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Customer oriented management practices leading to BIS embeddedness

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Abstract

Business intelligence systems (BIS) are able to provide relevant and innovative information thus can present a competitive edge for many organizations in order to compete in the marketplace and provide value for their customers, but in order to leverage their potential they need to be effectively used and become an integral part of organizational activity. Our study aimed to provide evidence, that organizations that focus on customers will have higher embeddedness of BIS into the organizations work system, and that customer oriented management practices lead to more differentiated and effective BIS utilization. The conceptual model was tested and analyzed by structural equation modeling based on survey data. The results show that focus on customers importantly impacts on management support of BIS use, which in turn as direct or indirect support leads to more intensive, extended and embedded use of BIS. Organizational customer orientation also directly impacts on embedding BIS into the routines of workers, suggesting that these organizations will have higher return on investments in BIS and ultimately better organizational performance.

Keywords: Business intelligence systems, BIS embeddedness, Focus on customer, Management support of BIS use.

Introduction

As Business Intelligence Systems (BIS) provide innovative information (Elbashir, Collier & Sutton, 2011) they present a valuable resource for competing in the marketplace for many organizations (Wixom & Watson, 2010), particularly when organizations operate in highly competitive environments (Popovič et al., 2012) and are focusing on their customers. Focus on customers (or customer orientation) is associated with the competitiveness of the environment in which organizations operate. Hence, market oriented (or profit oriented) organizations are more dependent on innovative and competitive information (Lee & Xia, 2006). Deshpande, Farley and Webster (1993) treat customer orientation and market orientation as synonyms and define this concept as "the set of beliefs that puts the customer's interests first, while not excluding those of all other stakeholders such as owners, managers, and employees, in order to develop a long-term profitable enterprise" (Deshpande et al., 1993, p. 27). Birgelen, Ruyer and Wetzels (2003) posit that higher prior knowledge of customer satisfaction, represented in embeddedness, stimulates decision-makers behavior of information acquisition and use derived from marketing intelligence and that they are to be more inclined to set customer-oriented priorities on the basis of customer satisfaction information. Tallon, Kraemer and Gurbaxani (2000) found that market-focus firms use information technology (IT) to create or enhance a value proposition for their customers. Bearing in mind the specific characteristics of BIS, they can increase knowledge reach and richness, facilitate reliable information sharing, and increase the profundity of new information and knowledge gained from focusing on customers (Alavi & Leidner, 2001).

Integrating these arguments we should expect that employees in organizations that focus on customers use BIS more and that particularly BIS should be more embedded into their routines. This study thus brings novel insights as our findings show that organizational focus on customer has a strong direct impact on management support of the use of BIS, and management support also enhances all the researched dimensions of BIS use. Further on, focus on customer strongly impacts on the embeddedness of BIS into the organizational work system. The results indicate that if the organization is focused on their customers or is setting (or has intention to set) customer oriented priorities it would be reasonable to invest in BIS, as they provide innovative and competitive information (Elbashir et al., 2011) and strategically oriented information processing and analysis for effective decision making (Isik, Jones & Sidorova, 2013). Such organizations should have greater utilization of BIS, because it will be more embedded into the routines of workers and by that organizations should have increased customer satisfaction and organizational productivity (Deshpande et al., 1993; Karimi, Somers & Gupta, 2001) and ultimately better organizational performance (Popovič et al., 2012). With respect to importance of customer satisfaction information that can be more effectively exploited by promoting embedded BIS use into employee's routines, this study represents an exciting, but nevertheless unexplored field of research.

The structure of the paper is as follows. In the next section BIS embeddedness specifics are elaborated. The research model is then conceptualized and hypotheses are developed. Further on the research design, methodology and results are given. This is followed by discussion of the results including the implications for research and practice and conclusion.

BIS Embeddedness specifics

BIS are most commonly identified as solutions holding quality information in well-designed data stores connected with business-friendly tools, and their goal is to provide stakeholders at various levels in an organization with timely access, effective analysis and an insightful presentation of the information generated by enterprise-wide applications, enabling them to make the right decisions or take the right actions across a broad range of business activities (Popovič, Coelho, & Jaklič, 2009). Their growing strategic importance is seen from the volume of investments in business analytics and business intelligence as BIS present number one CIO's technology priorities according to Gartner Research (2013), which emphasizes the need for greater attention to BIS in research studies.

In order to study the use of BIS, it is important to understand the specific characteristics of BIS as compared to operational information systems (IS), that justify the need to examine different dimensions of BIS use leading to effective BIS utilization, particularly in more competitive and customer oriented environments. The use of BIS is in most cases voluntary, whereas for operational IS the use is mostly mandatory or necessary for carrying out the business processes. Venkatesh and Davis (2000), Venkatesh, Morris, Davis & Davis (2003) and Venkatesh and Bala (2008) have already identified the importance of voluntariness of use when studying IS usage behavior. Grublješič and Jaklič (2013) case study analysis has pointed to the fact that users in more competitive environments have claimed such a system in order to provide more successful results leading to better performance and therefore they use BIS more in depth than for example, in a public company, where users are not rewarded by their effectiveness. Further on, the

position within the organizational structure of BIS users is different, where BIS users are generally more educated workers and mostly managers, and operational IS users are all organizational and educational levels' workers. The data in BIS are more aggregated and integrated at the level of entire organization and there is more sharing of information, which relates to the need for improvements in information culture (Marchand, Kettinger & Rollins, 2001) in organizations. The information needs as well as the methods used to identify these needs of operational IS primarily derive from the processes, and are more structured and well-defined at the operational or process level, while in BIS they are much less structured and the needs and methods of identification of these needs are often ad-hoc, research-oriented and innovative in nature, based on performance management, and come from the operational processes as well as from external sources. Operational IS as well as older decision support systems and executive IS are oriented more on the software solution, and BIS more on the necessary data, centered around data warehousing and provide the analytical tools required to integrate and analyze organizational data (Frolick & Ariyachandra, 2006). With operational IS the focus of information quality problems present traditional problems of data quality, such as accuracy and completeness, whereas regarding BIS the focus is more on the relevance of information provided by BIS, as a key problem of information quality in unstructured business processes is providing relevant information to managers (Delone & McLean, 2003; Eppler, 2006; Popovič et al., 2009). The required reliability of operational IS is much higher where the functioning of the system is usually a prerequisite of process execution. In general, compared to operational IS the benefits of BIS are much more indirect and long-term (Gibson, Arnot & Jagielska, 2004) which may negatively affect their initial perceived usefulness, but on the other hand may provide competitive advantage for innovative and effective users. All these BIS specifics unveil the market niche opportunity for explorative users to seize competitive edge when competing in the market place.

Burton-Jones and Straub (2006) elaborate that in the IS for the decision-making domain researchers typically study IS characteristics that improve user decision making. Thus, for effective BIS use *informed action* (Burton-Jones & Grange, 2013) is necessary in the sense of acting upon the information obtained from BIS. We therefore employ Burton-Jones and Straub's (2006, p. 230) dimensions of system usage measured as the use of information from BIS, which are the frequency or intensity of use, the extent of use, and the nature of use.

The intensity of use (Davis et al., 1989; Venkatesh & Davis, 2000; Venkatesh et al., 2003; Venkatesh & Bala, 2008; Venkatesh, Brown, Maruping & Bala, 2008) is the most commonly used dimension of measuring the use of IS in the literature. This dimension of use has most commonly been conceptualized and operationalized as the frequency or duration, based on users' self-assessment of time spent in using a system (Davis, 1989; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008) or the duration of their usage via system logs (Taylor & Todd, 1995; Venkatesh et al., 2003).

The extent of BIS use should capture the "extent to which the user employs the system to carry out the task" (Burton-Jones & Straub, 2006, p. 233). In the post-adoption context, more use is not always considered desirable. In this context Po-An Hsieh and Wang (2007, p. 216) introduce the term "extended use" that refers to using more of the complex system's features to support individual's task performance, that can potentially lead to better results and realize the promised

return on investments (Jasperson, Carter & Zmud, 2005). Deng and Chi (2013) argue that BI application context offers an ideal opportunity to examine a variety of post-adoptive system uses.

The third dimension that captures the most eloquent part of the concept of effective BIS use and consequently the utilization of organizational efforts with its implementation is the *nature of BIS use* which should follow the principles of system *embeddedness* in a business. The embeddedness represents a qualitative leap in use and can be understood as "the extent to which the use of BIS is an integral part of organizational activity" (Furneaux & Wade, 2011, p. 579). In the post-adoption phase of BIS implementation, use should evolve from initial acceptance through the routinization phase to *infusion*, which occurs when BIS becomes more deeply embedded within the organization's work system (Cooper & Zmud, 1990; Saga & Zmud, 1994). In the context of BIS, fusion involves deeply embedding BIS within the business to create "BI-driven decision-making routines and BI-enabled organizational processes that take managerial decision making to new levels of understanding and foresight" (Shanks, Bekmamedova, Adam & Daly, 2012) within the Business Process Management (BPM) framework. Burton-Jones and Straub (2006, p. 236) in this context conceptualize the dimension of *deep structure* usage as exploitive system usage, which is the "extent to which users exploit features of the system to perform the tasks". Jasperson et al. (2005, p. 542) further elaborate that much post-adoptive behavior or continuing IT use is likely to reflect a "habitualization of action, where the decision to use the IT application feature occurs more or less automatically via a subconscious response to a work situation" and Ortiz de Guinea and Markus (2009) support this habitual or automatic use, which points to embedded use into the routines of users.

Conceptualization of the research model

Focus on customer is closely related to the competitiveness of the environment in which organizations operate, hence market oriented (or profit oriented) organizations are more dependent on innovative and competitive information (Lee & Xia, 2006). Deshpande et al. (1993) treat customer orientation (or focus on customer) and market orientation as interchangeable concepts. Customer orientation is defined as a "set of beliefs that customer needs and satisfaction are the priority of an organization" (Liu et al., 2002, p. 369), while not excluding the needs of "all other stakeholders such as owners, managers, and employees, in order to develop a long-term profitable enterprise" (Deshpande et al., 1993, p. 27). Birgelen et al., (2003) posit that decision-makers with higher embeddedness of customer satisfaction are more inclined to set customer-oriented priorities on the basis of customer satisfaction information. They further argue (Birgelen et al., 2003, p. 764) that "decision-makers will weigh information differently depending on their perception of its relevance". The importance of this claim is shown by considering the economic costs of customer satisfaction research and the opportunity cost of not using this data. Recalling that one of the primary focuses of BIS is the relevance of information provided by BIS, as a key problem of information quality in unstructured business processes is providing relevant information to managers (Delone & McLean, 2003; Eppler, 2006; Popovič et al., 2009), and integrating the Birgelen et al. (2003) argument, we should expect that organizational focus on customers should have an impact on management support of BIS use. Birgelen et al. (2003, p. 764) further acknowledge that only a few studies address decision-maker attitudes leading to acceptance or rejection of business (and marketing) intelligence, and that

only a few, if any, "explicitly focus on customer satisfaction information for priority setting within firms". Based on these arguments we pose our first hypothesis:

H1: Focus on Customer positively influences on Management support of BIS use.

Management support refers (Venkatesh & Bala, 2008, p. 296) to "the degree to which an individual believes that management has committed to the successful implementation and use of a system". Prior research has suggested that one of the most critical success factors for complex systems (including BIS) is management support and championship (Wixom & Watson, 2001; Yeoh & Koronios, 2010). Since the implementation of BIS often requires substantial changes to organizational processes, employees' roles and jobs, reward systems, control and coordination mechanisms, management support in the form of commitment and communication related to BIS use is "absolutely critical for the legitimacy of the implementation process and employees morale following the implementation" (Venkatesh & Bala, 2008, p. 296). Management support of the use of BIS, such as encouragement, leading by example in using BIS, and promoting decision making based on the information provided by BIS, should have a positive impact on different dimensions of BIS use, leading to more effective BIS utilization. Jasperson et al. (2005, p. 536) argue that such interventions and support can "induce, or perhaps mandate, the individual to apply unused features, to apply already-used features at higher levels of use, to discover new uses of existing features, or to identify the need to incorporate new features into the IT application". Following these arguments we pose Hypotheses H2a, H2b and H2c as we should expect that management support of the use of BIS will have positive impact on all three researched dimensions of BIS use:

H2a: Management support of BIS use positively influences on Intensity of BIS use.

H2b: Management support of BIS use positively influences on Extent of BIS use.

H2c: Management support of BIS use positively influences on Embeddedness of BIS.

Organizational focus on customer emerged as a pressing determinant influencing BIS acceptance in Grublješič and Jaklič (2013) case study analysis. Therefore we hypothesize that it should have a direct impact on BIS use behavior. Although the technology, organization and environment framework (TOE) includes environmental competitiveness to have an impact on adoption and acceptance of IT innovation (Tornatzky & Fleischer, 1990), focus on customer has not yet been included in previous IT acceptance and use models as an antecedent of IT use, and thus provides valuable insights concerning the context specific issues. As BIS provide innovative information (Elbashir, Collier & Sutton, 2011) they present a prerequisite for competing in the marketplace for many organizations (Wixom & Watson, 2010), particularly when organizations operate in highly competitive environments (Popovič et al., 2012). Customer orientation should have favorable impact on business performance and enhance customer satisfaction as well as organizational productivity (Deshpande et al., 1993; Karimi et al., 2001), and IT implementation plays a role of complementary asset to communication with customers (Feng, Sun, Zhu & Sohal2012). Tallon et al. (2000) found that market-focus firms use IT to create or enhance a value proposition for their customers. Bearing in mind the specific characteristics of BIS, they can enable reliable information sharing, increase knowledge reach and richness, decrease ambiguity and increase the profundity of new information and knowledge gained from focusing on customers (Alavi & Leidner, 2001). Accordingly, the extent of BIS use dimension measures

also using BIS to provide more differentiated and customized service to customers (Doll & Torkzadeh, 1998). Integrating these arguments we should expect that employees in organizations that focus on customers use BIS more and that particularly BIS should be more embedded into their routines. On this basis we hypothesize:

H3a: Focus on customer positively influences on Intensity of BIS use.

H3b: Focus on customer positively influences on Extent of BIS use.

H3c: Focus on customer positively influences on Embeddedness of BIS.

Research design and methodology

Our questionnaire was developed by building on previous theoretical basis to assure content validity. To ensure face validity, pre-testing (Cooper & Schindler, 2003) was conducted, using a focus group involving selected university staff and IS academics from the field who were not included in the subsequent research. Minor changes were made based on their suggestions. We used a structured questionnaire with seven-point Likert scales, with anchors ranging from totally disagree (1) to totally agree (7), for all items used in our study to measure impacts on BIS use and different dimensions of use, except the extent of BIS use was measured with anchors from not at all (1) to a great deal (7).

Measurement items were developed based on literature review and supported by expert opinions. All constructs in the proposed models are based on reflective multi-item scales. Focus on customer construct was measured using six items with highest factor loadings from Liu et al. (2002) customer orientation construct, who adapted Deshpande and Farley's (1998) composite measure of customer-focused market orientation to capture market orientation as an aspect of organizational culture. To measure Management support of BIS use we have used one validated item from Wixom and Watson (2001) and have developed two more items that fit to our nomological network. All three manifest items had large factor loadings in the confirmatory factor analysis, and were sufficiently discriminable, proving reliability and validity of these measures for this construct. Use behavior was measured as a reflective composite index of three dimensions, capturing intensity, extent and embeddedness of BIS use, following Burton-Jones and Straub's (2006) classification. These three aspects of BIS use have been conceptualized as three different constructs, since we expect that there will be diverse impacts on these three aspects of use. The three intensity of use items were adapted from Wixom and Todd (1995), capturing increasing intensity of BIS use. The Extent of BIS use was measured by adapting Doll and Torkzadeh (1998) multidimensional measures of how extensively BIS is utilized in an organizational context for decision support, divided to measure problem solving and decision rationalization (explaining decisions and improving decisions); then work integration, divided to measure horizontal integration and vertical integration (work planning and vertical communication); and customer service functions. Each concept was measured with three item scales having highest factor loadings (Doll & Torkzadeh, 1998). BIS embeddedness items were developed based on Shanks et al. (2012) dimensions of BIS embeddedness in the business. Embedded BIS use was operationalized by capturing if use of BIS is seamlessly integrated with business process execution, if BIS is embedded into the decision-making routines of decision-makers across the organization and if importance and use of insights from BIS are embedded within the business strategy formulation process, leading to alignment of BIS and business

strategy (Shanks et al., 2012). Appendix A provides a detailed list of all of the indicators used in the measurement model.

The data were collected through a survey of 2173 medium- and large-sized business organizations in an EU country. Organizations were selected from an official database published by a National Agency for Public Legal Records. Questionnaires were addressed to a wide range of employees, that is, all users of BIS (top management, heads of departments and divisions, IS managers, etc.) The final response rate was 9.3 %.

Results

To conduct the data analysis, the Partial least squares (PLS) path modelling approach to structural equation modelling was chosen in this study. This is a widely selected methodology in the IT and IS field as it is suitable for predicting and theory building because it examines the significance of the relationships between the research constructs and the predictive power of the dependent variables (Chin, 1998).

We first examined the reliability and validity measures for our reflective measurement model. Since all the manifest variables loaded satisfactory, the model was not modified. Manifest variable FoC1 had marginal loadings to 0.7 (0.62) and was retained for sound theoretical reasons (Hulland, 1999). All Cronbach's alphas by far exceeded the 0.7 thresholds (Nunnally and Bernstein, 1994). Without exception, the latent variables composite reliabilities are higher than 0.9 (which are the thresholds for more advanced stages of research) showing the high internal consistency of indicators measuring each construct and thus confirming construct reliability. The Average Variance Extracted (AVE) is generally around 0.6 or higher, thus exceeding the threshold of 0.5, demonstrating the convergent validity of the constructs. The reliability and convergent validity of our final measurement model were also confirmed by computing standardized loadings for the indicators and Bootstrap t-statistics for their significance. All standardized loadings of the indicators in our model exceeded (or were marginal to) the 0.7 threshold and they were found without exception to be significant at the 0.001 significance level, thus confirming the high indicator reliability and convergent validity, as shown in Table 1.

Table 1: Reliability and validity measures of the measurement model

Constructs	Indicator	Final model		Estimates (Final model)		
		Loadings	t-Values	Cronbach's Alpha	Composite reliability	Average Variance Extracted
Focus on Customer	FoC1	0.6237	7.8473	0.8732	0.9039	0.6126
	FoC2	0.8190	21.8865			
	FoC3	0.8095	19.1362			
	FoC4	0.8132	20.2773			
	FoC5	0.7865	16.3391			
	FoC6	0.8249	23.418			
Management support of BIS use	MS-BIS USE 1	0.9215	66.3072	0.8793	0.9251	0.8046
	MS-BIS USE 2	0.8716	28.5319			
	MS-BIS USE 3	0.8982	49.6203			
Intensity of BIS use	IU1	0.8919	24.6231	0.8879	0.9305	0.8169
	IU2	0.9269	63.3414			
	IU3	0.8922	26.0148			
Extent of BIS use	PS1	0.7431	16.3082	0.9738	0.9756	0.6558
	PS2	0.8169	21.6251			
	PS3	0.8159	20.912			
	ED1	0.7987	17.9224			
	ED2	0.8489	25.9848			
	ED3	0.8447	26.9952			
	ID1	0.8569	30.3312			
	ID2	0.8536	28.9491			
	ID3	0.8643	30.3083			
	HI1	0.8371	30.2993			
	HI2	0.8399	28.1153			
	HI3	0.8375	26.6496			
	WP1	0.7976	17.6928			
	WP2	0.7628	22.3446			
	WP3	0.7626	20.8881			
	VC1	0.7495	17.1941			
	VC2	0.7644	15.8578			
	VC3	0.7723	15.8841			
	CS1	0.7943	21.8295			
	CS2	0.8171	25.4711			
	CS3	0.8099	24.6241			
BIS embeddedness	EMB1	0.8708	25.0459	0.9123	0.9448	0.8510
	EMB2	0.9575	93.3199			
	EMB3	0.9369	63.0819			

The discriminant validity is shown by the following two procedures: (1) a comparison of the item cross-loadings to construct correlations and (2) determination whether each latent variable shares more variance with its own measurement variables or with other constructs (Fornell & Larcker, 1981; Chin, 1998). The assessment of the indicator loadings on their corresponding constructs is the first procedure for testing the discriminant validity. Our figures indicate that manifest variable correlations with their theoretically assigned latent variables are an order of magnitude larger than other loadings to other constructs. All the item loadings therefore met the

criteria of the first procedure in the assessment of discriminant validity. For the second procedure we have compared the square root of AVE for each construct with the correlations with all other constructs in the model. It can be observed in Table 2 that all of the square roots of AVE are significantly higher (and also substantially larger than the threshold) than the correlations between the constructs, thus confirming that they are sufficiently discriminable. Based in the results of both tests we conclude that all the constructs show evidence of acceptable validity.

Table 2: Correlations between the latent variables and square roots of the AVE

	Focus on Customer	Management support of BIS use	Intensity of BIS use	Extent of BIS use	BIS embeddedness
Focus on Customer	0.7826				
Management support of BIS use	0.3561	0.8970			
Intensity of BIS use	0.1937	0.3107	0.9038		
Extent of BIS use	0.2657	0.3730	0.7489	0.8098	
BIS embeddedness	0.3492	0.4338	0.7183	0.6619	0.9225

As shown in Figure 1, the influence of Focus on customer explains about 12.7 % of the variance in Management support of BIS use. Looking at the explained variability of the Intensity of BIS use, it can be seen that about 10.4% of the variance in Intensity of BIS use is explained by the influence of Management support of BIS use (as Focus on customer was found to play no significant role). Further on, the influence of Management support of BIS use explains about 15.9% of the variance in the Extent of BIS use (as again Focus on customer influence proves to be not statistically significant). On the other hand it can be seen that 23.2% of the variance in Embeddedness of BIS is explained by the influence of Management support of BIS use and Focus on customer as well. Chin (1998) describes that, if certain inner path model structures explain an endogenous latent variable by only a few (e.g., one or two) exogenous latent variables, ''moderate'' R^2 is acceptable (Henseler, Ringle & Sinkovics, 2009). As our major contribution was to explain that organizational Focus on customers clearly demonstrates higher embeddedness of BIS into the routines of workers, and as well impacts on higher dedication of management towards BIS use, the model has sufficient explanatory power and is capable of explaining a sufficient proportion of the variability in this construct (Chin, 1998; Henseler et al., 2009). The variability in other two constructs of BIS use should be further researched, as it is definitely clear that intensity and extent of BIS use cannot be explained solely by management support and focusing on customers, since the goal and impact of these systems is much broader.

The direct and positive impact of Focus on customer on Management support of BIS use was found to be statistically significant (at 0.001 significance level), thus supporting H1 ($\hat{\beta}$=0.356). Further on, Hypotheses H2a, H2b and H2c are all supported (at 0.01 and 0.001 significance level), showing that Management support of BIS use has strong direct and positive impact on Intensity of BIS use ($\hat{\beta}$=0.277), Extent of BIS use ($\hat{\beta}$=0.319) and Embeddedness of BIS ($\hat{\beta}$ =0.354) respectively. The impact of Focus on customer on Intensity of BIS use and Extent of BIS use was found to be non-significant, thus rejecting hypotheses H3a and H3b. But on the other hand hypothesis H3c is strongly supported, significant at 0.01 significance level, showing

that Focus on customer directly and positively ($\hat{\beta}$=0.223) influences on Embeddedness of BIS into the routines of workers.

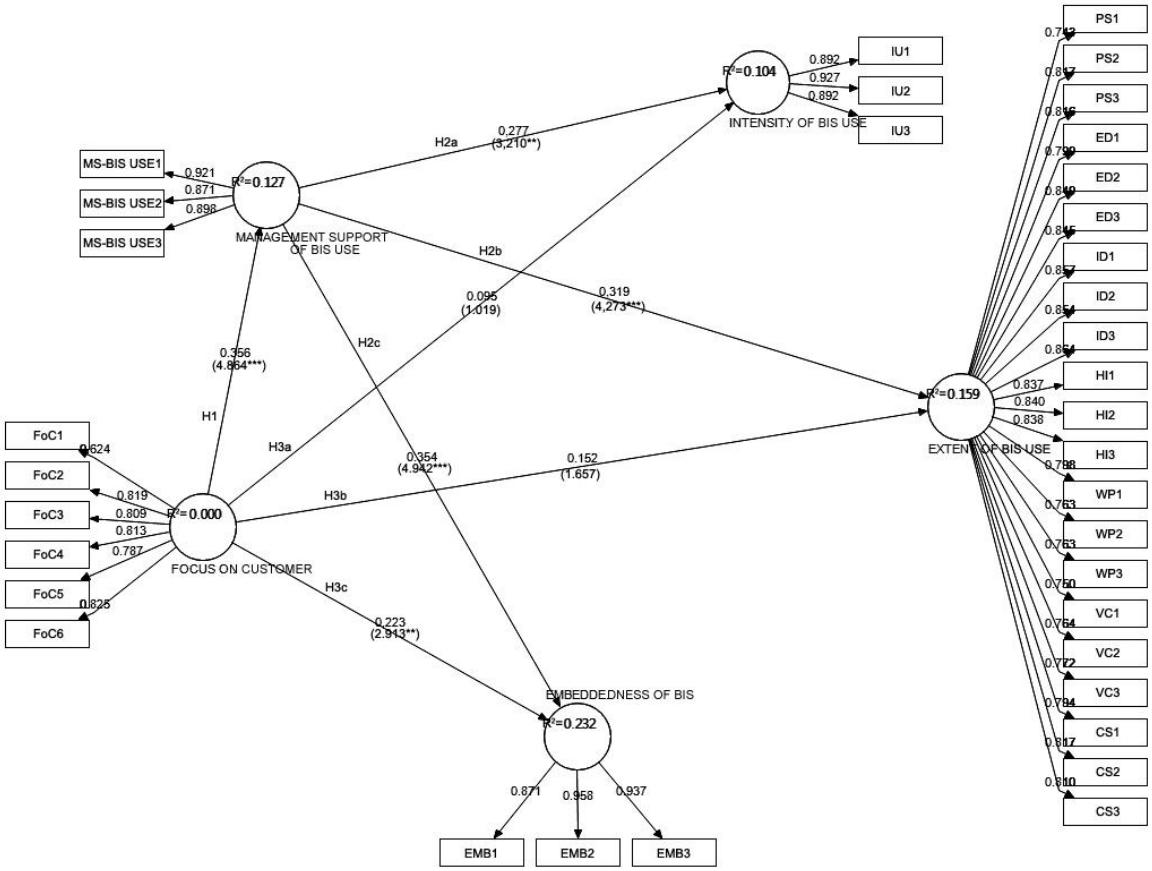

Figure 1: The final measurement model.

Notes: (ns) non-significant; * significant at 0.05 level (two-tailed test); ** significant at 0.01 level (two-tailed test); *** significant at 0.001 level (two-tailed test)

Discussion and conclusion

Our study provides novel insights regarding the antecedents that drive the effective use of BIS. Effective use of BIS occurs when the use of BIS becomes an integral part of organizational activity. The empirical model estimation provides proof for conceptualizing three different dimensions of BIS use. These differ among themselves by quantitative and qualitative aspects. The results show that for BIS embeddedness, to what we argue captures the most eloquent part of the concept of effective BIS use and consequently the utilization of organizational efforts with its implementation, organizations that focus on customers should benefit the most. This is supported by the fact that BIS will be infused into the routines of workers, technology infrastructure and strategy (Shanks et al., 2012). Additionally, organizational focus on customers positively impacts on management support of BIS use, which further positively influences on all three researched dimensions of BIS use.

Wixom and Watson (2010, p. 14) elaborate that BIS have moved from being a contributor to organizational success to being "a prerequisite for even competing in the marketplace". This argument supports our finding that organizational focus on customer (customer or market orientation) has a strong impact on management support of BIS use (supporting H1). This goes along with Birgelen et al. (2003, p. 777) discovery, that a level of decision-makers' embeddedness of customer satisfaction, "the personal importance being attached to in, and prior knowledge on customer satisfaction will increase the level to which one thinks about satisfying customers and what the benefits for the firm are". Surely supporting and encouraging BIS use and leading by example by using BIS and the information provided by BIS can leverage these synergies.

Management support of BIS use clearly impacts on all three dimensions of BIS use, and this impact is the strongest for embedding BIS into the routines of workers (supporting H2a, H2b and H2c). This is consistent with the findings of Venkatesh and Davis (2000, p. 189) who argue that in voluntary settings, which are most common for BIS use, the mechanism of "internalization" comes to fore, which refers to the process "by which, when one perceives that an important referent thinks one should use the system, one incorporates the referent's belief into one's own belief structure". Our questionnaire items include indirect (such as sponsoring and championing) and direct (such as leading by example in using BIS) management support (Jasperson et al., 2005) of BIS use. Jasperson et al. (2005) call for the need for management attention, involvement and direction particularly in the post-adoptive lifecycle of IT use. In the BIS context (that refers to complex systems) this sustained support is obviously imperative for successful and effective BIS utilization.

Our findings provide empirical support for what emerged as an important issue in Grublješič and Jaklič (2013) interview session, which is that focus on customer indeed has an important impact on the embedded use of BIS. Literature has already established the importance of IT in creating and enhancing communication and value proposition for customers (Tallon et al., 2000; Feng et al., 2012) and that market oriented (or customer oriented) organizations (Deshpande et al., 1993) are more dependent on innovative and competitive information (Lee and Xia, 2006). There was no statistically significant impact of Focus on customer on intensity of BIS use, nor on the extent of use (thus rejecting H3a and H3b).On the other hand it influences on integration of BIS use with business processes, embeddedness of BIS into the decision-making routines and alignment of insights from BIS with business strategy (Shanks et al., 2012), thus supporting H3c. These results are in line with the findings of Birgelen et al. (2003, p. 777) that "commitment toward customer satisfaction has a positive impact on the acceptance and use of customer satisfaction information for the purpose of customer-oriented priority setting", derived from marketing intelligence that can be leveraged by routinized use of BIS.

The findings thus indicate that customer oriented management practices lead to higher, more effective and sustainable BIS utilization. By this organizations can leverage benefits "such as improved product and service quality, improved customer satisfaction, higher productivity, and improved financial performance" (Karimi et al., 2001, p. 127), providing important implications for research and practice. Focus on customer is a part of a broader organizational culture (Deshpande et al., 1993), and the results of our study enrich the understanding of social and psychological mechanisms at work in customer oriented management practices. These lead to a differentiated and more effective use of marketing intelligence from embedding BIS into the

organizational work system. Overall, the findings enrich our understanding of the phenomena of post-adoption BIS use behavior.

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Appendix

Appendix A. Indicators of the measurement model

Construct	Label	Indicator
		Indicate to what extent you agree/disagree with the following statements (1 = totally disagree; 7 = totally agree; X = don't know)
FOCUS ON CUSTOMER	FoC1	Our business objectives are driven primarily by customer satisfaction.
	FoC2	We constantly monitor our level of commitment and orientation to serving customer needs.
	FoC3	We freely communicate information about our successful and unsuccessful customer experiences across all business functions.
	FoC4	Our strategy for competitive advantage is based on our understanding of customers' needs.
	FoC5	We measure customer satisfaction systematically and frequently.
	FoC6	We are more customer-focused than our competitors.
MANAGEMENT SUPPORT OF BIS USE	MS-BIS USE 1	Overall, management has encouraged the use of BIS.
	MS-BIS USE 2	Management leads by example in using BIS.
	MS-BIS USE 3	Management supports decision making based on the information provided by BIS.
INTENSITY OF BIS USE	IU1	I use BIS as a routine part of my job.
	IU2	I use BIS at every opportunity.
	IU3	I have been increasingly using BIS.
EXTENT OF BIS USE		
DECISION SUPPORT:		
Problem solving	PS1	I use BIS to help me think through problems.
	PS2	I use BIS to make sure the data matches my analysis of problems.
	PS3	I use BIS to check my thinking against the data.
Decision rationalization:		
Explaining decisions	ED1	I use BIS to help me justify my decisions.
	ED2	I use BIS to help me make explicit the reasons for my decisions.
	ED3	I use BIS to rationalize my decisions.
Improving decisions	ID1	I use BIS to control or shape the decision process.
	ID2	I use BIS to improve the effectiveness and efficiency of the decision process.
	ID3	I use BIS to make the decision process more rational.
WORK INTEGRATION:		
Horizontal integration	HI1	My work group and I use BIS to coordinate our activities.
	HI2	I use BIS to coordinate activities with others in my work group.
	HI3	I use BIS to exchange information with people in my work group.
Vertical integration:		
Work planning	WP1	I use BIS to help me manage my work.
	WP2	I use BIS to monitor my own performance.
	WP3	I use BIS to get feedback on job performance.
Vertical communication	VC1	I use BIS to communicate with people who report to me.
	VC2	I use BIS to communicate with people I report to.
	VC3	I use BIS to keep my supervisor informed.
CUSTOMER	CS1	I use BIS to serve internal and/or external customers.

SERVICE	CS2 CS3	I use BIS to improve the quality of customer service. I use BIS to more creatively serve customers.
BIS EMBEDDEDNESS	EMB1	The use of BIS is seamlessly integrated with business process execution. Processes in which there is an information need for analytical decision making are carried out without interruption due to the use of BIS.
	EMB2	BIS is embedded into the decision-making routines of decision-makers across the organization.
	EMB3	The importance and use of insights from BIS are embedded within the business strategy formulation process, leading to the alignment of BIS and the business strategy.