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Evaluating IT Fashion Investments regarding Risk and Return

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ABSTRACT

IT fashions are IT innovations within a hyped phase. They are on the rise and claimed to be “the next big thing”. Investing in IT fashions bears potential for high returns in case the technology becomes institutionalized and first mover advantages can be realized. Contrary, it bears the risk of investing in a losing technology. By waiting for others to make the first move organizations bypass this risk but accept the chance of being out-innovated. Depending on an emerging technology’s evolution and its characteristics, the extent of risk and return differ for each strategy. Literature regarding risk and return of IT investments does not address these idiosyncrasies adequately. Our aim is to outline risk/return for each strategy and characteristics of emerging technologies that determine its extent. Hence, this conceptual paper brings together IT fashion and IT investment literature to provide a basis for further research on the evaluation of fashionable IT innovations.

Keywords

IT innovation, IT fashion, Investment evaluation, Risk/Return

INTRODUCTION

Due to the continuous and dynamic development of IT, increasing competition and expectations from customers, organizations regularly face the challenge to decide *whether*, *when* and in *which* new emerging IT innovation to invest. A central question thereby is whether an emerging IT innovation will become the “next big thing” with sustainable dominance or whether it is only a short-term hype that sooner or later fades away. To name a few examples buzzwords like Cloud Computing, Social Software Suites or (3D) Media Tablets are some topics that for now are extensively hyped both within research and practice (Gartner, 2010). Cloud Computing applications for example are predicted to grow by about 25% annually and will reach a volume of over 150 billion dollar in 2013 even though this concept neither is institutionalized nor seems to be within the next years (Pring et al., 2009). Nonetheless, Fujitsu, one of world’s largest IT service providers will invest over one billion dollar, a quarter of Fujitus’s annual capital spending, in Cloud Computing (DataCenter, 2010). Even though the list of new technologies not fulfilling its high expectations, the high failure rate of application service providers or the .com crisis should be enough warning, organizations still heavily invest in IT innovations within a fashionable phase (Fenn and Linden, 2005; Fenn and Raskino, 2008).

To emphasize the peculiarities of IT innovations within a fashionable phase literature agreed on a certain term for this type of IT innovation. In line with Wang (2010), Baskerville and Myers (2009), as well as Fichman (2004b), we define an *IT fashion* as an IT innovation that is going through a hyped phase, consequently is on the rise and by its proponents claimed to be a fundamental improvement. Hence, IT fashions are IT innovations during a fashionable phase (see also Wang (2010) for a methodological distinction between IT fashion and IT innovation).

Questions like how to evaluate or when and in which extent to invest in IT fashions are major challenges for organizations (Wang, 2010; Dos Santos and Peffer, 1995). Investing too early within a fashionable phase bears the risk of investing in immature technology leading to higher learning costs or even bankruptcy in the case the technology never becomes institutionalized. By investing (too) late organizations run the risk of being out-innovated by competitors and thus losing customers due to out-dated technology and services, resulting in lower market share and returns (Stratopoulos and Jee-Hae, 2010). Nonetheless, organizations neglect a balanced view on risks and returns within the evaluation of fashionable IT innovations (Wang, 2010; Swanson and Ramiller, 2004; Fiol and O’Connor, 2003). As both strategies, investing rather early within a fashionable phase as well as investing rather late, have to be considered risky, existing literature dealing with

the fashion phenomenon and the adoption of IT innovation emphasizes the importance of an integrated risk/return analysis of IT fashion investments (Wang, 2010; Baskerville and Myers, 2009; Swanson and Ramiller, 2004; Wells et al., 2010).

The objective of this paper is to address and emphasize the extent of risk and return within the evaluation of IT fashion investments for both, an early investment as well as a late investment strategy. Drawing from related literature we furthermore identify seven characteristics of emerging technologies that determine the extent of risk and return for both strategies. Our aim is to bring together existing methodologies from IT investment literature with the idiosyncrasies of IT fashions and set the basis for further analytical research within this field to contribute to a central research question within IT innovation theory: *Whether, when and in which* new emerging IT innovation to invest.

RELATED WORK

IT innovation research

The majority of IT innovation literature extensively examined the question which prerequisites organizations have to fulfill to adopt IT innovations early, with a certain frequency and a certain extent of implementation (Fichman, 2004b; Iacovou et al., 1995). It is widely accepted that a set of variables like size, structure, knowledge, or compatibility affects the quantity of IT innovation adoption within organizations and therefore can be described as an innovator profile. Organizations fitting this profile are expected to have higher expected returns by IT innovations as they can innovate easier and more effective. Next to these variables concerning the organization itself, other authors emphasize the probability of adoption and diffusion of a particular class of IT innovations according to their characteristics (Premkumar et al., 1994; Rai et al., 2009). Swanson and Ramiller (2004) as well as Fiol and O'Connor (2003) argue that organizations should regard the peculiarities of different types of IT innovations and stress the importance of a well-founded ex-ante evaluation. In addition, Haner (2002) claims quality and a thorough selection of suitable types of (IT) innovations as an important determinant for positive returns through IT innovation investments. Fichman (2003) argues that an IT innovation's long-term destiny should be an important factor to incorporate within the evaluation of an IT innovation. By destiny he means that some IT innovations reach institutionalization whereas some are completely abandoned by organizations.

IT fashion research

While traditional IT innovation research is mainly focused on a phase in which an IT innovation already has been institutionalized, IT fashion research concentrates on the early hype and the middle phase of diffusion in which "[...] legitimacy stems from fashion, regardless of what the destiny of the innovation eventually turns out to be." (Wang, 2010). IT innovation literature hitherto stated that within the innovation lifecycle, early adoption of IT innovations is mainly driven by the need of performance improvements while the late adoption of IT innovations often is due to pursue legitimacy (Tolbert and Zucker, 1983). Though, IT fashion literature states that this theory is ambiguous to what happens in the very early and middle phase of diffusion and emphasizes the importance of this phase in which a technology has to cross the chasm from being a fashionable IT innovation into an institutionalized IT innovation and in which organizations and its stakeholders have to implement a relevant infrastructure (Moore, 2002). One might propose that in this setting usually the most efficient innovations that bring the most performance enhancement are going to become institutionalized. However, this proposition does not always hold true. First, each organization is unique and thereby realizes different performance enhancement from new emerging innovations. Second, innovations within the early and middle phase usually are object of fashion waves that vastly influence its popularity and therefore its broad acceptance and probability of becoming institutionalized (Wang, 2010). Hence, IT fashion research is derived from both, IT innovation and management fashion research (Baskerville and Myers, 2009; Abrahamson, 1991). Although both, management or administrative practices and IT practices follow fashion waves and have similar aspects, simply transferring the findings of management fashion theory on the IT field does not address the problem setting adequately (Wang, 2010). Certainly, some IT fashions may overlap with management fashions as well as IT fashions often enough show administrative aspects and vice versa, especially with the increasing role of IT within administrative techniques (Wang, 2010; Lee and Collar, 2003). Though, IT innovations in general and certainly IT fashions usually are characterized by software and/or hardware artifacts which are often tailored by a vendor for the organization which is engaged in the IT fashion. Consequently, investments in IT fashions often enough require high switching and investment costs that make a decision about an IT fashion different from a decision about a management fashion (Wang, 2010; Fichman, 2004b; Rogers, 2003). Hence, IT fashions have to be treated differently as management fashions and require different methods for evaluation and decision making. For the justification of a distinct IT fashion research, also Fichman (2003) and Wang (2010) distinguish management fashions from IT fashions. The uniqueness of certain IT innovations therefore requires separate IT fashion research to apply and extend management fashion theory as well as to develop a fashion theory specific for IT innovations (Wang, 2010). Walden and Browne (2009) focus on emerging technologies with high uncertainty that are adopted by a small group of technophile early adopters and find that following the behavior of similarly-situated organizations can be a useful strategy. This focus illustrates the decision making

situation on IT fashion investments quite properly and the proposed strategy seems to be promising. Nevertheless, it still assumes the existence of first movers which – following the definition of IT fashions – often enough do not exist yet. Following other organizations in a community also assumes a constructive community learning process concerning innovations. Wang and Ramiller (2009) outline that IT fashions challenge this learning process as the discourse about a new emerging technology usually contains much more superstition and uncertainty about its future usefulness within its fashionable phase. Newell et al. (1998) as well as Westrup (2003) in this context examine the role of a “fashion setting network” of knowledge and idea entrepreneurs (academics, vendors, consultants, gurus etc.) that propagates an IT fashion as the basis of dramatic improvements. According to Swanson and Ramiller (2004) the justification of IT fashion investments thereby often is affected by a mindset of “[...] everyone is doing it [...]” or “[...] it’s time to catch up.”

Little research has focused on the extent of risk and return concerning IT fashion investments. Wang (2010) examined that those organizations that invest in fashionable IT tend to have lower returns in the short-run but outperform their competitors in the long-run and thereby realize higher returns. However, focusing on returns neglects the fact that IT fashion investments can “[...] fail to produce the expected benefits or indeed, any benefits at all.” (Fichman, 2004b). Hence, IT fashion investments have to be considered as very risky (Fenn and Raskino, 2008; Fichman, 2004b; Dos Santos and Peffers, 1995).

Further literature contributed concepts that exploit the similarities between IT fashion investments and investments in R&D (Schwartz and Zozaya-Gorostiza, 2003b; McGrath, 1997; Fichman, 2004a). Regarding investments in technological R&D, Cha et al. (2009) observed that service-oriented organizations are more likely to prioritize investments in R&D higher than non-service-oriented organizations. By exploiting the similarities from investments in technological R&D and new, immature and innovative technology, this investment type can be seen as platform for follow-up projects that builds upon the original investment. Hence, this approach supports the decision making process as a company can “[...] retain full exposure to the upside potential of the technology [...] but can limit losses to just the positioning investment if future events prove unfavorable.” (Fichman, 2004a). Even though this seems promising for the evaluation of IT fashion investments regarding both, risk and return, investments in R&D are not entirely comparable to investments in IT fashions regarding two major aspects. First is that investments in R&D activities usually aim on fundamental research and therefore precede the very early phase of diffusion of an IT innovation meaning that the occurrence of an IT fashion usually follows R&D activities. Second is the fact that R&D activities usually are conducted by single organizations without integrating a network of stakeholders. Hence, a key characteristic regarding the evolution of IT fashions, the fashion-setting-network, is not applicable for investments in R&D. Investments in R&D activities therefore are different from investments in IT fashions where the focus is the engagement in an already existent technology or paradigm that is already developed but still lacks wide adoption and acceptance. Even though investments in IT fashions need to be treated differently, the methodologies are quite similar and therefore R&D evaluation methodologies are a promising direction for future research in the IT fashion area.

In what follows we go more into detail regarding this idiosyncrasy of IT fashion investments, analyze the role of risk return within the evaluation and emphasize the limits of existing IT investment evaluation approaches when applied to IT fashion investments.

IT FASHION INVESTMENT EVALUATION

From fashion to institutionalization

As IT fashion theory examines IT innovations within their fashionable phase, incorporating the fact that some technologies never become institutionalized and just remain a passing fad (=downside potential) should be a central and an important subject within the evaluation of IT fashion investments. The transition from IT fashion into an institutionalized technology is closely linked to the concept of “hype cycles”, regularly published by Gartner (2010). This concept helps to illustrate the path of an IT fashion starting in a phase in which a *technology trigger* by a fashion setting network promotes it to be a technology that is “[...] new, efficient, and at the forefront of practice.” (Wang, 2010). This hype usually ends up in a *peak of inflated expectations*. Sooner or later the hype fades away as the expectations of the benefits fall short of expectations, resulting in a *trough of disillusionment*. These three milestones mark the phase in which an IT innovation has fashionable aspects and in which a technology’s destiny is unclear. Following this phase opportunistic adopters often enough abandon ship, rivaling and more mature technologies come up, shrinking IT budgets scale back IT projects and the IT innovation, former in fashion, now is out of fashion and gets stranded (Case I) (Wang, 2010; Stratopoulos and Jee-Hae, 2010). Only few technologies are worth to continue experimenting with and put solid hard work in to understand the technology’s applicability, its risks and its benefits. In this case, this leads to a *slope of enlightenment* for the technology that is usually followed by a *plateau of productivity* in which the real-world benefits are realized and the IT innovation has evolved from an IT fashion into an institutionalized technology (Case II) (Fenn and Raskino, 2008; Stratopoulos and Jee-Hae, 2010). Figure 1 illustrates the benefits/losses, organizations anticipate with a new emerging technology both within the hyped phase as well as for the scenarios of institutionalization and the possibility of investing in a technology that gets stranded.

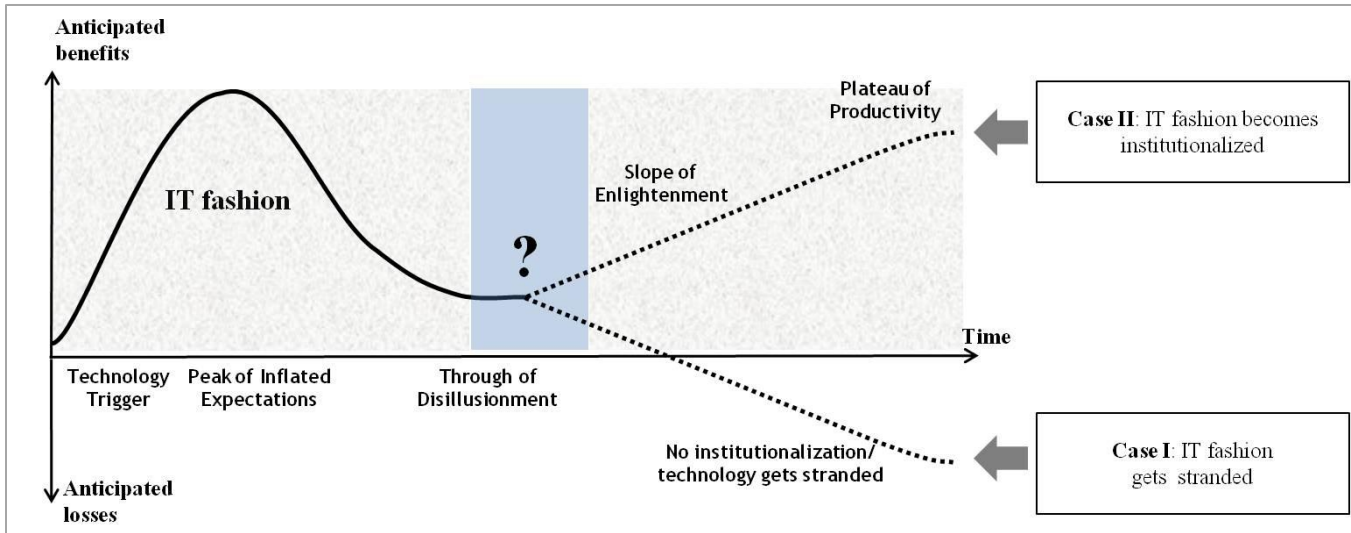


Figure 1: An emerging technology's potential evolution

Risk and Return of early vs. late investments in IT fashions

In case the technology becomes institutionalized early adopters that invested within the fashionable phase can realize over-proportional higher returns in comparison to late investors due to first mover advantages (Wang, 2010; Kessler and Chakrabarti, 1996). On the other side, a late investment strategy saves costs and expenses in case the technology never becomes institutionalized as companies then can draw back on alternatives that have prevailed (Dos Santos and Peffer, 1995). Next to the returns, risk has to be considered: The investment in an IT fashion that never transforms into an institutionalized IT innovation bears the risk of losses or even bankruptcy (due to high development costs, useless and odd technology etc.) as investments in IT innovations often enough come along with “[...] broad process an strategy changes and large system developments that may take years to implement.” (Fenn and Raskino, 2008). Hence, IT fashion investments are associated with high expected returns that come along with a high volatility and therefore are very risky. On the other side, a late adoption strategy that bypasses the risk of being stuck with a stranded technology by awaiting experiences of competitors has beneficial aspects (lower implementation costs due to existing routines, best practices, learning effects etc.). However, waiting for others to make the first move bears the risk of being out-innovated by early investors. In case the former fashionable technology will prevail, the risk of being out-innovated and thereby losing customers has to be considered. Consequently, expected returns of this strategy a) probably will not reach the level a first mover can realize and b) can heavily deviate downwards (=late mover disadvantage). Thus, a late investment strategy can hedge the over proportional high risk of investing in a stranded technology but simultaneously has to accept the possibility of losing a leadership position or even the threat of risking the organization's long-term competitiveness and survival. Figure 2 illustrates possible scenarios for benefits/losses, organizations should anticipate for an early as well as for a late investment strategy and thereby shows the extent of risk which is illustrated by the high volatility, the return for each strategy and both cases (institutionalization vs. stranding of new emerging technology) shows. One could argue that measuring the upside potential as a risk is not intuitive. Measuring risk as volatility indeed is a concept that has its origins in financial and decision theory where the risk of a decision alternative is measured in terms of the variance, the possible outcome is associated with. Managerial theory and some IT investment research contrary often states that decision makers have a different conceptualization of risk as they usually judge losses more as a risk than potential gains (March and Shapira, 1987; Tanriverdi and Ruefli, 2004). Regarding the idiosyncrasies of evaluations of IT fashions, applying two sided risk measures in fact is useful as we regard an ex ante investment evaluation situation in which financial theory assumes a positive relationship between risk and return. Thus, the IT fashion at the time of investment bears both the chance of becoming institutionalized (upside “risk”) and the possibility of ending as a losing technology (downside risk). An ex ante decision support model thereby aims on both, sanctioning the underestimation of investing in a losing technology as well as sanctioning the underestimation of the upside potential which can result in not being prepared adequately for the success (lack of capacity, service level agreements, client counselors etc.). Other literature that focuses on the risk/return relationship of IT investments (Dewan et al., 2007; Fogelstrom et al., 2010; Schwartz and Zozaya-Gorostiza, 2003a) supports the use of two-sided risk measures and states that “[...] IT investments can result in a range of positive or negative incremental cash flows [...]” and thereby IT risk should be defined as “[...] the variability of returns [...]” (Dewan et al., 2007).

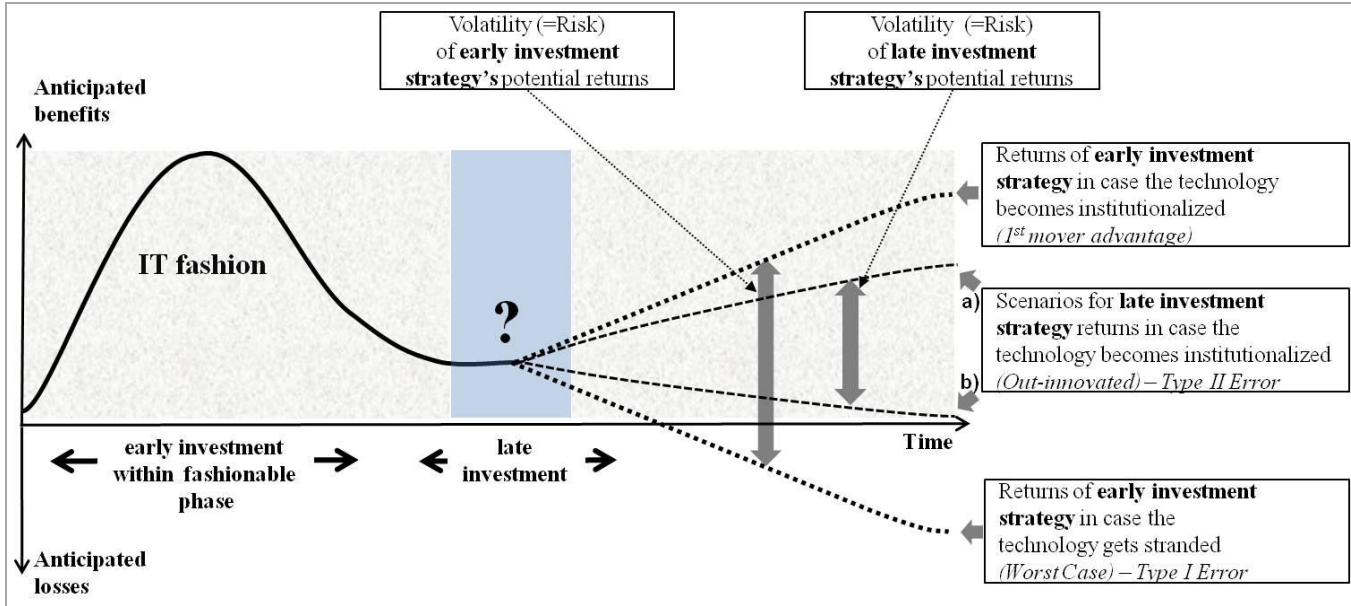


Figure 2: Associated risk/return of late vs. early investment strategy

Challenges for evaluation

The illustrated idiosyncrasies challenge most established qualitative and quantitative IT investment evaluation methods. The application of traditional financial or qualitative methods seems insufficient and misleads organizations within their decision making process on investments in emerging technologies. Traditional financial appraisal methods like Cost-Benefit-Ratio (CBR), Internal Rate of Return (IRR), Net Present Value (NPV) or advancements of these methods do not adequately consider the downside risk of investing in a technology that gets stranded. Applying real option approaches allows for uncertainty of future returns and flexibility to suspend or abandon an investment in a fashionable IT innovation in case it seems to remain just a transient fad. Still, they do not provide a decision on whether an early investment or a late investment strategy seems more promising as its application on IT fashions at first assumes the investment in an IT fashion and then enables a decision on whether to stick on the technology or not. Decision trees seem to be worthwhile but require solid estimations on the probability that an IT fashion becomes the next big thing. Portfolio approaches that aim on investing in several technologies simultaneously face a similar problem. In addition, their application is difficult as companies often cannot apply several emerging technologies simultaneously that require similar infrastructure. Additionally, investing too little in too many IT fashions still can be risky: An organization could end up in a situation in which it indeed is not out-innovated by competitors or is committed to a technology that gets stranded. Still it cannot fully realize competitive advantage as it is not committed enough to one technology and thereby forfeits reliability. Reliable estimations constitute an exception and managers that foresee what the next big thing is usually “[...] become rich and may end up on the cover of business magazines.” (Denrell and Fang, 2010). The application of more strategic approaches like Critical Success Factors (CSF) or Multi-Objective/Multi-Criteria (MOMC) enables the definition of qualitative factors that are regarded as important by an organization. Still, this evaluation methodology suffers from the threat of biased decision makers that are misguided by a fashion setting network that enforces the fashionable status of an emerging technology. In addition, a quantitative evaluation that allows for an integrated risk/return evaluation to compare different alternatives is not provided by these strategic oriented methodologies. Hence, a poor application of existing methodologies misleads decision makers and therefore misguides organizations within their decision on whether and when to invest in fashionable IT.

Consequently, decision makers have to consider the extent of risk and return for an early as well as for a late investment strategy adequately. In addition to the uncertainty of a technology's evolution, both strategies' risk/return also depends on a technology's characteristics that determine the extent of risk and return for each strategy. By focusing on the impact on risk and return of the relevant characteristics, we set the basis for future empirical research as well as for analytical research that approaches investments in IT fashions with methods from financial or decision theory. Contrary to financial theory, IT investment literature assumes an ex ante non-linear relationship between risk and return of IT investments (Tanriverdi and Ruefli, 2004). Hence, we hereby provide the basis for future research that deals with the risk/return relationship by analyzing whether an IT fashion investment might contribute over- or under proportional risk for its return or whether the risk and

return contribution might be balanced. Incorporating the risk/return contribution of IT fashion investments will be a crucial task for future decision models within this area. Decomposing the overall risk/return contribution of an IT fashion investment into its characteristics thereby is one key contribution of this paper. The seven characteristics that are analyzed in the following are derived from i) the discussion about the idiosyncrasies of IT fashions within this paper and ii) a thorough analysis of previous literature in IT fashion and IT innovation theory (Wang, 2010; Fichman, 2004b; Swanson and Ramiller, 2004; Rogers, 2003; Fichman, 2004a). We thereby analyzed the relevant literature, applied a similar approach as Fichman (2004a) and for this research concentrated on three complementary perspectives of IT innovation theory namely i) technology strategy, ii) innovative bandwagons and iii) technology adaptation. We consider the identified characteristics to be the most relevant for an integrated risk/return evaluation of fashionable technologies and the question of whether to invest within a fashionable phase or wait for institutionalization. As this paper aims on the technological dimension of fashionable IT innovations, we do not consider characteristics of organizations yet. Analyzing organizational aspects similar to an innovators profile will be focus of future research within the field of IT fashions. Our proposal of characteristics does not claim for completeness. Interdependencies in between the characteristics also could enhance, relax or supersede one or more characteristics. In what follows, we present those characteristics and analyze their implication on the extent of risk and return for both investment strategies given the uncertainty of the technology's evolution. Hence, this conceptual paper serves as a basis to extend existing evaluation methods or develop new methods that incorporate these characteristics that determine risk and return within the evaluation of fashionable IT investments as it seems "[...] important to consider what characteristics potential adopters evaluate in a technology." (Walden and Browne, 2009). Some characteristics thereby might illustrate the idiosyncrasies of IT fashion investments more adequate than others or are more exclusive relevant for IT fashion investments in opposite to other, non-fashionable IT innovations. To give a first idea of which characteristics (in our view) might be more or less appropriate, we ordered the characteristics according their ability to illustrate the peculiarities of IT fashion investments by starting with the most relevant and most appropriate.

Characteristics of emerging technologies that determine the extent of risk and return

Susceptibility to promotion by fashion setting network

Emerging technologies do not come into fashion accidentally. According to management and IT fashion theory fashion setting networks usually boost the hype that comes along with an emerging technology by producing discourse on the technology within books, articles, workshops or conferences (Wang, 2010; Abrahamson, 1991). On the one hand, the more an emerging technology is part of a fashion setting movement, the more likely it is that the fashion setting network drives it to institutionalization as parts of the network usually benefit from an institutionalization. On the other hand, the more an emerging technology is susceptible to activities and discourse within the fashion setting network, the more probable it is that opportunistic adopters jump on it but abandon ship later on, resulting in a higher risk concerning its destiny (Fichman, 2004a). Hence, a technology's susceptibility to a promotion by a fashion setting network has to be taken into consideration as a deterrent of risk and return within the evaluation to determine its scope of risk and return adequately. To incorporate this characteristic into an evaluation methodology, a measure for susceptibility has to be defined. This does not seem trivial but using the extent to which an IT fashion is promoted via different channels (online, conferences, white papers, workshops, academic research etc.) might serve as first step.

Prospective sustainability of competitive advantage

The competitive advantage resulting from an investment in an IT fashion that later on evolves to an institutionalized IT innovation (e.g. vendor lock-in effects) also depends on the easiness for competitors to copy and paste this success by investing later (Mata et al., 1995). The more difficult it is to copy the success when the technology is institutionalized, the higher the expected return for an early investor in case the IT fashion becomes institutionalized. Though this chance of higher expected returns in certain situations could easier justify the risk of an early investment there remains the risk that competitors can copy the technology faster than expected – leading to a higher volatility (=risk) of the higher expected returns. When evaluating IT fashion investments, the prospective sustainability of competitive advantage and its impact on the risk and return structure therefore has to be considered. As measuring the prospective sustainability of competitive advantage seems to be a challenging task, identifying measures for this characteristic still is subject to future research. In a first step, simulating possible scenarios might serve as a first step.

Prospective dominance

The higher the probability of investing in a technology that, once successfully institutionalized, will dominate the market (resulting in higher expected returns), the more worth it seems to run the risk that the technology gets stranded and the company backs on a losing technology (Fichman, 2004a). The extent to which an emerging technology will reach a dominant position once it has become institutionalized therefore is an important determinant of risk and return that is to consider within the evaluation of an IT fashion. Similar to the before mentioned characteristic, estimating the prospective dominance seems to be challenging, requires further research and in the meanwhile needs simulating different scenarios to overcome the lack of adequate data for.

Radicalness

Radicalness of an emerging technology can be defined as its potential to reduce costs of production or to realize new business cases, resulting in higher returns. Radicalness thereby usually is connected with the extent the emerging technology changes existing processes, routines and infrastructure technology. Consequently, investing in a radical changing technology can lead to higher returns in case it becomes institutionalized as it is more difficult and takes longer for competitors to copy the technology etc. In case the technology gets stranded, radicalness increases the risk of bankruptcy etc. as the related changes within the organization cannot easily be changed back (Henderson and Clark, 1990). When evaluating IT fashion investments, the scope of radicalness of the emerging technology to evaluate should be considered adequately. As organizations have to analyze thoroughly possible changes regarding existing processes, routines and infrastructure technology when it aims on investing in IT fashions, the ex ante estimate of the IT fashion's radicalness should not be too difficult to implement.

Importance for business model

Whereas some emerging technologies are more critical for the business model of an organization and thereby contribute more to its value creation, some only have a supportive character (Porter, 2001). In case the technology evolves from an IT fashion into an institutionalized IT innovation, the investment in a hyped technology with high importance for the business model bears the potential for high returns. This is due to the fact that the first mover advantage is combined with the relevance of the technology for the business model. As a result, this significantly leads to a higher market share, more profits etc. (Kessler and Chakrabarti, 1996). In contrast, the investment in an IT fashion that has a high relevance for the business model bears the even higher risk of bankruptcy due to inappropriate technology and services in case the technology gets stranded. As the importance of an emerging technology for the business model influences both, risk and return, an evaluation method has to consider this characteristic adequately. Determining the importance of a fashionable technology for an organization's business model is rather a simple task and therefore might be easy to measure and quantify.

Flexibility

Flexibility, meaning the range of possibilities of configurations, interactions with existing technologies or the possibility to adopt or abandon it sooner or later increases the possibility to use a fashionable technology in a different manner in case it does not become institutionalized. Therefore, the less flexible a technology is, the more risky the investment within its fashionable status has to be considered. Contrary, low flexibility makes it more difficult for competitors to copy and paste the technology or use it differently – making higher expected returns possible (Fichman, 2004a). In case an organization invests in a technology that does not become institutionalized, learning effects can ease the switch to related technologies that became accepted instead if the technology is flexible enough. As both, risk and return are determined by flexibility it should be considered adequately within the evaluation of IT fashion investments. Due to the fact that organizations carefully analyze new technology and the fit with their existing IT infrastructure, measuring flexibility of an IT fashion and incorporate it into an evaluation method seems rather easy to implement.

Divisibility

High divisibility, i.e. the option to divide the implementation of an emerging technology in several sequential stages whereas each already generates a positive payoff (Leonard-Barton, 1988) provides the opportunity to realize returns from an investment in an IT fashion even if it does not become institutionalized. This is an important issue to consider within the decision making process and evaluation of an IT fashion investment as it reduces the risk of being stuck with odd-technology without any possibility for value creation in case the technology does not become institutionalized. An IT fashion evaluation method therefore should consider divisibility as a determinant of risk and return separately to enable an adequate evaluation. Similar to the before mentioned characteristic, determining and measuring the grade of divisibility and possible financial outcome of every sequential stage seems to be possible and therefore easy to implement within an evaluation method.

Figure 3 summarizes the characteristics that determine the extent of risk and return, an IT fashion investment evaluation method should consider adequately. Next to the consideration of whether the emerging technology becomes institutionalized at all, these are determinants of both strategies' (early vs. late investment) and both cases' (institutionalization vs. getting stranded) extent of risk and return. Hence, we propose to consider these determinants within an adequate ex-ante evaluation of IT fashion investments.

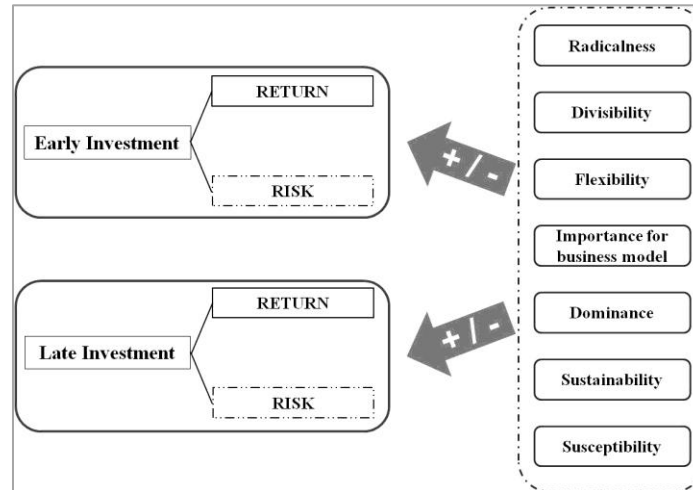


Figure 3: Characteristics of emerging technologies that determine risk and return

CONCLUSION AND IMPLICATIONS FOR FUTURE RESEARCH

Organizations face the challenge on whether to invest in IT innovations within a fashionable status (=IT fashion) and thereby follow an early bird strategy or whether to wait until the technology has become institutionalized. To provide a theoretical concept for further analytical ex-ante and integrated risk/return evaluation models we examine the extent of risk/return within IT fashion investments for both strategies. Further, we identify and analyze relevant determinants of risk and return that are to consider within an adequate evaluation of fashionable IT innovations. Analytical decision models that consider the presented and discussed determinants within an integrated risk/return evaluation of IT fashion investments can provide valuable tools for the decision making process on the optimal point of time concerning the adoption of emerging technologies. By extending existing IT investment evaluation methods these models have to incorporate the idiosyncrasies of IT fashions adequately.

Certainly, evaluation methods that build upon our results will not be able to predict the next big thing for sure. Also the list of characteristics we identified is derived argumentatively, may not be complete or needs empirical evidence. The derived and presented characteristic also cannot model all challenges of an early/late investment decision but provide a first basis. Further research herein needs to test these characteristics and their practical relevance. Equally there seem to be interdependencies in between the determinants that are to consider within a decision model to consider the effects adequately. Also considering all determinants simultaneously seems to be a challenging task. Incorporating all determinants presented in this paper within one valuation approach seems very challenging, too. We therefore suggest incorporating those characteristics that seem to be the most important for a certain technology and/or organization.

The utilization of the basic findings presented within this paper and the application in an analytical ex-ante decision model indeed seems to be a promising approach to support the questions of a) whether to invest in fashionable IT innovations, and b) which emerging IT innovation is more likely to become institutionalized, what the related risks are and whether it is worth to take these risks. The concept illustrated within this paper has two central implications for research and practice. Regarding the domain of IT fashion and IT innovation literature, the paper could guide future empirical and analytical research investigating the described characteristics and their impact on risk and return for an early as well as for a late investment strategy. For practitioners, the paper provides an overview of i) the risk/return structure regarding early and late investment strategies concerning IT fashion investments and ii) characteristics of IT fashions whose peculiarities might deserve to be considered within the valuation process.

An integrated view on both, risks and returns of IT fashions thereby can contribute to a central research question in IT innovation theory: *When to adopt an emerging IT innovation*. To answer these and further research questions on the engagement with IT fashion, the presented paper serves as a basis within IT fashion and IT innovation research and therefore

contributes to the understanding and improvement of this research stream as “[...] IS researchers should be among the leaders, and not the followers, of fashion.” (Baskerville and Myers, 2009).

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