

A METHOD TO EVALUATE THE ROLE OF STAKEHOLDER DYNAMICS IN INNOVATION ADOPTION PROCESSES; THE STAKEHOLDER-BASED INNOVATION ACCEPTANCE WEB (SIAW)

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The introduction of innovations in organizations with high professionalization seems to lead to mixed results in practice. It is widely known that innovation adoption success is largely dependent on user commitment and absorption of the innovation in work processes. However, the hardest task for any person interested in innovation implementation activities is how to achieve high levels of commitment and acceptance of those stakeholders that matter the most. In this article, we argue that much can be gained by having good insights in indicators of both influence *and* acceptance of stakeholders during innovation implementation and adoption phases; the so-called socio-technical dynamics. To gain insights in a stakeholder's potential influence and potential acceptance of the innovation *during* the innovation implementation project, we argue that stakeholder capacity and intentions are key characteristics. By reviewing relevant theoretical foundations relating to innovation implementation, technology acceptance and stakeholder theory, we argue that literature considering the combination of both capacity as well as intentions in an integrated evaluation model is scarce.

In this article, we are presenting a synthesized model and methodology for the iterative evaluation of stakeholder dynamics during innovation implementations; the stakeholder-based innovation acceptance web (SIAW). Insights in the combination of capacity and intentions dimensions can help in focusing and matching engagement strategies. The practical model, as part of the iterative methodology, aids in visualizing and classifying stakeholders in order to determine stakeholder engagement priorities during an innovation implementation project. Preliminary findings using the here described methodology look promising and indeed seem to support stakeholder engagement decision making favoring innovation adoption outcome.

Keywords: innovation adoption, stakeholder analysis, stakeholder dynamics, technology acceptance.

Introduction

The introduction of new technology in organizations with high professionalization seems to lead to mixed success results in practice. Project managers continuously have to decide when and how to engage a large arena of different stakeholders during the innovation implementation process, in order to optimize the innovation outcomes (Vos and Achterkamp 2006). According to Ferlie et al. (2005), high professionalization of an organization can slow innovation spread due to social and cognitive barriers. These kinds of professional differences can only be overcome by means of social interaction, trust and motivation. The social interaction between peers, sharing opinions within the own community of practice, is of high importance in that respect (Gallivan 2000). Creating trust, motivation and ensuring appropriate levels of interaction can be achieved through means of active and matching modes of engagement during the innovation implementation. This demands a clear view of the stakeholder environment relevant for the innovation implementation and the individual and clustered stakeholder interests, stakes, intention, influential power and values. Only then active engagement strategies and corrective interventions can take form and can be evaluated over the course of the innovation journey. In practice however, we often do not have the time nor opportunity to engage actively with all stakeholders involved. Therefore, it would be of great value to be able to prioritize stakeholder in such a way that both influence and intentions of a stakeholder can be taken into consideration.

In this article we explore whether such an integrated model, taking into account both dimensions of influence and acceptance, does exist and what constructs would matter in designing such a model.

Eventually, the main goal of this article is to present a practical tool and methodology that enhances insights in complex stakeholder environments. We hypothesize that for a correct fit between engagement strategies and stakeholder environment, we need combined insights in technology acceptance of stakeholders as well as stakeholder influential capacity on innovation outcomes. In other words, we need a tool that is able to answer the questions of *who* matters and *in what way*, in such a way that it can be used in practice to design engagement strategies and corrective actions.

In this article we are focusing on the implementation of innovations in organizations with high professionalization. This paragraph highlights some key innovation concepts and findings in research potentially relevant for our research goal.

As described by Frambach (2002), *product* innovation adoption is the *decision* of any individual or organization to make use of an innovation (Frambach and Schillewaert 2002). This implicates an innovation to be a static yes or no decision. In his dissertations, Rogers (1995) considers innovation adoption more as a *process* than just a discrete decision in time. He describes innovation adoption as *the process through which an individual or other decision making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision* (Rogers 1995). In the point of view of Van de Ven (1989), the above mentioned phases and activities may occur sequentially, but always with feedback and feed-forward loops. (Van de Ven, Angle et al. 1989; Rip and Schot 2002) In other words, according to the process view of innovation, there's a continuous change and evolvement of salient stakeholders as well as the innovation at hand. This can be best described by the

innovation journey analogy of Van de Ven (1989); there's no preset path given in advance, travelers create a path by walking.

Stakeholder Dynamics

We consider the travelers of this innovation journey as stakeholders of the innovation at hand. For the definition of a stakeholder we refer to the description of Freeman (1984) where a stakeholder in an organization is by definition any group or individual who can affect or is affected by the achievement of the organization's objective. Clarkson (1995) extends the concept of stakeholder to a person or groups that have, or claim, ownership, rights, or interests in a corporation and its activities, past, present, or future (Clarkson 1995). In other words, stakeholders are located either internal or external of the organization, with some sort of interest and/or stake with respect to an objective, in our case, the innovation (objectives) that can change over time. Important to note is that the set and number of stakeholders are context- and time dependent and viewpoints and wishes of stakeholders may change over time (Burgelman and Sayles 1986; Pouloudi 1999; Pouloudi and Whitley 2000). In their research, stakeholder behavior can be captured in a set of universal principles. These principles lead to a set of implications for the proper identification and classification of stakeholders.

Principles of stakeholder behavior	Implications for stakeholder identification and analysis
1. The set and number of stakeholders are context and time dependent	<ul style="list-style-type: none"> Stakeholder map should reflect the context Stakeholder map should be reviewed over time
2. Stakeholders can not be viewed in isolation	<ul style="list-style-type: none"> Consider how stakeholders are linked
3. A stakeholder's role may change over time	<ul style="list-style-type: none"> Adopt a long-term perspective; study how perceptions change
4. Stakeholders may have multiple roles	
5. Different stakeholders may have different perspectives and wishes	<ul style="list-style-type: none"> There are different versions of the stakeholder map for different perspectives
6. The viewpoints and wishes of stakeholders may change over time	<ul style="list-style-type: none"> These different versions should be studied over time
7. Stakeholders may be unable to serve their interests or realize their wishes	<ul style="list-style-type: none"> Need to consider political issues (as well as technical, economic or other)

Table 1:
Key stakeholder behavior principles

The principles implicate that, due to the dynamic nature of the stakeholder environment, only by means of *iterative* stakeholder analyses, insight in the composition and influences of the stakeholder environment can be gained in relation to the specific innovation. For the purpose of our research, we define stakeholder dynamics *as the continuous changing configuration of stakeholder clusters as a result of changes in stakeholder priority*.

Stakeholder identification and classification

As described by Vos et al. (2006) stakeholder identification is mostly about determining which stakeholder is considered to have some sort of interest with respect to the issue of

investigation (Vos and Achterkamp 2006). The authors describe a method focusing on identifying stakeholders in the particular context of innovation projects. We build on their presentation of two distinct phases of stakeholder analysis methodology; the preliminary identification (shortlist) and following the classification of stakeholders. The classification of stakeholders determines a stakeholder's priority. In practice, these two seemingly separate activities of identification and classification can be executed in congruence. As described by Savage et al. (1991) stakeholder assessments should include the capacity, opportunity and willingness of a stakeholder in relation to the issue.(Savage, Nix et al. 1991). In the next paragraphs we will elaborate on these constructs.

Stakeholder Priority: Capacity And Intentions

As it appears, we need principles of stakeholder theory to account for a stakeholder's importance (who matters) or salience as well as technology acceptance and behavioral constructs to account for the *direction* of the stakeholder salience (how do they matter in relation to innovation implementation outcomes). In other words, both a stakeholder's capacity as well as its intentions need to be considered *in conjunction* for the evaluation of the impact of a stakeholder on innovation adoption processes; we need both dimensions of the stakeholder engagement priority vector (figure 1). In this section we will explore the constructs of capacity and intentions and the stakeholder characteristics that can be used to describe them.

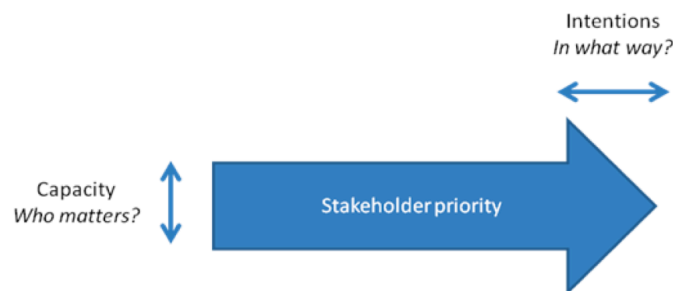


Figure 1:
Stakeholder engagement priority as a vector

Stakeholder capacity; potential influence

When considering a stakeholder's capacity to influence innovation implementation projects, one may build on dynamic stakeholder theory research. According to dynamic stakeholder theory, it is stated that the attributes urgency, power and legitimacy are positively correlated to the earlier mentioned salience of stakeholders, as described by Mitchell (1997) and Bourne (2005) as the degree to which managers give priority to competing stakeholder claims.

These attributes make it possible to describe a stakeholder's capacity; to classify who matters the most. A definitive stakeholder possesses all three attributes; an expectant stakeholder possesses two; a latent stakeholder possesses one; and a non-stakeholder possesses none. Stakeholders may shift from one class to another over time and across the issues facing the organization, as is the case in our metaphor of the innovation journey that

is undertaken by stakeholders (Rossetti, Hill et al. 2009). Bourne (2005) further expanded the framework of Mitchell et al. (1997) by arguing that the attribute urgency is dependent on a stakeholder's vested stake in a project (eg. innovation implementation) and the importance of the stakeholder to the project. Furthermore, instead of legitimacy, Bourne (2005) argues that the concept of proximity gives a better classification in relation to a stakeholder's salience.

In conclusion, even though dynamic stakeholder theory attributes account for a prioritization of stakeholders, it is solely based on capacity dimensions. No classification of acceptance or intentions is provided by the predominant theories discussed. The salience of a stakeholder alone does not state much about the intentions or stance of the stakeholder with respect to the innovation. For example, definitive stakeholders can both oppose or support the innovation. They both have substantially different effects on how a stakeholder's capacity is, or potentially will be, enacted. Both enactments demand for different engagement strategies or interventions from, for example, the project team. This leads to the conclusion that we specifically need to take into consideration additional theory with respect to technology acceptance, to acquire a comprehensive view of the stakeholder environment.

Mitchell's attributes (Mitchell, 1997)	Bourne's attributes (Bourne, 2005)	Definition of attribute
Power	Power	The extent to which stakeholders are able to persuade or coerce others into making decisions, and following certain courses of action; having influence over the situation.
Legitimacy	Proximity	Level of involvement in the project. Legitimacy is used for the extent to which a stakeholder has a legitimate right to be involved in the solution to the problem, with us taking an inclusive stance in the debate on whether such legitimate rights are based on authority, legal rights or by having 'something at risk' in the decision (Mitchell et al. 1997).
Urgency	Urgency, based on two attributes: - Vested stake - Importance to	Urgency is an indicator of the stakeholder's perceived attitude towards the importance or intensity of the problem and need to deal with it. In other words; Feeling strongly enough about an issue to act.
Salience	Priority	Outcome measure; priority resulting from all other attributes.

Table 2:
An overview of the dynamic stakeholder classification attributes

Stakeholder intentions; potential acceptance

In the large body of literature available on the subject of technology acceptance, *individual* innovation adoption is often described as the decision processes to either accept or reject an innovation during the innovation journey. In other words, it is seen as an *individual technology acceptance decision*. Most influential models in this area are the Technology

Acceptance-models (TAM, TAM2), the social psychology models Theory of Reasoned Action (TRA) or the Theory of Planned Behavior (TPB) and more recently the Unified Theory of Acceptance and Use of Technology (UTAUT) (Fishbein and Ajzen 1975; Pijpers 2002; Venkatesh, Morris et al. 2003). In general, these models explain usage behavior as a result of behavioral intention, which in turn is a result of attitude and beliefs with respect to the innovation. TAM describes two dominant beliefs as predictors for actual use of an innovation by an individual; perceived usefulness, the degree to which a person believes that using a particular system would enhance his or her job performance and perceived ease of use, the degree to which a person believes that using a particular system would be free of effort. Comparable predictors can be found in the more recent research by Venkatesh et al. (2003). Beside a stakeholder's technology expectancies, role typology and participation level may aid to classify the *direction* of a stakeholder's capacity. (Savage, Nix et al. 1991; Vos and Achterkamp 2006).

Role typologies can be used to capture a stakeholder's functional role in terms of involvement in the project. The use of role typologies may raise indications that in a certain point of time, the salient stakeholder community or decision making unit lacks certain roles or that stakeholders fulfill too many roles at once, which may require corrective action. In this way, the addition of role typologies to our evaluation methodology can help in shaping corrective implementation activities and to better characterize a stakeholder.

The main rationale behind the typologies is that along the scale from informative-consultative-decisional, the more involved the stakeholder is in the shaping of the innovation. (Green and Hunton-Clarke 2003)

From the theoretical domain of Organizational Development (OD), Passmore & Fagans (1992) described a *participation theory* that characterizes five levels of participation and success factors for effective participation, ranging from conforming to creating. (Passmore and Fagans 1992) Their model may help in classifying stakeholder involvement in the project. Since the model assumes some form of participation, no classification is included for 'destructive' participation or resistance. For the purpose of our research model, however, opposition might be a found level of participation. We therefore include this additional level in the model.

In conclusion, where dynamic stakeholder theory in general lacks attention to intentions, the way capacity can potentially be enacted, the above discussed models do not take into account the salience of a stakeholder in the stakeholder environment; they treat each individual equally. In other words, all stakeholders are considered equally influential. This makes these models often impractical to use in complex project environments. In practice, not all stakeholders intentions can or need to be constantly taken into account; some stakeholders may be more important with respect to innovation outcome than others.

An Evaluation Methodology

In order to be able to establish stakeholder environment dynamics *snapshots*, we integrate the discussed dimensions in a visual model. The relevant constructs of innovation adoption and technology acceptance theory are combined with the relevant and proven constructs of

stakeholder theory. Where possible, we use validated and previously tested constructs and scales (Appendix I).

We will use the above dimensions as *vectors*, where we separate the capacity and the participation/role domain. The domain of individual acceptance dimensions additional and adjacent to both of the other domains. This can be visualized as follows.

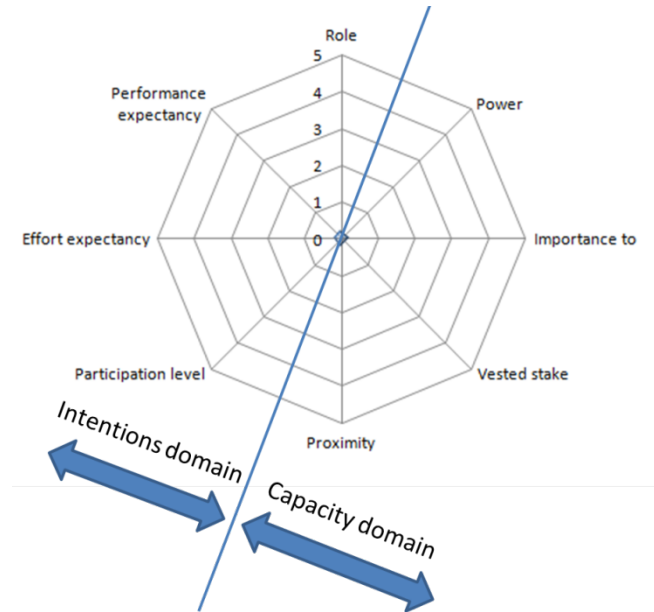


Figure 2:
SIAW vector representation of dimensions

The proposed kind of modeling makes it possible to construct visual stakeholder snapshots at different phases of the implementation trajectory.

Engagement priority

Based on the constructs of the SIAW, outcome measures can be identified that can be used to compare stakeholders or to compare one stakeholder's profile over the sequence of phases during the innovation journey. Furthermore, these measures can be used to prioritize stakeholders for engagement and to suggest possible engagement strategies. The main outcome measures is *engagement priority*, consisting of the combination of the outcome measures *potential stakeholder influence* and *potential stakeholder acceptance*.

The combination of the role and power vector can be considered a secondary measure; the *power-function match*. The table below summarizes the measures and its meanings.

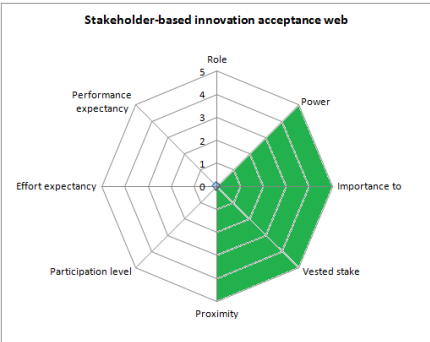
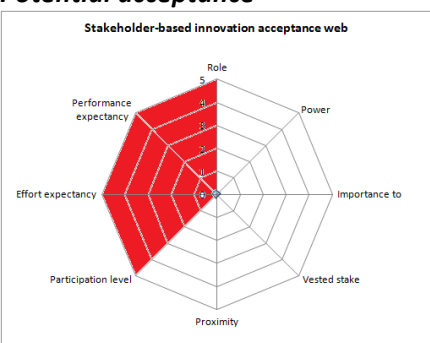
Measure	Root dimensions	Large covered area indicates...
<p>Engagement priority</p>  <p>Stakeholder-based innovation acceptance web</p>	<p>Role Power Importance to Vested stake Proximity Participation level Performance expectancy Effort expectancy</p>	<p>High level of need for attention or engagement priority</p>
<p>Potential influence</p>  <p>Stakeholder-based innovation acceptance web</p>	<p>Power Importance to Vested stake Proximity</p>	<p>High capacity of stakeholder to exert influence with respect to the innovation during and after implementation.</p>
<p>Potential acceptance</p>  <p>Stakeholder-based innovation acceptance web</p>	<p>Role Performance expectancy Effort expectancy Participation level</p>	<p>Low potential acceptance based on intentional characteristics of the stakeholder only. <i>So not adjusted for the salience of the stakeholder. Note that this is an 'inverted' score, since we use the web to indicate areas for attention.</i></p>

Table 3:
Outcome measures explained

Engagement strategy modes

Now we discussed the concepts of capacity and intentions leading to an engagement priority, it is time to elaborate on how to possibly engage the different stakeholders, now we have insights in their capacity and intentions. Richards et al. (2004) indicate that different levels of engagement are likely to be appropriate in different contexts, depending on the objectives of the work and the capacity for stakeholders to influence outcomes (Richards, Carter et al. 2004). Also, theory exists with respect to strategies for managing organizational stakeholders. (Savage, Nix et al. 1991). The potential threat and the potential to collaborate of a stakeholder make it possible to distinct four different types. In their article, Savage, Nix et al. (1991) describe the four types of stakeholders as either supportive, marginal,

nonsupportive or mixed blessing (Savage, Nix et al. 1991) based on these dimensions of a stakeholder. This connects to our previous elaboration on what factors contribute to a person’s behavior towards an innovation (eg. remember the discussed technology acceptance models). We take the underpinnings of their model as a basis for our strategy and stakeholder type matrix. Key components of our literature review include the potential influence and potential acceptance of a stakeholder, connecting to the described typologies.

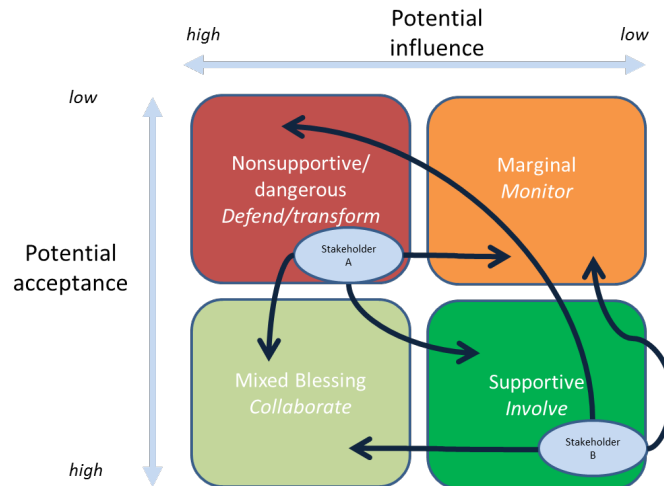


Figure 3:

Engagement strategy modes based on potential acceptance and potential influence measures

Each type of stakeholder demands a different type of engagement strategy, that can be operationalized in detail according to the project circumstances. According to this model, one of the engagement strategy fundamentals is to transform stakeholder relationship from a less favorable to a more favorable one. Less favorable is seen as low acceptance (and high capacity). So instead of just acting based on the evaluated stakeholder quadrant, one must evaluate the intended transformation direction of the stakeholder, i.e. changing a stakeholder's expectations/intentions or capacity, and plan actions accordingly. Due to the iterative nature of the here described methodology, effects of interventions can be monitored.

In terms of the constructs of our research, acceptance can be transformed over the low-to-high continuum by changing (a combination of) effort expectancy, performance expectancy, level of participation or functional role. Transforming influence means, in the light of our research framework, trying to alter a stakeholder’s power, proximity, vested stake or importance to the project.

Stakeholder type	Engagement strategy	Strategy modes
Supportive <i>Supports (project) organization goals and actions</i>	Involve <i>Involve in relevant issues, encourage cooperative potential; increase decision-making participation.</i>	1. Improve influence 2. Maintain acceptance
Marginal <i>Not concerned</i>	Monitor <i>Monitor the interests of the stakeholder, involve in specific relevant issues.</i>	1. Monitor/Improve acceptance 2. Only then: Monitor/improve influence
Nonsupportive (dangerous) <i>Most distressing, high influence, low acceptance.</i>	Defend/transform <i>Reduce dependence on the stakeholder. Try to change capacity status of stakeholder (by enhancing other stakeholders) or try to transform intentions by eliminating uncertainties.</i>	1. Increase acceptance 2. Decrease influence
Mixed-Blessing <i>Can swing both ways in terms of influence and acceptance</i>	Collaborate <i>Maximize collaboration. Not collaborating leads to the risk of transferring the stakeholder to a nonsupportive one.</i>	1. Maintain acceptance 2. Maintain influence

Table 4:
Stakeholder types and connecting strategies

An iterative evaluation methodology

The above-discussed model gives insights in the development of a way to determine who really matters and how the stakeholder matters by combining the capacity and intention constructs. This in turn helps in shaping and executing engagement strategies consisting of interventions.

In this paragraph, an iterative evaluation methodology is presented, based on the above elaborations. The developed SIAW is part of this methodology. In order to account for time related dynamics, one is advised to periodically perform these steps, in congruence with the proposed methodology of Vos et al. (2006).

(i) stakeholder identification

From the intra-organizational spectrum of individuals one need to preliminarily indentify all actors that might be affected by the innovation process. This can be done by documentation, conversations and interviews with different organizational members (Vos and Achterkamp 2006). This produces a list of relevant stakeholders.

(ii) stakeholder classification

In this step, the stakeholder-based innovation acceptance web (SIAW) proposed here is constructed.

The identified stakeholders need to be classified based on their capacity and intentions. In other words, all stakeholders need to be classified on the dimensions proximity, vested stake, importance to and power. This makes it possible to further *drill down* to those

stakeholders that really matter. This determines the composition of the decision making unit . Subsequently, we are interested in the roles and levels of participation and coping tactics of these important stakeholders. *How* do they matter; what is their role with respect to the innovation? This can be done by means of workshops and interviews and based on available documentation. The SIAW can then be constructed by the project team.

(iii) determine engagement priority

The different stakeholder-based innovation acceptance webs over time, give insights in the dynamics of the decision making unit. Each web results in a set of outcome measures as discussed earlier. These outcome measures indicate a stakeholder's engagement priority at a certain point in time.

(iv) determine engagement strategy and interventions

Based on the outcome measures, one can classify an engagement strategy. The iterative webs and the outcomes can be discussed periodically, linking actions and timelines to the outcome measures. Furthermore, the effect of interventions on (groups of) stakeholders can be evaluated with the help of the webs.

Discussion

In our research we found that the combination of a stakeholder's potential acceptance and level of potential influence during the innovation implementation is not found in integrated models in previous research, so that it provides practical insights to design engagement strategies. We combined stakeholder theory concepts together with key findings grounded in innovation and technology acceptance theory as well as organizational development foundations. This resulted in an evaluative model, consisting of two key domains relevant for innovation adoption outcomes; stakeholder capacity and stakeholder intentions. Furthermore, the model takes into account the dynamics of the stakeholder environment during the innovation journey. The here proposed model can be used to evaluate the evolvement of stakeholders and subsequently the composition of the decision making unit with respect to the innovation at several points in time over the implementation trajectory. The use of the methodology and model proposed here focuses attention to the stakeholder environment and the fit with the innovation implementation. Furthermore, it provides insights in the effectiveness of corrective interventions on (groups of) stakeholders.

The natural tendency for people to only take the active, current stakeholder environment into consideration for engagement tends to ignore the dynamics of the stakeholder environment in practice. A more dynamic approach to the evaluation of the stakeholder context by using a synthesis of constructs may increase insights in the design of appropriate engagement strategies. In this article, we proposed a method for the evaluation of stakeholder dynamics in relation to IT based innovation adoption processes.

Even though the separate concepts used in the SIAW are grounded sufficiently in academic literature, still much debate exists about for example the tedious and ambiguous identification and classification of stakeholders in general. The same holds for the measurement of innovation acceptance indicators. The hardest task for any person

interested in stakeholder management activities is how to achieve a realistic and representative overview of the stakeholder environment.

Empirical research needs to be done to evaluate the method proposed as a whole and its usefulness in practice. In particular, the relation between the combination of constructs and eventual innovation success needs to be investigated. Whether the model will fit a broad variety of situations or even non-IT based innovations is a subject for further research.

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Appendix A

Stakeholder dynamics & innovation adoption: domains, dimensions and constructs; themes and references found.¹

Domain	Dimensions	Scaling (as derived from literature)
Stakeholder capacity	Power Importance to Vested stake Proximity	1 (low) to 4 (high) 1 (low) to 5 (high) 1 (low) to 5 (high) 1 (low) to 4 (high)
Stakeholder intentions	Level of participation Role typology	We use an inverted axis; where 6 Opposing 5 Conforming 4 Contributing 3 Challenging 2 Collaborating 1 Creating (where 1 is the best participation level) 1 Client/informative 2 Designer/consultative 3 Decision maker/decisional (where 1 is low and 3 is high decisive power over innovation)
Stakeholder technology acceptance	Performance expectancy Effort expectancy	1 (excellent) to 7 (poor) 1 (excellent) to 7 (poor)

Table 5:
Stakeholder domains and dimensions

¹ As can be seen, for some dimensions we choose inverted scales. The reasons for this is that we want to use the graph for additional outcome measures. Also note that not all scales are equal, this has to do with the variety of operational constructs used in the dimensions. The choice of vectors and their scales are derived from existing empirically tested constructs.