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## Conceptualizing Individualization in Information Systems – A Literature Review

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## Conceptualizing Individualization in Information Systems – A Literature Review

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### Abstract:

Driven by advances in information and communication technology, end users nowadays operate extensive information systems to support all kinds of private and professional activities. Previous IS research has coined various terms to refer to this rather new phenomenon. Some scholars call it individualization in IS; others refer to it as consumerization of IT. While scholars still struggle to agree on a common conceptualization and terminology, it is clear that particular aspects of this new phenomenon have already been addressed by previous work on technology acceptance, satisfaction, or technology diffusion. However, these previous findings do not form a distinct and integrated body of knowledge because no one has yet associated them with the phenomenon of individualization. To address this gap, we suggest an integrated, yet generic, conceptualization of individualization in form of a meta-theory. Based on the key entities and relations of the meta-theory, we conduct a structured literature review to identify pre-existing IS contributions to the individualization phenomenon, which help explain the phenomenon of individualization in IS. Furthermore, we analyze the identified literature for gaps in understanding the phenomenon and outline future research opportunities.

**Keywords:** Individualization, Individual IS, Meta-theory, Literature Review.

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## 1 Introduction

Driven by advances in computing power, memory capacity, storage capacity, and network bandwidth, individuals now possess information technology once found solely in large organizational units. Such technology forms the platforms for numerous software packages and Web-based services, which are deployed and used in the individual context. Examples include mobile or Web-based versions of productivity solutions (e.g., Web-based office suites), advanced communication solutions (e.g., video chat and screen sharing), and also novel services (e.g., social networks and file hosting/sharing platforms).

Because both hardware and software constitute a major part of an information system (IS), rapid advances in the hardware cannot happen without impacting software (Baskerville, 2011a). In fact, research has pointed out that a new class of information systems is emerging. Scholars use different terms to refer to this new class. Baskerville (2011a) has coined the term individual information system (IIS) to emphasize the idiosyncratic character of these types of systems. Vodanovich, Sudaram, and Myers (2010) call such systems ubiquitous information systems to emphasize their pervasive character. Originally, IIS supported all kinds of private activities, ranging from pure entertainment to communication and quasi-professional administrative activities (Baskerville, 2011a). With their increasing extent and mightiness, however, IIS have also become more useful for professional activities. Employees nowadays use their former solely private IIS also for professional activities: private smartphones substitute company phones, and private social network accounts are used to connect with business partners. Each IIS is different than the other since its composition is dependent on a variety of factors and mechanisms related to the individual and the individual's context. Looking at the current state of IS literature, one can see that previous work does not fully address such factors and mechanisms with existing theories.

The main reason for this problem is that current literature lacks a holistic conceptualization of the IIS phenomenon and the antecedents that lead to its composition. While several research streams provide insights on different perspectives of IIS, they neither employ the same terminology nor attempt to integrate their results. For example, research on consumerization (Moschella, Neal, Opperman, & Taylor, 2004; Weiß & Leimeister, 2012) has investigated IIS on the organizational level. It focuses on the diffusion of technologies originally developed for the consumer market in an organization. However, research on individualization (Baskerville, 2011b) describes a similar consumerization process that takes place on the individual level. It specifically researches the repeated individual decision that takes place when new technologies are adopted to the individual IS and used for business purposes (Ortbach, Bode, & Niehaves, 2013).

However, the adoption of IIS in a company neither can be restricted to an organizational nor an individual phenomenon. Predicting whether an adoption takes place successfully (e.g., as part of a bring-your-own-device program (BYOD)) or unsuccessfully (e.g., in form of shadow IT (Györy, Cleven, Uebernickel, & Brenner, 2012)) requires a holistic understanding of the phenomenon. This includes, in particular, knowledge of the various individual and organizational factors and an understanding of how they are linked to each other.

In this paper, we conceptualize the factors and mechanisms that influence IIS's composition, which respectively govern the individualization in IS. We conceptualize these factors and mechanics in in the form of a meta-theory, which we derive from related theories in sociology. The meta-theory integrates the organizational and the individual perspective on individualization in IS. It comprises three main entities: the individual, the organization, and the individual information system as the sum of different IT components. The meta-theory prescribes three key relations between these entities that directly or indirectly influence an individual IS's composition. For each relation, we conduct a separate literature review to identify existing theories to help shape the nature of each relation further.

This paper is structured as follows: in Section 2, we develop the meta-theory based on individualization and structuration theory. Individualization theory provides the theoretical lens to describe individualization in IS from an individual perspective, while structuration theory constitutes the theoretical lens to explain individualization in IS from the perspective of the social context. In Section 3, we use the meta-theory as the basis for a structured literature research to identify the relevant body of knowledge in the IS literature that helps explain our meta-theory's main entities and relations. In Section 4, we present the findings of our analysis in form of five research streams. In Section 5, we conclude by discussing our findings' implications for theory and practice, illustrate our study's limitations, and outline opportunities for future research.

## 2 A Meta-Theory for Individualization in IS

### 2.1 Theoretical Background

IIS are a new phenomenon in the domain of IS research that did not occur until a wide choice of affordable consumer IT was available. Sociology, however, knows a similar phenomenon that has been shaping modern industrialized societies for many decades: individualization. The core of individualization in sociology is the occurrence of increasingly diverse biographies that depart from traditional lifestyles and individuals' roles in society. Sociology research has developed the individualization theory to explain this phenomenon (Beck, 2007). The individualization theory describes individualization as a dual process whereby individuals are detached from "historically prescribed social forms and commitments, such as a particular social class or group, and re-embedded in new ways of life in which they are responsible for the design of their own biographies" (Beck, 1992, p. 128). Biographical development becomes more dependent on personal choices and decisions and increasingly deviates from traditional, institutionalized value systems of a social context (Brannen & Nilsen, 2005; Ester, Halman, & de Moor, 1994).

While individualization has increased over the decades, it remains unlikely that this process will yield a completely individualized biography. Personal choices are always limited by a particular degree of institutional constraints because it is impossible to be completely independent from any social context. As Beck puts it, individualization does not take place in an "empty space" (Beck, 2002, p. 2). Instead, modern individuals deploy their options in a densely woven social environment. Individuals in modern societies are restricted by a variety of new demands, controls, and constraints. As Beck (2002, p. 2) notes, "From pension rights to insurance protection, from educational grants to tax rates: all these are institutional reference points marking out the horizon within which modern thinking, planning and action must take place".

Whether the individual or the social context have the primacy in this relationship is addressed by the structure or agency debate (Barker, 2003). Researchers take different standpoints in this matter. Some claim that social structures determine an individual's behavior, while others say that human agency does. The structuration theory that Giddens (2013) introduced offers a third way. It proposes the duality of structure and agency and sees them as complementary forces. Structure influences human behaviors, but humans are also capable of changing the social structure they inhabit (Giddens, 2013). In such a social structure, all entities (e.g., individual persons or organizations) are connected via dyadic ties (Kane, Alavi, Labianca, & Borgatti, 2014). For each individual, this creates a social network through which the individual is connected to its social context. The interaction in a social network is called socialization. Socialization leads to an exchange of differing values, attitudes, morals, knowledge, and skills. This exchange effects both the individual identity (the collection of idiosyncratic preferences) and may even effect the identity of the social context (the common set of preferences shared by this social structure). Ultimately, this leads to different biographical decisions and to an adjustment of institutional and traditional constraints over time (Choi, Alexander, Kraut, & Levine, 2010; Fang, Duffy, & Shaw, 2010; Hurley, 1988; Jones, 1983; Van Maanen & Schein, 1979).

To summarize, three key relations that link the individual with its various social contexts and its biography characterize individualization:

- The increasingly self-determined composition of an individual's biography according to idiosyncratic factors originating from the individual's identity.
- The decreasing influence of traditional / institutional constraints on the biography originating from affiliated social contexts.
- A balancing effect of socialization that realigns idiosyncratic and social preferences via successively adjusting the individual and social identity through the exchange of values, attitudes, morals, knowledge, and skills.

### 2.2 A Model of IS Individualization

To transfer this understanding to the IS realm, we examine at the three key relations of individualization in sociology and see whether or not they apply to the IS domain. The first resemblance between the field of sociology and IS can be found in the dual process of detachment from "historically prescribed social forms and commitments" (Beck, 1992, p. 128) and a re-embedding in new ways of life (Atkinson, 2007). The "social forms and commitments" from the field of sociology translate to standard solutions provided by a

particular organizational context. One can characterize the “re-embedding in new ways of life” as the process of composing an individual IS based on available alternative components. Corresponding to the sociology phenomenon that seems to progress over time, it is likely that the trend to build individual IS will also increase in the future because both supply of appropriate alternatives and the knowledge on how to use them will increase (Zittrain, 2008, p. 43).

The second resemblance is that building an individual IS does not take place in an empty space. Instead, individuals remain subject to a baseline of demands, controls, and constraints imposed on them by the social context. To execute specific tasks or to collaborate with a particular group, individuals have no other choice than to establish some degree of compatibility with others and include specific components into their individual IS that may not be their favorite choice.

The third resemblance is the influence of the social network on the individual identity. The individual identity with regards to IT, the so-called IT identity, forms the basis for adoption decisions and gears the composition of the individual IS. The individual IT identity, however, remains unstable. Instead, a continuous exchange of values, attitudes, morals, knowledge, and skills connected to IT changes how individuals think about information technology. As a consequence, individuals change their minds about available and adopted alternatives and adjust the composition of their individual IS correspondingly.

To conclude our conceptualization, similar to its counterpart in sociology, the phenomenon of individualization in IS is characterized by three relations that link the key entities ( individual IT identity, social IT identity, and individual IS) to each other (see Figure 1):

- The increasingly self-determined composition of an individual's information system depending on its idiosyncratic needs and preferences.
- The decreasing influence of institutional constraints of a particular social context on the composition of the individual IS.
- A balancing effect of socialization that realigns idiosyncratic and social preferences via the exchange of values, attitudes, morals, knowledge, and skills connected to IT.

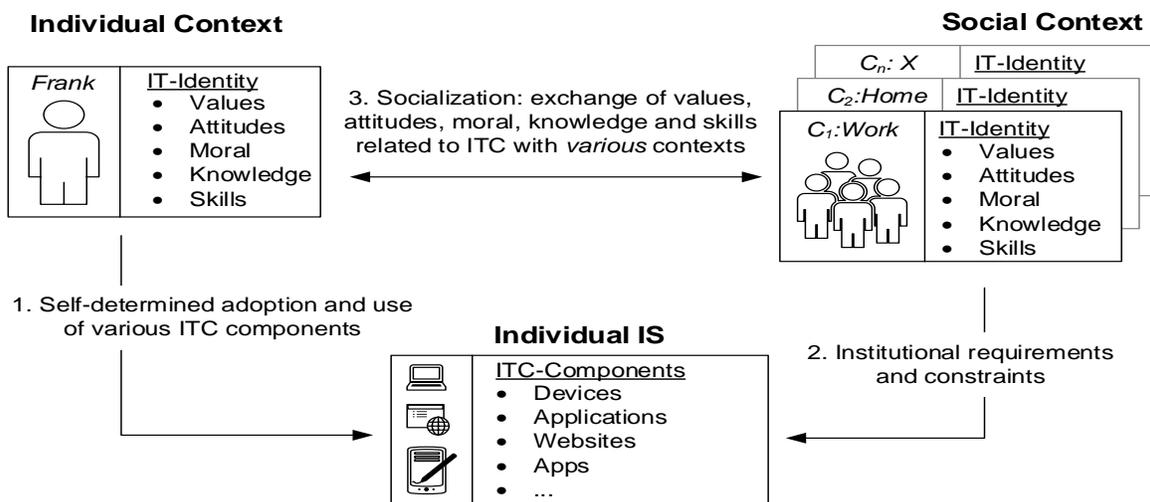


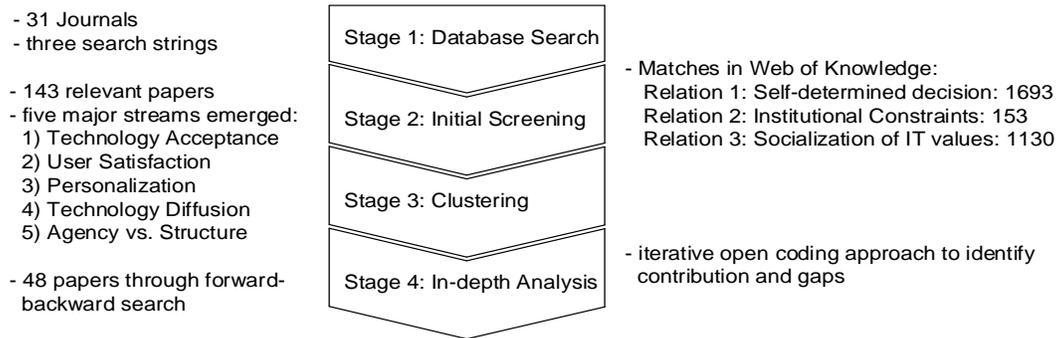
Figure 1. Meta-theory for Individualization in IS

### 3 Research Methodology

To identify existing work that helps explain the phenomena of individualization in IS, we conducted a structured literature review following Webster and Watson (2002). With our presented meta-theory, we could search in a vast but also undefined body of knowledge. With a search strategy informed by our meta-theory, we drew the line between relevant and non-relevant literature. The meta-theory comprises three key relations that involve two entities each (e.g., the individual (IT identity) and the IT identity of the social context). Each relation by itself describes a more enclosed perspective of individual IS: as such, we could develop clear rules for each relation to distinguish between relevant and non-relevant literature. We

then integrated and analyzed the resulting literature with respect to the complete meta-theory while accounting for the fact that most related work contributes to more than one relation.

In detail, we conducted our analysis in four consecutive phases (see Figure 2).



**Figure 2. Process of Literature Analysis**

**Phase 1 (database search):** we built our search strings for the database search based on the following mechanism. First, we generated search terms using the related entities and relations in the meta-theory. Pairs of adjectives and nouns represented the entities (e.g., “individual IT identity”) and pairs of attributes and verbs (e.g., “choose (infinitive) self-determinedly”) and pairs of adjective and nouns (e.g., “self-determined adoption”) represented the relations.

To account for different abstraction levels occurring in literature, we derived sub-terms for each entity and relation by using wording from common definitions and taxonomies in literature. For instance, to describe the entity “individual”, we drew on the sociology literature and derived terms that were part of its definition (e.g., we broke down the entity “identity” into its characteristics value, attitude, moral, and skill). For the entity “information system”, we used the terms hardware, software, data, processes, and people (Silver, Markus, & Beath, 1995; Tatnall, Davey, & McConville, 1995). We applied this procedure for all entities and relations if possible. Then, we entered each of the derived terms and sub-terms into a synonym generator to derive possible alternatives to include in the search. In a last step, we concatenated the terms using a subject-predicate-object order along the three different individualization paths (e.g., “(Individual IT identity OR individual AND (values OR attitude OR ...) AND (self-determined-adoption OR choose self-determinedly OR ...) AND (information system OR software OR ...)”). The appendix lists all of our search strings, each one around one page long. We chose to include all journals from the AIS Senior Scholars’ basket of journals (top 8) and additionally all journals that received a ranking point average below 20 in the AIS meta-ranking of MIS journals<sup>1</sup>. Thus, we conducted our search in a total of 31 journals including *MIS Quarterly*, *Information Systems Research*, *Information Systems Journal*, *Journal of the Association for Information Systems*, *European Journal of Information Systems*, *Journal of Information Technology*, and *Journal of Strategic Information Systems*. For the search process, we used ISI Web of Knowledge because, with it, we could use one completely concatenated search term for each individualization stream. Here, we searched in topic, which included abstract, title, and keywords.

**Phase 2 (initial screening):** our search yielded a large number of results. Relation one (self-determined adoption) yielded 1,693 matches, relation two (institutional constraints) yielded a list of 153 matches, and relation three (socialization of IT values) yielded 1,130 hits. We then initially screened these matches based on both title and abstract, which resulted in a list of 228 possibly relevant papers. We downloaded and checked these papers for relevance again, which resulted in 143 papers. In most cases, papers that we omitted either used the keywords in a different way or did not yield any insights with respect to our research perspective. For instance, with respect to institutional requirements and constraints, our search yielded several papers on organizational capabilities and adoption decisions for specific enterprise systems (e.g., Saraf, Liang, Xue, & Hu, 2012; Teo, Wei, & Benbasat, 2003). However, because these papers did not provide any insights regarding the individual level, we did not include them in our review.

**Phase 3 (deriving research streams and searching forward/backward):** to this end, we tagged each paper with particular keywords indicating its major topic (e.g., acceptance at the individual level or

<sup>1</sup> <http://ais.site-ym.com/?JournalRankings>

adjusting of software by end users). We clustered papers with similar tags to a research stream named after the common topic they all addressed. Each author performed these two tasks individually; differing results were consolidated in a group workshop. We arrived at five major IS research streams that contribute to understanding individual IS: 1) technology acceptance, 2) technology diffusion, 3) agency and structure, 4) personalization, and 5) user satisfaction. In these streams, we performed several iterations of forward and backward searches to identify relevant papers on the common topic that we may have missed in our initial search run. The forward backwards search yielded another 48 papers, which resulted in 191 papers altogether that contribute to theoretically understanding the phenomenon of individual IS.

**Phase 4 (identification of contributions and research gaps):** we analyzed both the initially identified papers and the ones derived from the additional, stream-related search with respect to their contribution to the understanding of one of the three relations of the meta-model. Here, we used iterative open coding (Strauss & Corbin, 2008) to identify how far each paper contributes to the discussion on IT individualization and which aspects were not addressed. We present these findings in Section 4.

## 4 Results

Individualization in IS has a strong notion of individuals adopting and using technology. Therefore, not surprisingly, two research streams emerged that are concerned with the factors and mechanisms that govern individual-level adoption and usage behavior (stream 1: technology acceptance—68 papers) or the formation of attitudes towards technology (stream 2: user satisfaction—27 papers). Together, they comprise most of the theoretical grounding of individualization in IS currently found in the analyzed literature (95 papers). A third research stream focuses on the mechanisms and factors that affect situations in which individuals become more than consumers of components but instead become actively involved in adjusting existing, or even designing and implementing, new components in their IIS (stream 3: personalization—32 papers). In addition, we identified two research streams that focus more on the role of the social context and its relation to individual IS or the individual itself. The diffusion of IIS in a social context and the impact of socialization in the process is partially covered by technology diffusion literature (stream 4: technology diffusion—16 papers). The agency vs. structure research stream (48 papers) addresses IIS from a rather abstract point of view and focuses on the mechanisms and factors that govern the relation between the individual and the social context.

In the following subsections, we provide detailed insights into the main contributions of each stream concerning the three relations of our meta-theory.

### 4.1 Technology Acceptance Stream

**General concept:** a major research stream, which contributes to the understanding of individualization in IS because it explains why individuals accept or reject certain technologies, is the technology acceptance stream. One of the most prominent models to explain system usage is the technology acceptance model (TAM) (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh, 2000). The early versions of the model only consider two predictor variables of system usage: (1) perceived usefulness and (2) perceived ease of use (Davis, Bagozzi, & Warshaw, 1989). Later, researchers added a variety of constructs to the model that lead to new acceptance theories both for professional usage (Venkatesh & Bala, 2008; Venkatesh, Morris, Davis, & Davis, 2003) and private usage (Brown & Venkatesh, 2005; Venkatesh, Thong, Chan, Hu, & Brown, 2011).

**Contributions to self-determined composition:** most constructs used in the technology acceptance or rejection literature conceptualize individual beliefs towards a particular technology. Speaking in terms of our meta-theory, these beliefs are used to explain the self-determined adoption or non-adoption of the systems under investigation. Particularly, the individual perceptions of ease of use and usefulness have been an established element in the generic acceptance models (Venkatesh & Bala, 2008; Venkatesh et al., 2003). However, research has shown that these perceptions may, in turn, be influenced by individual characteristics such as level of education or prior experience with technology (Agarwal & Prasad, 1999). Yi, Fiedler, and Park (2006) state that “predisposed individual differences can be invariant across multiple technologies, exerting continuing effects on the adoption decisions irrespective of the specific characteristics of the technology” (p. 394). Focusing on mobile technologies used for private purposes, Carroll, Howard, Vetere, Peck, and Murphy (2001) found that adoption requires a fit between an individual’s lifestyle and the particular technology. This lifestyle is characterized by a large number of

potential factors, and researchers have included several in their models of technology acceptance. For instance, Venkatesh, Thong, Xin, and Xu (2012), adding constructs such as hedonic motivation, price value, and habit, studied the acceptance and use of technology in the private context. However, most of these models focusing purely on acceptance of particular technologies are rather static in nature and do not consider the availability of alternative systems serving the same purpose. Recent studies apply a new concept called switching behavior to close this gap. These studies' authors investigate why people switch from one technology to another to perform a particular task. For example, Polites and Karahanna (2012) show that habitual use, perceived transition costs, and psychological commitment encourage switching reluctance. Similarly, Ye and Seo (2008) show that user satisfaction and breadth of use of the incumbent system are negatively associated with switching behavior. Other work has also established that attitudes and norms cannot be considered static but underlie dynamic change over time (Kim & Malhotra, 2005). This is primarily the case because the social context is instable and, thus, leads to continuous modifications and adaptations of individual beliefs. To close this gap, researchers have taken a longitudinal view on IS acceptance and set out to understand and explain continued IS usage (Karahanna, Straub, & Chervany, 1999). Kim and Malhotra (2005), for example, use TAM in a longitudinal study and identify three additional mechanisms that determine post acceptance behavior: (1) sequential updates of beliefs according to judgments and intentions made earlier, (2) a feedback mechanism from behavior to beliefs, and (3) past use as a determinant for future use. Similarly, in an effort to explain technology continuance intention, Morris, Venkatesh, and Ackerman (2005) found a significant relationship between pre-adoption beliefs and post-adoption beliefs. As for the effects of social context, the authors show that these relationships are also significant for social influence (i.e., positive disconfirmation of social influence has a positive effect on post-usage social influence). Moreover, Al-Natour and Benbasat (2009) also criticize existing acceptance models by stating that they "have been static in nature" (p. 661), and they develop an interaction-centric model to study of user-artifact relationships. They follow the perception that users not only accept technologies but also have certain choices in terms of how to use them. This idea is similar to that of Carroll et al. (2001) who introduced the model of technology appropriation (MTA) based on the idea that technology is usually not simply adopted and used as intended by the designer but individually shaped by users. In other work, Fidock and Carroll (2006, p. 2) talk about an appropriation process "through which people adopt, adapt and incorporate technology into their work practices; it describes how users transform technology as it was envisaged by the designer into technology as it is currently used".

**Contributions to institutional requirements and constraints:** while the acceptance literature does not focus on institutional constraints, some authors have integrated related constructs in their models, particularly for organizational level acceptance. For instance, Furneaux and Wade (2011) recognize the "importance of institutional pressure as an environmentally based source of continuance inertia" (p. 577) and also integrate the concept of organizational initiative in their model (i.e., efforts that alter internal operations and may create pressure for change in information systems). Similarly, Liang, Saraf, Hu, & Yajiong (2007a) investigate the effect of institutional forces on top management support and the role of this support on the assimilation of ERP systems. They show that top management participation is a very strong predictor of the assimilation of enterprise systems.

**Contribution to influence of socialization:** while the technology acceptance literature primarily focuses on individual beliefs toward technology, social influences have always been an integral part of the models in this area of IS research. In the context of mobile internet usage, Lee, Choi, Kim, and Hong (2007) state that "cultural characteristics individuals derive from their national culture may be influenced and modified by their membership in...social groups that have own specialized cultures" (p. 13). This notion is generally accepted in the technology acceptance literature.

Regarding the influence of socialization, most models contain constructs that govern the social influences on the individual adoption decision. For instance, one can consider the constructs subjective norm and image to be related to the societal influence on an individual's IS norms and values. Subjective norm refers to the degree to which an individual perceives that most people who are important to it should use (or not use) the system (Fishbein & Ajzen, 1975; Venkatesh & Davis, 2000). Image refers to the degree to which individuals believe that using an innovation will enhance their status in their social context (Moore & Benbasat, 1991). However, because these influences are capsulated in distinct constructs that are related directly only to behavioral intention to use, possible impacts that social relations have on the forming an individual's IT identity are neglected. For example, most existing technology acceptance models do not account for interaction effects between subjective norm and, for instance, performance or effort expectancy. Thus, current models do not address a social group's influence on an individual's perception of a particular technology. Instead, individual behavioral beliefs are regarded as separate entities that

exist independently from any social context. Some exceptions are the works by Schepers and Wetzels (2007), who found a significant relationship between the subjective norm and perceived usefulness, and Venkatesh and Bala (2008), who show that the subjective norm influences image. Going one step further in adding social constructs to explain technology acceptance and use, Sykes, Venkatesh, and Gosain (2009) drew on social network theory and found network density (i.e., receive-help ties) and network centrality (i.e., give-help ties) as major predictors of system use. Other researchers have also taken steps to explain groups' technology adoption by using constructs closely related to socialization aspects such as majority opinion or opinion of high-status individuals (Sarker & Valacich, 2010).

Figure 3 summarizes the contribution of the technology-acceptance research stream to our understanding of individualization in IS.

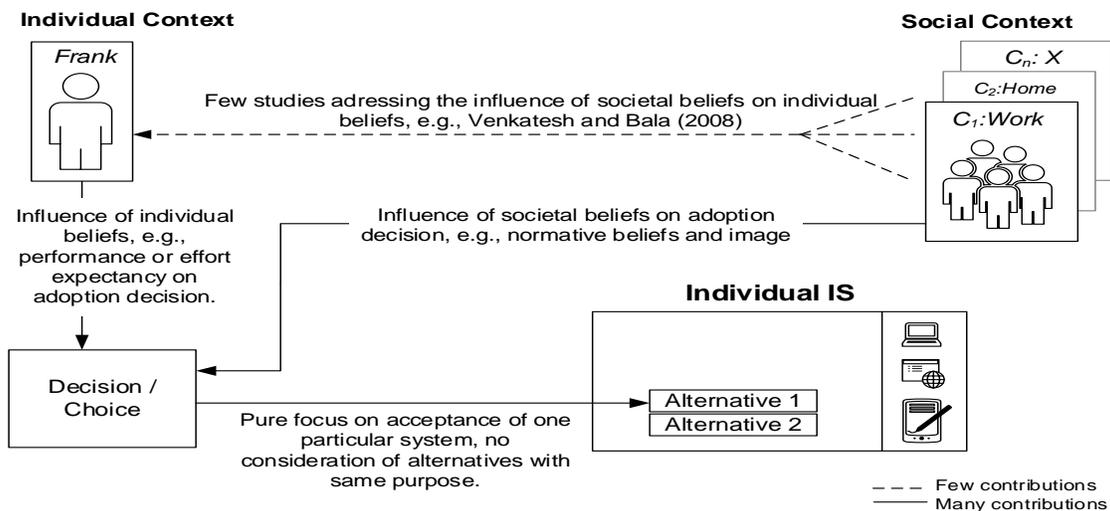


Figure 3. Contribution of Technology Acceptance Research Stream

## 4.2 User Satisfaction Stream

**General concept:** a second research stream of relevance comprises research regarding IS user satisfaction. The concept of user satisfaction can be traced to the work of Cyert and March (1963), who suggest that an information system that meets the needs of its users will evoke satisfaction. If the system does not meet individuals' needs and preferences, users will become dissatisfied and are likely to look for alternative options (Ives, Olson, & Baroudi, 1983).

User satisfaction has become a widely applied concept to measure the success or effectiveness of information systems (Deng et al., 2008; Gatian, 1994). Researchers typically define it as the attitude that a user has towards a system based on its design characteristics such as system reliability or information timeliness (Wixom & Todd, 2005). In the context of individual IS, user satisfaction may explain why particular design characteristics of a component lead to its adoption to the individual IS.

Previous research has developed and tested several instruments to measure user satisfaction for a variety of system classes. Such instruments define user satisfaction as the weighted user reaction to a variety of IS characteristics. Most instruments embody linear models. However, nonlinear models have also been proposed (Sethi & King, 1999), which, depending on the field of application, yield better predictions. Several instruments exist that allow one to measure users' satisfaction of rather large-scale IS that organizations provide. Such systems include traditional data processing environments (Bailey & Pearson, 1983; Ives et al., 1983), mainframe-based corporate database environments (Goodhue, 1988, 1995), and decision support applications (Sanders, 1984; Sanders & Courtney, 1985).

**Contributions to self-determined composition:** particularly relevant for the case of individual IS are those instruments that measure satisfaction in the context of software applications that end users individually choose or that are designed particularly for end users. An instrument that finds wide application is the end user computing satisfaction (EUCS) instrument (Doll & Torkzadeh, 1988). EUCS is defined by five weighted antecedents: (1) information content, (2) format, (3) accuracy, (4) ease of use, and (5) timeliness (Doll, Deng, Raghunathan, & Torkzadeh, 2004). The instrument has been tested for

reliability successfully (McHaney & Cronan, 1998; Torkzadeh & Doll, 1991) and validated in various contexts (e.g., in different cultures) (Deng et al., 2008).

Anderson and Chen (1997) follow a similar path and present a methodology for empirically evaluating different software packages, such as spreadsheets, word processors, and data-bases, based on their impact on user satisfaction. The core of their approach lies in identifying the set of the most relevant performance attributes, and, through a simultaneous system of equations, computing the relative importance of each attribute. Their findings suggest that user software satisfaction is accounted for by (1) function/feature, (2) service/support, and (3) implementation/friendliness of the system.

Rivard and Huff (1988) have developed an instrument that allows one to measure end user satisfaction that occurs in relation to self-developed applications. They apply a mixed-method approach to develop an instrument that explains user satisfaction connected to end user developed data processing applications. They identify six first-degree factors that account for most of the observed variance in user satisfaction: (1) the independence of the user from the (IT-) department, (2) satisfaction with the environment setup, (3) user friendliness of available software tools, (4) user attitude toward user-developed applications, (5) the degree of proactive provision of software applications by the (IT-) department (called push), and (6) the satisfaction with the support of the (IT-) department.

The concept of user satisfaction has been embedded in many models. Such models provide more detailed insights into the mechanisms that link IS characteristics to satisfaction. Culpán (1995), for instance, investigates how end users develop attitudes towards computers. Her findings hint that a user's initial interest and the mode of learning about computers are important in how they form attitudes toward a system. Yaverbaum and Nosek (1992) found that computer education and training supported user satisfaction. Lawrence and Low (1993) investigated the antecedents of user satisfaction connected to user-driven development. They found that the perceived quality of representation (i.e., a user's involvement in the development process) positively influenced user satisfaction because they feel their interests are represented in the development project. While the latter three studies were all conducted in the context of an organization, their findings also hint towards possible antecedents of satisfaction that may apply in the context of individual IS: relevant antecedents may include general interest in IT, the level of knowledge in IT, and the representation of idiosyncratic requirements in the selection of IT components.

Lankton and McKnight (2012) provide important insights into the mechanism that links antecedents to user satisfaction. They analyzed user satisfaction through the lens of expectation disconfirmation theory (EDT) to determine how initial expectations about IS and the actual performance of IS lead to satisfaction. They found that the distances between expected usefulness and ease of use and between actual usefulness and ease of use lead to confirmation or disconfirmation that influence user satisfaction. In the course of their investigation, they also discovered two effects that provide additional explanation on how individual attitudes towards IT are formed: first, inexperienced users' satisfaction relies more on their initial expectation than performance because these users usually lack the skill to evaluate the performance of software sufficiently (assimilation effect). Second, negative performance has a significantly larger impact on user satisfaction than positive performance (asymmetric effect). Regarding designing and evaluating (individualized) IS, the EDT allows the following conclusions: first, improving negative attributes of IS is more important than strengthening positive attributes, and, second, inexperienced users are poor predictors for evaluating an IS.

Cyert and March's (1963) initial definition for user satisfaction suggests that their presented findings help one design IS that result in high user satisfaction, higher adoption, and, eventually, higher system use. However, this inference is premature because most satisfaction studies agree that attitudes (i.e., user satisfaction) are generally poor predictors of actual behavior (i.e., actual adoption of IT/system usage) (Gatian, 1994; Wixom & Todd, 2005).

Several researchers have developed and validated modes to close this theoretical gap between attitudes towards a system, expressed in terms of user satisfaction, and actual behavior, expressed in terms of system usage. Downing (1999) succeeds in the latter by empirically showing that system usage is a valid predictor for user satisfaction. Wixom and Todd (2005) focus on the latter and merge technology acceptance research and user satisfaction research to create an integrated research model. The model combines the strength of satisfaction and acceptance research by linking particular design characteristics on the one side to actual user behavior on the other side. The user satisfaction stream contributes the link between design characteristics and attitudes, while the acceptance stream closes the gap between attitudes and actual behavior (i.e., system usage).

Satisfaction research provides insights in understanding relation 1 of the meta-theory. However, satisfaction research also has the weakness that it focuses mostly on functional (e.g., integration with organizational IT) and non-functional characteristics (e.g., IS staff's support of IT) that are important in an organizational context. Idiosyncratic antecedents that would govern private adoption and use outside an organization (e.g., interoperability with other home technologies) are rarely investigated.

**Contributions to institutional requirements and constraints:** some younger papers on EUCS include social factors in assessing user satisfaction (e.g., culture) (Deng et al., 2008). However, the investigated links between the social context and user satisfaction differ from the effect of institutional constraints on the individual IS's composition because such factors do not directly influence the system's composition but rather affect a particular stage in the individual adoption decision (given that adoption and use (behavior) are actually influenced by satisfaction (attitude)).

**Contribution to influence of socialization:** the analyzed satisfaction research does not contribute to our understanding of the relationship between the individual IT identity and the IT identity of a social context. It focuses on structural relations between the individual factors and IT characteristics and ignores long-term effects on user satisfaction (e.g., those caused by socialization).

Figure 4 summarizes the contribution of the satisfaction research stream to the understanding of individualization in IS.

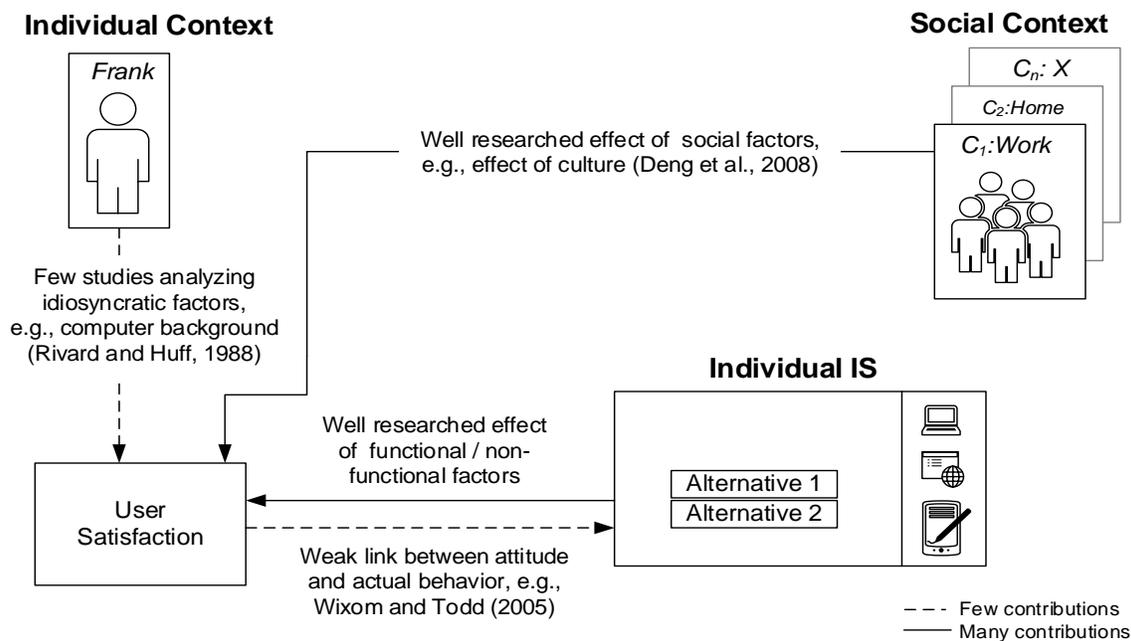


Figure 4. Contribution of User Satisfaction Research Stream

### 4.3 Personalization Stream

**General concept:** a third research stream connected to individualization in IS centers on the personalization of information systems. It focuses on IS that are designed to be modified and redesigned in the context of use (Germonprez, Hovorka, & Collopy, 2007) (e.g., through empowering users to set parameters and to adjust the IS to their idiosyncratic requirements) (Liang, Lai, & Ku, 2007b). Personalization, in contrast to the more general phenomenon of individualization, covers a relatively narrow research field that is mostly concerned with how individuals' IT identity shapes their IS or their particular components (relation 1). Compared to the technology acceptance stream that emphasizes behavioral intentions, the personalization stream also explains attitudes that individuals demonstrate. For instance, Smits, McLean, and Tanner (1993) differentiate between three individual needs (individuals' need for achievement, affiliation and power), originally suggested by Chusmir (1989), to make personalized predictions about individuals' motivations.

**Contributions to self-determined composition:** personalization research focuses on users' motivations to personalize IS and on personalization's positive impact on user IS satisfaction. It assumes that IS are

(1) personalized based on feedback about the IS given by its users, or (2) personalized by users themselves (Liang et al., 2007a). Several researchers have confirmed that user participation during the design and development phase of software applications increases users' acceptance with the IS (Ives & Olson, 1984) and their satisfaction with it (Rivard & Huff, 1984). However, organizations find it difficult to find users who tailor or purchase new, complex applications such as cloud services and mobile applications. This raises questions about who would chose to develop new software and why (Rosson, 1984). Following previous research, this would be individuals who are intrinsically motivated and willing to synthesize, abstract, and support the computational needs in their sociotechnical context (Mackay, 1990; Nardi, 1993; Rosson, Ballin, & Nash, 2004). Such individuals are likely to develop new software applications if the resulting application supports their real-world goals, such as creating a spreadsheet model in Excel (Jones, Blackwell, & Burnett, 2003) or building a website (Rosson, 1984; Rosson, Burnett, & Scaffidic, 2013). In this context, Saleem (1996) found a cross-over interaction effect between user participation and functional expertise. While, for low participating users, acceptance is greater under conditions of low functional expertise, for high participating users, acceptance is greater under conditions of high functional expertise.

Furthermore, linked to the ability to personalize an IS is the ability to select between various alternative configurations, modules, and setups because flexibility provides possibilities for users to personalize their applications. Palmer (2002), for example, applied media richness theory, as originally developed by Daft and Lengel (1986), to derive different options for how to present information on a webpage and, thus, personalize the page to single users' tasks.

**Contributions to institutional requirements and constraints:** the impact of institutional constraints is not examined by personalization. As defined above, personalization distinguishes itself from individualization by purely focusing on the relation of the individual and the information system.

**Contribution to influence of socialization:** similarly, personalization research also does not improve our understanding of the socialization effect between the individual IT identity and the IT identity of a social context. Instead, it highlights the relationship between the individual and the information system.

Figure 5 summarizes the contribution of the personalization research stream to our understanding of individualization in IS.

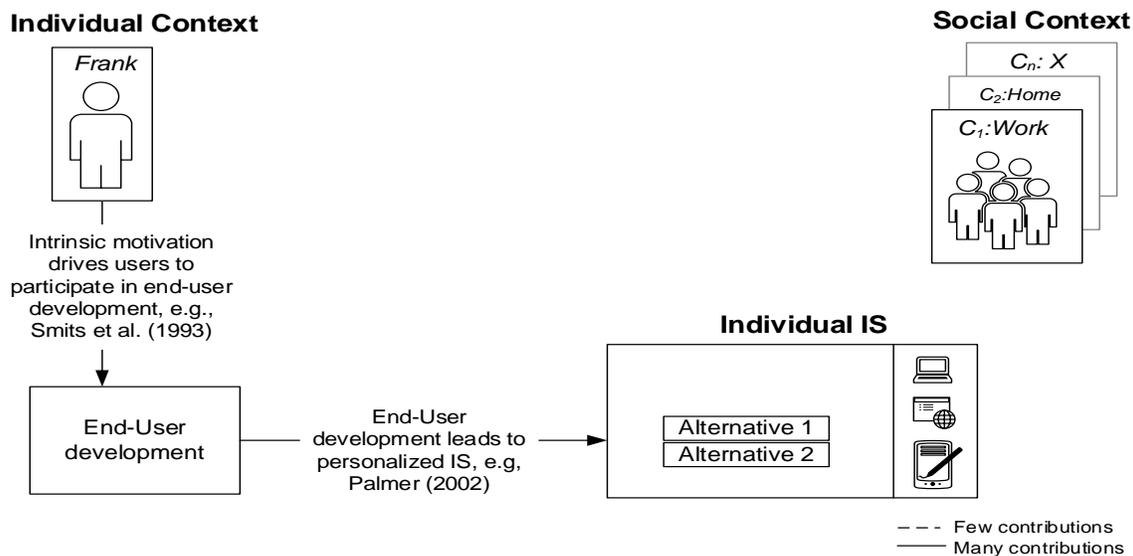


Figure 5. Contribution of Personalization Research Stream

#### 4.4 Technology Diffusion Stream

**General concept:** a fourth relevant research stream originates from the innovation diffusion theory (IDT) (Rogers, 2010). It emphasizes how new technologies, practices, and ideas are adopted in a population of potential adopters (Bhattacharjee, 2012). The major underlying assumption of the theory is that diffusion starts slow but accelerates with each additional adopter until the innovation is adopted by the majority of

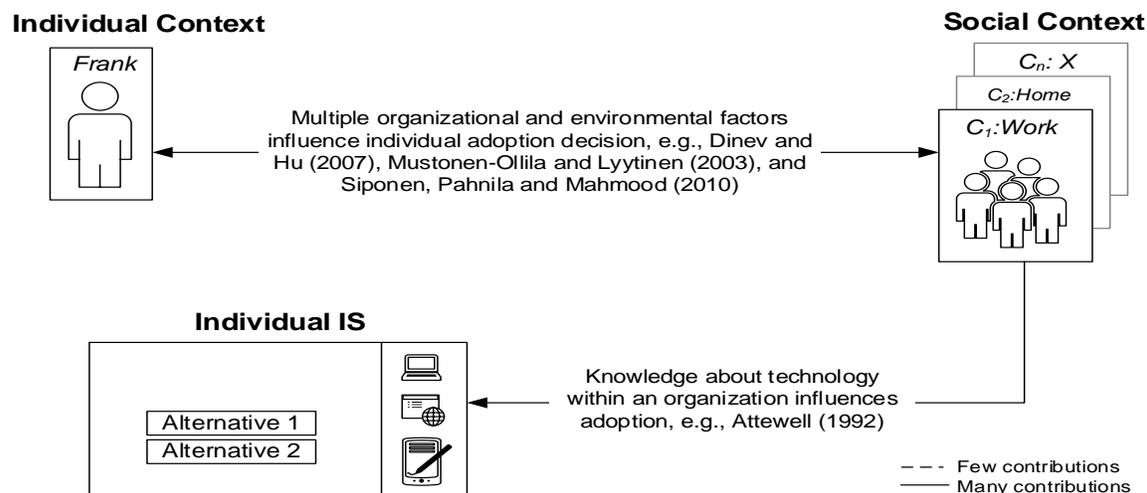
the population. After this point, diffusion slows down, which leads to an S-shaped curve as cumulative adoption function.

IDT provides the possibility to study diffusion of technology adoption at both the organizational and the individual level (Bhattacharjee, 2012). Thus, it provides options to investigate individualization from the organizational perspective and the individual perspective.

**Contributions to self-determined composition:** although IDT defines and differentiates stages that individuals may enter during their adoption decision, no studies exist that actually apply IDT at the individual level thus far. Therefore, the diffusion research stream does not contribute to a better understanding of self-determined composition of the IIS.

**Contributions to institutional requirements and constraints:** regarding individualization at the organizational level, early studies identified available knowledge about a technology in an organization as a major driver of that technology's diffusion. Knowledge about a technology that is available in an organization decreases knowledge barriers and improves adoption of that technology. New adopters, in turn, generate and provide additional knowledge about the technology, which progressively lowers the knowledge barriers for others to adopt and use the same technology (Attewell, 1992).

**Contribution to influence of socialization:** Dinev and Hu (2007) draw on IDT to explain socialization effects. Specifically, they investigate the effects of technological awareness on (1) individuals' attitude formation stages, (2) subjective norms, and (3) perceived behavioral control. They assume that individuals build up knowledge and become aware of new technologies through interacting with society. This socialization effect affects the individual's preferences and perceptions (e.g., attitude formation, perceived behavioral control, and social preferences such as subjective norms).



**Figure 6. Contribution of the Technology Diffusion Research Stream**

Furthermore, Mustonen-Ollila and Lyytinen (2003) conducted three longitudinal case studies based on IDT to focus on organizational and environmental factors that determine a technology's diffusion in an organization. The authors found four environmental factors (i.e., cultural values, technological infrastructure, community norms, and funding) and six organizational factors (i.e., long technological experience, working teams, opinion leaders/change agents, interdependence from others, adopter roles, and management/hierarchy) that can be mapped to the influential power of the society in our model. The authors also found three organizational factors (i.e., interpersonal networks/communication channels, near-peer networks and informal communication) that correspond to the proposed interaction between the individual's IT identity and the IT identity of the social context. In addition, Siponen et al. (2010) applied diffusion theory to investigate how the social context impacts individuals' adoption decisions. Specifically, they found that actions' and norms' visibility affect an individual's intentions because it promotes the importance of complying with subjective norms and, thus, creates social pressure on individuals. Besides numerous studies supporting IDT, there has been considerable criticism. One downside of the diffusion research stream is its pro-innovation bias—its inherent assumption that all innovations are beneficial and will eventually diffuse in the entire population (Bhattacharjee, 2012). Hence, similar to technology

acceptance, technology diffusion is not suited to explain choices made by individuals based on their idiosyncratic needs and preferences because, according to IDT, individuals will make all possible choices eventually.

Figure 6 summarizes the contribution of the technology diffusion research stream to the understanding of individualization in IS.

#### 4.5 Agency vs. Structure Stream

**General concept:** the last relevant research stream in IS is research that contributes to the agency versus structure debate that we briefly mention in the introduction. In his original work on structuration theory, Giddens (2013) rejects the traditional dualistic view that social actions are either fully determined by social structures or by autonomous decisions of human agents and suggests that they are determined by both. However, the original theory does not particularly address technological aspects but rather deals with highly abstract social phenomena that “can make it difficult to grasp the significance of structuration theory in the IS context” (Jones & Karsten, 2008, p. 129). Nevertheless, IS researchers have adopted the structuration theory and human agency in a variety of different contexts including cross-cultural software production and usage (Walsham, 2002), mobile computing (Cousins & Robey, 2005), and virtual team development (Sarker, 2002). More specifically, DeSanctis and Poole (1994) propose an adaptive structuration theory in the context of IS that “describes the interplay between advanced information technologies, social structures, and human interaction” (p. 125). Their key proposition is that advanced information technologies trigger adaptive structuration processes that are able to change existing rules and resources use in organizational social interaction.

**Contributions to self-determined composition:** in an IS context, we can define human agency as “a temporally situated process in which actors reflect simultaneously on the past, present and future implications of their potential actions” (Brooks, 1997, p. 83). As such, when regarded from our theoretical perspective of individual IS, it is strongly related to the formation of an individual information system based on an individual’s IT identity. However, it addresses an organizational level rather than describes the individual processes that lead to an IIS’s formation. On the individual level that we primarily address with our meta-theory, the agency discussion is often associated with the concept of self-efficacy. For instance, Bandura (1982) regards the self-efficacy mechanism as central for human agency and states that “self-percepts of efficacy influence thought patterns, actions and emotional arousal” (p. 125). In this context, he defines agency as a concept that “embodies the endowments, belief systems, self-regulatory capabilities and distributed structures and functions through which personal influence is exercised” (Bandura, 2001, p. 2) and defines intentionality, forethought, self-reactiveness, and self-reflectiveness as its key properties. In IS research, the self-efficacy concept has been widely adopted and transferred to the realm of technology. Studies have developed constructs and items for computer self-efficacy (Agarwal, Sambamurthy, & Stair, 2000; Compeau & Higgins, 1995; Hardin, Chang, & Fuller, 2008; Marakas, Yi, & Johnson, 1998; Marakas, Johnson, & Clay, 2007) and computer anxiety (Bennett & Perrewé, 2002; Hackbarth, Grover, & Yi, 2003), or internet self-efficacy (Hsu & Chiu, 2004) and tested their influence on, for example, usage intention or user satisfaction.

**Contributions to institutional requirements and constraints:** in contrast to agency, structure is conceptualized as objective properties of society as a whole (Jones & Karsten, 2008). These objective properties also determine how individuals act. Thus, while agency can be understood as individuals’ capability to decide freely based on their preferences, structure can be seen as a potential factor that limits the selection space. As such, structure is strongly related to the aspect of institutional constraint in our individualization framework. Similar to the finding that the influence of the social IT identity on the formation of the individual information system is decreasing while that of the individual IT identity is rising (Baskerville, 2011a), researchers have found that social theories have gradually moved away from structural explanations involving technology and social structure and toward explanations involving human agency (Brooks, 1997). However, while this development is in line with our notion of individualization, it is important to still consider structure as influencing factor with respect to technology selection especially because limiting or pre-determining choices becomes more and more important for organizations in the context of bring-your-own-device (BYOD) or choose-your-own-device (CYOD) strategies. In addition, similar to the agency discussion, while the concept of structure is situated on an organizational level, it has an equivalent on the individual level. The individual perspective is closely related to the construct of autonomy that has been widely adopted in IS research (Ahuja & Thatcher, 2005; Ahuja, Chudoba, Kacmar, McKnight, & George, 2007). Yet, most studies in this context use it to describe job autonomy

(i.e., employees' freedom to decide on their own how to perform their work). In addition, it is important to distinguish between what individuals are capable of doing in terms of knowledge and skills and what they are willing to do based on idiosyncratic needs and individual beliefs. Thus, while the concept of self-efficacy as defined in IS literature governs the former aspect, autonomy is strongly related to the latter one.

Contribution to influence of socialization: the socialization aspect has been a core aspect of the structuration discussion. Structuration theory (Giddens, 2013) suggests that there is a two-way interaction between the individual and the social context. On the one hand, the specific social environment and the opinions created in it influence the use of particular technologies. These influences may either reinforce the way that technology is used or lead to completely new ways of usage. The latter, on the other hand, may then invoke changes in social or organizational structures with respect to the "intended usage" and may also lead to completely new designs (DeSanctis & Poole, 1994).

Similar to this, Orlikowski (1992) speaks of a duality of structure. On the one hand, individuals use technologies. On the other hand, individuals also construct technologies both physically and socially. As individuals interact with technologies during their work, they enact structures that shape their emergent and situated use of those technology (Orlikowski, 2000). For instance, in the context of BYOD, a superior who reprimands an employee for using the individual's own technology for work will reinforce this rule in the mind of both of them as "standards of appropriate behavior" (Walsham, 2002, p. 361).

Figure 7 summarizes the contribution of the structure versus agency research stream to our understanding of individualization in IS.

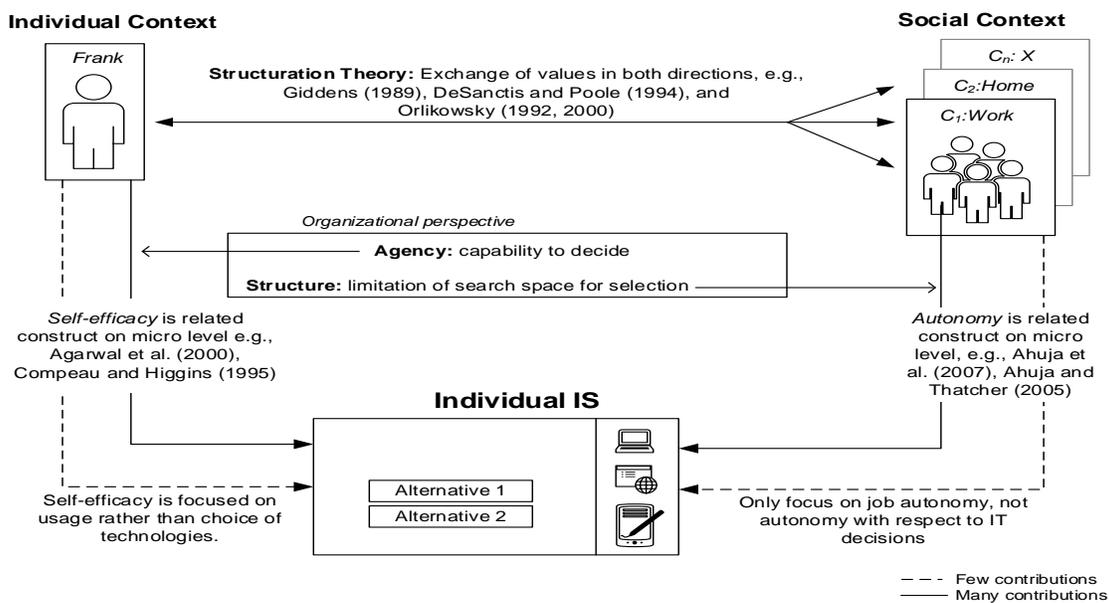


Figure 7. Contribution of Agency versus Structure Research Stream

## 5 Discussion

In this section, we discuss the findings from our literature review and guide further research by identifying current research gaps in the literature concerning the meta-theory. As for technology acceptance research, the focus lies on the relationship between the individual IT identity and the individual IS (relation 1). Some constructs in the existing models (e.g., subjective norm or habit) also address the influence of societal norms on the acceptance of a particular technology and, thus, the formation of an individual IS. However, these constructs are regarded as direct influences on the acceptance decision and are not tested with respect to their impact on individual beliefs (relation 3). For instance, we identified few papers that draw a connection between these constructs and individual beliefs such as performance expectancy or ease of use (Venkatesh & Bala, 2008). Based on findings from sociology, it may also be possible that these variables are influenced by the norms of the society. For instance, if a person is in a social context that favors easy-to-use technology and, in addition, is repeatedly told that this technology was easy to

use, the individual might experience it as actually easier. Structuration theory suggests that individual beliefs are formed by means of a socialization process and, thus, have a direct relation to the societal beliefs (relation 3). Future research could address this gap in acceptance literature and evaluate the relationship between subjective norms and behavioral beliefs in more depth. In addition, most current literature on technology acceptance addresses only the adoption of a particular given technology. In this context, researchers have found that many existing theories in the context of technology acceptance “do not explicitly consider the availability of alternative systems that users may have access to and may have a preference for” (Muthitharoen, Palvia, & Grover, 2011, p. 205). Thus, while the established acceptance models predict adoption of a single given technology well, they are unable to explain the choice behavior of individuals that are confronted with a variety of competing alternatives (Lee, Kozar, & Larsen, 2003), which becomes particularly important due to the fact that more and more alternatives are available that people can choose from to build their individual IS (Baskerville, 2011a).

User satisfaction research helps explain how object-related beliefs about IT lead to the formation of attitudes that eventually may influence the composition of the individual IS. In terms of the meta-theory, this stream provides insights into the mechanisms that determine the relation between the individual IS identity and the resulting individual IS (relation 1). User satisfaction provides a tool to measure whether users are content with the characteristics of an available IS or not. Most of these characteristics, functional and non-functional, are directly related to job-characteristics or structural characteristics of a professional context. Investigating user satisfaction from a rather professional perspective neglects, however, such antecedents, which may explain user satisfaction with privately chosen IS. Another point for clarification is the relationship between attitude and behavior. As we explain earlier, most satisfaction studies admit that attitudes are weak predictors for behavior (Wixom & Todd, 2005) and relativize the explanatory power of user satisfaction in the context of system design. As long as this theoretical gap isn't closed, it remains unclear whether a particular component is adapted to the individual IS because of its superior system design, expressed as high user satisfaction, or due to other yet unknown reasons.

The review of the personalization research stream strengthens our understanding of the relation between the IT identity of the individual and its individual IS (relation 1). Personalization refers to the process of adjusting software applications to the requirements of a single user. It resembles individualization at a different granularity—the characteristics of a single application. Many findings contribute to explaining the factors and mechanisms that apply at the level of individual IS. The personalization research stream assumes that domain knowledge that users provide during a design and development stage of an IS positively affects adoption. It complements the technology acceptance stream by focusing on the role of motivation and attitudes in the process. However, similar to the gap in satisfaction research, findings in personalization also indicate that attitudes are weak predictors for actual behavior, which, which is supported by other studies on personalization that have found that few employees actually do personalize their IS. This raises the question: why do some users personalize their applications and others not (Rosson et al., 2013)? The answer to this question is important to individual IS as well since the factors that make users personalize their IS are probably also relevant to understanding why certain individuals adopt individual IS and others do not (relation 1).

The review of technology diffusion literature contributes helps better explain the self-determined composition of IIS (relation 1) and provides insights into the effect of socialization (relation 3). While previous studies draw on IDT determined factors that influence the relationship between individuals' IT identity and the IT identity of the social context (i.e., the organizational level), to our knowledge, no study has applied IDT to examine the stages that individuals may enter during a certain technology's adoption process (i.e., the individual level) (Bhattacharjee, 2012). Thus, future research on individualization could delve into the potential stages as Rogers (2010) originally hypothesized; that is (1) learning about the possibility to individualize an IS, (2) being persuaded to individualize an IS, (3) deciding to individualize an IS, (4) actually implement an individualized IS, and (5) deciding to use it. However, IDT may also be applied to investigate the relationship between individuals' IT identity and the IT identity of the social context (organizational level) further. Previous studies have only identified factors that influence a technology's diffusion and have not explained why and how these factors lead to diffusion (with the exception of knowledge about a technology that is available in an organization). To address this gap, scholars need to investigate the relationships between the identified antecedents and a technology's diffusion. This, in turn, would improve our understanding of individualization because it would explain how the society affects individuals' IT identity. Eventually, further individualization research could incorporate time as an important factor as the impact of diffusion varies over time (Mustonen-Ollila & Lyytinen, 2003).

Our review of literature with respect to agency vs. structure or, more particularly, structuration theory shows many overlaps with our understanding of IIS. Here, the general distinction between agency and control refers to an organizational perspective of the phenomenon. While agency covers individuals' capacity to take individual decisions (relation 1), these decisions may be limited or influenced by structures (relation 2) (e.g., the organizational entities they are part of). In addition, structuration theory also refers to the exchange of values between agent and organizational entities, which corresponds to the upper part (relation 3) of our meta-theory. Thus, the whole research stream is focused on explaining the interplay between agency and structure on an organizational level. With respect to factors that resemble this discussion on an individual level, we were able to identify self-efficacy for the relationship between the individual IT identity and IIS and autonomy with respect to that between the social IT identity and IIS. However, the current literature on self-efficacy only regards the construct with respect to usage of a particular technology. Self-efficacy with respect to technology choice has not yet been targeted in IS research. The same applies to the level of autonomy that individuals are granted in their organization. Here, IS research has mainly evaluated overall job autonomy. Currently, it has not been adapted to describe technological autonomy (i.e., the freedom to choose the IT tools that are perceived to be most useful for fulfilling the task). However, with respect to IT consumerization and BYOD, this aspect becomes more and more important when talking about the individualization of information systems (Dell & Intel, 2011; Murdoch, Harris, & Devore, 2010). An exception is Wu and Lederer (2009) who focus on explaining the autonomy to adopt—or not adopt—one specific and given technology. They introduce the concept of environment-based voluntariness as the “context-dependent freedom in adopting an information system” (p. 421) and test it in the context of the TAM. They show that the concept moderated most relationships in the TAM. However, autonomy in the context of technology choice behavior remains largely untargeted by current IS research.

## 5.1 Summary

As our review shows, current IS research relevant to understanding individualization in IS foremost focuses on the relationship between the individual IT identity and the individual IS because it is much easier to measure beliefs on an individual level than it is to determine beliefs of the social context. Our analysis shows that, currently, there are few efforts in IS research to directly assess the IT identity of a social group. Rather, behavioral studies in IS have measured beliefs and norms of the social context as perceptions of the individuals whose behavior was analyzed. In addition, our review shows that most IS research targeting the relationships between the social context and both individual IS and the individual IT identity is conceptual in nature. Thus, empirical research is necessary, particularly with respect to organizational strategies that may govern the individualization in IS. For instance, determining the effects of different strategies in the context of BYOD on satisfaction or acceptance can be considered an important area of future research.

Our study is beset with multiple limitations that we need to mention. First, a literature review can hardly be regarded as comprehensive (vom Brocke et al., 2009). We followed a multi-step approach: we first identified an initial set of papers and structured them along possible research streams. Second, we searched for additional papers in these streams by means of a forward and backward search. For this, we only included journal papers because they are regarded to have the highest quality. However, this can also be regarded as a limitation of our research because we might have missed more recent publications on the different aspects of individualization that have been published in conference proceedings. Third, we identified both research streams and gaps and, thus, we may have been biased by individual research perspectives and preferences. While we conducted the analysis as objectively as possible and discussed and integrated results in a workshop setting, other authors may have come up with a different set of streams or gaps.

Both the results of our study and the limitations show potential avenues for future research. On the one hand, research could focus on closing the identified gaps by addressing, for example, the impact of socialization in the context of technology acceptance or user satisfaction. Here, it may be possible that individuals' beliefs regarding a technology are influenced by that of the social context they are a part of. On the other hand, future studies could develop a more in-depth understanding of each stream's contribution to the proposed meta-theory. For this, it may be necessary to broaden the search space and include additional papers from conferences or lower-level journals. In conclusion, while there are multiple studies that address distinct aspects with respect to IIS, a comprehensive discussion is missing.

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## Appendix A: Title of the Appendix

### Relation 1: Individual Context – Individual IS

*(individual OR person OR user OR ((individual\* OR idiosyncra\* OR unique OR personal\*) NEAR/5 (identity OR character OR individuality OR personality OR identification OR uniqueness OR self OR selfdom OR selfhood OR selfness OR ipseity OR character\* OR aspect OR facet OR idiosyncrasy OR indication OR mark OR note OR particularity OR peculiarity OR property OR quality OR specialty OR trait OR virtue OR Value OR assessment OR worth OR Attitude OR approach OR belief OR mindset OR "mental state" OR notion OR opinion OR perspective OR "point of view" OR position OR view OR stance OR moral OR maxim OR moralism OR point OR rule OR skill OR competence OR ease OR ingenuity OR "know how" OR proficiency OR savvyness OR readiness)))*

*NEAR/10(Choose OR accept OR adopt OR appoint OR cast OR pick OR select OR determine OR judge OR "make decision" OR "make choice" OR "opt for" OR prefer OR Choice OR alternative OR choosing OR decision OR evaluation OR judgment OR option OR pick OR preference OR rating OR substitute)*

*NEAR/10("Information System" OR Hardware OR "IT artifact" OR "IT artefact" OR tool OR utensil OR implementation OR software OR application OR "bundled software" OR courseware OR groupware OR "operating system" OR "productivity software" OR program OR spreadsheet OR "systems software" OR data OR information OR knowledge OR Processes OR action OR routine OR working OR practice OR transaction OR development OR operation OR method)*

### Relation 2: Social Context – Individual IS

*(group OR community OR collective OR organization OR company OR society OR ((collective OR aggregate OR common OR consolidated OR corporate OR grouped OR joint OR mutual OR shared OR unified OR united) NEAR/5 (identity OR character OR identification OR uniqueness OR ipseity OR Characteristic OR aspect OR facet OR indication OR mark OR note OR particularity OR peculiarity OR property OR quality OR specialty OR trait OR virtue OR Value OR assessment OR worth OR Attitude OR approach OR belief OR mindset OR "mental state" OR notion OR opinion OR perspective OR "point of view" OR position OR view OR stance OR moral OR maxim OR moralism OR point OR rule OR skill OR competence OR ease OR ingenuity OR "know how" OR proficiency OR savvyness OR readiness)))*

*NEAR/10 (Choose OR accept OR adopt OR appoint OR cast OR pick OR select OR determine OR judge OR "make decision" OR "make choice" OR "opt for" OR prefer OR Choice OR alternative OR choosing OR decision OR evaluation OR judgment OR option OR pick OR preference OR rating OR substitute)*

*NEAR/10 ("Information System" OR Hardware OR "IT artifact" OR "IT artefact" OR tool OR utensil OR implementation OR software OR application OR "bundled software" OR courseware OR groupware OR "operating system" OR "productivity software" OR program OR spreadsheet OR "systems software" OR data OR information OR knowledge OR Processes OR action OR routine OR working OR practice OR transaction OR development OR operation OR method)*

### Relation 3: Individual Context – Social Context

*(individual OR person OR user OR ((individual OR idiosyncratic OR unique OR personal OR personalized) NEAR/5 (identity OR character OR individuality OR personality OR identification OR uniqueness OR self OR selfdom OR selfhood OR selfness OR ipseity OR characteristic OR aspect OR facet OR idiosyncrasy OR indication OR mark OR note OR particularity OR peculiarity OR property OR quality OR specialty OR trait OR virtue OR Value OR assessment OR worth OR Attitude OR approach OR belief OR mindset OR "mental state" OR notion OR opinion OR perspective OR "point of view" OR position OR view OR stance OR moral OR maxim OR moralism OR point OR rule OR skill OR competence OR ease OR ingenuity OR "know how" OR proficiency OR savvyness OR readiness)))*

*NEAR/10 (socialization OR interact OR interchange OR exchange OR counterchange OR gain OR gather OR attain OR "pick up" OR obtain OR receive OR learn)*

NEAR/10 (group OR community OR collective OR organization OR company OR society OR ((collective OR aggregate OR common OR consolidated OR corporate OR grouped OR joint OR mutual OR shared OR unified OR united) NEAR/5 (identity OR character OR identification OR uniqueness OR ipseity OR Characteristic OR aspect OR facet OR indication OR mark OR note OR particularity OR peculiarity OR property OR quality OR specialty OR trait OR virtue OR Value OR assessment OR worth OR Attitude OR approach OR belief OR mindset OR "mental state" OR notion OR opinion OR perspective OR "point of view" OR position OR view OR stance OR moral OR maxim OR moralism OR point OR rule OR skill OR competence OR ease OR ingenuity OR "know how" OR proficiency OR savvyness OR readiness)))

## Appendix B: Searched Journals

Table 1. Searched Journals

1	European Journal of Information Systems
2	Information Systems Journal
3	Information Systems Research
4	Journal of the Association for Information Systems
5	Journal of Management Information Systems
6	MIS Quarterly
7	Journal of Strategic Information Systems
8	Journal of Information Technology
9	Communications of the ACM
10	Management Science
11	Artificial Intelligence
12	Decision Sciences
13	Harvard Business Review
14	AI Magazine
15	Decision Support Systems
16	Information & Management
17	ACM Transactions on Database Systems
18	IEEE Software
19	IEEE Transactions on Software Engineering
20	Journal of Computer and System Sciences
21	Sloan Management Review
22	Communications of AIS
23	IEEE Transactions on Systems, Man, and Cybernetics
24	ACM Computing Surveys
25	Academy of Management Journal
26	International Journal of Electronic Commerce
27	Administrative Science Quarterly
28	Information Systems Frontiers
29	Organization Science
30	Journal of Global Information Management
31	Journal of Database Management

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