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Third Generation Knowledge Management Systems

Towards an Augmented Technology Acceptance Model

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Abstract

The paper examines the applicability and sufficiency of the Technology Acceptance Model (TAM) in the context of social software and newer generation knowledge management systems (KMS). A reinterpretation of the two TAM constructs "Perceived Usefulness" and "Perceived Ease of Use" in light of expectancy-valence theory reveals that the TAM predominantly focuses on performance expectations on different behavioral levels and, thus, fails to account for the entire range of drivers and barriers related to KMS usage.

1 Introduction

In recent years, the prevailing conception of knowledge management (KM) in the scientific literature and its practical applications has undergone major changes and paradigmatic shifts, which are often retrospectively referred to as the "three generations" of knowledge management [Snow02; Snow03; Schü03a; Schü03b]. Unlike its predecessors, the third generation of knowledge management thinking pursues a novel holistic perspective by taking into account the embedded and multifaceted nature of knowledge and by omitting the predominant focus on knowledge sharing. A further constituting aspect of the alternation of generations or "phase shift in thinking" [Snow03, 23] is the increasing attention to the factors that drive or impede knowledge workers' commitment to KM initiatives. Earlier generations of corporate KM activities typically overemphasized the coordinating role of IT as a key driver for the success of knowledge management programmes. In taking such a technology centric approach, they often

fell below expectations, failing to attain the necessary acceptance of the users. The shortcomings of these earlier generations convey that the participation and cooperation of knowledge workers should not be taken for granted. While IT is indeed a "hygiene factor" [Snow02], which can effectively enable and facilitate the creation and sharing of knowledge, equal weight has to be put on the motivation of knowledge workers and the mitigation of other, non-technological barriers to the participation in knowledge-related activities. In order to remedy acceptance problems, it is insufficient to merely link knowledge sharing "with bonus schemes, appraisals and targets" [Snow02]. The prevailing literature nowadays emphasizes that "sharing cannot be forced" [HuWi04, 90], or as stated by Snowden [Snow02, Snow03], "knowledge can only be volunteered, it cannot be conscripted". In this way, "commitment" substitutes "compliance" as a driver of knowledge workers' participation in newer generations of knowledge management thinking [Malh03].

Prominent examples like the online project Wikipedia, which is an instance of a knowledge repository, or social networking websites like LinkedIn or openBC, being representatives of the "personalization strategy" [cf. HaNT99], convey the dynamics and power of this new generation of systems. They successfully instigate intense system usage by tapping users' intrinsic or natural motives to participate and by mitigating usage barriers. In so doing, they belong to a socially enriched type of system, which is often labeled "social software", a term that is very much discussed in the scene of blogs and online forums while having yet only little impact in the scientific literature. Eagle [Eagl04] shortly defines "social software" as "programs that enable a group of people to accomplish common goals", i.e. software that encourages social interaction and collaboration. According to Avram [Avra06, 1], social software involves "the use of computing tools to support, extend, or derive added value from social activities". Quite similar, Thomas et al. [ThKE01, 872] use the term "social computing", which comprises "digital systems that draw upon social information and context to enhance the activity and performance of people, organizations, and systems".

One aspect of the "social" nature of social software is the way "it adapts to the user, instead of forcing the user to adapt to it; becomes part of the user's means of representation, and augments human interaction, instead of narrowing it down" [Avra06, 7]. With social software, sharing is not imposed. Instead, social software "leaves the control of knowledge with the individuals

owning it" [Avra06, 1]: They are able to self-assign to communities based on their personal preferences and maintain their own space over which they have personal control. Consistent with this notion of a socially enriched type of software, one assumption is inherent in many of the current publications on knowledge management: Acceptance is of pivotal importance for the success of KM initiatives in general and the success of knowledge management systems in particular. To successfully tap the desires and needs of knowledge workers, knowledge management has to meet the terms of a new principle of self-organizing [Schü03b], thereby partially breaking with the traditional top-down management imperative. Processes of knowledge creation and transfer rather require a supporting, cultivating, and nurturing responsibility of management, instead of being manageable in the usual sense.

Successful systems such as Wikipedia or LinkedIn are promising examples of the usefulness of newer generation knowledge management systems. They show that social software or third generation KMS have the potential to make invaluable contributions to organizational KM initiatives, leveraging the human and social capital of an organization. However, we can only learn from these examples if we understand the underlying drivers of system acceptance and how these drivers operate in shaping usage intentions. With the rising interest in the determinants of knowledge workers' motivation to KMS usage, an extensive body of research has compiled a long list of potentially important elements of the "knowledge management puzzle" [ThKE01, 872], i.e. factors that characterize a good KM strategy and supportive KMS. These factors, mostly gathered by means of theoretical analyses and qualitative case studies, range from concrete system characteristics to abstract phenomena such as "trust", "intrinsic motivation", "social obligation" or "reciprocity". However, research is scattered into divergent perspectives and lacks a common frame of reference. In addition, few publications have so far empirically investigated possible causal models of knowledge management system acceptance and usage, which succeed to integrate the large number of qualitative findings or examine their relative importance in explaining and predicting KMS usage.

A noteworthy exception is the IS Success Model by DeLone & McLean [DeMc92; DeMc03], which is often utilized as a framework to structure the variety of success factors [MaHä01; AlLe01, 130-131] or as a fundament of quantitative studies [QiBo05]. Although the goal of our article is likewise to develop an underlying framework of critical factors in knowledge

management, we intend to rely on a slightly different theoretical grounding: the Technology Acceptance Model (TAM), which is one of the most prominent models that *explicitly* investigate the causal antecedents of the intention to use. The Technology Acceptance Model [Davi89; DaBW89] hypothesizes that information system adoption and usage can be explained and predicted by considering two focal behavioral beliefs: "Perceived Usefulness" and "Perceived Ease of Use". It calls attention to the fact that a mere focus on the usability-oriented "Ease of Use" of a system is insufficient to explain system acceptance and should be complemented by the purpose-oriented system "Usefulness" [DaBW89, 1000]. The quantitative study by Money & Turner [MoTu04] is one of the first that empirically investigated the appropriateness of the TAM for the context of knowledge management. Even though their results should be confirmed by other studies with larger sample sizes and more advanced methodology, it seems that the original finding of the TAM, being able to predict about 40% to 50% of the variance in the behavioral intention, can be replicated in the field of knowledge management. Yet, despite these encouraging results, it is questionable whether the two constructs, "Ease of use" and "Usefulness" cover all major behavioral beliefs behind knowledge acquisition and sharing as well as behind KMS usage. In view of the large number of factors currently discussed in the knowledge management research, the two TAM constructs appear insufficient to account for the full richness of decisive motives and barriers in knowledge management. We therefore hypothesize in line with Money & Turner that "it may be necessary to add other theory-based individual beliefs to the current TAM belief constructs" to "increase the explanatory power" of the TAM [MoTu04, 8].

The first step in elaborating on this hypothesis has to be concerned with a better understanding of the content and origins of the TAM constructs and how they are embedded into the much larger landscape of motivation theory. Moreover, it may be interesting to identify other important salient behavioral beliefs that are presumably relevant to third generation KMS but yet not part of it. We approach this first step by arguing below that expectancy-valence theory – being a crucial fundament of TAM – can be used to reinterpret and extend the TAM in the face of third generation knowledge management. In essence, expectancy-valence theory argues that individuals invest and direct effort with a view to the expected outcomes of behavior [Vroo64; PoLa68]. Although most of the prominent models of system acceptance and usage rely on such "expectations-based frameworks" [cf. Sedd97, 247], they mostly just refer to expectancy-

valence theory in order to substantiate the assumed dependence of acceptance on anticipated behavioral consequences. In contrast to this rather superficial respect of expectancy-valence theory, we claim that expectancy concepts can as well be useful to systematically identify and delimit a fuller spectrum of concrete behavioral beliefs relevant for KMS usage.

In order to provide evidence to this argument, the rest of this paper is organized as follows: In the next chapter, we will give a short introduction into expectancy-valence theories of work motivation. The subsequent chapter 3 will proceed by formulating an integrated, two-tier expectancy framework that delimits two interdependent behavioral levels to which the expectancy-valence approach may apply. Based on these theoretical groundings, the two TAM belief constructs will be revisited in section 4.1 as well as extended in section 4.2. Even though not being able to provide a complete specification of possible enhancements, the paper will indicate several important behavioral beliefs still omitted in the TAM. Chapter 5 will conclude the paper by summarizing its core statements.

2 A Short Introduction into Expectancy-Valence Theories

Expectancy-valence theories hypothesize that individuals choose between different behavioral alternatives and between different levels of effort by anticipating the impact of their decisions on resultant outcomes (see Figure 1). Individuals thus determine a set of relevant, salient consequences that may arise from their actions. These consequences, however, are not of equal importance but are valued differently. The particular value or "valence" of an outcome [Vroo64, 15] can have two sources [cf. Vroo64, 16]: On the one hand, it may originate from the "instrumentality" (❶) of the outcome in allowing for further possible outcomes. An often-mentioned example of such an instrumental outcome is a monetary reward. On the other hand, valence may be due to some intrinsic value created to the individual (❷), like enjoyment or feelings of achievement.

Furthermore, individuals are theorized to form expectations in terms of anticipated, "subjective" probabilities that particular outcomes will actually be obtained [Vroo64]. The obtainment of an outcome may be impeded by a variety of internal or external factors. Most of these impediments originate from the fact that the attainment of consequences is bound to the *successful*

implementation of a behavior. Although outcomes may also be directly contingent on behavior and effort (❸), as is the case with the cost of exerted effort, outcomes are typically attained as a function of personal performance and success [PoLa68]. The expectancy component can hence be decomposed into two separate beliefs: First, expectations are formed on whether effort is likely to result in fulfillment of aspired success, which we call "performance expectations" (❹). Second, an expectation is formed on whether achieved performance is going to be followed by valued outcomes, which is called the "instrumentality" of performance (❺). Unlike performance expectations, perceived instrumentality can also be negative if actions are counterproductive in achieving certain goals and, thus, has a range from -1 to +1. According to Vroom [Vroo64], performance expectations, perceived instrumentality and outcome valence jointly shape the motivational "force" of a behavior, which in turn is the basis of a relative evaluation of different behavioral alternatives.

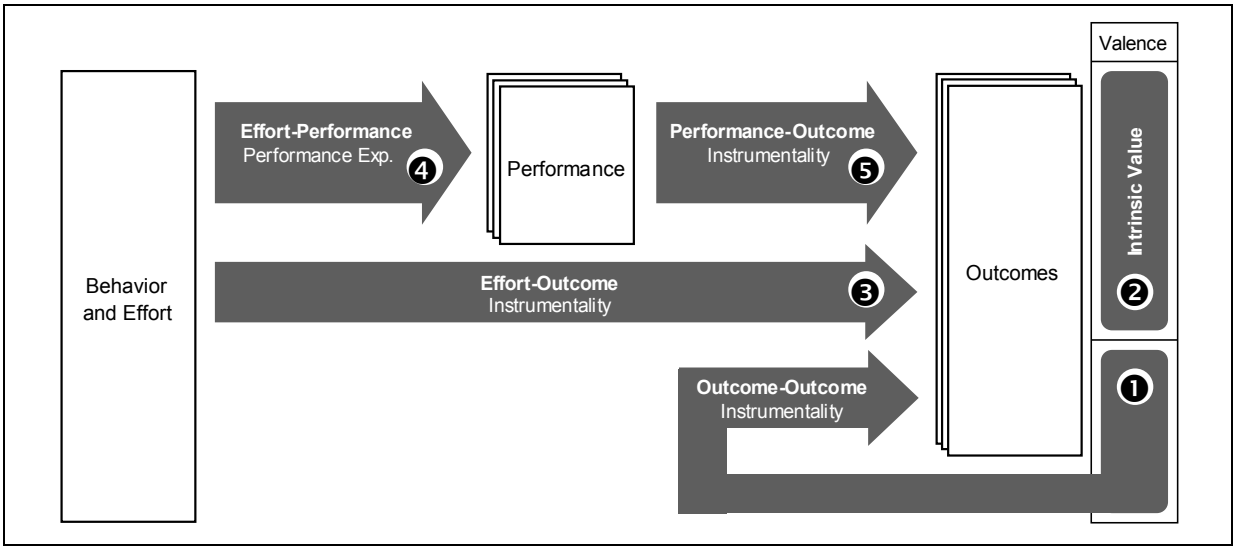

Figure 1: Core schema of expectancy-instrumentality-valence theories (own visualization)

3 Extending Expectancy-Valence Theory for Third Generation KM

3.1 Towards an Integrated Expectancy-Valence Model for Knowledge Management

In the knowledge management literature, the analysis of acceptance of *knowledge management systems* is typically intertwined with the more general investigation of *people's commitment* to knowledge-related activities. This mingling of two dimensions of acceptance may be due to the

fact that the identification of motives for system usage requires a holistic point of view, which takes the organizational environment and organizational culture into consideration. In this vein, we argue that in formulating a holistic KMS acceptance model, it is important to recognize these two distinct tiers. They can be referred to as organization-level and tool-level acceptance (for a distinction between tool-level and organizational-level tasks see e.g. [TeCZ06, 229-231]).

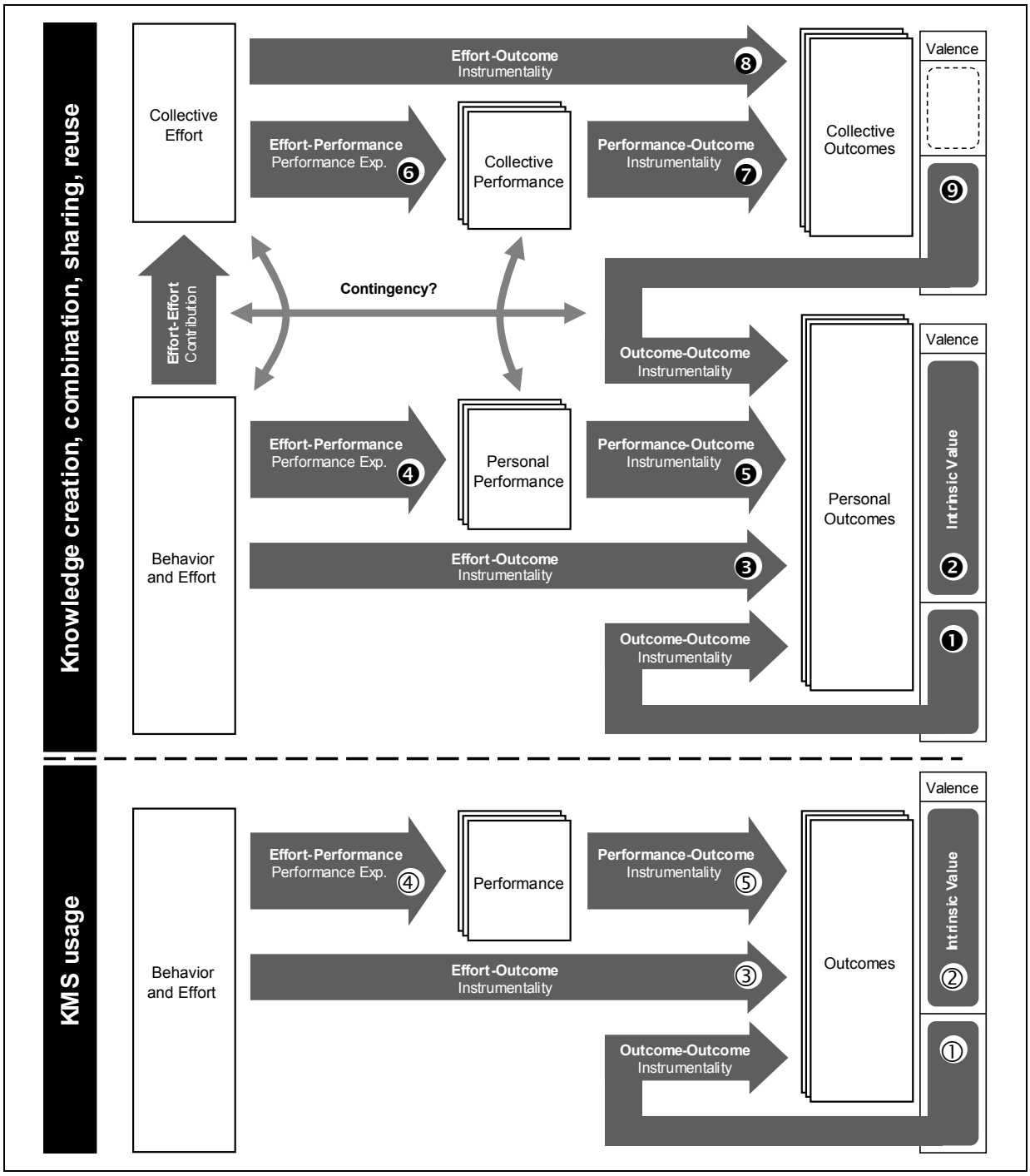

Figure 2: A two-tier expectancy model of behavioral beliefs in knowledge management

KMS usage has to be understood as being related to, but also separable from the more general organization-level tasks of the individual or collective to create, combine, share or reuse knowledge. Figure 2 gives an overview of an integrated expectancy-valence framework we propose to use for analyzing KMS usage. In particular, we claim that the expectancy-valence model introduced above can be applied to each of the two interdependent behavioral levels, because behavioral alternatives will exist on each of these tiers and will be evaluated based on idiosyncratic expectancies and anticipated outcomes.

A knowledge worker, who decides to enroll into knowledge-related activities and to KMS usage, may start out by evaluating his *expected personal performance* in sharing or reusing knowledge (❹). These expectations will not only reflect personal capabilities, but also external factors such as sufficient organizational support. Moreover, expected personal performance in KMS usage (④) will play an important role within this cognitive appraisal. For instance, a user of the Wikipedia website, who wants to contribute his personal knowledge to the project, will evaluate his general capabilities of putting his knowledge into words [cf. CaCa02, 700] and compiling useful new articles or article revisions. Herein, his expected performance will be partially determined by his skills in using the Internet or the Wikipedia website. Therefore, it seems reasonable to assume a bottom-up influence of lower-level performance expectations (④) on the attainable upper-tier performance (❹).

The second dimension of the decision to engage in knowledge-related activities is concerned with the *expected outcomes* of a participation. On the one hand, these outcomes directly follow from exerted effort (❸), exemplified by the time-related opportunity costs of a participation [CaCa02, 688; ArPW03, 70; Kall03, 119] or a risk of jeopardizing knowledge-based status in the organization [CaCa02, 697; ArPW03, 69]. On the other hand, they may be obtained as a function of accomplishable individual performance (❺). For instance, attaining approval by the Wikipedia community may necessitate that the contributed article meets relevant community standards to have a longer lasting impact.

The latter example also illustrates that personal outcomes, if contingent on personal success, normally necessitate that personal contributions are identifiable and separable as well as measurable through comparison with existing quality or performance standards [cf. Shep93;

KaWi01]. Consequently, the "visibility" of individual contributions may be a further aspect of the scope of behavioral beliefs that relate to the instrumental value of personal performance (❺/⑤).

One question remained unanswered so far: Why is the upper tier of the expectancy-framework relevant to the decision to use a concrete knowledge management system? This top-down influence can be explained by the fact that upper-level outcomes (❺) contribute to the expected outcomes of lower levels (⑤), though mediated by upper-level performance expectations (❹). Even if the usage of a KMS may also directly imply personal consequences like enjoyment or intrinsically valued feelings of competence, motives to the usage of a KMS will foremost stem from higher, purpose- or task-oriented levels. However, upper-level outcomes only act as motives to the lower level of KMS usage, if they are supported by sufficient expected performance on the upper level. Stated differently, expected rewards that are contingent on sharing knowledge are only motivating factors to the use of a KMS, if the individual is actually confident in his or her personal ability to share knowledge. The same applies of course to other knowledge-related activities.

3.2 KMS Usage as a Commitment to Collective KM Activities

Aside from the delimitation of the two behavioral levels discussed above, a further source of behavioral beliefs, germane to the upper tier, can be the collective or collaborative nature of knowledge-related activities that are often embedded into the formal or informal communities of the organization. A contemporary stream of research tries to apply the expectancy-valence approach to such settings of collective actions. Herein, one is faced with contradicting phenomena: On the one hand, it is argued that the sole presence of others often positively enhances exerted effort and subsequent performance, which is called "social facilitation" [see e.g. Vroo64, 230; Shep93, 67], whereas another stream of research examines a phenomenon that Latané, Williams & Harkins [LaWH79] labeled "social loafing" and that implies quite the opposite effect: People often reduce their productivity and effort in case of working collectively.

Among others, Shepperd [Shep93] as well as Karau & Williams [KaWi93; KaWi01] have conducted an extensive review on the topic of „social loafing", „social dilemmas" and „collective work motivation" and presented an integrated model, based on Vroom's expectancy-

valence theory, to analyze the interaction of various influential factors. Even if many of these group implications operate on a personal level by affecting individual motives or barriers (like enabling community support or reputation-based expert status), there are also implications related to a more general, collective level. Therefore, Karau & Williams state that individuals not only care for personal level outcomes, but also for the impact of their behavior on the collective, they identify with. This latter collective level is concerned with the success of the whole group and the attainment of collective outcomes as a function of collective effort and performance. In line with this reasoning, we argue that the original expectancy-valence model as shown in Figure 1 should be extended to a version as shown in the upper tier of Figure 2. This extended model would account for the additional motives and barriers, which are important in such settings of collective activities, and would integrate elements of the „Collective Effort Model" by Karau & Williams [KaWi93; KaWi01] that for example has already been applied to the contexts of online communities [LBLW05] or open source communities [HeNH03].

In analyzing the elements of the collective level, single individuals will firstly assess the collective performance, which the group is likely to accomplish (❻). As Bandura [Band01] underlines by distinguishing between "self-efficacy" and "collective-efficacy", collective performance is more than the sum of members' individual contributions but also involves "transactional dynamics" such as coordination and concerted interaction. Moreover, collective performance expectations not only result from a mere evaluation of other group members' capabilities, but also comprise an expectation on whether these members will actually contribute. In addition, individuals will also evaluate the collective outcomes that are obtainable in view of the likely collective performance (❼) as well as the costs (and other outcomes), which are directly contingent on collective effort (❽).

Mutual participation and valuable contribution by peers are vital for two reasons: On the one hand, individuals may identify with the outcomes of collective effort and these are likely to be of higher value the more effort is denoted to the common pool. For example, the contributors of the online project Wikipedia may be motivated by the projects' intention to establish an open, freely available encyclopedia. In this case, they may value the sheer number of articles, although not being interested in each of these topics. On the other hand, participation of peers

also increases the likelihood that contributors can *personally* benefit from others' contributions, only being interested in specific subparts of the collective good.

In any case, it is crucial that collective performance and collective outcomes are perceived to be instrumental in attaining personally valued outcomes in order to act as a motivating factor for the commitment of knowledge workers (❾). For example, individuals may personally value the collective achievements of the group. However, even if the collective level is linked to the personal level, own contributions of effort and performance have to be deemed crucial for the sufficiency of collective effort and performance in turn. Otherwise, individuals would lack an incentive to *personally* contribute effort to the collective pool [KaWi01]. Even if this latter appraisal, which is visualized by the smaller arrows in Figure 2, may also be a subject of strategic considerations, knowledge workers are often simply just not able to recognize the relevance of their knowledge to the group [AlLe01, 126; ArPW03, 70; CaCa02, 700]. Researchers therefore discuss means to increase the perceived dependency of group success on the participation of all its members or to emphasize the indispensability and non-redundancy of single contributions.

4 Towards an Augmented Technology Acceptance Model

4.1 A Reconsideration of the TAM in Light of Expectancy-Valence Theory

What can be learned about the Technology Acceptance Model (TAM), if reinterpreted in light of this two-tier expectancy-valence approach? Which expectancies of the framework are already covered by TAM's two belief constructs "Perceived Ease of Use" and "Perceived Usefulness"?

4.1.1 Perceived Ease of Use

Davis [Davi89, 320] defines the construct "Perceived Ease of Use" as "the degree to which a person believes that using a particular system would be free of effort". Interestingly, the underlying items of this TAM construct all have a rather similar, narrow focus on two particular behavioral beliefs: On the one hand, nearly all items express individual expectancies concerning the likely personal performance results of system usage. This is for example evident in items

such as “I would find it easy to get THE SYSTEM to do what I want it to do.” [Davi89]. As these items refer to personal performance in the interaction with the particular system, “Perceived Ease of Use” can be regarded as relating to effort-performance-associations on the lower level of KMS usage (④).

In addition, items like “Learning to operate THE SYSTEM would be easy for me.” [Davi89] also refer to the monetary or non-monetary costs that directly result from effort spent on KMS usage. As these expenses are interpretable as a negative instrumentality of effort for obtaining positively valued outcomes, these items additionally correspond to effort-outcome-association on the level of KMS usage (③).

4.1.2 Perceived Usefulness

According to Davis et al. [DaBW89, 985], “Perceived Usefulness” can be defined as the “prospective user’s subjective probability that using a specific application system will increase his or her job performance within an organizational context”. Although “Usefulness” is often interpreted to cover the expected outcomes or consequences of system usage [CoHi95, 197], the focus is actually on a “use-performance relationship” [Davi89, 320]. In line with this understanding of the construct, “Perceived Usefulness” seems to be a type of performance expectation as well, similar to “Perceived Ease of Use”, though on a higher level (❹). A reconsideration of its underlying items in light of expectancy-valence theory confirms this proposition. For example, the focus on performance increases is obvious in items such as “Using THE SYSTEM in my job would increase my productivity.” or “Using THE SYSTEM would improve my job performance.” [Davi89]. In addition, some of the items again tap the cost dimension and therefore correspond to direct effort-outcome associations (❸).

4.2 Extending TAM’s Behavioral Beliefs on the Background of Expectancy-Valence Theory

As the discussion in the preceding section has conveyed, both TAM belief constructs each cover specific aspects of the two-tier expectancy framework, as they both relate to expected personal performance on the two different behavioral levels (❹/④). Due to systems’ ability to alter expected personal performance on both behavioral levels, it seems reasonable to include

constructs such as “Perceived Ease of Use” or “Perceived Usefulness” in a model of KMS acceptance and usage. However, TAM’s *predominant* focus on these dimensions inherently implies that personal performance is assumed to be followed by some kind of positively valued outcome or avoidance of negative ones. While this latter assumption may be justified in traditional applications of the TAM, the literature on knowledge management emphasizes that the instrumental value of individual performance cannot be taken for granted.

In fact, the participation in knowledge-related activities can involve significant disincentives in terms of costs and risks, which are often not offset by associated positive outcomes. Although most studies herein refer to opportunity costs that originate from time-related constraints [see e.g. AlLe01, 127; ArPW03, 70; CaCa02, 694], there is actually a wide variety of motivational barriers to the participation of knowledge workers. For example, sharing one’s ideas may imply disclosing personal secrets, loosing position-based status or expert status or personal competitiveness [AlLe01, 69; CaCa02, 694; AlLe01, 126]. In addition, individuals may fear criticism [ArPW03, 70] through revealing personal weaknesses or a personal lack of knowledge, or may hesitate to reveal the superiority of others. Likewise, contributors may have a “fear of abuse” [cf. Snow02] or misuse [ArPW03, 72] or may decide on a private usage of knowledge because of confidentiality considerations [ArPW03, 70].

Given these costs, it is decisive whether knowledge sharing or reuse is actually perceived to be important for one’s own personal aims (❺). A general unawareness of potential benefits is a frequently mentioned barrier to the participation of employees in knowledge-related activities [e.g. Kall03, 121; CaCa02, 688]. Even if the rationales behind engaging in knowledge management may originate from job- or task-related motives and rewards (especially in *harvesting* or *reusing* knowledge), research has by now delimited many other potential objectives. For example, knowledge workers may strive for gaining expert status [ArPW03, 69; CaCa02, 694], reputation [CaCa02, 695], or formal or informal social recognition [ArPW03, 69; CaCa02, 696]. Here, they may perform what is called “impression management”, i.e. they may desire to deliberately shape their image as perceived by their environment, such as conveying their uniqueness, their indispensability, or their social embeddedness. Furthermore, contributing to knowledge management initiatives can encompass personal feelings of competence, proficiency, creativity, or achievement, feelings of relatedness and belonging, affiliation, or

group cohesiveness. For instance, people may enjoy working in a team as well as helping others [CaCa02, 692] and doing a kind of mentoring. Moreover, personal contributions may be elicited by desires for competition, for contesting one's ideas as well as out-performing others; or they may be the result of "moral obligations" [ArPW03, 69] or social norms of "reciprocity" [CaCa02, 692].

Neither of the above-mentioned motives and barriers is addressed explicitly by the core TAM constructs. The same is true for motives that are related to the collective level. The collective level may for example be a source of further motives, if individuals identify with collective actions, value collective outcomes or intrinsically enjoy collective activities (❾). It raises question like whether knowledge management is seen as important for the collective or the organization as a whole (❼/❽) and whether the organization is supposed to be able to accomplish sufficient collective performance and the "critical mass" herein [CaCa02, 699] (❻).

However, besides its tendency to omit the instrumentality of individual effort and performance, it is likewise also questionable whether the two TAM constructs actually cover all relevant aspects of performance expectations. For example, the construct "Perceived Usefulness", unlike "Ease of Use", does not focus on expected *absolute* personal performance, but on systems' ability in bringing about performance *increases,* compared to a not explicitly defined base case. Although this is consistent with the relative evaluation of behavioral alternatives in expectancy-valence theories, it would nevertheless be interesting to ask respondents whether they believe to generally have the necessary capabilities and resources to accomplish sufficient personal performance (❹). Even if a KMS is able to assist the user in his knowledge-related activities, other factors like a lack of other resources or organizational support can severely undermine knowledge workers' motivation.

5 Summary and Outlook

In the introduction of this paper, we claimed that earlier generations of corporate knowledge management initiatives typically overemphasized the coordinating and facilitating role of IT. A similar point of view seems to be inherent in the Technology Acceptance Model with its predominant focus on performance expectations or increases on different behavioral levels.

However, the preceding chapters have indicated that this perspective fails to account for the entire set of behavioral beliefs pertinent to the field of knowledge management. The decision to use a KMS is subject to a much wider variety of behavioral beliefs. Taking a too narrow focus not only reduces the predictive validity of the acceptance model, but also underestimates the power of this new, socially enriched generation of KMS to successfully shape the motives and mitigate the barriers of potential users.

Further research should try to empirically test this conjecture by complementing the performance-oriented TAM with additional, outcome-oriented constructs. Presumably, some of these model extensions can directly be taken from the large number of re-specifications and enhancements to the Technology Acceptance Model, which researchers have already proposed and empirically validated since its initial publication. Here, the two-tier expectancy framework may serve as a unifying framework for integrating the various TAM extensions with the broad literature on barriers and motives in knowledge management. Such a stream of research would invaluably contribute to a deeper understanding of the success factors of newer generation KMS and facilitate the transfer of their characteristics to a wider range of organizational applications.

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