How Can HRM Support Business Intelligence Systems?

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Abstract. This paper deals with HR[1] Management issues in a BI[2] system. In a more precise way, we got interested in the motivational aspects of a BI system or how to increase employees' motivation in such systems. The question asked in this paper is: which HR functions could play a role in enhancing BI activities? After a literature review we chose to focus on Hannon's [10] model in order to answer this question. Results are discussed and illustrated through a field study in a big technological firm.

1 Introduction

Seeking information is part of executives' life since like forever. They look for, analyze and diffuse huge amounts of information every working day. Managing this information appears to be central, especially nowadays with the IT[3]'s progress and development. Business Intelligence (BI) Systems, as a means of managing information and supporting decision appear to be essential in an organization [6, 21]. Hence, their implementation in an organization appears to be problematic in many ways.

One of the most important BI issues highlighted by the literature concerns executives' will and motivation for BI activities. Indeed, many authors stress the important role of individuals in a BI system (S.[4] Amabile [3]) suggesting that their coordination and cooperation can have an influence on BI activities. Going further, other authors like [29] insist on the essential part played by the individuals' will and participation while developing BI activities. Finally, it seems that a major part of the literature agrees on the importance of executives' motivation in a BI System but, at the same time, authors observe that the elements supposed to help HR managers in that context are rarely defined [10, 5, 25].

The aim of this paper is precisely to work on that point; trying to understand how HR managers can bring executives to participate and collaborate in a BI system. The idea is to determine the major elements that can be implemented and/or used by HR managers for that matter. The question here can be resumed by: What can HR managers do to enhance BI activities in their organization?

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[1] Human Resources

[2] Business Intelligence

[3] Information Technologies

[4] First name first letter is indicated when authors have the same name.

In order to answer this question, we made a literature review on that topic and then defined the elements that could play a part on executive's motivation. First, we'll briefly explain what BI systems are then we'll expose some of the elements found in the literature concerning motivation in BIS[5], and we'll build up a model that we expose to reality by using a recent case study.

1.1 What is a Business Intelligence (BI) System?

Constant development of Information Technologies (IT) and globalization are the main factors that give an international aspect to competition. Today's firms must deal with a complex perceived environment where unpredictability rhymes with uncertainty.

Business Intelligence, as a practice of information management, falls under the general prospect to help managers acting and deciding in this complex context. In a more specific way, this practice tends to increase the reactivity and the competitiveness of companies, helping them to adapt more easily to a changing and dubious environment.

More than twenty years ago, authors were claiming that scanning an enterprise environment is necessary [18, 27, 30, 16]. Using different nominations such as BI, business intelligence or strategic intelligence/watch, today's literature highlights the importance of watching the firm's environment [3, 6]. At the same time, the relationship between performance and BI has been widely discussed and reconsidered [3, 19]. Indeed, it seems difficult to determine in advance whether the information selected in an BI process will be useful or not. We believe that the exact impact of these activities on organizational performance is still to be discovered.

Many research studies on BI explore the effect of situational dimensions, organizational strategies, information needs, and personal traits on scanning behaviour [6].

Thus, the BI often relates to strategic questions such as the axes of development for a firm, it also concerns information about the business activities and strategies pursued by competitors. It can be seen as a dynamic process [28] which consists in "the acquisition and use of information about events, trends, and relationships in an organization's external environment, the knowledge of which would assist management in planning the organization's future course of action" [6].

A BI system can be challenging according to the complexity of the process. Many aspects must therefore be taken into account and BI Systems appear to be complex. Hence, making models/representations of those systems seems to be problematic and the exact impact on firms' performance is still to be found [28, 14, 3].

In a general way, authors [2] often relate BI System to a particular cycle called "information cycle". That cycle can be defined over four specific phases [22, 3]: (i) the expression of needs phase where research and attention areas are identified, (ii) information seeking phase, which means exploring the research areas previously identified and selecting relevant information, (iii) exploitation phase where the

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[5] Business Intelligence System

information is questioned, analyzed and evaluated, and finally, (iv) diffusion phase, as the result of the whole process is spread.

This cycle starts all over again each time a specific demand comes out. Figure 1 was adapted from previous works [17, 22, 13], it shows the different phases of a BI Process and their articulation in an elementary way.
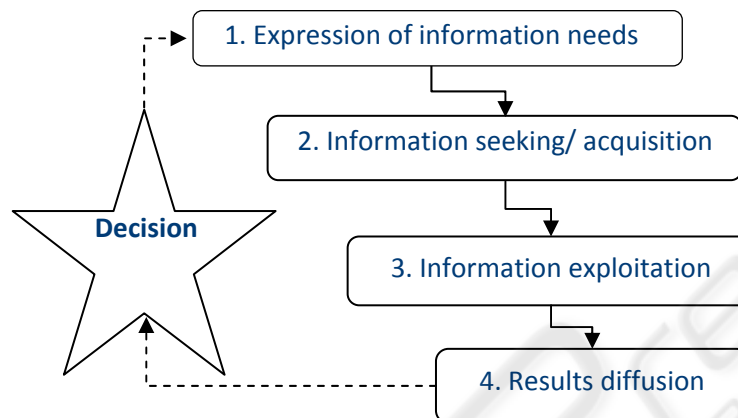
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        ┌─ ─ ─ ─► ┌──────────────────────────────┐
        ┆          │ 1. Expression of information needs │
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    │Decision│      │ 2. Information seeking/ acquisition │
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        ┆          │ 3. Information exploitation │
        ┆          └──────────────────────────────┘
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        └ ─ ─ ─ ─ ─│ 4. Results diffusion │
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Fig. 1. The Business Intelligence System phases.

This representation shows the BI System as quite simple and linear. It doesn't illustrate all the interactions between phases and provides no detail on their realization.

It only helps to understand the whole process in a basic perspective. A BI system involves the participation of various actors and a multitude of interactions inside and outside of the organization. HR managers are highly concerned here.

HR Managers are the ones who have to handle the issues related to the motivational/organizational aspects of a BI System, answering questions such as: how employees do collaborate/cooperate in those systems? How to enhance their participation to a BI System and how can they be involved? Etc.

Many departments are concerned in a direct way by BI activities and are therefore a part of the BI system of the firm. [10] suggests that sales, strategy and R&D departments are often very concerned with BI issues and we can understand why by considering the importance of competitiveness and reactivity in those particular departments. Of course, this doesn't explain why and how those activities take place. Why do executives in a general way have BI activities, is it a part of their jobs? If not then why do they have such activities?

Motivational aspects appear to be very important as far as BI is concerned. Many authors claim that BI activities widely depend on executives' will and motivation [10, 14, 9].Indeed, a BI System is often informal [26, 28], it is hard to determine the way it works in an organization. Consequently, quantifying BI activities is not obvious as we cannot really know whether an executive is really searching for BI information or not. HR Managers have to deal with those issues in order to enhance executives' collaboration and participation to the BI system and to support their global BI activities.

1.2 The Importance of Motivation for BI

As we previously mentioned, BI happen to be strongly related to the will/motivation of executives. [14] explains that basically, BI is about *perceiving information* that is not obvious to perceive, BI has therefore a *pro-active dimension* and it is actually important to take into account the will of individuals in this specific context. Here, we can assume that BI systems depend in a direct way on the behavior of its members: their acceptance, participation, and interest on the BI system. [10] says that the more interested members are the ones who can catalyze and develop the efforts for the BI activities. In fact, [15, p. 16] stresses that "what really matters in organizations is the management of motivations, especially in organizations where efforts in terms of BI are required for an adaptative behavior". This means that this motivation appears as essential in a changing environment where executives must constantly learn and adapt and BI is a changing process. It is in permanent evolution, depending basically on the targets defined by the organization and these targets are not static as they evolve as the environment is changing. According to that, [25, p. 59] stress that the tough, complicated part which is frequently overlooked or ignored when it comes to changing processes, is getting organizational members to accept, exhibit and sustain news ways of behaving.

Moreover the effective participation of executives in BI activities is often hard to quantify. First because those activities are often informal and their identification in an organization is not simple [3]. Indeed, BI activities are different from other classical activities in a firm that can be quantified such as sales, purchasing or production for instance. Secondly; executives do have, most of the time, other responsibilities in addition to their BI activities and one cannot really say if executives are having BI activities during their work or not.

Furthermore, choosing the BI System members appears to be related to its success [24, p. 82]. Indeed, the members must be "open to change" in order to adapt their schemes of interpretation to the circumstances. Exploiting information and making sense of it is strongly related to cognitive process of individuals and cannot happen unless the individual is ready to adapt his reference schemes, question his certitudes in order to build up new reference schemes with different concepts and references [20, p. 276].Consequently; BI members are as important as their motivation. For all the reasons developed above, it appears complicated for HR managers to deal with BI motivational issues; the next paragraphs will determine how HR can work on that particular point.

1.3 What Leverage for BI Executives' Motivation: What can HR do?

The lack of elements in the literature about enhancing BI activities makes this study exploratory. As we seen previously, the importance of motivation in a BI System appears as essential but only a few authors made some advanced researches about this question.

Some of them [14, 12] suggest the participation of a BI manager in the BI system who will be responsible for enhancing the participation of BI system members. This manager can also be responsible for all BI activities in the firm according to Romani and Bournois [5].

In a more specific way, [12] propose a system in order to encourage and stimulate some specific BI executives: information seekers. The model is based on 5 forms of feedback (FB5): Moral award; Work valorisation; Developing BI executives curiosity; Invitation to new researches; Giving possibility to BI executives to realize their own efficiency.

The aim of this system is to support a novice BI manager making him pay attention to elements to consider for improving motivation of information seekers. This is a pretty soft model that doesn't give any information on the way these 5 forms of feedback can be implemented in a company and/or related to HRM.

Our study considers all BI executives and not only information seekers. Here, we agree with [10] while he assumes that the BI system should not vary from an employee to another or from a function to another, a department to another. The whole firm, not only a part of it, should become more alert.

Considering the whole firms' executives, we suggest to use Human Resources in order to enhance BI activities. The idea here is to use the HR function to improve the working environment of BI executives and then, their motivation and behavior. [10] defines a model made of five HR systems that can play a role in the BI context.

- ✓ **The Performance Evaluation System:** Here, the author suggests that the BI activities could be evaluated upon a formal performance criterion. For instance, this could be materialized by an official daily/weekly/monthly rapport concerning their BI activities progress.
- ✓ **The Compensatory System:** This one is about linking employees' salary to their results in terms of BI activities. This might have an impact on the way those activities are perceived in the organization. An award system could be developed here.
- ✓ **The Carriers' Planning System:** The idea here is to take into account the BI activities just like other activities of the employee when it comes to aspects such as promotion, transfer, or employees delocalization.
- ✓ **The Employees Benefit System:** This system could bring some benefits to employees according to their BI activities. They could for instance get some days off in order to assist a congress where they can have information concerning their competitors and the personal fees used for BI activities could be paid back.
- ✓ **The Disciplinary and Separation System:** This system is basically about protecting the firm's interests. [10] suggests here that all the employees, not only executives, sign a document for confidentiality and non competition. First to prevent employees from spreading confidential information and second, to make sure that all employees understand the strategic importance of information and that they handle it carefully.

We'll use Hannon's 5 systems' model in our study in order to make a link between HR managers and BI executives' motivation. We tried to look upon those particular systems in a big industrial firm that we'll call Omega and see if reality reflects theory. Let us first present the company and our methodology for our field study. We'll than analyze our data and bring up some results.

2 The Case Study: Presenting the Company and the Method

Omega, considered as the world leader in its business market, has more than 12000 employees and a sales turnover of several millions Euros. Active around the world, with many sales and marketing offices, several Research & Development centers and personalization facilities as well as manufacturing sites, its list of clients includes international banking, identity and telecom companies.

Our aim at Omega is to understand employees' motivation to have BI activities in order to enhance such activities. We made a model of the BI system in order to understand it. WE tried to identify how individuals are supposed to communicate and collaborate in the BI system. We focus on the whole process of BI, trying to identify the different BI supports for finding information, such as the Internet website, the intranet, mails exchange, the newsletter, etc. After that, we made interviews with a major part of the BI system employees, asking them questions about their work trying to define their motivations.

We used a qualitative method of collecting data during about four months at Omega. The data collection was made on two steps: first we made staff interviews questioning about 45 BI employees each interview lasted from 1 to 3 hours. We also used some internal documentation (weekly samples, corporate brochures, intranet, flow charts, internal studies, etc.) in order to evaluate the information collected. In the second part of the study, we worked for 4 months at Omega as a business analyst (in the most important BI team of the firm). The idea was to observe the BI system from the inside and to get closer to BI executives. The interviews and the data collected were analysed and coded using software for qualitative analysis (Nvivo).

2.1 Observation and Data Analysis

From our data analysis we can say that BI activities in Omega are not really enhanced by HR management in a general way. Some incentives exist but they are quite few.

> "*BI system is kind of a push /pull system: push by the alerts we make, the newsletter etc. and pull thanks to our website, the award system and of course the human network on which I strongly believe*" a BI Manager said.

We'll summarize the different types of incentives used by the HR Management at Omega in two major categories.

2.1.1 The Motivation using a Reward System

It is about motivating BI executives and employees by rewards or an official recognition of the senior in rank. The objective of these procedures is, naturally, to encourage the actors to invest themselves in the system of BI. In this context, once a month, the "best contributor" is elected and rewarded. It is about the employee providing information of BI considered to be interesting by management. The reward will be a small gift (a flash disk for example), a thank you email, with his directors in copy, and having his name and photograph on the site BI for a month.

2.1.2 The Motivation using BI Tools

Several BI tools are available at Omega. These tools can be regarded as indirect motivation systems. Indeed, they have as a role to organize, facilitate the access and the practice of activities of BI in the company. In that, they contribute to facilitate and make these activities possible. This facilitation is supposed to encourage the actors to take part and develop activities of BI. 3 major BI tools:

➢ *The strategic newsletters*
We refer here to the newsletter published by the BI managers (weekly and monthly). In both cases, the newsletter consists of a press review (more or less specialized), synthesized and sometimes with accompanying notes. It is a question of questioning the outstanding facts and checking the veracity and the source of information.
The newsletter constitutes a motivating system at least for two reasons: initially, the subscriber is incited to read it and thus to get information just by receiving it in his mailbox. Then, he is encouraged to nourish a strategic thought as for what occurs in the environment of the company. However, the newsletter helps the subscribers to make their own analysis of the market and the position of the company.
Moreover, the newsletter reminds its subscribers of the existence of the BI managers and this can play a role in increasing the interactions between employees and BI managers.

➢ *The BI intranet website*
The Intranet is a privileged tool of BI System. First because a great number of employees can have their access to the intranet. This means that the management is trying to get a big number of employees to participate to BI activities. Moreover, the BI website is to some extent the "display case" of BI System. Very visited, it contributes to sensitize the actors of the company to the strategic environment of the company.
 "*In order to make the BI website interesting, we try to make it accessible for the greatest number of employees.*" a BI manager said.

➢ *The reporting tool*
The reporting tools seem to play an important role in employees' motivation. Indeed, these tools are linked to the organizational routines of the company. They are used kind of "automatically" in the firm and have no real confrontation with the phenomena of resistance to change. The motivation is indirect because the actors use these systems of reporting for all their activities and not only those related to BI. It is a method of diffusion but also of control of information, each actor submitting his report to his higher hierarchical. We listed two cases of reporting where the activities of BI can be observed.

• **Weekly or Monthly Reports System:** These reports enable the employee to explain his activities to his direct senior in rank, once by week or once a month. The fact of including in the weekly or monthly reports a part devoted to BI information enhance the employee to think in a specific way to this type of information: the actor is in front of a "gap to fill" and must think of information

to put into it… Moreover, the document is intended for its senior in rank. In addition, this system makes it possible to structure and facilitate the communication of this type of information while having a formal procedure. Indeed, the weekly /monthly system makes it possible to communicate on the employees' activities and to send a positive image to its superior with each time the weekly (or the monthly) is correctly filled. That can in particular play a part as for the appreciation of the employee by his superior.

- **Management Presentation:** We refer here to the BI presentations made by BI executives to the top management. These presentations are as formal as a Weekly/Monthly report because they enable BI executives to communicate on their activities and to legitimate their work.

3 Summarizing the Results of the Study

The previous paragraphs allowed us to understand some of the motivational aspects at Omega. The idea now is to analyze the data collected at Omega according to the HR motivational model presented previously. Let's go back to the HR motivation systems defined by Hannon and see their impact on Omega.

3.1   The Performance Evaluation System

At Omega, only a few employees are evaluated upon a formal performance criterion when it comes to BI activities. This is the BI executives who have 100% of their work related to BI activities. Some formal tools are developed anyway trying to enhance BI activities such as the reporting tools (weekly/monthly reports and management presentation). Employees can be evaluated within those formal systems by the hierarchy.

3.2   The Compensatory System

There are some award systems developed at Omega. As we seen previously it is more like moral rewards than financial once at Omega.

3.3   The Carriers' Planning System

The link between carrier planning and BI activities is not clear and systematic at Omega. The link can be defined as indirect because the performance can be linked to BI activities and at the same time to the carrier planning system.

3.4   The Employees Benefit System

This system brings some benefits at Omega employees according to their BI activities. Some of them are enhanced to participate at congress and manifestations in

order to obtain information concerning their competitors. But they do not have any incentives for BI in a typical way (formation to BI tools for instance).

3.5 The Disciplinary and Separation System

At Omega, all the employees do sign a document for confidentiality and non competition. This basically preserves the company's interest. But employees at Omega see this procedure as a formality and seem not to matter that much about it.

4 Conclusions

This paper was about linking HR to BI assuming that HR functions can play an important role in motivating BI executives and employees. Sharing this point of view with other authors like John Hannon [10] and Boettcher and Welge [4] we suggest using HR functions in order to enhance BI activities in a firm.

We started by a literature review, trying to determine which factors may have an influence in the motivation of BI employees and executives. We focused on Hannon's five HR systems' model to describe how HR systems could be linked to BI activities. In a more specific way, we used Hannon's model to determine how HR systems could play a role in executive's motivation and will as far as BI activities are concerned. After that, we used a field study in a big industrial firm to understand how HR functions could be managed in order to increase employees' motivation.

So, we defined five HR functions according to Hannon's work [10] which are: The performance evaluation system, the compensatory system, the carriers' planning system, the employees benefit system, and the disciplinary and separation system. The way of using each one of these systems according to BI motivational issues has been discussed. Both HR and BI managers could take benefit of our study. On one hand, HR managers could understand that they can play a role in a BI system and how they can act in order to develop such a system (using the five HR systems previously explained) and, on the other hand, BI managers could give much more importance to BI employees' motivation, understanding that it is crucial and working with the company's HR functions.

Of course as we previously said, this is an exploratory study that must be developed and pushed further in some future work. Studies making the link between HR management and BI system are rare and are still to be developed. Finally, the idea of this paper is basically about changing the way of looking at BI activities stressing that motivational aspects are essential and can no longer be neglected.

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