User Acceptance Affecting the Adoption of Enterprise Portals

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INTRODUCTION

The implementation of enterprise portals has been cited as the most important business information project of the next decade (Collins, 1999; Daniel & Ward, 2005). However, introducing enterprise portals can cause resistance and confusion among users. Often, portals provide a completely new work environment based on new user interfaces structuring content, services, and applications in a very different manner (Kakamanu & Mezzacca, 2005; Shilakes & Tylman, 1998). In addition, enterprise portals often provide new functions and features that, at first, can overload the user.

Although the development and introduction of enterprise portals is already considered as a complex and challenging task (De Carvalho, Ferreira, & Choo, 2005), the subsequent process of getting end-users to accept and adopt the portal in their daily work processes is even more challenging. Often, this is seen as the most crucial factor to making the portal solution a success (Aiken & Sullivan, 2002; Kakamanu & Mezzacca, 2005).

Models and methods for measuring and increasing the acceptance of enterprise portals are expected to contribute significantly to a successful, efficient, and economic portal implementation. In the past, this led to a number of different portal acceptance models, each with certain advantages and weaknesses. Usually, the models focus on one or a few particular portal implementation projects, for example, a human-resource portal or a consumer portal.

The broad range of different enterprise portal implementations, starting with extranet portals providing in-depth content and offering special advantages for business-to-business or e-commerce activities, up to intranet portals supporting internal communication and knowledge management, demands a highly flexible and adaptable framework supporting the systematic identification of individually important, measurable, and independent acceptance criteria. In this article, such a general purpose model, called the dynamic acceptance model for the reevaluation of technologies (DART), is presented.

We start by reviewing existing portal acceptance models. Subsequently, we present the DART model and its application in one exemplary enterprise portal implementation. Finally, we summarize our key findings and outline further trends in portal acceptance research.

BACKGROUND

The usage of innovations and innovative technologies is a wide-spread research area. Within this area, two different views concerning the user adoption can be tracked: research on the diffusion of innovations within and among organizations (adoption and diffusion of innovation theory), and research considering the individual user acceptance of an innovation (acceptance research). Supported by other literature emphasizing the perspective of individuals and groups (Daniel & Ward, 2005), we concentrate our further considerations on user acceptance research often cited as the primary indicator for system usage (Ruta, 2005).

In general, (user) acceptance is defined as an antagonism to the term refusal, and specifies the positive decision to use an innovation (Amberg, Bock, Möller, & Wehrmann, 2003). Acceptance research has its origins in both industrial and business science. While industrial science focuses on the conditions of user friendly technologies and techniques, the business science discipline discusses user acceptance in various disciplines, for example, marketing, organization, production theory, and information systems research.

Acceptance of technology is considered as a mature research topic, leading to a variety of competing theoretical models, each providing different sets of acceptance determinants (Venkatesh, Morris, Davis, & Davis, 2003). As a discussion of all of these models is beyond the scope of this article, we focus our analysis on models specific to the characteristics of enterprise portals, calling them portal acceptance models.

In compliance with Daniel and Ward (2005), enterprise portals are defined as "secure Web locations, that can be customized or personalized, that allow staff and business partners access to and interaction with a range of internal and external applications and information sources" (Daniel & Ward, 2005, p. 3). The primary function of enterprise portals

is, according to Detlor (2000, p. 92), "to provide a transparent directory to information already available elsewhere, not [to] act as a separate source of information itself."

From this definition, a broad variety of different purposes of enterprise portals can be distinguished, ranging from extranet portals providing in-depth content and offering special advantages for business-to-business or e-commerce activities, up to intranet portals supporting internal communication and knowledge management. According to other portal definitions (Benbya, Passiante, & Belbaly, 2004), the following terms are usually being used interchangeably to refer to enterprise portals: corporate portals, enterprise information portals, employee's portals, human resources portals, industry portals, intranet portals, extranet portals, business-to-employee portals, business-to-business portals.

Reviewing the state of the art of portal acceptance models, three different classes of approaches can be identified. The first class denotes the adaptation and application of existing universal technology acceptance models, mostly the technology acceptance model (TAM). The second class of approaches uses more than one (typically two or three) existing approaches and combines the advantages of each model. And finally, the third class denotes newly designed, explorative approaches. Table 1 gives an overview over selected approaches (ordered by class and by author's name).

Examining the first class of acceptance models, it becomes evident that the majority of the approaches rely on portal-specific interpretations and extensions of existing technology acceptance models. For instance, Van de Heijden (2003) draws upon an adapted version of the TAM and its acceptance determinants, perceived usefulness and perceived ease of use, by enhancing it with two additional determinants, perceived attractiveness and perceived enjoyment.

The second class of approaches is combining more than one model. These approaches take into account the results of Daniel and Ward (2003), recognizing that portal adoption is a project of both technology implementation and organizational change. Consequently, existing technology acceptance models are combined with models emphasizing selected organizational and social aspects. De Carvalho et al. (2005), for example, claim "a combination of TTF and TAM has proven to be a superior model to either the TAM or the TTF model alone" (De Carvalho et al., 2005, p. 5).

The last class is more or less reflecting the findings of explorative analyses of portal implementation projects. Chidley (2004), for example, identifies two key constructs, user interest and, as a moderating factor, perceived risk. Kakumanu and Mezzacca (2005) propose five factors that are introduced independently of the established acceptance models.

Consequently, a general portal acceptance model should be applicable within different portal implementation projects, even being applicable across the different stages of the portal life cycle (enabling the reapplication of the model). This, in turn, demands a highly flexible and adaptable model, supporting the systematic identification of individually important, measurable, and independent acceptance criteria. Key to the model is the balancing between organizational and technological aspects, as demanded Daniel and Ward (2003) and De Carvalho et al. (2005). Such a model is presented in the following section.

DYNAMIC ACCEPTANCE MODEL FOR THE REEVALUATION OF INNOVATIVE TECHNOLOGIES

DART is a highly flexible acceptance model, designed for the analysis and evaluation of user acceptance in a variety of different application areas, for example, Web-based aptitude tests (Amberg, Fischer, & Schröder, 2005), change management (Amberg, Möller, & Remus 2005), and situation-dependent mobile services (Amberg et al., 2005).

Design Criteria

The fundamental design criteria of DART are:

- the adaptability to individual requirements of the research item;
- a balanced consideration of relevant influencing factors;
- the use as a permanent controlling instrument; and
- the applicability during the whole development and implementation process.

In the following, we describe the architecture of DART with respect to enterprise portals.

Architecture of DART

DART is based on the fundamental idea of the balanced scorecard (cf. Kaplan & Norton, 1992) using a metastructure in order to identify a balanced set of individually measurable acceptance criteria. As a key characteristic, DART's metastructure emphasizes the user's individual point of view by an explicit consideration of the user's perception (Davis, 1989).

DART uses the following complementary and orthogonal categories: *benefits* and *efforts* comprise all positive and negative facets of enterprise portals (Davis, 1989; Ruta, 2005). Furthermore, *enterprise portals* and *contextual conditions* include all basic sociocultural and economic conditions that also have an important impact on user's acceptance (Chou et al., 2005; De Carvalho et al., 2005; Ruta, 2005).

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