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## **CONTRIBUTION OF NORMATIVE STAKEHOLDER THEORY TO AN EDUCATIONAL DATA WAREHOUSING PROJECT**

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### **Abstract**

With exponentially growing data quantity, the importance of succeeding in educational data warehousing implementation significantly increased. High level of system quality is more associated with succeeding in organizational- and project implementation than in technical implementation, therefore this thesis aims to find a way to improve factors affecting organizational- and project implementation success. Majority of them is strongly people-related, but still there is a gap in literature on how these factors should be improved. Many researchers in the discipline of stakeholder theory are engaged with stakeholder identification and classification. This research investigates how normative stakeholder theory can contribute to the improvement of these people-related factors by conducting an exploratory case study. Stakeholders of a learning analytics project at the University of Amsterdam are identified and classified in accordance with a significant classification model, furthermore, presence of the previously defined factors is measured within the project. As a result, this paper provides several recommendations on the improvement of these factors by linking them with the identified and classified stakeholder groups.

### **Introduction**

As quantity of data exponentially increased in the last decades, collecting data manually from several sources was more time-consuming and the chance for errors became relatively big. Furthermore, data had to be 'cleaned up' before analysis and new policy implementations into databases were often impossible (Hoekstra, 2014). Therefore the importance of data warehousing (DW) projects noticeably increased in the last couple of years (Rome, 2004; Cuzzocrea & Dayal, 2011). Ineffective stakeholder management can easily lead to mistakes, delays and misinterpretation or misunderstanding of information, which can have crucial consequences, even the failure of the project (Nelson, 2007; Cerpa & Verner, 2009). Many scholars in the discipline of stakeholder theory highlighted the significance of identifying, classifying, involving and engaging stakeholders and their claims (e.g. Mitchell et al., 1997; Agle et al., 1999; Espinosa-Orias & Sharratt, 2011; Parent & Deephouse, 2007). Most of the literature examines the previously mentioned issues in an organizational environment. But what happens if stakeholder identification and classification are examined the context of an educational data warehousing project? How could stakeholder theory help in a better understanding of DW implementation success?

There are several factors in the data warehousing literature that are proved to influence data warehousing success, substantial part of them can be closely related to the management of stakeholders, for instance adequate user participation, proper management support, high level of team skills etc. (Wixom & Watson, 2001; Shin, 2001; Yeoh & Koronios, 2010). Using Mitchell et al.'s (1997) normative stakeholder theory as the backbone of the theoretical framework, stakeholder groups can be identified and classified by assigning the attributes of power, legitimacy and urgency to them. This way, better identification and positioning of stakeholder groups are assumed to help improving the factors affecting DW organizational- and project implementation success. In this research, the following questions are aimed to be answered: *Who are the potential stakeholders in the project? How are stakeholder groups classified in the project?* To do so, an exploratory case study is conducted by examining the UvAInform Learning Analytics project at the University of Amsterdam (UvA).

### ***Learning Analytics and the UvAInform Project***

There are many ways of exploiting the advantages of educational data warehousing, but analyzing individual behaviour is one of the most profitable options, especially in the fields of sales and marketing (Wixom & Watson, 2001). Considering the same principle in the world of education, there are lots of opportunities in tracking and analyzing individual student behaviour and performance during the whole period of studying. Learning Analytics (LA) collects, measures, analyzes and reports findings on the basis of “digital breadcrumbs” that learners leave in different computer systems with the main purpose of comparing and predicting student performance, discovering social interactions and optimizing learning outcomes and learning environments (Educause, 2011; SOLAR, 2010).

In this research, the UvAInform Learning Analytics project is examined. The objective of UvAInform is to deliver a community sourced, secure, scalable repository for the use of learning analytics within the UvA. Learning Record Store (LRS) subproject is focusing on building a repository of student activity. The LRS will reliably store and retrieve data from Blackboard, Student Information System, MijnUvA and potentially 60-65 other systems from the UvA. The LRS is designed to work at scales above 100 billion records and will enable collecting student activity streams, querying and administration. The LRS is planned to be the basis for several pilot projects focusing on applications and data visualization for potential users.

### **Normative Stakeholder theory**

Modern management literature takes the concept of stakeholders into consideration since Freeman (1984) published his significant book: *Strategic Management: A Stakeholder Approach*. He aimed to enable managers to understand and adequately and effectively manage stakeholders. He defined stakeholders as “*any group or individual who can affect or is affected by the achievement of the organization's objectives*” (Freeman, 1984, p.46). Stakeholders have to be identified in order to manage their claims and to be aware of their influence, (multiple) roles or even their existence. According to Mitchell et al. (1997), Freeman's (1984) definition is a very broad one based on the “*empirical reality that companies*

can indeed be vitally affected by, or can vitally affect, almost anyone” (p.857). Setting boundaries thus is necessary when it comes to stakeholder identification and classification. Also, effective prioritization is needed as treating stakeholders equally will be cost ineffective and “will potentially conclude in a stalemate with opposing positions” (Currie et al., 2009). In the significant article of Mitchell et al. (1997), the basis of normative stakeholder theory was formed by researching the potential positive influence between stakeholders’ possession of three attributes (power, legitimacy and urgency) and stakeholder salience (“the degree to which managers give priority to competing stakeholder claims” (Mitchell et al., 1997, p.869)).

Based on how many attributes stakeholders possess, Mitchell et al. (1997) identified seven types of stakeholders, as can be seen on Figure 1. Each stakeholder type has different characteristics.

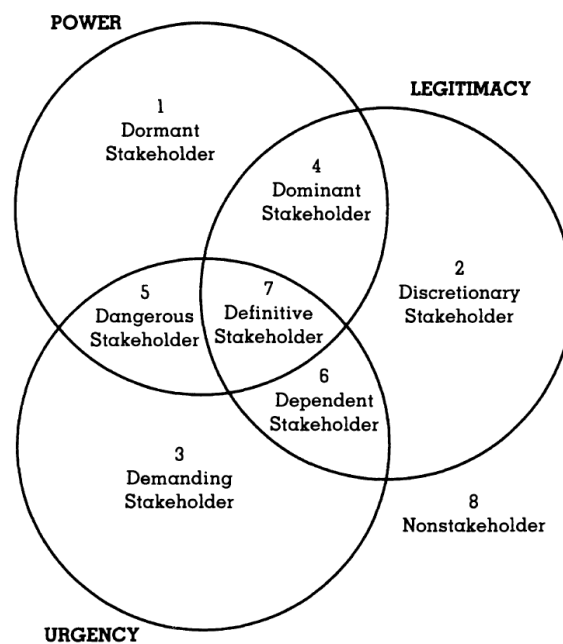


Figure 1. Stakeholder classification (Mitchell et al., 1997, p.874)

According to the model, if a person or group does not possess any of the attributes then it is not considered as stakeholder. Stakeholders possessing one attribute are called latent stakeholders (marked with 1, 2 and 3). These stakeholders are often not even recognized by managers. Stakeholders who possess two attributes are the ones who enter the ‘active’ zone from the ‘passive’. This category was named expectant stakeholders (marked with 4, 5 and 6). When all three attributes are present at individuals or groups, they are called definitive stakeholders (marked with 7).

## Stakeholder identification

According to Vos and Achterkamp (2006), all potential stakeholder groups can be identified by individual brainstorming methods. During brainstorming sessions with 2 managers involved in UvAInform, all potential stakeholder groups were debated and were put on a list after arguing pro and contra in accordance with Freeman’s (1984) stakeholder definition. If at least two out of the three participants agreed that a stakeholder can affect or be affected by the

achievement of the project than it was put on the initial stakeholder map. If a stakeholder group was put on the map, and if it was related to another group that was already on the map, the relation was illustrated between them with a line or an arrow. This initial stakeholder map helped visualize the organizational structure of UvAInform project. Two key persons were identified who were assumed to be able to clear up the remaining concerns about non-identified groups or stakeholders whose position could not be accurately defined. Therefore a semi-structured in-depth interview was conducted with both of them. Both interviewees were asked at the beginning of the interviews to introduce themselves, their role(s) and responsibilities in the project. Due to privacy reasons, names of all interviewees in this research are not documented in this research. The first interviewee was identified as the coordinator of the UvAInform project and was therefore asked firstly to identify all stakeholders in the project, secondly to compare his list to the initial stakeholder map. The second interviewee was identified as the person being responsible for the communication bridge between the UvA and external expert organizations. Resulting from the brainstorming sessions and the two interviews, the final stakeholder map was drawn including 22 potential stakeholders, their relations and hierarchical structure.

### **Stakeholder classification**

#### ***Methodology***

In order to classify the stakeholders, ten persons were selected for semi-structured interviews in a way that all of them should be aware of the existence of most of the stakeholder groups and with the aim of representing as many core stakeholder groups with management functions as possible. Stakeholder groups outside the core bodies were not involved in this part of the research as most of them are not aware of many stakeholder groups and they would not have been able to judge whether particular stakeholder groups possess the attributes of power, urgency and legitimacy.

Before the interviews were conducted, participants were asked to fill in an online survey. The survey aimed to support the interviews as limitation of time did not allow the interviewer to ask about every stakeholder group separately. Filling out the survey also helped interviewees think of all potential stakeholder groups before the interview and this way they could be more prepared. Consequentially, the survey was not meant to support the research with quantitative methods and therefore it was not analyzed statistically. In the survey, interviewees could agree or disagree on a 9-point Likert scale with statements regarding all stakeholder groups' conditional possession of stakeholder attributes (power, legitimacy, urgency) (Mitchell et al., 1997). Additionally, these statements were also built on the work of Agle et al. (1999) who analyzed the construct validity of the attributes.

During the first part of the interviews, rationales behind participant's survey answers were detected in order to find out why they think that particular stakeholder groups are more or less powerful, legitimate than others and why different stakeholder groups' claims are more urgent than others'. Interview protocols were the same as by the previous ones with the exception that one interviewee was interviewed via Skype as he was abroad by that time.

When analyzing the interviews, majority's opinion on the possession of stakeholder attributes was taken into consideration, it determined the classification of stakeholders.

## **Results**

Most of the stakeholders were recognized as definitive stakeholders meaning they possess every attribute. Although all of these groups should get the highest attention, there are some differences within the groups. Board of the UvA (1) and the Steering Group ICT (2) are on the highest level of the internal hierarchical structure of the UvA, huge majority of the interviewees declared them as one of the most definitive stakeholders, because formally they have the final words on every major decision. Lots of interviewees emphasized that every organization within the UvA is legitimate, but hierarchical levels influence the level of legitimacy. According to almost all interviewees, the two most important stakeholder groups were the Expertise Group Education (EGE) (10) and the Learning Analytics Focus Group (LAFG) (10). LAFG is the actual steering group of UvAInform project, they are deciding on every decision, however EGE is even more definitive as they can overrule decisions of LAFG anytime. They have the real power to cut budgets, allocate resources as bodies above them in the hierarchy make decisions mostly based on their advice. Every interviewee agreed on that every organization that is directly supporting the operational work of the project, possesses all attributes. These are the UvA IT Support Centre (ICTS) (3), the Learning Record Store (LRS) Steering Board (14), the pilot project managers (15) and the system developers (16). ICTS and developers are especially important according to some of the participants, for instance, Interviewee#5 said that *"The project is hugely dependent on them technically, ICTS has a large number of experts and they are the ones deciding on technical feasibility of pilot projects"*.

Every participant declared that data privacy regulation and support has significant role in the project, therefore UvA Legal Affairs (7) and UvA Ethics Committee (8) have the power and legitimacy to influence the project (even if they don't use it at the moment, so they are rather 'phantom' definitive stakeholders) and of course their claims would be very urgently handled once they are more involved.

There were four groups classified as definitive stakeholders, but it was not that simple to put them in the 'box' as some interviewees either did not have enough information on the stakeholder group or there were different and opposite opinions about their attribute possession. UvA Academic Affairs (6) is an organization on a high hierarchical level within the university. According to Interviewee#10, they are definitive, because *"UvAInform has to fit in the academic direction of UvA, so Academic Affairs surely does the power to influence the outcome of the project, UvAInform has to take Academic Affairs' claims seriously"*. On the other hand, few people said that they are too far away in the organizational structure to have serious influence on the project. Academic Affairs is also a phantom stakeholder group as it does not use its power. Most of the participants did not have enough information on how a potential cooperation with Uvadata (5) would be fruitful, but the ones who did, emphasized that involving managers of Uvadata could help accelerate the project. Consequentially, although they are not willing to cooperate at the moment, Uvadata does have power (even if

they do not use it, they are ‘phantom’ stakeholders as well), legitimacy and their claims would be handled urgently. UvA teachers, professors (19) and UvA study advisors (20) are one part of potential end-users of the project. They are not fully involved so far, but according to the majority of interviewees, maybe not strongly, but they do possess all attributes, for instance Interviewee#10 said that *“Faculty representatives in LAFG sometimes talk with professors and study advisors, and this way maybe just very weakly, but they can indirectly influence decisions”*.

Two groups were recognized as dependent stakeholders, which means they do not possess power, but they are legitimate and their claims are urgent for the management. UvA Portfolio Management (4) is high-level central body at the UvA, but *“They don’t have real power to influence the strategic direction of the project as they only have administrative functions”* according to Interviewee#4. As they are reporting to the UvA Board, they are legitimate and majority of participants said that their claims have to be managed urgently in order to get the project properly documented. Current UvA students (17) are dependent stakeholders as they had power in the project if they would be involved. Participants had different opinions on how urgently their claims would be managed, but more interviewees stated that they possess urgency even if not as most of the definitive stakeholders do. As they are the primary end-users of UvAInform, almost every interviewee would delegate power to them and this way make them definitive in the project. The difference between current UvA students and the ‘phantom’ definitive stakeholder groups is that while UvAdata, Legal Affairs etc. do have a the power, but at the moment they are not willing to use it, current student do not have the power, therefore they are dependent on the management of UvAInform, who could give it to them.

Three groups possess only the attribute of legitimacy (discretionary stakeholders). External expertise groups (9) do not have power to influence the project and their claims are also not being managed urgently enough according to the majority of participants. Although they do not have as high legitimacy as internal organizations, they are proper stakeholders of the project according to most interviewees. Interviewee#9 stated: *“External expertise groups don’t really have claims in this project, however, management of UvAInform should consider their guidelines, research directions and findings much more often and in a more urgent way in order to contribute to LA research in a proper way. More than one person should be connected with them in order to better communicate the external community standards”*.

Two other potential end-users were also recognized as discretionary stakeholders: UvA incoming students (18) and UvA educational program directors (21). As incoming students are not part of the organization of the university yet and educational program directors are only meant to be side users of the project, they only possess legitimacy.

Other expertise groups (9) and focus groups (11) within the UvA are non-stakeholders. They were potential stakeholders because they are competing for budget against EGE and LAFG, but this competition is not a real one, and they cannot influence the project, according to almost all of the interviewees. Future employers of UvA students and HR agencies (22) are

still not real potential end-users, they will not be involved in the near future, said majority of the interviewees.

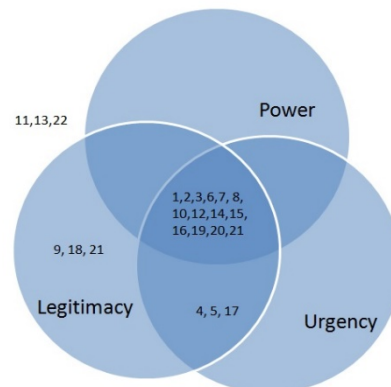


Image 2. UvAInform stakeholder classification

## Conclusion

Using qualitative methods (brainstorming, semi-structured interviews some backed up with a survey) and applying normative stakeholder theory, 22 stakeholder groups were identified and classified. Classification model did not provide clear distinction between the majority of stakeholder groups, as most of them were defined as definitive stakeholders. This still leaves project management struggling with the problem of how to differentiate them and their claims. Every definitive stakeholder group should get high attention, but it might make it almost impossible for the management to reconcile so many claims with the highest attention, therefore differentiation is needed. Results of the classification model indicated that besides having differences in attribute possession (there are many groups more powerful, legitimate etc. than others), there are three subcategories to be differentiated. Firstly, there are the 'real' definitive stakeholders, for instance EGE and LAFG that apply and use their attributes unequivocally. In general, management teams are assumed to represent this category as they need to use their attributes to run the project. Secondly, the 'partially phantom' definitive stakeholder groups who are the formally the most powerful and legitimate groups with the most urgent claims, but they are not involved in the operational processes and only use their influence when they really feel it is necessary. In the UvAInform project, CvB and Steering Board ICT represented most likely this subcategory, in general, shareholders of organizations where projects run are assumed to be these groups. Lastly, there are the 'phantom' stakeholders who do have all the attributes but do not use them, simply because they do not have an interest in using them. Uvadata can be a typical example for this category in UvAInform, while in general, potential suppliers and strategic partners could fit in this class. It should be the management's responsibility to convince 'phantom' stakeholder groups to cooperate, this way raising the chance of a more successful DW implementation.

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