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User's Attitude – Contemporary Reflections of an Old Concept

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ABSTRACT

User's attitude is a central construct in IT adoption models. Based on the Theories of Reasoned Action and Planned Behavior the affect-based attitude scales adapted by Davis et al. 1989 in the Technology Acceptance Model (TAM) have remained basically unchanged ever since. However, scientometric results from MISQ and ISR from 1989-2010 resulting in a total of 37 articles indicate that 26% of attitude-behavior-relations in IT adoption models are insignificant. This paper represents an attempt to explain and analyze these findings by adding aspects of contemporary social psychology research on attitude and developing a research framework that merges these aspects with IT adoption characteristics. As a result, two propositions are developed containing combinations of adoption characteristics, where attitude is assumed to have a larger impact on usage than in others. Scientometric data supports the proposition that the attitude-behavior relation is likely to be significant, when usage is voluntary combined with hedonic IT systems and post-adoption scenarios. This research questions the manner of adapting the attitude scales applied by Davis et al. and advocates the usage of situation-based scales that incorporate the specificities of IT adoption in order to reduce the level of insignificance of the attitude construct in IT adoption models.

Keywords

User's attitude, IS adoption, classification framework, Scientometric, MIS Quarterly, Information Systems Research.

INTRODUCTION

Observations of the use and acceptance of information technology (IT) represent one of the major streams in information systems (IS) research. About 350 articles on the adoption, diffusion and use of technology have been published in the most important, expert-reviewed scientific journals since the mid 1980s (Williams et al., 2009). Since Davis et al. (1989) introduced the Technology Acceptance Model (TAM), several user acceptance models have been proposed, tested, refined and unified throughout IS literature (Venkatesh et al., 2003; Zhang et al., 2008).

User's attitudes towards IT, based on the Theory of Reasoned Action (Fishbein and Ajzen, 1975), and the Theory of Planned Behavior (Ajzen, 1991), thereby represent an important antecedent for the endogenous variables. Originating from social psychology, the study of attitudes as a base for human decisions and behavior remains a core concept and a major focus of research within this discipline (McGuire, 1986; Eagly and Chaiken, 1993; Ajzen, 2001; Crano and Prislin, 2006). Concerning the importance of attitudes, Allport stated already back in 1935 that "the concept of attitude is probably the most distinctive and indispensable concept in contemporary American social psychology" (Allport 1935, p. 198).

Although, the correlation between attitude and behavior is unquestioned in contemporary social psychology research, there is considerable variability in the degree to which attitudes predict behavior (Ajzen, 2001; Glasman and Albarracín, 2006). In IS literature, the relationship between user attitudes and usage is likewise ambivalent. It was found to be insignificant in the TAM and the construct therefore excluded from later versions (Venkatesh and Davis, 2000; Venkatesh, 2000) and further important IT adoption models and theories (Venkatesh et al. 2003). The inconsistent results in the study and measurement of attitude indicate that there are conceptual and operational misconceptions of attitude in IS literature. Some authors (Yang and Yoo, 2004; Zhang et al., 2008) have already raised the issue whether attitude deserves more attention in IS and if the affective based measures introduced by Davis et al. in 1989 are still consistent with contemporary social psychology research and the particularities of IT adoption scenarios. This situation should be a starting point for further investigation (Zhang et al., 2008), that the present research aims to address.

The paper is structured as follows: In section 2, aspects of contemporary research on attitudes are summarized, stressing their relevance for IT adoption contexts. Moreover it contains a framework that merges contextual characteristics of IT adoption with attitude relevant perspectives that were introduced within this section. The framework aims at providing a detailed view on factors that influence user's attitude regarding adoption behaviors and at giving insights in IS related concepts of attitude. Furthermore, two propositions on attitude performance in IT adoption contexts are developed. In the third section, scientometric data from MIS Quarterly and Information Systems Research (ISR) is analyzed, in order to illustrate what has been done on attitudes in IS top literature and if there is evidence that supports the proposition of section 2. Hereinafter the results are discussed with respect to their implications for further research.

CONCEPTUALIZATION OF ATTITUDES WITH REGARDS TO IS ADOPTION CONTEXTS

IS professionals, managers and researchers face the critical but difficult task of explaining and predicting user's reactions to the new technologies in order to improve productivity (Beaudry and Pinsonneault, 2005). Research in this area is often described as one of the most mature research streams in contemporary information systems (IS) and has resulted in several theoretical models that routinely explain about 40 percent of the variance in individual usage intention (Venkatesh et al., 2003). Attitudes toward using and actual usage of technology have been subject in this area at least since the appearance of the TAM in 1989. Based on the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and the Theory of Planned Behavior (TPB) (Ajzen, 1991) Davis et al defined attitude as a person's affective evaluation of a specific object (Davis et al., 1989). This definition and according scales were adapted by various authors in IS literature (Compeau et al., 1999; Venkatesh et al. 2003) and have remained basically unchanged ever since. Although, irregularities concerning the constructs explicative power and significance were tested and stated (Venkatesh et al., 2003), the constructs definitional and conceptual bases have not been questioned in general.

Regarding social psychology as the root discipline, various evolutionary steps as to definition, perspectives and concepts have been made concerning the research on attitudes. The present section of this paper summarizes some of these developments that are useful in IT adoption contexts.

Around 1990, McGuire (1985, p. 235) identified the so called *third peaking* in attitude research. After issues of measurement that were the major focus of the second peaking around 1960, the 90s persuasion, content, structure and functioning were dominant (McGuire, 1985; Crano and Prislin, 2008). The affect-based definition of attitude provided by Davis et al. 1989 can be subordinated to a subphase within this development that is called *primacy of affect*. Initiated by authors like Zajonc (1984) affective issues increased strongly during these times (Eagly and Chaiken, 2005). Ironically in IS, user acceptance research that followed on the TAM were primarily based on cognitive belief-based models incorporating attitude as affect-based construct (Beaudry and Pinsonneault, 2010). Thus, IS literature has failed to provide a holistic definition of attitudes.

Affective and cognitive primacy:

Regarding social psychology, a conceptual and holistic definition of attitude is given by Eagly and Chaiken (1993) who define attitude as "*a psychological tendency that is expressed by evaluating a particular entity with some degree of favor and disfavor.*" (p. 1). They further comment on their conceptual understanding of the term psychological tendency as referring to "*(...) a state that is internal to the person*" and evaluating to "*(...) all classes of evaluative responding, whether overt or covert, cognitive, affective or behavioral*" (p. 1). The cognitive category contains thoughts, associations, linkages or beliefs that people establish between the particular entity – the attitude object – and various attributes (Fishbein & Ajzen, 1975). The affective category consists of all classes of feelings or emotions that people have in relation to an attitude object, and the behavioral category compasses a person's actions with respect to the attitude object, including behavioral experiences with the attitude object. Figure 1 illustrates all three classes of attitudinal responses.

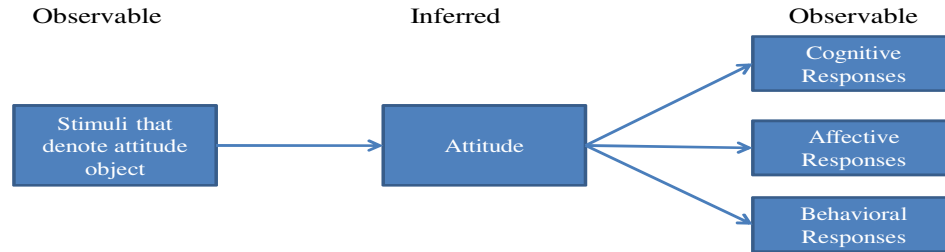


Figure 1: Attitudinal responses divided in three subclasses (Eagly and Chaiken, 1993, p. 10)

In IS adoption literature, the different classes of attitudinal responses have not been sufficiently acknowledged (Yang & Yoo, 2004). The terms “affect” and “evaluations” were rather used interchangeably (e.g. Zajonc & Markus, 1982; Davis et al., 1989; Venkatesh et al., 2003). With respect to empiricism this is valid, as long as the evaluative responses are highly correlated and thus interchangeable without causing losses in statistical power. However, some attitudes may be heavily weighted toward one or two classes of attitudinal responses, depending on the attributive structure of the attitude object and respondents’ characteristics. Regarding for instance utilitarian business-related infrastructure, emotional responding in terms of affect is highly unlikely. Thus utilitarian systems are assumed to cause cognitive responses resulting in a so called *cognitive primacy* for utilitarian systems (analogously affective primacy for hedonic systems). Furthermore, little behavioral responding is likely to occur without direct experience with the attitude object (Eagly & Chaiken, 1993). Yang and Yoo (2004) note the lack of precision of IS adoption literature with reference to the different evaluative classes and the tendency towards affective scaling of attitudes (Venkatesh et al., 2003; Yang & Yoo, 2004). However, they also only refer to a dyadic instead of a tripartite structure of attitude.

The relevance of attitudinal classes for IT adoption becomes clear, using the example of the UTAUT model (Venkatesh et al. 2003). During the development phase the authors tested various IT adoption models and included constructs under various conditions in order to determine constructs that perform well across all variations of settings. Attitude was measured 44 times and turned out to be insignificant in 24 cases. The authors observed that insignificance of attitude occurred when constructs related to performance expectancy and effort expectancy are included in the model. Consequently, any observed relationship between attitude and intention was considered to be spurious and resulting from omission of other key predictors (Venkatesh et al., 2003, p. 455) and attitude therefore excluded from the UTAUT.

From the social psychologist’s view on attitudes the results of the paper are not surprising. The tripartite model of attitude as illustrated in figure 1 implies that the attitude object (IT) shifts the weighting of attitudinal responses to a certain response class dependent on its characteristics. Hedonically oriented behaviors or objects such as chatting or a social networking sites for instance tend to be affectively driven, while usefully oriented behaviors or objects like studying or task managing tools are cognitively driven (Millar and Millar, 1998). Consequently, basing attitude scales on feelings (affect) increases the attitude-behavior correlation when the behavior is hedonic and focusing on feelings while the behavior is utilitarian decreases the attitude-behavior correlation (Glasman and Albarracín, 2006). In case of UTAUT, 24 of the 24 measurements of attitude that were insignificant, applied affective scales in combination with utilitarian attitude objects. Ironically, the conclusion drawn by the authors indirectly referred to the tripartite model. Performance expectancy and effort expectancy are cognitively driven constructs. If user’s attitude is presumed to be heavily weighted towards the cognitive response class because of a utilitarian attitude object, then the presence of cognitively driven constructs and affect-based measured attitude makes attitude redundant which is expressed by the construct’s insignificance.

Memory-based constructions versus temporary constructions of attitude

Another important IT specific regarding attitude is the distinction of pre- and post-adoption settings because they directly address the question, whether attitude is a stable entity stored in memory or a temporary judgement constructed on the spot on the basis of the information at hand (Bohner & Dickel, 2011). Researchers advocating the memory-based conception of

attitudes, people's attitudes are the summary of evaluations about an attitude object represented in memory. They can be retrieved or accessed diversely quick, dependent on the strength of the association. In contrast to this, advocates of the temporary conception argument that attitudes are exclusively guided by information present in the external context. (Albarracín et al., 2008). Figure 2 depicts different, time-related conceptual definitions of attitude.

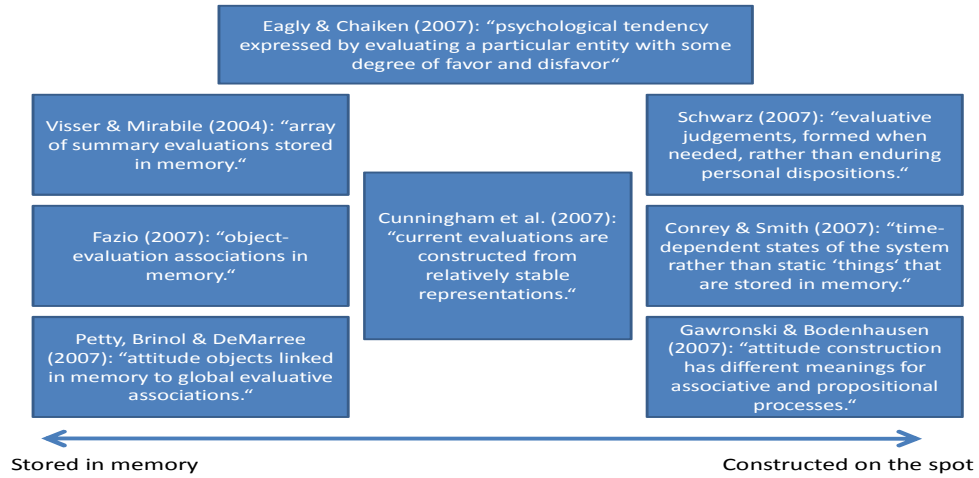


Figure 2: Attitude definitions ordered according to their stable vs. temporary constructions (Bohner and Dickel, 2011)

IT users that face pre-adoption situations are very likely to construct their attitudes on the spot, based on present information while in post-adoption situation settings users are able to retrieve their attitudes from memory and their experience. Figure 3 illustrates user's attitudes depicted as judgments influenced by external information, memory of past attitudes and prior knowledge. The figure makes obvious, that the impact of external information in pre-adoption situations is essential to the initial attitude, whereas in post-adoption settings prior knowledge and stored initial attitudes determine the new state of attitude as well.

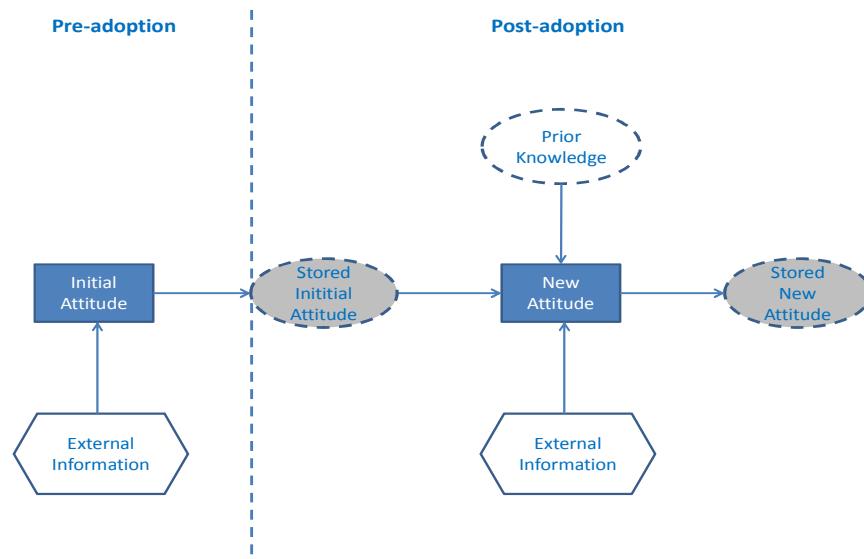


Figure 3: User's attitudes in pre- and post-adoption situations subject to external information, prior knowledge and stored initial attitude (Albarracín et al., 2005, p. 6)

For IS researchers this knowledge is important for the following reasons. In pre-adoption situations, users form judgments on the basis of temporarily available information (Albarracín et al., 2005). Thus the content of that information and its presentation can be critical to user's attitudes. In post-adoption settings external information is likely to have a different impact depending on whether or not users possess a prior accessible attitude. The accessibility is determined by the strength of the association between an attitude object and its evaluation. If the link between the two is strong, the attitude is highly accessible and exposure to the attitude object will activate prior evaluation (Albarracín et al., 2008). Taking this into account, it is advisable to either measure attitudes at different spots in time or incorporate attitude accessibility measures in order to obtain a holistic picture of user's attitudes.

Heterogeneous and homogeneous information in voluntary and mandatory usage scenarios

The influential power of external information in both scenarios raises another issue, namely if the information sources are of homogeneous or heterogeneous nature. In mandatory usage situations all the information users have about an object (the IT) is tendentially one-sided or homogeneous which, in pre-adoption scenarios, is likely to result in stable user attitudes (Glasman and Albarracín, 2006). Is the usage of a system voluntary by contrast, users tend to acquire information from various heterogeneous sources. Besides, regarding the impact of user's attitude on behavioral intention, it seems natural that in voluntary usage settings the influence of user's attitude is stronger than in mandatory settings where usage is effectively imposed by a third party.

In the following part, the presented characteristics of adoption characteristics and the relevant attitude concepts are merged within a conceptual framework in order to outline combinations where the impact of user's attitude on behavioral intention is likely to be low or high. Subsequently scientometric data of MIS Quarterly and ISR since 1989 is used to see what was done within the different framework categories in IT adoption research.

Classification framework

The present section outlined, that human attitudes are multi-layered concepts, based on dynamic forces that form and transform existing attitudes. Those forces or influencing factors that are particularly relevant in IT adoption scenarios were presented as well as their mode of impact. In combination with this background, the precedent section indicated, that the construct's psychological background demands an integration of the specificities of IT adoption scenarios, which are likely to influence the attitude behavior relation, into the item creation and operationalisation of the construct. The following Figure 4 depicts a framework that illustrates the relevant adoption characteristics and their corresponding attitudinal concept.

The figure consists of eight 3-dimensional cubes, each reflecting a combination of IT adoption characteristics. The arrows at the outside symbolize the psychological perspective equivalent to the adoption characteristics on the axes. Thus, choosing a hedonic/utilitarian information system as research subject affects the weighting of attitudinal responses to primarily affect/cognition. Moreover, in pre-adoption/post-adoption situations, where users are unfamiliar/familiar with an information system they will construct their attitudes temporarily/retrieve them from memory. In order to construct this attitude towards the information system, users rely on information present at the moment of construction. In mandatory/voluntary usage scenarios, this information is likely to come from homogenous sources (e.g. the third party that imposes the usage)/heterogeneous sources (e.g. internet platforms, newspapers etc.).

These remarks outline that the impact of user's attitude depends on the external circumstances (i.e. adoption characteristics). Thus, if a system is utilitarian, usage is mandatory and users are confronted with a pre-adoption scenario, attitude towards the system seems relatively unimportant to their usage decision. If by contrast usage is voluntary and the system hedonic in a post-adoption scenario, user's attitude is likely to be a main driver of behavior. Hence, with reference to figure 4, the following two propositions can be derived:

1. The impact of attitude on behavior is relatively strong in voluntary usage situations with hedonic systems and post-adoption scenarios.
2. The impact of attitude on behavior is relatively weak in mandatory usage situations with utilitarian systems and pre-adoption scenarios.

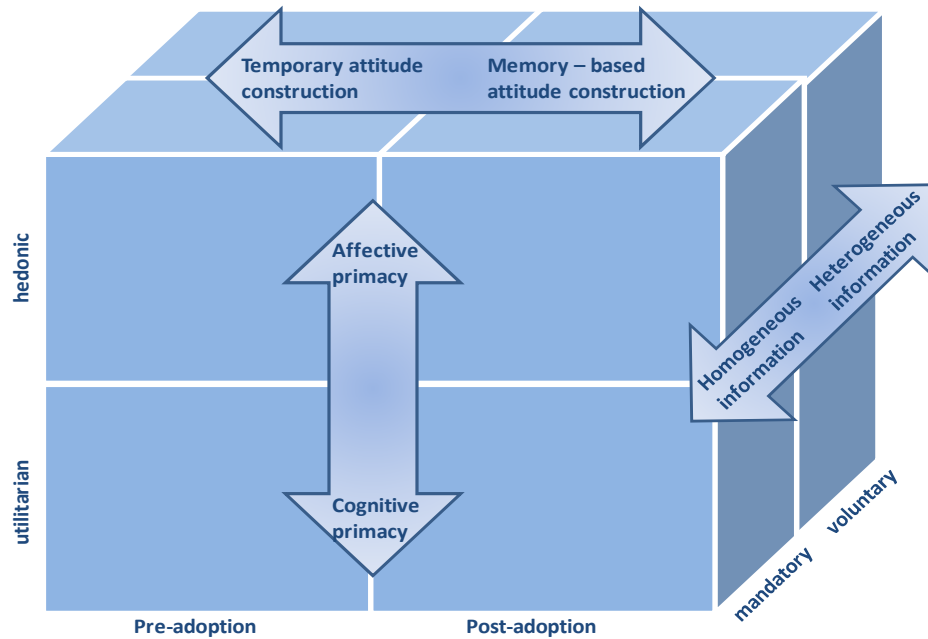


Figure 4: IT adoption characteristics and corresponding attitude concepts.

Based on this conceptual perspective, the combinations of Figure 4 are combined with scientometric data from MISQ and ISR from 1989-2010, in order to outline how often the single combinations occurred and how often the attitude turned out to be significant. The purpose is to find evidence that support the formulated proposition.

RESULTS

A scientometric approach was chosen for a literature review on attitude as it points out interesting insights on the manner IT adoption researchers publish their content. Leyesdorff defines scientometrics as “*the quantitative study of scientific communication*” (Leyesdorff, 2001, p.1). As to the IS domain, Straub (2006) stressed the importance of these self-studies to the progress and development of the IS field. To ensure the meaningfulness of the results, the top two peer-reviewed journals of the IS field, namely MIS Quarterly and Information Systems Research, were chosen because the identity of the IS discipline is largely established by top journals that publish in the field (Lowry et al., 2004). MIS Quarterly and Information Systems Research are known as the two top journals with the highest visibility and prestige within the IS discipline (Katerattanakul et al., 2003; Lowry et al., 2004).

A timeframe of 20 years was determined, starting with the early beginnings of IT adoption research and the introduction of TAM in 1989 and searched through every single issue of the journals selected between 1989 and winter 2010. In total, more than 1050 articles were accessed via Business Source® Complete by EBSCOhost. Only articles were extracted where attitude was hypothesized and/or measured on an empirical bases. As a result 37 relevant articles were extracted among which 28 were published in MISQ and 9 in ISR. The sample contained 58 authors in MISQ and 23 in ISR (Viswanath Venkatesh, Henri Barki and Izak Benbasat each contributed 3 articles).

Regarding the classification of hedonic and utilitarian systems (van der Heijden, 2004), utilitarian systems are clearly dominant (70.4% of articles in MISQ and 62.5% in ISR). As to the degree of voluntariness, voluntary settings build the majority (67% of articles in MISQ and 100% in ISR) just as post-adoption situations (56% in MISQ and 75% in ISR).

The implication of this data with reference to Figure 4 is that the majority of articles are located in the right lower posterior. Figure 5 illustrates the occurrence of the different combination by quantity. Note that the figure depicts an article-based view, meaning that if attitude was measured twice in one article, once under mandatory once under voluntary conditions, the article is classified to the category *voluntary and mandatory*. For the purposes of forthcoming analyses a single-measurement-based-

view is presented. The total count of articles relevant for Figure 5 had to be reduced from 37 to 34, eliminating articles where information about one of the categories was not applicable.

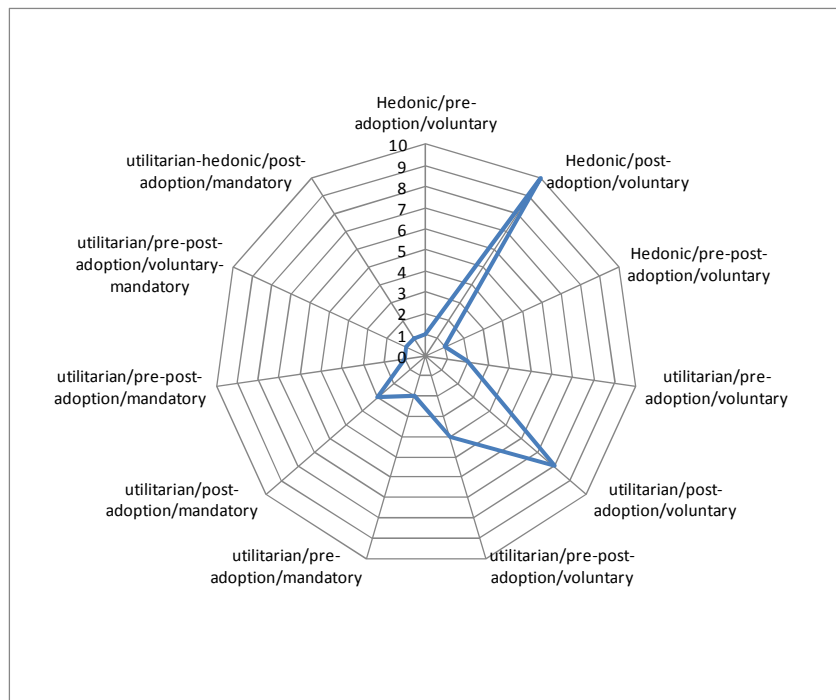


Figure 5: Occurrence of different adoption characteristics in MISQ and ISR.

In Figure 6 the distribution of significance levels of the attitude-behavior-relation within the different combinations are illustrated. Note that the figure is based on 135 single measurements of attitude. For reasons of simplicity and content only two classes are distinguished, *significant* and *not significant*. As to the significant measurements, the level of significance was not numerically determined but adopted from the authors of the according paper. The results revealed 74.1% significant attitude-behavior-relations and 25.9% insignificant.

With reference to the propositions derived in chapter 3, Figure 6 shows that there is evidence that supports proposition 1: Compared to utilitarian systems, in cases of hedonic systems insignificance occurs in 16% of the cases (27% insignificance with utilitarian systems), and the combination hedonic/post-adoption/voluntary shows the smallest percentage of insignificance of all combinations (9%). Nonetheless an enlargement of sample size is needed for confirmation. As to utilitarian systems and proposition 2 the results of Figure 6 are not meaningful. Voluntary and mandatory settings don't seem to make any difference within this figure. However, that does not prove that proposition 2 is basically false. As Venkatesh et al. 2003 stated, the influence of other constructs (especially cognitively driven ones) in the measurement model seems to have an impact on the significance-level of attitude. Thus, regarding proposition 2, a more detailed examination will be necessary.

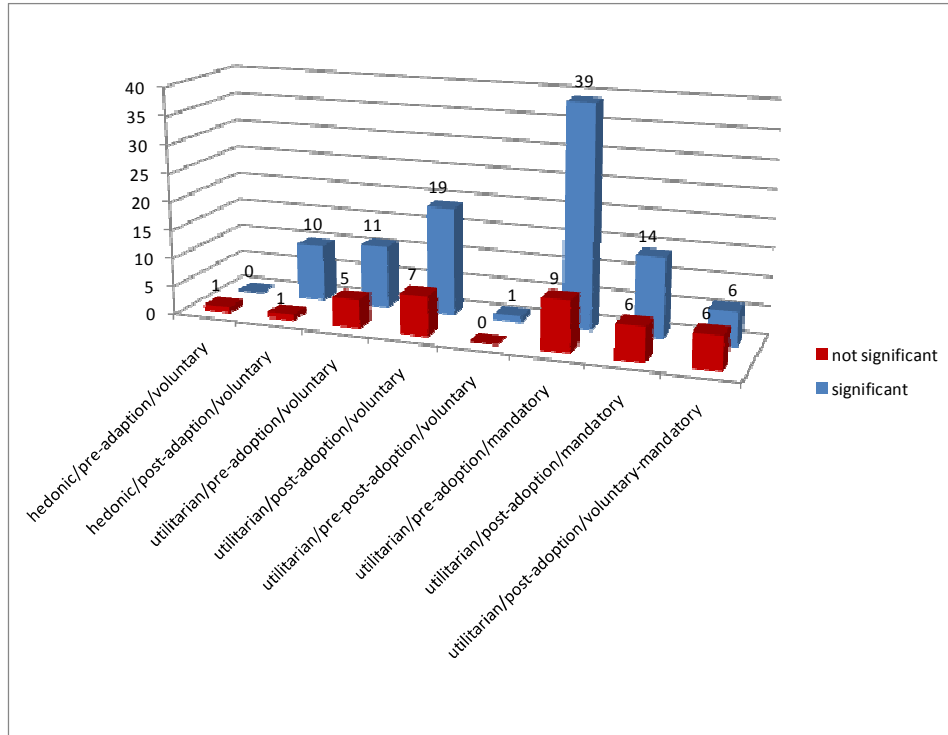


Figure 6: Distribution of significance levels across adoption characteristics.

Another aspect that is assumed to be influential in this respect is presented in Figure 7 by the division into different sectors. This classification is interesting in the context of user attitudes because in a business environment individual behavior underlies other influences than in a private environment. The figure shows that 16 articles can be classified to the household sector, 13 to business sector and 5 to the institutional sector (e.g. adoption in institutions subject to public law, the health care system or public administration agencies). Consistent with Figure 4, 73.3% of studies conducted in the household sector had hedonic research subjects and in 93.3% usage behavior was voluntary, while in the business sector only utilitarian research subjects were investigated.

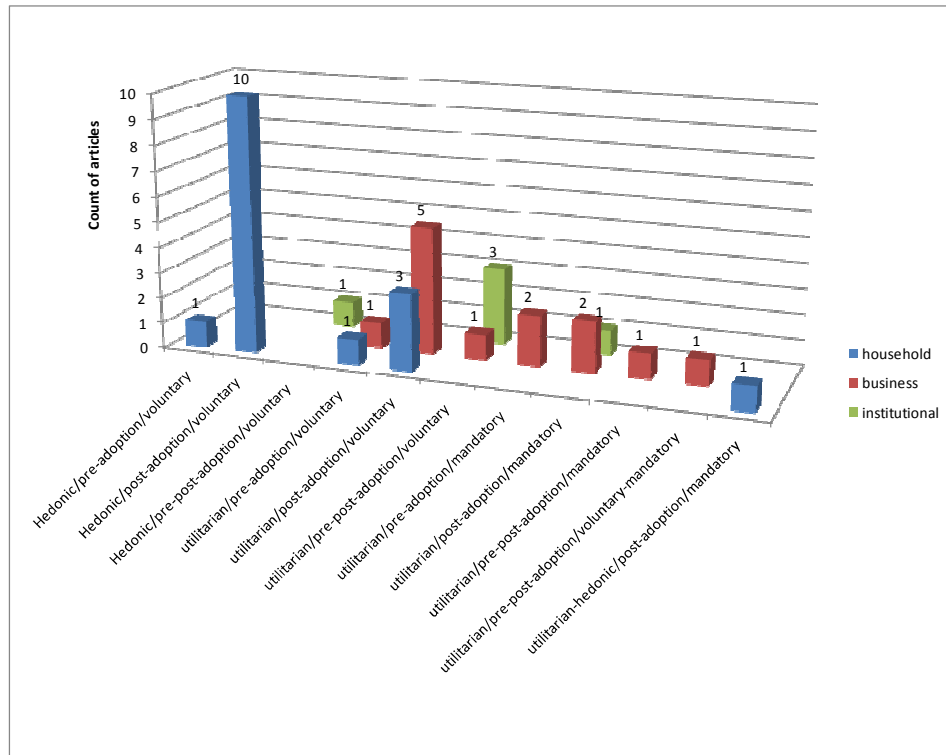


Figure 7: Occurrence of different adoption characteristics divided in sectors.

In general, the results lead to the conclusion that adoption characteristics seem to have an influence on the significance level of the attitude-behavior-relation in IS adoption models but further examination and a larger sample is needed for verification. Moreover, more aspects should be considered influential and regarded with reference to attitude performance in adoption models. The next section summarizes and discusses the findings, outlines the research contribution and gives an outlook to further research.

DISCUSSION AND FURTHER RESEARCH

The results of the scientometric analysis indicate that there is evidence supporting the proposition that the circumstances under which an adoption process takes place influence the impact of user attitudes on behavior. This research advocates that attitude scales should be customized according to the specificities of IT adoption instead of applying scales from established adoption models to varying research conditions. According to this paper the incorporation of user attitudes as a construct in adoption models with respect to the individual conditions of every adoption situation is an attempt to reduce the level of insignificance between user attitudes and usage intention.

As the last chapter outlined, more detailed investigation and an enlargement of sample size is needed to confirm the formulated propositions. Moreover aspects as the interaction of attitude with other constructs like subjective norms (Titah and Barki, 2009) that have already come up in IS adoption literature should also be considered within the scope of further analysis.

Other interesting issues relevant to a revised conceptualization of attitudes in IS literature have been published in the last issue of MISQ, namely the classification and influence of emotions on technology acceptance (Beaudry and Pinsonneault, 2010) and the study of technology adoption by groups as an alternative of methodological individualism (Sarker and Valacich, 2010). The former questions the application of cognitively driven, belief-based models in IS literature and advocates the integration and classification of emotions in IT adoption model. With respect to the presented research on attitudes this is strongly supported, but under the premise that the characteristics of the research subject itself determine the focus on emotions or cognition. The latter article adds aspects like majority opinion or intra-group conflict with relevance to

attitude. Both articles are an example that IS literature obviously turn away from modifying old models toward developing new models and alternative views on IT adoption.

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