80). For example, Kleiderkreisel, a German C2C e-marketplace for used clothes, has become popular for its community exchange. These consumers regard shopping as a way to socialize with peers. Adopters exchange information about the latest trends in fashion and lifestyle or ask for feedback for instance on a certain outfit. A larger network size may increase the opportunity to engage with peers and thus influence the PP of e-marketplace adopters. Even though little is known about the relationship between perceived network size and PP, a few studies indicate the existence of a positive linkage between the two constructs. In the context of instant messaging, Li et al. (2005) found perceived critical mass to be positively and significantly correlated to perceived enjoyment. Furthermore, Zhao & Lu (2012)

examined the adoption of micro-blogging services and found perceived network size to positively affect a user's perception of playfulness. In contrast to micro-blogging and instant-messengers, e-marketplaces are not as focused on facilitating social interactions. However, the authors posit that the aforementioned social aspects of online shopping may lead to similar effects. Therefore, the following hypothesis is presented:

H7c: A user's perception of an e-marketplace's network size is positively related to the user's perceived playfulness.

3.4.2 Complementor size

In contrast to network size, complementor size represents indirect network externalities (Lin & Bhattacherjee, 2008). The authors define complementor size as the number of producers of complementary goods or services on the supply side of the e-marketplace. As the number of complementary functions and services increases, users gain access to a bigger portfolio they can choose from (Strader et al., 2007) which, as a consequence, increases the platform value for the individual user (Gawer & Cusomano, 2014). In fact, Chiu et al. (2014) identified a broad product offering as a utilitarian benefit of online shopping, allowing the user to choose from a broader variety of products for making comparisons and finding the desired product. Thus, the usefulness of the e-marketplace is likely to increase as the number of products and services grows. The effect of perceived complementor size on PU has been empirically proven in previous studies by Lin & Bhattercherjee (2008) and Zhou & Lu (2011). For instance, third-party applications in mobile instant messaging have a positive and significant effect on the user's PU (Zhou & Lu, 2011). Therefore, the authors hypothesize:

H8a: A user's perception of an e-marketplace's complementor size is positively related to the user's perceived usefulness.

Furthermore, a large complementor size might not only be a utilitarian benefit to buyers but of hedonic value as well. Previous research on social computing technologies has found perceived complementarity to be positively related to users' enjoyment (Lin & Lu, 2011; Zhou & Lu, 2011). Further research on the adoption of micro-blogging services supported the findings and found perceived complementarity to positively affect user's perception of playfulness (Zhao & Lu, 2012). In the case of e-marketplaces, some users might enjoy having a broad selection of products and services at hand to choose from. Moreover, the authors assume that some if not many users visit an e-marketplace without having a specific product or service in mind but like to browse through the product portfolio for inspirational purposes. To support that assumption, a study by Chiu et al. (2014) indicates that the majority of consumers demand discovery in order to satisfy their intrinsic needs when shopping online. Similarly, Kim & Eastin (2011) found that some online shoppers enjoy the act of shopping as an end to itself and derive fun and pleasure from information seeking on an online shop. Hence, a larger product and service portfolio may increase the user's enjoyment. Therefore, the authors hypothesize:

H8b: A user's perception of an e-marketplace's complementor size is positively related to the user's perceived playfulness.

3.4.3 Price competitiveness

Pricing strategies have become the predominant means to overcome platform challenges such as the chicken-and-egg problem (Caillaud & Jullien, 2001) or WTA dynamics (Eisenmann et al., 2006). In general, platform literature argues that due to the users' price sensitivity, price is identified as a major economic incentive in multi-sided platforms to get the different groups of users on board (Evans, 2003; Rochet & Tirole, 2003). What is more, price sensitivity especially accounts to online commerce, because monetary savings through cheap prices and sales promotions are considered as the key draw for online buyers (Soscia, Girolamo & Busacca, 2010; Chiu et al.,

2014). In fact, Atchariyachanvanich, Okada & Sonehara (2008) found that online buyers derive utilitarian value from monetary savings. This is corroborated by the findings of Cho & Sagynov (2015), who found perceived lower prices to positively affect PU in an online shopping study. Furthermore, the significance of price sensitivity has been empirically proven within the C2C e-marketplace context (Liang et al., 2018). However, a buyer's price sensitivity cannot be regarded in isolation and therefore should be considered in relation to the pricing of competing e-marketplaces. Thus, the prices offered on a specific e-marketplace compared to the price of a competing e-marketplace may eventually decide, which e-marketplace, if any, the end user eventually adopts. In fact, Clauss, Harengel & Hock (2019) found that the price relative to competitors determines loyal e-marketplace usage. The authors thus assume that the perceived price competitiveness, which refers to the perceived price relative to other e-marketplace competitors, may affect the buyers' in making effective decisions about products or services offered and consequently their BI to use an e-marketplace. Therefore, the authors hypothesize:

H9a: A user's perception of an e-marketplace's price competitiveness is positively related to the user's perceived usefulness.

Traditionally, price sensitivity has been considered to provide utilitarian shopping value for consumers (Tauber, 1972; Schindler, 1989). However, consumer research has turned to view high price sensitivity as a way to derive hedonic value from hunting bargains, which applies to situations in which the selling price is below the internal reference price of a consumer (Schindler, 1989). Schindler (1989) argues that bargain perception can evoke feelings of excitement, but also negative one such as anger and resentfulness. In the same vein, several authors found that bargain hunting is positively related to hedonic shopping value and indicates a hedonic reason to shop (Babin et al., 1994; Wolfinbarger & Gilly, 2001; Arnold & Reynolds. 2003). Martinez & Kim (2011) note that bargaining has evolved from being associated with products or services that are low priced or are of rather low quality to being referred to "simply

getting the best value for your money" (p. 342). Against this backdrop, it is posited that buyers that perceive high price competitiveness for e-marketplaces may also obtain higher levels of hedonic value through e-marketplaces. Hence, it is hypothesized:

H9b: A user's perception of an e-marketplace's price competitiveness is positively related to the user's perceived playfulness.

4   Methodology

In this chapter, an overview is presented regarding the methodological approach of this study and in what way the underlying decisions guide the research and thereby affect the findings. The study's research process has been guided by the conceptual framework of Saunders, Lewis & Thornhill (2016) referred to as the "research onion". The research onion by Saunders et al. (2016) depicts conceptual, interdependent layers to guide methodological choices for research projects. The first two outer layers pertain to the research philosophy and the approach to theory development underpinning this research. Forthcoming layers depict the methodological choice, research strategy, and the time horizon of the research, which all focus on the design of the research and its coherence. Following the ethical concerns that emerge from the chosen research design, the study's data collection techniques and procedures are presented, which represent the core of the "research onion" (see Figure 6).
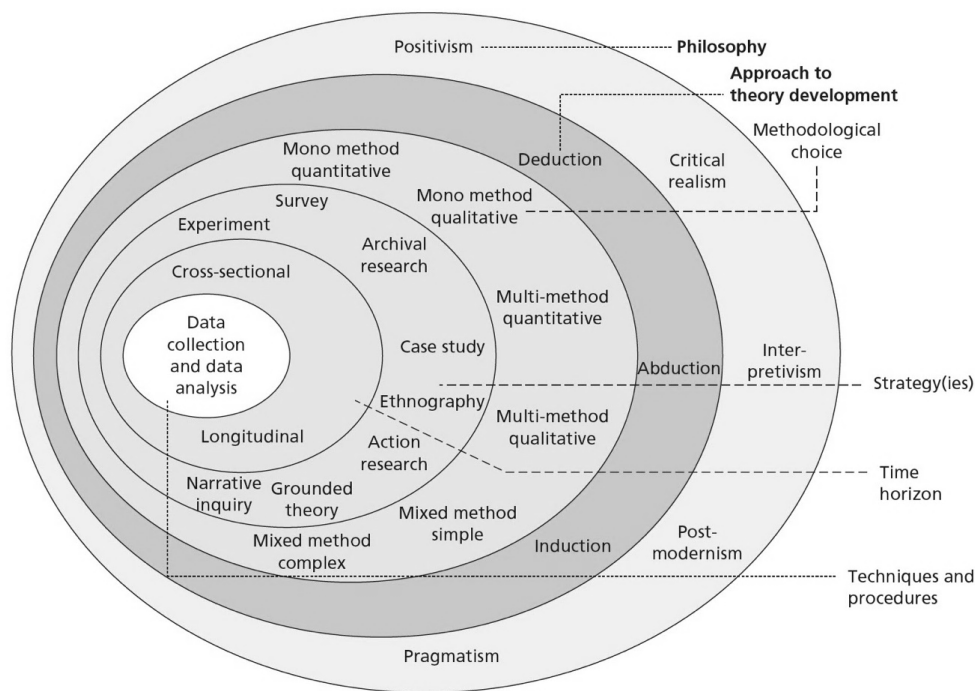
Figure 6: The "research onion" (Saunders et al., 2016)

4.1 Research philosophy

The research philosophy is related to "a system of beliefs and assumptions about the development of knowledge" (Saunders et al., 2016, p. 124). The awareness of the present research philosophy is of critical relevance in providing an understanding of the relationship between the researchers and their subject (Saunders et al., 2016; Johnson & Clark, 2006). In light of an abundance of different research philosophies, Saunders et al. (2016) conceptualized five distinct research philosophies for management and business researchers to adopt. These can be positioned within a continuum between two extremes: positivism and interpretivism. For a positivist. there is only one true reality, and knowledge consists of observable and measurable facts. In addition, the positivist operates as a neutral and detached object in order to be as objective as possible. Interpretivists, in contrast, see reality as a complex and socially construed world that is subjected to interpretations and potentially differing

perceptions. Interpretivist research cannot be viewed as entirely neutral and must reflect the interpretations made by the researcher. Besides these, there are three other common philosophies, namely critical-realism, postmodernism, and pragmatism, which differ in their research assumptions but are positioned within a continuum between positivism and interpretivism (Saunders et al., 2016).

In pursuit of investigating the observable social reality of e-marketplace adoption by buyers, the researchers adopted a positivism research philosophy. In fact, the study aims to produce generalizable rules in regard to the effects of system- and platform-specific characteristics on a buyer's adoption of e-marketplaces. To provide scientific, objective, accurate, and valid research, the authors' methodological choices require a highly structured practical methodology that excludes the researchers' values and beliefs from the research process and facilitates replication.

Whether or not researchers are aware of their philosophical stance, they will make a number of assumptions at each stage of their research (Burrell & Morgan, 1979). These assumptions shape the researchers' understanding of the research question, the method they use, and how they interpret their findings (Crotty, 1998). Saunders et al. (2016) emphasizes three central types of assumptions that have to be regarded; (1) ontological, (2) epistemological, and (3) axiological positions (Saunders et al., 2016; Bryman 2012; Collis & Hussey, 2013). They comprise assumptions about (1) the realities encountered during research, (2) human knowledge in general, and (3) the extent and possibilities how researchers' values influence their research process. Each position can be described as a continuum between two extremes, objectivism, and subjectivism (Saunders et al., 2016).

(1) Ontology is a branch of philosophy that is concerned with assumptions about the nature of social reality (Collis & Hussey, 2013). Whereas objectivism regards the social reality that is investigated as external to ourselves and others, subjectivism expresses the position that social reality is constructed based on the perception and related

actions of social actors (Saunders et al., 2016). In order to explain a buyer's decision to adopt an e-marketplace, the authors argue that it is necessary to objectively assess consumer adoption behavior by assuming a true ordered reality.

(2) Epistemology is a branch of philosophy that is concerned with assumptions about valid and adequate knowledge. This translates into different beliefs of what type of knowledge is legitimate. On the one hand, objectivism concentrates on observable and measurable facts derived from objectively collected and analyzed data (Saunders et al., 2016). On the other hand, subjectivism stresses the significance of individuals' uniqueness and their interpersonal relations in their roles as social agents (Saunders et al., 2016). Consistent with the positivism research philosophy, the present study is based on the stance of objectivism. The researchers argue that generating observable and measurable facts are suitable to derive a better understanding of e-marketplace adoption. The researchers seek to identify causal relationships in their data to create law-like generalizations. Thereupon, the researchers use these universal rules to help to explain and predict behavior and events for e-marketplace adoption.

(3) Axiology is a branch of philosophy that addresses the role of values and ethics during the research process (Saunders et al., 2016). Whereas objectivists try to remain detached and undertake research in a value-free way, subjectivists acknowledge that they share a relationship with the subject under investigation which they cannot be fully detached (Saunders et al., 2016; Crotty, 1998). This bias may influence the research through a range of value-bound decisions (Bryman 2012). In accordance with the researchers' philosophical stance of positivism, the underlying axiological position is objectivism. The researchers try to remain neutral and detached from their research as well as data in order to avoid affecting their findings. For example, the researchers claim to be external to the process of data collection via a standardized online questionnaire as their values do not influence the answers given by the participants. However, the researchers are aware that a complete exclusion of values may be impossible as the researchers make choices regarding the issue to study, the

research objectives to pursue and the data to collect (Saunders et al., 2016). Therefore, throughout the research process, values are constantly reflected upon in a critical manner in order to be aware of their potential limitations.

4.2 Approach to theory development

A researcher's approach to reasoning has a significant impact on the design of the study as it shapes the relationship between theory and research (Bryman 2012; Collis & Hussey, 2013). This research logic is usually categorized as either (1) inductive or (2) deductive. However, researchers stress that this is not a binary system (Saunders et al., 2016). Yet, it is essential to distinguish whether (1) data is analyzed in order to develop a conceptual framework that explains the observations resulting in untested conclusions or (2) if established theory drives the development and testing of hypotheses (Saunders et al., 2016). The purpose of the present study is to understand the causal relationships of system- and platform-specific characteristics towards the adoption of e-marketplaces. Therefore, the authors argue that a deductive approach serves the research objective. The aforementioned phenomena are explained by testing hypotheses that are derived from existing theory. To test and either confirm or refute the derived hypotheses primary data is collected and analyzed.

4.3 Research design

The research design comprises the general plan of the researchers on how to answer the underlying research question of this thesis project. In the context of this research, this means that subsequent methodological choices are outlined to research end user adoption of e-marketplaces. As essential elements to consider when designing a research, Saunders et al. (2016) propose the purpose of the research design, the research strategy, and the time frame.

4.3.1 Purpose of the research design

Depending on the purpose, research can be designed either exploratory, descriptive, explanatory, evaluative or some combination of these (Saunders et al., 2016). Whereas, for example, in exploratory studies, the main objective is to discover insights about an issue, problem, or phenomenon of interest, explanatory studies attempt to establish causal links in order to explain the relationship between different variables (Saunders et al., 2016). The present study draws on Davis' (1989) TAM to advance a research model for explaining how platform- and system-specific characteristics influence buyers' adoption of e-marketplaces. Using TAM's explanatory power, the study seeks to explain the causal link of e-marketplace adoption and platform- and system-specific variables via the TAM constructs PU, PEOU, PP, and BI. In other words, this research seeks to establish conclusive evidence to understand the causal link of the aforementioned variables. Therefore, the study is of explanatory nature.

4.3.2 Research strategy

The research strategy represents the author's choice of means to address the study's research question (Saunders et al., 2016). Due to the authors' philosophical stance of positivism, this study focuses on generating data to discover observable and measurable facts in the buyers' adoption of e-marketplaces. These quantifiable observations are used for statistical analysis which in turn help the authors to find causal relationships and produce law-like generalizations for e-marketplace providers. Following a quantitative research design, empirical data for testing the research model is collected adopting a survey strategy. Surveys are a common and popular research strategy to collect quantitative data for analysis (Saunders et al., 2016). Thus, a mono method quantitative study approach was considered to provide a rich method for the underlying explanatory research purpose. More specifically, the survey is conducted online via a self-completed web and mobile questionnaire with prescribed closed questions. The questionnaire is designed using Qualtrics, a professional online tool

for conducting surveys and for exporting and analyzing quantitative data (Qualtrics, 2020). The choice of the questionnaire design is influenced by several requirements and characteristics of the study project.

Firstly, the required sample size of 200 participants can be considered large. Therefore, the cost of implementation and geographical reach have been considered as decisive factors in the choice of the research strategy. Self-completed web and mobile questionnaires incur low costs, gain likely faster responses, and can be geographically dispersed (Saunders et al., 2016). To take a case in point, the online survey tool of choice, Qualtrics, offers free student access. Moreover, the questionnaire's hyperlink can be easily distributed online to reach a large audience, who in turn can send their responses immediately. Additionally, we consider e-marketplace users as an internet-savvy audience which is likely to favor an electronic way of participation. Thus, the survey type is considered most suitable for the present research project. Secondly, with regards to the questionnaire design Saunders et al. (2016) note that the type and number of questions should be considered. The study's questionnaire consists of closed and incomplex questions concerned with the opinion of buyers about an e-marketplace website, which depict suitable types of questions for web and mobile questionnaires according to Saunders et al. (2016). Furthermore, the length of the questionnaire is, according to Qualtrics (2020), feasible for online conduction. Thirdly, surveys are predestined to produce theoretical models to explore possible reasoning of relationships between variables and thus is in line with the explanatory nature of the present study (Saunders et al., 2016). Due to its quantitative nature, self-completed questionnaires depict a predominant data collection strategy in TAM research (e.g. Ahn et al., 2007; Chiu et al., 2013; Park et al., 2018; Wang et al., 2005).

4.3.3 Time horizon

According to Saunders et al. (2016), a further important consideration in the research design is the time horizon. In general, the time horizon can be distinguished in cross-sectional and longitudinal. For this research design a cross-sectional approach is used to serve the research objective, since the thesis project seeks to shed light on the e-marketplace adoption of end users at a given point in time. However, several studies suggest that a user's transactional experience with e-commerce shops has a moderating impact on their interaction with the website (e.g. Hernandez, Jimenez & Martín, 2009; Liu et al., 2019). Therefore, it has to be acknowledged that a longitudinal study that explains buyers' behavioral intention over time would have bred a promising research path. Nonetheless, with respect to the limited time frame of this thesis research project, the scope of the study is confined to a cross-sectional perspective.

4.4 Ethics

Ethical concerns emerging from the research design should be acknowledged to protect the research subjects' rights and well-being (Saunders et al., 2016). Following a web and mobile online survey questionnaire that also asks for personal data, it is considered crucial to develop trust and respect by recognizing the rights of the participants involved. Therefore, the study addresses general and internet-mediated ethical research issues by applying ethical principles stressed by Saunders et al. (2016). These ethical principles are communicated to the participants within the cover page of the survey. Firstly, the voluntary nature of the questionnaire and the right to withdraw is emphasized. Secondly, participants are informed that their responses remain anonymous and confidential and are used for academic purposes only. Further in this regard, the survey utilizes an anonymous hyperlink which does not collect identifying information such as name or e-mail address (Qualtrics, 2020). Thirdly, the contact information of the researchers is given for further inquiries about the research and the nature of the study is stated clearly in the questionnaire cover page.

Considering the above, necessary steps are taken that ensure that the research subjects are given sufficient information to make an informed consent to participate in the study (Saunders et al., 2016). Furthermore, the survey questionnaire is only distributed within online communities in which the researchers have been active members in order to mitigate possible ethical issues such as perceived deception.

4.5   Data collection

With respect to the use of a questionnaire as a research strategy to collect primary data, several considerations are made to establish a well-designed questionnaire that consequently ensures the achievement of the research project's objectives. Therefore, the choice of sampling method, technique and size are discussed, as well as the questionnaire development and proceeding data collection procedures are outlined.

4.5.1   Sampling method

The unit of analysis in the research project is the individual user on the demand side of e-marketplaces. However, considering associated budget, time, and access restraints of master thesis projects, interviewing the entire population is not feasible (Saunders et al., 2016). Therefore, the study focuses on middle and northern European e-marketplace users as the underlying target population. From this target population a sample is selected for survey inclusion, which allows limiting the costs and makes the data collection and analysis more manageable. Common sampling methods can be distinguished into two types: probability sampling and non-probability sampling (Saunders et al., 2016). In probability sampling, the chance of each member of the target population being included in the sample is known and typically equal for all members. This allows a high degree of generalizability of the survey's findings. However, a prerequisite for the use of probability samples are sample frames which constitute a complete list of all users in the target population. With respect to the extraordinary number of e-marketplace users, a sampling frame is considered

unproducible due to the excessive costs and time consumption associated (Dillman et al., 2014). To further illustrate, with regards to internet populations Dillman et al. (2014) note that due to the lack of existing sample frames for web users almost all online methodologies rely on non-probability sampling. In the same vein, Saunders et al. (2016) suggest the use of non-probability samples in the case of unavailable sample frames. Moreover, the chosen sampling method is more cost-efficient and can often reach a broader participation base more quickly, which is considered beneficial considering the cost and time restraints of this project (Dillman et al., 2014). Therefore, the survey uses non-probability sampling. Nevertheless, several limitations have to be acknowledged when using non-probability sampling. For non-probability samples, the selection probabilities are not known and thus it is not possible to make statistical inferences about the characteristics of the population (Dillman et al., 2014). Consequently, the generalization from non-probability samples to a larger target population is not feasible.

According to Saunders et al. (2016), non-probability sampling offers a broad range of sampling techniques. A main concern with non-probability samples is the limited extent of representativeness. The non-probability sampling technique which bears the highest likelihood of representativeness is quota sampling. The technique selects samples based on the probability proportionate to various quota variables in the target population. However, commonly used for large target populations, quota sampling often requires sample sizes in the four-digit range and thus is considered infeasible for the thesis project due to limited resources. Concerning the scope of the research and limited resources available, volunteer sampling is considered as an appropriate non-probability sampling technique. More specifically, the research adopts the volunteer sampling form of self-selection sampling, which allows individuals to participate in a survey on their own accord. Self-selection sampling publicizes the need for research units and collects data from those that decide to take part in the survey. According to Saunders et al. (2016), this form of volunteer sampling is characterized

by low costs and may reduce the amount of time necessary to search for appropriate research units. However, the study acknowledges that self-selection sampling inherits a low likelihood of representativeness due to its voluntary nature (Saunders et al., 2016). Moreover, self-selection sampling is subject to self-selection bias (Saunders et al., 2016). In other words, research units' decision to participate could be biased by their strong opinion or feelings towards the research. In the context of this study, the respondents may share a similar profile, because the researchers publicize their research through social media channels that are used by users with personal or professional connections to the researchers such as fellow students, co-workers, friends, or family. Thus, the opinion or feelings towards the research might be influenced due to their ties to the researchers.

With respect to non-probability sampling techniques, Saunders et al. (2016) argue that determining an appropriate sample size is ambiguous and that there are no established rules to follow. In the same vein, Patton (2002) points out that an appropriate sample size is dependent on the project's research question, objectives and the resources at hand. To address this ambiguity, the research project takes into account two variables to determine an appropriate sample size. Firstly, the study acknowledges the minimum required sample size for this study's applied SEM technique of Partial Least Squares (PLS). For this SEM technique, Gefen, Straub & Bodreau (2000) recommend that the minimum sample size should be larger than ten times the number of measurement items for the most complex construct. With nine items, PP depicts the most complex construct in the proposed research model and thus the recommended threshold for the sample size is 90. Secondly, the study's sample size is oriented towards existing, similar TAM studies and their respective sample sizes. A meta-analysis of previous TAM literature by Lee et al. (2003) found that the average sample size of TAM studies between 1986 and 2003 was 211. Additionally, the thesis project reviewed sample sizes of TAM literature in the B2C e-commerce context as further points of reference. More recent studies such as Tandon,

Kiran & Sah (2016) and Green & Pearson (2011) had sample sizes of 365 and 360, respectively, while older studies such as Gefen (2002) had 160. Against this backdrop, the thesis project determines that an acceptable sample size should be a minimum of 200 participants.

4.5.2 Questionnaire development

Saunders et al. (2016) argues that the participants' response rate, as well as internal validity and reliability of the data collected from surveys largely depend on the design of the measurement items and the structure of the questionnaire. Therefore, the questionnaire development for this research took into account several factors to ensure its validity and reliability.

Firstly, the questionnaire consists of two parts: construct items and demographic as well as factual variables of the participants. Namely the latter two variables are age, gender, occupation, highest level of education of the participants and the frequency of usage of their recalled e-marketplace. The query of demographic and factual variables is used for descriptive purposes of the sample and to establish whether the participants share a similar profile. Definitions of construct items and according measurement items proposed in the theoretical model are based on the review of theory and empirical research in IS and other disciplines such as marketing and psychology. Constructs and corresponding measurement items considered in this study demonstrated substantial reliability and internal consistency in existing studies. The construct items PU, PEOU, and BI to use are adopted from Davis' (1989) original TAM model and according measurement items are adopted from past TAM research within the e-commerce field to better account for the studies e-marketplace context (Cyr et al., 2006; Koufaris, 2002). A multitude of studies has suggested the construct of PP as an extension of TAM (Lee et al., 2003). However, there are no unified measures and the concept is thus characterized by ambiguity (Ahn et al., 2007). With respect to e-marketplaces as IT-enabled consumer systems, the research project

adopts Moon & Kim's (2001) nine items for the PP construct, which have been developed to account for the intrinsic motivation factors in world wide web usage. The construct was validated by several following studies such as Ahn et al. (2007), Chung & Tan (2004), and Chiu et al. (2009). Perceived network and complementor size among the platform variables are derived from previous TAM studies that explored the impact of network externalities on technology acceptance (Park et al., 2007; Lin & Lu, 2011; Hsu & Lin, 2016). Moreover, the measurement construct of perceived price competitiveness is adapted from psychology and marketing research and consists of four measurement items which were originally described by Levesque & McDougall (1996) and furthermore have been used in TAM research by Yang & Peterson (2004). The measurement constructs of system-specific characteristics, which are namely navigability, content, interactivity, and responsiveness, are based on four web interface design elements, which are most dominant for the success of a web interface according to Palmer (2002). They have been further validated as antecedents for intention to transact for B2C e-commerce sites in a study by Green & Pearson (2011). Furthermore, the wording for all measurement items of the questionnaire is modified to fit the research context. All measurement items are set in a seven-point Likert scale ranging from Strongly Agree (1) to Strongly Disagree (7) to measure users' perceptions. By adopting existing and validated constructs and measurement items from previous studies, this research enables construct validity, which refers to the extent of representativeness and comprehensiveness of the measurement items that constitute a measurement construct (Saunders et al., 2016). Moreover, this procedure allows reliability assessment by enabling compatibility with previous studies.

Secondly, visual presentation of the survey can impact the likelihood of non-responses and errors (Dillman, 2007). Therefore, the layout design of the study's self-completed questionnaire should be designed to make reading and rating the questions easy. Moreover, an attractive appearance can encourage the completion and return of questionnaires (Saunders et al., 2016). Using Qualtrics style templates, a

professional-looking and consistent questionnaire is produced. Additionally, the survey is optimized and formatted for mobile use as mobile survey participation becomes increasingly common according to Qualtrics (2020) user behavior statistics. A cover page at the beginning of the online questionnaire is implemented to explain the purpose and to state necessary instructions of the study clearly and concisely, which can help to ensure a high response rate according to Dillman (2007). Sensitive information such as demographic and factual variables of the participants is placed at the end of the questionnaire. According to Dillman et al. (2014), placing sensitive questions at the end ensures the flow of the questionnaire and reduces the risk of quitting, because participants are more engaged with the questionnaire towards the end. Moreover, a definition of e-marketplaces and renowned examples are given to ensure the correct understanding of the term among participants.

Thirdly, the questionnaire is reviewed and pilot-tested in order to bring to light possible problems in answering the questions and to make necessary amendments before releasing the survey. Prior to pilot testing, the questionnaire is submitted to the thesis supervisor to get an initial review from an external expert of the representativeness and suitability of the structure and measurement items. Based on suggestions made by the supervisor, necessary minor amendments for the content of factual variables are made to further establish content validity and also the measurement items' wording is adjusted to ensure consistency. Bell and Waters (2014) emphasize the importance of pilot testing, as, without it, there is no indication of whether the survey will be successful. That said, pilot testing helps to ensure ease of read and answering of the questionnaire, as well as serves as an indicator for the questions' validity and the collected data's reliability (Saunders et al., 2016). According to Fink (2013), the number of pilot participants for student projects should be a minimum of 10. Following these suggestions, the study project conducted a trial run with a convenience sample of 12 participants to establish face validity. In other words, the test aimed to determine whether the questionnaire appears logical to the participants (Saunders et al., 2016).

Received feedback on the pilot test led to several adjustments in the questionnaire. The questionnaire took the pilot test participants ten minutes to complete on average, which is added to the formal instructions of the questionnaire as the expected time duration. Additionally, the introduction is supplemented with further common examples of e-marketplaces. Furthermore, the wording of perceived ambiguous questions is adjusted for further clarification. For instance, several participants did not know what the question "the e-marketplace helps me to be more effective" is exactly referring to, and thus the question is supplemented by "[...] more effective in the task I want to accomplish". With regards to the layout, the participants perceived the questionnaire as attractive and clear.

4.5.3 Participants and data collection procedures

The questionnaire (Appendix 2) is distributed via a website hyperlink. To reach out to as many possible participants as possible, the hyperlink is posted in popular social network groups. For five weeks in total, the survey is repeatedly placed on the social network groups, using a brief introduction of the topic to invite people to self-select and click on the hyperlink. Self-selected participants are then automatically taken to the web and mobile questionnaire provided by the online survey software Qualtrics (2020). Survey respondents are requested to recall an e-marketplace they frequently visited and to evaluate the extent to which they agree or disagree with the measurement items' statements.

The data collection was carried out in the period from May 11th to June 14th 2020. After sample extraction, which included the removal of 16 incomplete or interfering samples (e.g. participant recalled e-reseller instead of e-marketplace), a data record with 237 participants remains. The sample is based on the data of 111 (46.84%) male and 126 (53.16%) female subjects. The characteristic of gender is thus relatively evenly distributed. With regard to the age distribution, an even ratio among the different groups of ages was not fulfilled. The majority of participants were between

26-35 years old (56.40%), followed by participants between the ages of 18-25 (40.08%). The two groups of ages between 36-45 (2.52%) and over 45 (2.10%) were extremely low represented. The geographical area for data collection was limited to Western and Northern Europe with the majority stating that Germany (41.35%) and Denmark (37.13%) are their respective country of origin. While the majority of participants (81.85%) claimed to have a university degree as their highest educational qualification, 10.13% state high school degree, 6.75% stated vocational training or apprenticeship, and 1.27% "other" as their highest educational qualification. Furthermore, of the 237 respondents, 124 (52.32%) are students and 101 (42.62%) are employed. While 7 (2.95%) participants are out of work/currently looking for work, 5 (2.11%) stated self-employed as their current occupation. In total, 19 different e-marketplaces were recalled. The majority of participants named Amazon Marketplace (57.80%), Uber (10.54%), eBay (8.01%), and Kleiderkreisel (5.90%) as their recollected e-marketplace. Furthermore, when asked how often they perform a transaction on an e-marketplace, the majority stated at least once per month (29.11%), followed by at least once per 3 months (20.25%) and at least once per 6 months (17.30%). 35 (14.77%) subjects claim to perform a transaction at least once per two weeks, 23 (9.70%) at least once per week, 16 (6.75%) less than once per six months, and 4 (1.68%) at least once per day. An overview of the participants' demographics is provided in Table 1.

Variable	Category	Absolute quantity	Relative quantity
Gender	Male	111	46.84%
	Female	126	53.16%
Age	18-25	95	40.08%
	26-35	133	56.40%
	36-45	5	2.52%
	>45	4	2.10%
Level of education	No degree	0	0.00%
	Highschool degree	24	10.13%
	Vocational degree	16	6.75%
	University degree	194	81.85%
	Other degree	3	1.27%
Employment status	Pupil	0	0.00%
	Vocational training	0	0.00%
	Student	124	52.32%
	Employed	101	42.62%
	Self-employed	5	2.11%
	Out of work	7	2.95%
	Retired	0	0.00%
Transactional frequency	At least once per day	4	1.68%
	At least once per week	23	9.70%
	At least once per two weeks	35	14.77%
	At least once per month	69	29.11%
	At least once per 3 months	48	20.25%
	At least once per 6 months	41	17.30%
	Less than once per 6 months	16	6.75%

Table 1: Participants' demographics

5 Data Analysis

The research model was analyzed using structural equation modeling (SEM), supported by SMARTPLS and SPSS software. SEM, in general, is a popular statistical methodology for non-experimental research. According to Byrne (2010), "the term structural equation modelling conveys two important aspects of the procedure: (a) that the causal processes under study are represented by a series of structural (i.e., regression) equations, and (b) that these structural relations can be modelled pictorially to enable a clearer conceptualization of the theory under study" (p.3). In addition, SEM is considered a prevalent approach in TAM studies (e.g. Gefen et al., 2003; Pavlou & Mendel, 2006; Cyr et al., 2006). For all these reasons, SEM was chosen to analyze the in the present study hypothesized causal relationships among

the TAM constructs. Two dominant SEM techniques for analyzing complex interrelationships between observed and latent (unobserved) variables are covariance-based structural equation modeling (CB-SEM) and partial least squares structural equation modeling (PLS-SEM) (Gefen & Straub, 2000; Hair, Risher & Sarstedt, 2019). To analyze the gathered data of the present study, PLS-SEM was considered suitable for the following two reasons.

Firstly, it has been argued that PLS-SEM is advantageous to CB-SEM techniques in the case of small sample sizes (<300) and non-normality data (Fornell & Bookstein, 1982; Hair, Hult, Ringle & Sarstedt, 2013). In the present study, the sample size is 237 and thus below 300. Both the Kolmogorov-Smirnov and the Shapiro-Wilk tests can check for normal distribution (Sarstedt & Mooi, 2014). Using SPSS software, both tests of normality indicated that the data were not normally distributed, thus supporting the use of PLS-SEM (Appendix 3). Secondly, PLS-SEM is preferred due to its ability to handle complex models aimed at either predicting focal constructs or identifying relevant determinants by extending an existing theory (Hair et al., 2013). The present study proposes an extension of the widely used TAM in the context of e-marketplaces. Thus, the aim is to extend existing theory. Moreover, the research model includes 11 latent constructs, 50 indicators, and 20 model relationships. Consequently, the research model is deemed to be complex. In light of these factors, PLS-SEM is considered a suitable measurement technique.

For the evaluation of PLS-SEM models, Sarstedt, Ringle & Hair (2020) propose a two-stage analytical procedure: the examination of the measurement model and the structural model evaluation. The measurement model defines the relationships between the constructs (latent variables) used in the research model and assigns observed variables to each. The structural model, on the other hand, describes the relationship among the latent variables (Gefen et al., 2000). In particular, it provides insights on how particular unobserved variables either directly or indirectly affect changes in the values of other unobserved variables (Byrne, 2010). The two-stage

evaluation of the study's PLS-SEM model forms the forthcoming two sections of this thesis.

5.1 Measurement model

Before assessing the measurement model, it is important to specify whether the measurement model examines formative, reflective, or both measurement constructs (Bollen & Lennox, 1991; Eberl, 2004; Albers & Hilderbrandt, 2006). Even though, PLS-SEM provides the opportunity to include both formative and reflective measurement constructs (Barclay, Higgins & Thompson, 1995; Lowry & Gaskin 2014), a simple assumption of a formative or reflective measurement can be fatal since a misjudgment would lead to difficulties in interpreting the empirical data (Bollen & Lennox, 1991; Eberl, 2004). For a more detailed consideration of the effects of misspecification, the research work of Eberl (2004) can be used. Albers & Hilderbrandt (2006) indicate that it is inevitable to select the appropriate measurement models for the latent constructs and not vice versa. The recommendations made so far for determining the type of specification are mainly based on the assessment of experts (Rossiter, 2002; Diamantopoulos & Winklhofer, 2001) or subjective decisions of researchers that are based on yes-or-no questions (Eberl, 2004). Of course, this should not be viewed uncritically: Rossiter (2002) points out that many constructs (especially attitudes) can be specified as formatively as well as reflectively depending on the context. Overall, the evidence presented in this part suggests that specifying models as reflective or formative can be an ambiguous task. As a means to derive a basis for decision-making, the present study makes use of yes-or-no questions. While an in-depth discussion of the yes-or-no questions would exceed the scope of this study, Table 2 provides an overview of relevant decision-making considerations proposed in the literature. By answering these questions, the authors decided that the present constructs are correctly measured using a reflective measurement model. In other words, the indicators explain the constructs (Fornell & Bookstein, 1982) and can be

considered a consequence rather than a cause (Law & Wong, 1999). Hence, in the following the constructs will be treated as reflective in the measurement model assessment.

Source	Yes-or-No Questions	Measurement
Fornell & Bookstein, 1982	Has the construct been compiled as an explanatory combination of indicators? Is the construct an explanatory combination of observations?	Formative
	Are the indicators of the construct to be seen as realizations of a factor? Does the construct provide an explanation for the observations?	Reflective
Law & Wong, 1999	Do the indicators represent the cause of the construct?	Formative
	Do the indicators represent the consequence of the construct?	Reflective
Diamantopoulos & Winklhofer, 2001	Is causality directed from indicators to construct?	Formative
	Is causality directed from the construct to the indicators?	Reflective

Table 2: Yes-or-no question for model specification (Eberl, 2004)

Turning to the assessment of the measurement model, the following part draws on different sets of metrics to evaluate the reliability and validity of the construct measures used (Sarstedt et al., 2019; Hair et al., 2019). With regards to reflective measurement models, Hair et al. (2019) recommend three main steps for the assessment of the measurement model: estimation of internal consistency reliability, evaluation of convergent validity, and assessment of discriminant validity. In the following, the three steps are being discussed within the context of the study. Additionally, it is assessed whether common method bias is a threat to the study.

Internal consistency reliability assures that the items proposed to measure the same construct are sufficiently correlated and produce consistent results (Hair et al., 2019). When using PLS-SEM, Hair et al. (2019) recommend two options for the assessment

of the constructs' internal consistency reliability, which are widely used: Cronbach's alpha and Jöreskog's (1971) composite reliability. Sarstedt et al. (2020) reason that researchers should consider both measures. Cronbach's alpha represents a conservative measure that commonly reports low reliability estimates and is characterized by a less precise measure of reliability, while in turn, composite reliability values yield comparatively higher values. Considering the reasoning by Sarstedt et al. (2020), the study applies both internal consistency reliability measures. Composite reliability values vary between 0 and 1, whereas higher values represent higher levels of reliability. As a rule of thumb, composite reliability values that exceed an absolute value of 0.70 indicate a high degree of internal reliability, while values between 0.60 and 0.70 are deemed acceptable and values between 0.70 and 0.90 are considered satisfactory to good (Hair et al., 2017). A value higher than 0.95 could indicate redundancy of the measurement items and values below 0.60 likely lack internal consistency reliability (Hair et al., 2017). Cronbach's alpha results in an α coefficient of reliability which, similarly to the composite reliability measure, reports values between 0 and 1 and depicts higher reliability as the value approaches 1 (Hair et al., 2019). According to Sarstedt et al. (2020), the aforementioned composite reliability thresholds apply for Cronbach's alpha as well. The results of the composite reliability measure reported that all constructs exceed the prescribed threshold of 0.70, thus they indicate good reliability (Table 3). While nine constructs exceeded the prescribed threshold of Cronbach's alpha, the construct content (0.688) was reported as slightly below the threshold, but its reliability is deemed acceptable due to its slight difference to the threshold and being in an acceptable range of 0.60 to 0.70 (Hair et al., 2017).

The second step is the assessment of the convergent validity. Convergent validity indicates the degree to which a latent variable converges to explicate the variance of its indicators. In other words, convergent validity illustrates the extent to which different indicators positively correlate in their measurement of the same construct (Byrne, 2010; Hair et al., 2013; Hair, 2019). The evaluation of the convergent validity can be

done by examining each item's loading on its corresponding latent variable and assessing the score of the average variance extracted (AVE) for each latent variable (Hair et al., 2019). In order to ensure convergent validity, an item's outer loading should be no less than 0.70 (Moore & Benbasat, 1991; Hair et al., 2019) and the AVE should exceed 0.50 (Fornell & Larcker, 1981). By exceeding the prescribed AVE threshold of 0.50, it indicates that, on average, the variance of the construct's items is explained to more than 50% (Hair et al., 2019). The item loadings of the study indicate that 8 items - NAV4, INT2, RES1, PP1, PP2, PP3, PPC2, INT3 - had loadings to their particular construct below the recommended threshold of 0.70 (Appendix 4**).** According to Hair et al. (2019), loadings above 0.70 are deemed to represent acceptable item reliability, since they indicate that the construct explicates above 50 percent of the indicator's variance. Therefore, the respective items below the prescribed threshold were dropped from further analysis, and the measurement model was re-examined.

	Cronbach's Alpha	Composite Reliability	AVE
BI	0.855	0.893	0.626
CONT	0.716	0.840	0.637
INT	0.756	0.854	0.661
NAV	0.776	0.846	0.579
PCS	0.893	0.933	0.823
PEOU	0.837	0.891	0.673
PNS	0.827	0.881	0.650
PP	0.914	0.933	0.699
PPC	0.707	0.837	0.631
PU	0.855	0.902	0.697
RES	0.717	0.837	0.632

Table 3: Construct reliability and validity after eight items were dropped from the final scales.

After dropping measurement items below the threshold, all measurement items exceeded the threshold of 0.70 (Appendix 5). Moreover, following the re-examination of the model, Table 3 shows acceptable AVEs between 0.579 and 0.823. Thus, convergent validity is supported. Moreover, all Cronbach's alpha of the constructs, including content, exceeded the prescribed threshold of 0.70. Consequently, the measurement models show good reliability and convergent validity.

After having assessed the reliability and the convergent validity of the measured constructs, the third step is to assess their discriminant validity. According to Hair (2019), discriminant validity is "the extent to which a construct is empirically distinct from other constructs in the structural model" (p. 9). Discriminant validity can be assessed through two criteria. Firstly, the items' loadings on their corresponding construct should be greater than the cross-loadings on the remaining constructs (Chin, 1998). The analysis reports satisfactory discriminant validity since all items load higher on their respective construct than on other constructs (Appendix 6). Secondly, the square root of the AVE for each latent variable should be higher than its correlations with all other latent variables in the model, which is known as the Fornell-Larcker criterion (Fornell & Larcker, 1981). The inter-construct correlation matrix in Table 4 shows that the second criterion is met as well. Thus, all constructs display sufficient discriminant validity.

	BI	CONT	INT	NAV	PCS	PEOU	PNS	PP	PPC	PU	RES
BI	**0.791**										
CONT	0.241	**0.798**									
INT	0.114	0.056	**0.813**								
NAV	0.137	0.431	0.025	**0.761**							
PCS	0.273	0.203	0.058	0.123	**0.907**						
PEOU	0.347	0.368	0.062	0.350	0.316	**0.821**					
PNS	0.223	0.087	0.017	0.016	0.541	0.235	**0.806**				
PP	0.291	0.241	0.244	0.049	0.095	0.112	0.030	**0.836**			
PPC	0.406	0.351	0.043	0.194	0.289	0.328	0.280	0.223	**0.795**		
PU	0.326	0.437	0.097	0.150	0.215	0.325	0.148	0.271	0.485	**0.835**	
RES	0.248	0.395	0.132	0.368	0.280	0.421	0.200	0.161	0.393	0.326	**0.795**

Table 4: Fornell-Larcker Criterion

In the final step, it is assessed whether the study is affected by common method bias. The bias refers to a measurement error, which is caused by the measurement method used in a respective study. In the present survey study, perceptual measures were chosen to validate the theoretical model. Therefore, the authors used their network to acquire participants for this study. Due to the participants' proximity to the authors, social desirability might affect the participants' tendency to provide positive answers (Paulhus, 1991; Podsakoff, MacKenzie, Lee, Podsakoff, 2003). Another prevalent cause of common method bias within survey studies is the participants' tendency to provide consistent responses across items (Podsakoff et al., 2003). As a result of these two tendencies, path coefficients could be inflated due to a certain amount of common variation among indicators (Kock, 2015). The study used Harman's one-factor test suggested by Podsakoff & Organ (1986) to assess the threat of this bias. This test assesses whether a single factor emerges or whether a single general factor accounts for most of the covariance among the variables (Podsakoff et al., 2003). Using SPSS software, the results generated 50 factors, with the first factor accounting

for 18% (Appendix 7), which is less than the prescribed threshold of 50% by Podsakoff & Organ (1986). Thus, common method bias was not considered a threat to the study.

5.2 Structural model

Having assessed the measurement models as satisfactory, the following step in evaluating PLS-SEM results is examining the structural model (Sarstedt et al., 2019; Hair et al., 2020). According to Hair et al. (2019), the assessment of the structural model involves two steps: the estimation of the model's explanatory and predictive power and the examination of statistical significance and relevance of the path coefficients.

Firstly, the explanatory and predictive power of the structural model is estimated by applying the coefficient of determination (R^2) and the cross-validated redundancy (Q^2). As a prior step, however, Hair et al. (2019) suggest an examination for potential collinearity issues among the constructs to ensure that the regression results are not biased. The variance inflation factor (VIF) is a common metric to evaluate collinearity among constructs (Hair et al., 2019). An indication of collinearity issues are VIF values above 5. Hair et al. (2019) argue for VIF values close or lower to 3, as values between 3-5 can result in collinearity issues, too. In the present study, all of the VIF values were below 3 (Appendix 8). Thus, collinearity is not an issue.

In the following step, the R^2 values of the endogenous constructs were reviewed to evaluate the model's predictive power. The R^2 "indicates the variance explained in each of the endogenous constructs" (Sarstedt et al., 2020, p. 20). Generally, R^2 values range between 0 and 1, whereas higher values indicate higher predictive accuracy. However, Sarstedt et al. (2020) argue that deriving acceptable R^2 thresholds is challenging as they depend on the context of the study and the complexity of the research model. Thus, they propose to consider R^2 values from related studies. In the same vein, Benitez, Henseler & Castillo (2020) argue to consider the current

understanding of the phenomenon investigated to determine acceptable R^2 values. That said, well-understood phenomena are expected to yield high R^2, while for barely explored phenomena, a lower R^2 value is deemed acceptable. Turning to this study's R^2 values (see Table 5), the critical linkages to PU explained 33% of the variance, and respective PEOU linkages explained 27.3% of the variance. Both endogenous variables were linked to system-specific variables and platform-specific variables. While exogenous variables in the context of the system are well-understood and related constructs in e-commerce acceptance reported R^2 values of around 0.50 and higher (e.g. Ahn et al., 2004; Ahn et al., 2007), platform related exogenous variables are barely explored to the authors' knowledge. Taking into account both considerations, R^2 values for PU and PEOU are deemed acceptable. Similarly, PP is linked to both groups of exogenous variables. However, the explained variance of 15% for PP was comparatively low. Notably, PP is not well explored in the context of e-marketplace adoption. Therefore, the R^2 estimate is considered acceptable, but rather weak. For BI the R^2 estimate was 21.3%. Most referable e-commerce studies (e.g. Ahn et al., 2004; Chen & Tan, 2004; Green & Pearson, 2011) used mediating constructs such as attitude or satisfaction, while this study argues for a direct link of PU, PEOU, and PP. Although this R^2 estimate seems small to moderate, it can be considered acceptable, because the model is considered to be one of the only ones to explain a direct link to BI in this research context. In addition to the assessment of R^2, Hair et al. (2019) recommend examining the Q^2 value (Geisser, 1974; Stone, 1974) in order to assess the model's predictive accuracy. As a rule of thumb, Sarstedt et al. (2020) propose a specific endogenous construct to have a Q^2 estimate higher than zero to have acceptable predictive accuracy. In the present study, PU (0.212), PEOU (0.168), PP (0.098), and BI (0.116) report Q^2 larger than zero. Thus, they exceed the prescribed threshold and are further evidence to confirm the use of the respective endogenous variables for this study (Table 5).

	R²	Q²
Behavioral Intention	0.213	0.118
Perceived Ease of Use	0.273	0.200
Perceived Playfulness	0.150	0.083
Perceived Usefulness	0.330	0.160

Table 5: R² and Q² values

Secondly, the statistical significance and relevance of the path coefficients were examined. Results from the PLS-SEM analysis of the structural model, including path coefficients and their statistical significance, are illustrated in Figure 7. The path coefficient describes and reflects the strength of the relationship between two latent variables (Sarstedt et al., 2020). Usually, the path coefficient ranges from 1 to -1, whereas those closer to 1 indicate a strong positive relationship and path coefficients closer to -1 represent a strong negative relationship. Since a hypothesis test can never be carried out with one hundred percent certainty, a probability of error α which is referred to as the significance level is taken into account (Fantapié Altobelli & Hoffmann, 2011). For example, if α = 0.05 it can be assumed with a certainty of 95 percent that the test decision is correct. If the determined significance value p is below the previously defined significance level of α = 0.05, then the hypothesis, if confirmed, can be assumed to be true for the entire population with a certainty of 95 percent (Fantapié Altobelli & Hoffmann, 2011).
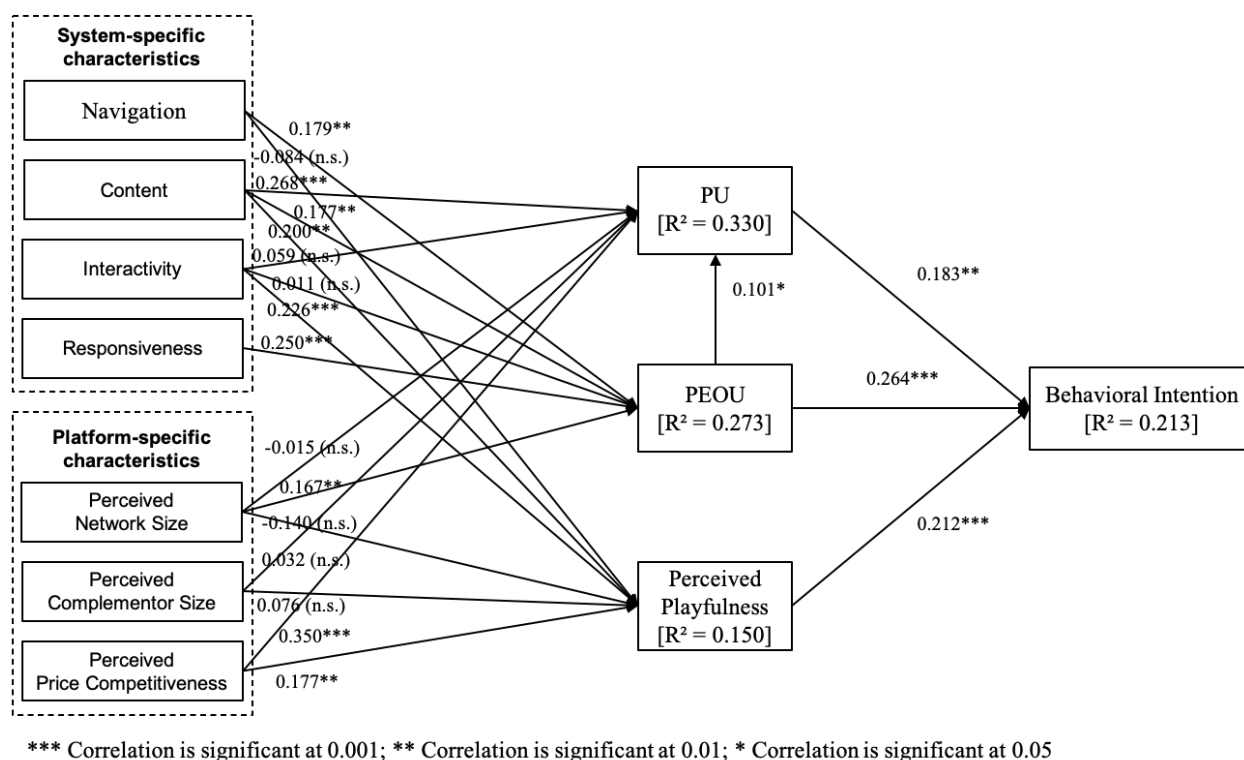
*** Correlation is significant at 0.001; ** Correlation is significant at 0.01; * Correlation is significant at 0.05

Figure 7: Results of Structural Model Analysis

As hypothesized, PU (β = 0.183, p ≤ 0.01), PEOU (β = 0.264, p ≤ 0.001), and PP (β = 0.212, p ≤ 0.001) exert positive and significant effects on BI, explaining 21.3% of BI's variance and substantiating hypotheses H1a, H1b, and H2. In accordance with our hypotheses H1c, H3a, and H9a, PEOU (β = 0.101, p ≤ 0.05), perceived content (β = 0.268, p ≤ 0.001), and perceived price competitiveness (β = 0.350, p ≤ 0.001) exert positive and significant effects on PU. On the contrary, H4a, H7a, and H8a are refuted, because perceived interactivity (β = 0.059, n.s.), and network size (β = -0.015, n.s.), perceived complementor size (β = 0.032, n.s.) do not show positive and significant effects on PU. Together, these constructs are explaining 33% of PU's variance. Consistent with our hypotheses H3b, H5a, H6, and H7b, content (β = 0.177, p ≤ 0.01), perceived navigability (β = 0.179, p ≤ 0,01), perceived responsiveness (β = 0.250, p ≤ 0.001) and perceived network size (β = 0.167, p ≤ 0,01) have significantly positive impacts on PEOU. However, perceived interactivity (β = 0.011, n.s.) exerts a positive

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but not significant effect on PEOU which is why H4b is not supported. Combined are these constructs explaining 27.3% of PEOU's variance. Both content (β = 0.200, p < 0.01) and interactivity (β = 0.226, p < 0.001) have positive and significant effects on PP. Thus, H3c and H4c are confirmed. On the contrary, perceived navigability (β = -0.084, n.s.), perceived network size (β = -0.140, n.s.), perceived complementor size (β = -0.076, n.s.), perceived price competitiveness (β = 0.177, p < 0.01) are neither positive nor significant for PP. Therefore, H5b, H7c, H8b, and H9b are not supported. Together are these constructs explaining 15% of PP's variance. An overview of the results of the hypotheses testing is shown in Table 6.

Hypothesis		Path coefficient	Result
H1a	Perceived Usefulness -> Behavioral Intention	0.183**	Supported
H1b	Perceived Ease of Use -> Behavioral Intention	0.264***	Supported
H1c	Perceived Ease of Use -> Perceived Usefulness	0.101*	Supported
H2	Perceived Playfulness -> Behavioral Intention	0.212***	Supported
H3a	Perceived Content -> Perceived Usefulness	0.268***	Supported
H3b	Perceived Content -> Perceived Ease of Use	0.177*	Supported
H3c	Perceived Content -> Perceived Playfulness	0.200**	Supported
H4a	Perceived Interactivity -> Perceived Usefulness	0.059	Not supported
H4b	Perceived Interactivity -> Perceived Ease of Use	0.011	Not supported
H4c	Perceived Interactivity -> Perceived Playfulness	0.226***	Supported
H5a	Perceived Navigability -> Perceived Ease of Use	0.179**	Supported
H5b	Perceived Navigability -> Perceived Playfulness	-0.084	Not supported
H6a	Perceived Responsiveness -> Perceived Ease of Use	0.250***	Supported
H7a	Perceived Network Size -> Perceived Usefulness	-0.015	Not supported
H7b	Perceived Network Size -> Perceived Ease of Use	0.167**	Supported
H7c	Perceived Network Size -> Perceived Playfulness	-0.140	Not supported
H8a	Perceived Complementor Size -> Perceived Usefulness	0.032	Not supported
H8b	Perceived Complementor Size -> Perceived Playfulness	0.076	Not supported
H9a	Perceived Price Competitiveness -> Perceived Usefulness	0.350***	Supported
H9b	Perceived Price Competitiveness -> Perceived Playfulness	0.177**	Supported

Table 6: Hypothesis testing overview

6 Discussion

This thesis aims to shed light on the phenomenon of B2C and C2C e-marketplace adoption using an extended version of the TAM. The study draws upon theories mainly from information systems, platform research, and consumer behavior to propose and empirically examine a comprehensive, yet parsimonious model that explains and predicts e-marketplace adoption. Although past studies on technology acceptance have examined the effects of system-specific characteristics on IT-based consumer systems, e-marketplace platforms, due to their two-sided market nature, are suggested to face additional challenges when it comes to adoption. Thus, what is not yet clear is how platform related factors influence the adoption of e-marketplaces. To address this gap in the literature, this research incorporates platform-specific as well as system-specific characteristics into a TAM-based e-marketplace adoption model. Proposing a dual role of e-marketplace users as IT-users and online shoppers, the study further investigated the role of PP as an additional belief in e-marketplace adoption. Thus, the study posits that PU, PEOU, and PP are key beliefs in explaining the BI to use an e-marketplace. System- and platform-specific characteristics are proposed as antecedents of the three proposed key beliefs. In the following chapter, the authors will try to answer the thesis' research question and check whether the proposed hypotheses can be verified or falsified with the available data set. In addition, implications for both theory and practice will be drawn from the results of the study. Finally, the limitations of the study are presented and an outlook for future research is given.

6.1 Discussion of findings

To answer the research question of how platform- and system-specific characteristics affect buyers' adoption of B2C and C2C e-marketplaces, the study analyzed the impact of platform- and system-specific variables on PU, PEOU, and PP, to explain the BI to use an e-marketplace. The results of the analysis from the responses of the

237 participants show that 13 out of 20 hypotheses are corroborated, raising four main points of interest.

Firstly, the study posited that PU (H1a), PEOU (H1b), and PP (H2) are key beliefs in explaining the BI to use an e-marketplace. The findings show that all beliefs are significant. The positive relationship between PU and BI, consistent with many TAM studies within the e-commerce context (e.g. Pavlou, 2003; Gefen et al., 2003; Islam et al., 2019), supports the assumed important role of PU in e-marketplace adoption. This path indicates that users' BI to use an e-marketplace is elevated, when they believe that it facilitates their shopping transaction and helps them to make effective decisions on products or services (Pavlou, 2003; Islam et al., 2019). Interestingly, the findings further show that there is a direct link of PEOU on BI, which also constitutes the strongest link among the three respective relationships. This result is interesting for two reasons. On the one hand, TAM studies reported mixed results on PEOU's direct link to BI (e.g. Szajna, 1996; Pavlou, 2003; Gefen et al., 2003; Islam et al., 2019). For instance, in her empirical validation of a revised TAM model by Davis et al. (1989) which proposed a direct link of PEOU on BI, Szajna (1996) found that PEOU is rather mediated through PU, as originally posited by Davis (1989). On the other hand, the finding contradicts the general notion of TAM research that PU is the dominant determinant of BI to use in TAM and PEOU is a secondary determinant (e.g. Davis et al., 1989; Venkatesh, 1999; Wakefield & Whitten, 2006). Nevertheless, the significance of PEOU shows that users perceive an effortless shopping experience on an e-marketplace web interface as the most salient for their BI to use it. This might be explained by e-marketplaces' main task to reduce transaction and search costs to efficiently match buyers and sellers. Buyers thus may perceive a high PEOU as most salient, since it leads to a faster match with the seller. Furthermore, the study posited a dual nature of e-marketplace users as IT users and online shoppers by incorporating the hedonic aspect of playfulness. The results indicate that a user's perception of playfulness is predictive of her or his BI to use an e-marketplace. This finding is in line

with previous TAM research, which found hedonic perceptions to play a considerable role in online shopping environments (e.g. Childers et al., 2001; Ahn et al., 2007). It implies that e-marketplace users are more likely to use an e-marketplace when they felt that it evoked feelings of enjoyment, fun, happiness, and stimulated their curiosity. In other words, the construct of playfulness helps to better explain e-marketplace adoption. While the finding is in accordance with previous research in consumer behavior and technology acceptance, it also reflects the importance of experiential aspects in nowadays western society. To illustrate the finding from a sociological perspective, Schulze (1992; 2005) argues that contemporary society strives for goods and services that cater an individual experience that helps to live "nicely" and "experience" life in the best way possible, rather than goods and services that provide general usability and functionality. Schulze (1992) refers to this transformed society as 'the experience society', which term can be ascribed to our contemporary society in developed countries and at the same time is the eponym of his respective seminal book. Against this backdrop, the results show that e-marketplaces are not merely valued for their usability and functionality, but also for their capabilities to create a multitude of experiences for users of, for instance, sensory, affective, and creative nature to inspire a holistic consumption experience.

Secondly, in order to answer the research question, the hypotheses H3a, H4a, H7a, H8a, and H9a were formulated, which postulate a positive effect of system- and platform-specific characteristics on PU and therefore indirectly on the BI of e-marketplace users. With the help of the PLS-SEM, only one system-specific and one platform-specific characteristic were found to be determinants of PU. The results show that perceived content (H3a) has a highly significant and positive effect on the PU of an e-marketplace. This is corroborated by several e-commerce acceptance studies that reported a positive impact of content on PU (Ahn et al., 2004; Green & Pearson, 2011). A possible explanation for this might be that good, relevant, and manifold product and service information helps the e-marketplace user to avoid problems as

well as uncertainties and thus support the user to make informed decisions about the products and services offered. In accordance with existing theory, which emphasizes the significance of pricing for platforms (e.g. Rochet & Tirole, 2003) and in online consumer behavior (e.g. Chiu et al., 2014), the present study found the price relative to other e-marketplace competitors (H9a) is perceived as helpful by buyers in making effective decisions about the e-marketplace's offerings. This finding can be explained by the utilitarian value that pricing and associated monetary savings provide (Chiu et al., 2014), which respectively enhances the individual user's utility when using an e-marketplace. However, the study was unable to demonstrate further positive effects of system- and platform-specific characteristics on the PU of an e-marketplace. In contrast to earlier findings by several studies (e.g. Lee et al., 2006; Li & Yeh, 2010; Islam et al., 2019), perceived interactivity (H4a) was not found to be a determinant of PU. In the present study, the relationship between the two constructs was positive but not significant, indicating that only for some users the personalization of the web interface's look, feel, as well as the content was seen as a valuable design feature to help the user to make effective buying decisions on an e-marketplace. Another unanticipated finding was that the impact of the two platform-specific characteristics perceived network size (H7a) and perceived complementor size (H8a) on PU could not be corroborated. There are several possible explanations for this result. On the one hand, a larger network size may not be beneficial for all types of e-marketplaces. Buyers of an e-marketplace where the amount of a specific product or service available is limited (e.g. Uber, eBay) may see other users as unwanted co-bidders. In the platform literature, scholars name this phenomenon negative same-side network effects (Boudreau & Hagiu, 2009). On the other hand, a larger complementor size entails a bigger variety of sellers to choose from which may complicate the users' goal achievement. Users might be overwhelmed with too many choices which eventually ends in indecisiveness. Schwartz (2005) refers to this as the paradox of choice. In addition to the system- and platform-specific characteristics, PEOU (H1c) was found to have a positive and significant effect on PU. Gefen and Straub (2004) extensively

discuss this relationship, suggesting that in most cases PEOU not only directly influences BI but also indirectly through PU. This result is consistent with those of other studies in the e-commerce context (e.g. Pavlou, 2003; Ahn et al., 2004; Green & Pearson, 2011). Thus, if the buyer perceives the e-marketplace's web interface as easy to operate it supports the buyer to make effective decisions about products and services offered.

Thirdly, out of the 4 system-specific and 1 platform-specific characteristics that were expected to have a positive effect on PEOU, only perceived interactivity (H4b) was not found to be a crucial determinant of e-marketplace adoption. The result for interactivity is somewhat surprising in the way that users prefer a generic rather than a personalized web interface and content for the effortless usage and learning of an e-marketplace. It is difficult to explain this result, but the discrepancy might be related to the fact that the participants did not relate customization to functions that facilitate buyers' search for information on products or services, which supposedly increase the ease of use in online shopping (Islam, 2019). Nonetheless, the results of the empirical analysis show that the other system-specific characteristics namely perceived content (H3b), perceived navigability (H5a) and perceived responsiveness (H6) positively correlate with PEOU and thus influence the BI of e-marketplace users. Even though the relationship between perceived content and PEOU is not well researched yet, the findings suggest that the right amount, variety, and relevance of product or service text, graphics, and multimedia lead to less effort in using an e-marketplace because less attention is wasted on irrelevant content. Moreover, the positive relationships between perceived navigability and PEOU, as well as perceived responsiveness and PEOU, indicate that buyers value a consistent layout, as well as feedback mechanisms, lower uncertainties in the use of the web interface, and thus reduce efforts to use and to learn an e-marketplace. More specifically, the findings imply that feedback mechanisms help users in case they experience difficulties in operating the e-marketplace and therefore increase the individual user's learning curve. In contrast

to the nonsignificant results on PU, perceived network size (H7b) was found to positively and significantly correlate with PEOU and thus influence the BI of e-marketplace users. This finding is somewhat surprising because the link is relatively new aside from a few empirical findings in the field of instant messaging (Van Slyke et al., 2007) and communication technologies (Lu et al., 2010). A possible explanation for this might be that a potential adopter perceives the e-marketplace as not so complex to learn and to use if many peers are using it. Also, potential adopters may feel encouraged to use the e-marketplace because they know that they can either ask the community or their network for assistance in case they need help.

Fourthly, several antecedents of PP were proposed to extend the causal link of e-marketplace adoption. PP is found to moderate the impact of content (H3c) and interactivity (H4c) on BI to use an e-marketplace. The results support previous research findings that high-quality content can enrich a shopping experience in the way that consumers feel heightened enjoyment and curiosity (Koufaris, 2002; Ahn et al., 2007). This finding implies that e-marketplace users derive hedonic value from good and relevant product information that helps them to make informed buying decisions. Koufaris (2002) argues that consumers especially derive enjoyment and curiosity from value-added information that goes beyond objective descriptions of the product or service. However, the finding cannot explain whether the participants derived their perceived hedonic benefit from value-added or non-value-added content. In accordance with research that has demonstrated the hedonic value of interactivity for online consumers (Fiore et al., 2005; Lee et al., 2006; Jiang & Benbasat, 2007), the study found perceived interactivity as an antecedent of PP. This finding implies that e-marketplace users derive playfulness from being able to interact with the site, as well as customize its look and content. One previous TAM study in the online shopping context by Green & Pearson (2011) found interactivity as an antecedent of PU, indicating a utilitarian outcome of the concept. Green & Pearson (2011) argued that customization and interaction make the consumer more connected to the web

interface and thus perceive it as more useful. However, the present study contradicts this view and finds interactivity to be significant for PP and not significant for PU. Previous research found that interactive elements and customization offer stimuli by allowing for an exploratory shopping experience, which may lead to emotional arousal (Jiang & Benbasat, 2007). Thus, the argument of Green & Pearson (2011) may also be reversed by implying that the assumed connection to the web interface is rather affecting hedonic outcomes. This reasoning is corroborated by the result of this study that interactivity is not found as a determinant of PU for e-marketplace adoption. That said, the two-sided connection leads to enjoyment and curiosity when using an e-marketplace rather than to more usefulness. In turn, the study shows that several assumed antecedents of PP were not significant. That said, the impact of navigability (H5b), network size (H7c), and complementor size (H8b) on PP was not supported. The premise that an easy to navigate e-marketplace would lead to more fun and enjoyment when using it seemed to be logical. However, the unsupported link of navigability on PP is an indication that users do not find a consistent and well-designed web interface as a determinant for enjoyable user experience. Thus, this study has been unable to provide further evidence presented by Chung & Tan (2004) for navigability as an antecedent for PP. A possible explanation is that buyers may consider good navigability as a hygiene factor which the user expects to be present, rather than a factor that leads to affective outcomes. Turning to the effect of platform related variables on the playfulness construct, this study confirms that price competitiveness is positively related to PP (H9b). The result supports previous findings from the consumer behavior literature, which suggest that price sensitivity extends beyond utilitarian value and also caters to hedonic value (Schindler, 1989; Martinez & Kim, 2011). In this context, the results imply that e-marketplace users, who perceive that the e-marketplace offers a better value for their money compared to other e-marketplaces, obtain affective outcomes. Contrary to expectations, the platform-specific variables of network size (H7c) and complementor size (H8b) were found to be non-significant for PP. Network size has been hypothesized to impact PP by

catering for the hedonic motivation of social shopping according to Arnold & Reynolds (2003). However, the results indicate that a large network size does not lead to increased shopping enjoyment. Thus, this finding may surprise since many e-marketplaces such as Kleiderkreisel and etsy facilitate social interaction between individuals and other individuals or companies. A possible explanation for this might be that the majority of participants referred to e-marketplaces with low levels of social interaction such as Amazon Marketplace, which accounted for the great majority (58%) of the recalled e-marketplaces. Thus, the positive effect of a large network size on PP may be considerably limited. Another possible explanation for this might be the effect of negative same-side network effects. As mentioned in the literature review, network effects can either have a positive and self-reinforcing outcome or on the other hand have a negative and congestive outcome (Boudreau & Hagiu, 2009). While the hypothesis was built on the premise of positive same-side network effects, a large network size on a user's side can also decrease the value for her or him. To take a case in point, many users on Uber decrease the availability of Uber cars for the individual, because of higher demand. Therefore, a larger network size may rather lead to feelings of anger and restlessness, when an Uber user is not able to get a ride in a timely fashion, which is likely to negatively affect PP. Moreover, another explanation may be that the hedonic shopping motivation of social interaction is more salient in brick-and-mortar retail stores than in online shopping. In retail store environments, buyers are more likely to go shopping together and interact with others face to face, which is expected to increase shopping enjoyment. Furthermore, the results show that a large perceived complementor size is not a determinant for the PP of an e-marketplace. In the context of an e-marketplace, a large complementor size equals a large variety of suppliers, which subsequently leads to a broader variety of products and services offered. Even though consumer research indicates that some consumers may satisfy hedonic motivations from having a broader selection of products and services through enriched possibilities of information seeking (Chiu et al., 2014; Kim & Eastin, 2011), the findings do not corroborate this effect for e-

marketplaces. It is difficult to explain this result, but it might be related to the underlying task for which a user visits an e-marketplace. For users that merely use the e-marketplace to buy a pre-selected product, exploration and discovery of a large variety of goods are likely not of importance. Buyers who are shopping for the sake of itself and without a specific goal in mind, a rich product or service variety provides a hedonic shopping experience. This reasoning is supported by consumer research studies, which suggest that buyers can be distinguished between hedonic shoppers, who derive fun and pleasure from information seeking, and utilitarian shoppers, who seek the most relevant information to make a purchasing decision (Wolfinbarger & Gilly, 2001; Kim & Eastin, 2011). Thus, the result may indicate that the participants are predominantly utilitarian shoppers that do not derive hedonic outcomes from information seeking.

Based on these findings, the present study aims to answer the research question of how system- and platform-specific characteristics affect buyers' adoption of e-marketplace platforms. Overall, the results show that both platform- and system-specific characteristics influence e-marketplace adoption. All proposed system-specific characteristics, namely content, navigability, interactivity, and responsiveness play a significant role in system-specific characteristics for e-marketplace adoption. Content has shown to be the most influential system-characteristics, impacting all three key beliefs PU, PEOU, and PP and thus indirectly the BI of e-marketplace users. Consequently, the construct plays a critical role for both utilitarian and hedonic outcomes. Navigability and responsiveness have shown to elevate the convenience for e-marketplace users by increasing the PEOU. On the contrary, interactivity is positively related to PP and thus has shown to cater for hedonic aspects of e-marketplace adoption. Notably, system-specific characteristics mainly influence PEOU and thus significantly help to decrease the effort to use and learn to use to operate an e-marketplace. Turning to the platform-specific constructs, the results indicate that only two out of three constructs are salient in explaining e-marketplace

adoption. Surprisingly, perceived complementor size did not have any significant impact on the key beliefs. A general explanation for this finding is that the effects of a large complementor size may not be mediated through the posited beliefs of PU, PEOU, and PP but might exert a direct effect on BI. In fact, Liang et al. (2018) found a direct link of price sensitivity to repurchase intentions for C2C e-marketplaces. The previous discussion of the proposed relationship paths of complementor size on PU and PP implies that for e-marketplace users perceived indirect network externalities do not play a significant role in e-marketplace adoption. Nonetheless, network size has shown to influence the PEOU of e-marketplace users and subsequently the BI of an e-marketplace. Furthermore, the results indicate that price competitiveness strongly influences both PU and PP. Thus, the construct increases hedonic and utilitarian beliefs in e-marketplace adoption. This result indicates the critical role of price competitiveness in explaining the adoption of e-marketplaces.

6.2 Theoretical implications

Based on these findings, the study contributes to the extant literature in several ways. Firstly, the study contributes to existing research by providing a comprehensive TAM-based model on B2C and C2C e-marketplace adoption incorporating system-specific, platform-specific characteristics, and PP. Applying system-specific characteristics, namely content, interactivity, responsiveness, and navigability into the context of B2C and C2C e-marketplaces, the study was able to establish their importance in a buyer's behavioral decision to adopt an e-marketplace. While previous IS research has established the importance of system-specific characteristics in the consumer adoption of other IT-based consumer systems, this study provides empirical results that verify their importance in the e-marketplace context. Furthermore, the present study enriches prior research on e-marketplace adoption by incorporating network size, complementor size, and price competitiveness as critical platform-specific characteristics relevant to buyers' adoption behavior. While some technology

acceptance studies on digital platforms demonstrated the significant role of both direct and indirect network externalities in the individual's adoption behavior (e.g. Wang et al., 2005; Lin & Bhattacherjee, 2008), they have not yet been considered in e-marketplace adoption. The study provides new insights into the relationship between network externalities and e-marketplace adoption decisions. While the network size has shown to positively influence e-marketplace adoption via the belief PEOU, the effect of complementor size on e-marketplace adoption contradicts existing network externality theory (e.g. Rochet & Tirole, 2003, 2006; Armstrong, 2006; Evans & Schmalensee, 2013) as the link could not be proven. As the significance of pricing has been empirically proven within the C2C e-marketplace context (e.g. Liang et al., 2018; Clauss et al., 2019), this study corroborates these findings by highlighting the important role of price competitiveness in buyers' decision to adopt an e-marketplace. On the one hand, the effect of perceived price competitiveness is mediated through the PU of an e-marketplace suggesting an effect on the degree to which a buyer believes that the e-marketplace will help to make effective decisions. On the other hand, perceived price competitiveness positively correlates with the PP of an e-marketplace affecting the degree to which a person experiences hedonic outcomes when using an e-marketplace. These findings enrich the understanding of how pricing affects the BI to use an e-marketplace. Furthermore, the present study is the first to extend an adoption model by incorporating PP as an intrinsic belief in the context of e-marketplaces. The belief has shown to be a significant determinant of BI and thus e-marketplace adoption. Hence, the results support the general notion within technology acceptance that consumers are influenced by both intrinsic and extrinsic motivations in their decision to adopt an IT-based consumer system (e.g. Childers et al., 2001; Ahn et al., 2007).

Secondly, the research contributed to IT-based consumer systems research by developing a novel, comprehensive technology acceptance model to explain users' adoption in B2C and C2C e-marketplaces. The results show that the extended TAM

was able to explain and predict buyer adoption of e-marketplaces and validated PU, PEOU, and PP as key beliefs. Thus, the study adds further support that modified TAM conceptualizations can be utilized in a rich variety of contexts and are appropriate to examine B2C and C2C e-marketplaces. From the standpoint of TAM research, the present study could be a useful aid for further B2C and C2C e-marketplace research via TAM, because it provides empirical evidence for several TAM related points of interest. To further illustrate, although TAM is a well-established theory TAM studies sometimes greatly differ in their reports of TAM related paths. An interesting implication of this empirical study is the confirmation of a direct link of both PEOU and PU on BI. Much research has proposed PEOU to be mediated through PU or affecting BI through an intermediary attitude construct (Adams, Nelson & Todd, 1992; Venkatesh & Davis, 1994). Moreover, the present study finds PEOU as the strongest belief about BI of an e-marketplace as opposed to the general notion in TAM research that PU depicts the dominant determinant of BI (e.g. Davis et al., 1989; Venkatesh, 1999). In TAM research the PEOU construct is still in debate due to mixed findings of its role, as discussed in the theoretical section (Marangunić & Granić, 2015). Thus, the results may provide researchers with a tentative answer to the role of PEOU in the B2C and C2C e-marketplace context. Moreover, the study may serve as a further motivation to reconsider the usage of attitude in future TAM studies as proposed by Davis et al. (1989).

Thirdly, based on a literature review, the research model specified several dimensions of system-specific characteristics as antecedents of PU, PEOU, PP. Even though the concepts and their relationships to the three key beliefs were not entirely novel in the online shopping context, the present study can provide several theoretical contributions to an enriched understanding of them for IS, e-marketplace, and HCI research. Indeed, scholars such as Green & Pearson (2011) called for further empirical examination of concepts such as content and interactivity. In general, the results reaffirm the importance of the concepts of content, interactivity,

responsiveness, and navigability as antecedents of the three key beliefs for IT-based consumer systems and confirmed several findings from previous studies, which have been conducted in similar contexts (e.g. Ahn et al., 2004; Green & Pearson, 2011; Islam, 2019). Notably, the present study contributed to the understanding of content-based constructs as determinants of both utilitarian and hedonic outcomes. Lastly, the research results did not support navigability as an antecedent of PP, which link was proposed by Chung & Tan (2004).

Fourthly, the present results corroborate the findings of previous work on the need for considering intrinsic aspects in both IT systems (e.g. Childers et al., 2001; Ahn et al., 2007) and the marketing arena (e.g. Hirschmann & Holbrook, 1982; Babin et al., 1994). Therefore, the authors provide further empirical evidence that online consumers are not purely utilitarian but also find hedonic outcomes as a crucial factor for their BI to use an e-marketplace. Thus, it also supports the view that IS research in the online shopping domain should consider hedonic aspects such as the respective playfulness criterion to explain consumer adoption and not only utilitarian aspects. Notably, price competitiveness does not only influence the PU of an e-marketplace user, but also his or her perceptions of PP. Thus, the findings corroborate previous research that bargaining perceptions can lead to affective outcomes (Schindler, 1989, Babin et al., 1994).

6.3 Managerial implications

E-marketplaces are an omnipresent platform business model in today's economy. However, only a few e-marketplaces reach a critical mass of buyers and sellers to establish their platform in the market (Duch-Brown, 2017). Thus, businesses continue to seek a better understanding of the factors that help them to increase e-marketplace adoption to consequently develop a successful e-marketplace platform. This research has several implications for managers that want to start a B2C or C2C e-marketplace business or leverage an existing e-marketplace model. In general, this study suggests

that managers need to consider both system-related and platform-related aspects to provide a holistic shopping experience and thus enhance platform adoption. In the following, the research provides managerial implications for e-marketplace businesses to increase users' adoption of an e-marketplace.

Firstly, the platform-related factor of price competitiveness has shown to be of prime importance for buyers' intention to use an e-marketplace. In other words, potential adopters or current users need to perceive prices as fair compared to competing e-marketplace platforms. Consequently, price competitiveness may be regarded as the main value driver for buyers in the e-marketplace domain. Hence, pricing strategies seem to be promising strategies for e-marketplaces to overcome the chicken-and-egg problem or leveraging existing network effects. As an implication, the management should implement effective price management to attract buyers, while optimizing revenue potential. This may be achieved by establishing pricing agreements with individuals and companies on the supply side of the platform, which helps to offer low prices to buyers. A popular example is Amazon Marketplace, which until recently required their third-party sellers to sell their products at a price that is not higher as they sell it anywhere else (Bond, 2019). The e-marketplace business can also make use of data-driven approaches to continually monitor their competition and dynamize its pricing to instantly react to price fluctuations. There is a multitude of startups that offer pricing optimization as a software as a service (SaaS) such as TGN Solutions (TGN solutions, 2020), Remi AI (Remi AI, 2020), or Copenhagen-based Danamica (Danamica, 2020). Moreover, classic marketing approaches such as discounts, promotions, product, or service bundling options with savings portray valid strategies. For example, Kleiderkreisel, an e-marketplace that allows its users to sell, buy, and swap secondhand clothing items and accessories, recently introduced a bundling option for products of the same seller (Kleiderkreisel, 2020).

Secondly, the results imply that the perception of a large same-side network size plays an important role in e-marketplace adoption. For managers, this means there is a need

to promote the perception among buyers that the e-marketplace is used by a large group of users. For this purpose, e-marketplace providers may create advertising campaigns to make the platform known to a broader audience and suggest a broad usage of it. More specifically, this research has found that a user's closer acquaintances help to shape perceived same-side network size. Thus, direct communication channels for users to publicize their usage of a certain platform with their friends or family depicts a more granular marketing approach. To illustrate two examples, the music streaming platform Spotify lets users see which other Facebook friends are using the service and the clothing e-marketplace Kleiderkreisel developed a forum for their community to interact (Spotify, 2020; Kleiderkreisel, 2020). Thus, e-marketplaces should provide their users with web interface functions that allow them to share their newly shopped products within their network. A direct link from the e-marketplace to, for example, Instagram showing "Hey, look what I just bought on..." will help to promote the perception among further potential users that the e-marketplace is used by a large group of users. In addition, managers can use affiliate marketing in cooperation with an influential individual or business to promote buying products or services via their e-marketplace.

Thirdly, the findings have implications to managers regarding the allocation of time and resources when designing and operating an e-marketplace's web interface. The results show that the system-specific variables, content, interactivity, navigability, and responsiveness play a critical role in shaping a buyer's online shopping experience. Thus, managers who provide e-marketplaces can make use of the results by using them as guidelines for their web interface development and daily operations of their e-marketplace. Content-wise the e-marketplace should present good relevant and manifold product information. Therefore, managers have to find out what content matches the information requirements of the e-marketplaces' target groups. More specifically, the e-marketplace should provide an adequate balance between general information (e.g. information regarding price and delivery) and value-adding

information (e.g. product reviews). In regard to the navigability, the web interface of the e-marketplace should maintain a similar layout as well as consistent design throughout the different pages. Furthermore, both the succeeding links provided and the sequence of obtaining information should be predictable. A measure to achieve good navigability is hiring User Interface (UI) designers that can optimize the sites navigability. Interactivity-wise the e-marketplace should provide options to customize the web interface's look and content, as well as possibilities for user interaction. For example, the web interface may allow image manipulation, zoom view technology, and filter functions for products or services and provide functions for the user to write product or service reviews. To assure responsiveness, the web interface should include FAQs, feedback mechanisms as well as the availability of response from the site manager. In this regard, managers can rely on startups such as Pypestream (Pypestream, 2020) or Ubisend (Ubisend, 2020), which offer AI-based chatbot solutions that can be integrated into the existing application programming interface (API). All in all, the results show that e-marketplace users value a holistic shopping experience. A possible step towards outstanding user experience is an investment in UX designers who are concerned with creating a holistic shopping experience by designing for both utilitarian and hedonic outcomes. By doing so, the managers can adjust their shopping experience to the needs of today's proclaimed "experience society" (Schulze, 2005) and seek differentiation from their competitors, which helps to safeguard their competitiveness within the industry.

6.4 Limitations and future research

The findings of this research should be interpreted within the boundaries imposed by the nature of the methods employed. The study is subject to several limitations, within which lie probable avenues for future research.

Firstly, the underlying research strategy applied in this project is a mono method quantitative survey study through which an in-depth understanding of platform- and

system-related factors involved in the adoption of e-marketplaces is sought. Online surveys are a popular method in empirical TAM research. However, choosing perceptual measures for validating the theoretical model can limit the generalizability of the empirical findings as social desirability may influence the way participants reacted to the online questionnaire. To control for this response bias, Harmon's single-factor test was used to compute the amount of common method variance across the measurement items. Even though the results of the test suggest that common method bias was unlikely to affect the empirical findings, caution should be exercised in interpreting the findings of this study. Future research should, therefore, explore ways of validating the theoretical model objectively. For example, a mixed-method collecting both self-reported and objective data about users' adoption behavior in regard to e-marketplaces would offer richer insights for the future.

Secondly, as already discussed in the methodology, a survey study using volunteer sampling is chosen due to constraints in time, budget, and access to the population. Scholars such as Saunders et al. (2016) emphasize the low likelihood of representativeness of this sampling method due to its voluntary nature. Thus, using volunteer sampling is considered a limitation in the present study in terms of the representativeness of the population. Furthermore, volunteer sampling may be subject to self-selection bias attracting participants that have a strong opinion or feeling towards the research. Hence, the results of the present study may be impacted by self-selection bias, as further outlined in the methodology chapter. Future research in this field would be of great help using either probability sampling or quota sampling bearing a higher likelihood of representativeness.

Thirdly, the empirical findings are drawn from a relatively homogeneous sample of e-marketplace users. For example, 96.40% of the participants were between 18-35 years old. In addition, only participants from Western and Northern European countries participated in the interviews due to the geographical proximity of the research team's background. In addition, more than half of the 237 respondents were students. The

authors thus caution against the generalization of the present findings beyond user groups that share similar demographic backgrounds of this study's population. Clearly, further research is needed in other national cultures and demographic compositions to examine the representativeness of the present results.

Fourthly, the phenomenon of e-marketplace adoption depicts a complex subject and has been theoretically derived from extant literature and been researched in a parsimonious model. The model is conceptualized as a holistic view on e-marketplace adoption but may not be able to explain the phenomenon in its entirety. Even though the model tested important platform- and system-specific variables affecting user adoption of e-marketplaces, other factors may play an important role in explaining user adoption behavior such as trust, delivery service quality, or product quality (e.g. Pavlou, 2003; Ahn et al., 2004). Thus, future research could further enhance the understanding of e-marketplace adoption by incorporating and testing additional factors in the proposed model.

Fifthly, a further limitation is the use of BI as a proxy for actual behavior as theorized in the TAM. While BI has been reported to strongly correlate with actual behavior across various contexts and is widely used in IS research (Ajzen, 1991; Yousafzai et al., 2007; Chuttur, 2009), a causal link from BI to the actual behavior can only be established successfully with objective data. Thus, future research may confirm the hypothesized causal linkage within the context of this e-marketplace adoption study to increase the credibility of the proposed model.

Finally, another possible area in need of additional research concerns the influence of potential moderating effects for e-marketplace adoption. Several studies proposed moderating effects on the perception of beliefs in e-commerce research such as task characteristic (Gefen & Straub, 2000), transactional frequency (Hernandez et al., 2009), age (McCloskey, 2007), and gender (Venkatesh and Morris, 2000). While this study did not account for moderating factors, further research may examine whether

these moderators similarly affect beliefs and the perception of the system- and platform-specific constructs in e-marketplace adoption.

The authors consider this study a steppingstone on the road to understanding e-marketplace adoption. However, some issues stay unresolved and some questions unanswered. This thesis took a first step at studying buyers' adoption of B2C and C2C e-marketplaces from a technology acceptance view incorporating both system- and platform-specific variables. The authors found several additional avenues for future research that were brought to light during the research process. For instance, one interesting avenue for future research may be the differentiation between various classifications of e-marketplaces. In other words, findings for e-marketplace adoption could differ in terms of product or service nature, industry type, service scope, transaction fashion, and ownership. For instance, a study focused on the adoption of service-based e-marketplaces such as the ride-hailing e-marketplaces Uber and Lyft may yield different results than product-based platforms such as Amazon Marketplace or Kleiderkreisel due to the different nature of their offerings. Moreover, this study focused exclusively on the demand side of B2C and C2C e-marketplaces. However, attracting the opposite supplier side also constitutes a critical task for platform providers to develop a successful platform business (Rochet & Tirole, 2003; Eisenmann et al., 2006). To illustrate, a C2C e-marketplace study by Chu & Manchanda (2016) reported that sellers can attract 3.5 times more buyers than buyers can attract sellers. Thus, looking at the suppliers' adoption of e-marketplaces indicates an interesting and necessary avenue for future research.

7   Conclusion

In various industries, e-marketplaces have risen to economic and business prominence enabling and assisting transactions between both buyers and sellers (Gawer, 2014; McIntyre & Srinivasan, 2016). However, only a few e-marketplaces are able to attract and retain a critical mass of buyers and sellers to establish an e-

marketplace business successfully. Thus, the understanding of e-marketplace adoption poses a fundamental problem to e-marketplace businesses and plays a critical role in determining their success or failure in the market. Previous IS research established the critical relevance of system characteristics for the adoption of IT-based consumer systems, while platform literature suggests several important concepts that influence platform adoption. Even though e-marketplaces are built upon a platform-based business model and depict IT-based consumer systems, there is no scientific work that has developed a model and empirically tested the impact of these characteristics on the adoption behavior towards B2C and C2C e-marketplaces. For this reason, the present study aimed at examining the research question of how platform- and system-specific characteristics affect buyers' adoption of B2C and C2C e-marketplace platforms. To answer this research question, the study proposed a comprehensive e-marketplace adoption model based on TAM with system characteristics and platform characteristics as critical antecedents of the key beliefs PU, PEOU, and PP. The study was conducted using a mono-method quantitative survey study. Based on a PLS-SEM analysis, the study finds that through the mediating effects of PU, PEOU, and PP, both system- and platform-specific characteristics play an important role in explicating buyers' decision to adopt an e-marketplace. Whereas content, interactivity, responsiveness, and navigability are identified as key system-specific characteristics, network size, and price competitiveness are shown to be significant platform-specific characteristics. These findings suggest several courses of action for managers to develop or leverage an e-marketplace business. Due to the significant role of perceived price competitiveness in e-marketplace adoption, managers should consider price management to effectively monitor their price competitiveness. Furthermore, marketing efforts should be concentrated on enhancing the network size perception among buyers to facilitate direct network effects. Taken together, managers should focus their efforts on the user interface and user experience of their e-marketplace's web interface to create a holistic shopping experience and subsequently enhance platform adoption. These measures

will help e-marketplace businesses to stand out from their competitors in their pursuit of developing a successful e-marketplace business. However, the authors caution that the generalizability of these results is subject to certain limitations, while also calling for future research to enhance the generalizability of the findings by applying, for example, a mixed-method approach. Considering the nascent stage of B2C and C2C e-marketplace adoption research, future research should contribute by continuing the search for antecedents affecting the user's beliefs. Further research is recommended to investigate whether the impact of antecedents differs with regards to the specific type of e-marketplace under investigation. This study has been the first to develop a comprehensive research model for B2C and C2C e-marketplace adoption. Thus, the authors believe that the study paved the way for a new perspective on platform adoption with regards to how platform related factors can be implemented in a TAM-based research model to better explain an end users' adoption decision about platform-based businesses.

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