Implementing IT Strategy – Laying a Foundation

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Abstract: The failure to implement corporate strategies in general and IT strategies in particular can be the reason for lost opportunities, duplicated efforts, incompatible systems, and wasted resources and thus lead to a competitive disadvantage. Empirical works in both domains, business and IT, show a number of problems that exist in practice. Although, being a major concern of business and IT executives, little research and a lack of methodological guidance to support the execution of decisions and actions exists. Since it is important and reasonable to design a methodological support driven by present problems, this article deduces features to compare approaches to IT strategy implementation found in literature. By combining empirical research and method engineering, the approach is in line with the guidelines of design science. On this foundation, we take the first step towards designing the process model of a comprehensive method to implement IT strategy.

1 Introduction

Whenever making strategic decisions, an organization is concerned with the development or implementation of strategy [MA93]. The skills to implement strategies can be a competitive advantage [HV91]. In that effect, efficient strategy implementation is the essential prerequisite for success and requires flexibility in a fast moving market [PW82]. Moreover, IT systems (42%), organizational culture (56%) and organizational structure (42%) are the most important reasons an organization cannot adjust to changes quickly enough and without high costs [Ga07]. IT supports adaptability and therefore acts as a crucial role for the implementation of strategies. Even after more than three decades of research in the disciplines of strategic management and information systems, strategy implementation is not fully understood. Brown shows that between 1991 and 2004 only 10% of scientific work in strategic information systems planning focus on the implementation of IT strategy [Br04]. Briefly, it is much easier to think of a good strategy than implementing it [FW92]. Thus, the implementation of strategies is of increasing interest in practice, since even “good” strategies are not necessarily implemented successfully [RS83].

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In spite of the high interest and implementations crucial role, empirical studies show that 60% to 90% of all strategy implementations fail [WA97]. Due to this obvious insufficiency, we conclude there is an absence of expertise in implementing strategy in organizations. Furthermore, even if a strategy implementation does not fail, the objectives could be met inefficiently without accounting for time and cost [Ta01]. To avoid the latter one can improve implementation skills and structure implementation activities [Re95]. Furthermore, a methodological approach and the adoption of the right activities and techniques can increase the success of strategy implementation [ZS98].

In our paper, we therefore analyze existing approaches for implementing IT strategy. By deducing requirements from practice (problems identified in empirical works) and by using method-oriented scientific approaches (method engineering), we combine two different perspectives and apply these to the problem of implementing IT strategies. We further use a design science approach to allow for a clear process model in our research-in-progress. According to the latter, the identification of the problem, motivation of its relevance and definition of a solution shape the foundation of a research endeavor [He04]. This allows for the design and development of the artifact.

2 Research Methodology and Approach

The basis of this paper is built upon the idea of design science in IS research [MS95, He04]. In particular, this paper is predominantly about step 1 in the design science research methodology (DSRM) process model by [Pe07] shown in figure 1. At first, as described in section 3, we identify the problem and lay out its importance. In this phase, a comprehensive review of empirical scientific literature leads to the requirements for a new approach. We ground these in two different perspectives: design science and scientific approach of method engineering (ME). Choosing the former to improve the rigorousness of design, the latter is chosen to ensure comprehensiveness regarding methodological support.

Next, we conduct a rigor cycle [He07] in section 4 by reviewing existing approaches to implement business and IT strategy [WW02]. Considering IT strategy as an instance of business strategy [Mo07], the requirements for implementing business strategy are also valid for implementing IT strategy. Thus, we analyze the state of the art in implementing business strategy as well as IT strategy in a sound standing and methodological manner. We therefore apply the systematic literature process by [Be07] and fulfill the guideline problem relevance by [He04]. However, we fulfill the remaining six guidelines in future research in steps 2 to 4 of our ongoing research-in-progress (cf. figure 1). The results of our relevance and rigor cycles in step 1 of the DSRM process model are twofold. On the one side, we identify areas that merit further academic research, on the other, we clarify the need for a method to implement IT strategy and therefore create the basis for an initial design cycle as step 2 of the DSRM process model. We fulfill step 2 by designing a process model as the fundamental part of a comprehensive method (section 5). Additionally, we take a first demonstration in a case study into regard in our conclusion. We also fulfill step 4 by the publication of this paper.

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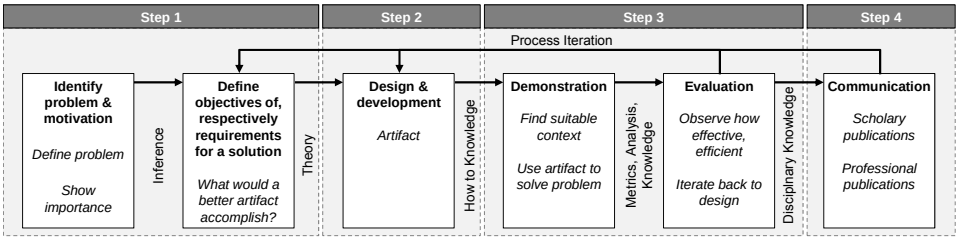

Figure 1: Design science research methodology process model [Pe07]

3 Problems in implementing IT Strategy

Only a limited number of empirical studies analyze common problems in implementing strategy. Despite of its organization wide impact, even fewer studies have a specific focus on IT strategy. Since we understand IT Strategy as an instance of business strategy, we consider empirical studies alluding to business strategy also as valid for the case of IT strategy [BG10]. Therefore, we allow for all empirical studies focusing on problems to strategy implementation in the domains of business and IT. We construe the problem dimensions identified by our analysis as unfulfilled requirements in practice. To allow for a high construct validity [Va08] of our results, we filter for studies with a high level of empirical evidence by applying a rating model by [GP10].

2.1 Examination of existing empirical results

One of the first authors to deal with problems and barriers of implementing strategy is [Al85]. According to his empirical work, the most frequent occurring problems were (1) that implementation took longer than expected, (2) unforeseen problems, (3) ineffective coordination, (4) competing activities and upcoming crisis, (5) insufficient qualifications and skills of employees, (6) insufficient training on lower levels, (7) uncontrollable external factors, (8) inappropriate leadership, (9) insufficient definition of core activities, and (10) insufficient information systems to control implementation.

More than a decade later, [Ag98] conducted another survey based on [Al85] results. His initial trigger was the following perception: „Unfortunately, the drama still continues and the balanced view toward the importance of both sides, formulation and implementation, has not been yet achieved“ [Ag98]. All six identified problems also occurred in his study in a slightly different order: (1) implementation took longer than expected, (2) unforeseen problems, (3) competing activities and upcoming crisis, (4) ineffective coordination, (5) insufficient definition of core activities and (6) insufficient information systems to control implementation.

In another study, [Ni97] identified numerous problems by conducting 58 expert interviews. He derived four problem dimensions to which he could map all given answers. These were:

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(1) Habits, vested rights and fear of changes, (2) the existing organization as a distinct functional structure, data processing and complexity of existing activities and work instructions, (3) social factors and human beings in terms of organizational culture, political behavior, power struggles, personal conflicts, divergence in objectives, strong interest in consensus and disinterest as well as (4) shortcomings in the implementation project as insufficient or inadequate communication, missing methodological and behavioral know how, inconsequence and a long duration.

[St01] also underpin the importance of central problems in implementing strategy by conducting expert interviews. The results include inadequate concretion and detailed definition of strategies, insufficient communication and intercession of strategy content, missing strategy acceptance and therefore behavioral resistance, discontinuity within internal and external implementation environment as well as missing methods and techniques to support an implementation.

[Hr06] conducted one of the newer studies. His goal was to gain insight into barriers of effective strategy implementation. He based his results on two empirical studies. Table 1 shows the resulting ranking. After the survey, he invited participants and experts to challenge the results in group-discussions. According to [Hr06], the first crucial perception of the participating managers was that all implementation efforts require guidelines, and strategy implementation should not be an unstructured process, dependent on outstanding leadership personalities. As a result, [Hr06] states that the first and most important step towards overriding the identified implementation barriers is to develop a structured approach (e.g. guidelines, techniques).

Barrier	**Wharton (n=200)**	**Wharton-Gartner (n=243)**
Inability to manage change and resistance	1	1
Poor or vague strategy	2	5
No guidelines or models available to support the implementation process	2	-
Weak or inadequate communication within organization	4	2
Attempt to implement a strategy in conflict with existing power structures	5	2
Unclear responsibilities within the implementation process	5	4

Table 1. Barriers to strategy implementation (Hr06)

[Go06] is one of the first authors to describe specific barriers to IT strategy implementation. Of all examined works, he observed that „It can be seen that none has as its main focus the implementation of IT strategy“ [Go99]. Subsequently he sent 1108 questionnaires to CIOs in Norway resulting in 151 valid cases. He could identify the following critical problems in IT strategy implementation:

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Resources for implementation not being available, user involvement during implementation to be low, no analysis of the organization has been conducted, changes in environment, potential resistances during implementation, to be implemented information technology and systems, projects not relevant for business strategy, no clear responsibilities for implementation, no management support for implementation and unclear communication. An important finding was that "While the literature on strategic information systems planning treats implementation only as one of many phases, the literature on information systems implementation lacks the gestalt perspective which is needed when plan implementation is to be studied." [Go99]. We conclude that a coherent consideration of all problems is necessary to allow for a contribution to research and practice.

2.2 Deduction of Problem Dimensions

In an overall analysis of the described empirical studies, we conclude that a number of crucial, partially identical problems in implementing strategy exist. Especially in the area of IT strategy implementation, problems leading back to the technological penetration as well as its broad impact and complexity, take an essential effect. Considering all empirical works, we were able to derive five distinctive problem dimensions:

Implementation planning: A number of the mentioned problems regarding execution and control activities allude to the implementation planning process. The authors point to an often insufficient concretion and precision of strategies as well as a missing instrumental support for strategy implementation. The latter causes an unexpected longer duration of the implementation in numerous cases, which we interpret as a clear insufficiency in planning. Hence, general deficits of implementation projects in terms of missing methodological knowhow also correspond to this problem dimension. Furthermore, the absence of guidelines and models supporting implementation activities are described as severe problems.

Organization: Organizational aspects comprise distinct functional structures, existing data processing methods and the complexity of existing activities and work instructions. Additionally, no management support and no clear responsibilities for the implementation also correspond to this problem dimension. Hence, an ineffective coordination because of the organizational situation is a major problem for a successful implementation.

Human resources: In the third dimension, we outline problems in the context of employees and organizational culture as a phenomenon directly related to human beings. This includes social factors, political behavior, power struggles, personal conflicts, and divergence in objectives, strong interest in consensus or disinterest as well as habits, vested rights and fear of change, partly caused by no user involvement and leading to potential resistances during implementation. Missing strategy acceptance and therefore behavioral resistance is triggered by the inability to manage change and resistance, which points to insufficient qualifications and skills of employees as well as insufficient training on lower levels.

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Communication: Communication has an implicit impact on all other problem dimensions. For instance, by developing and executing a communication strategy to match the current situation, the acceptance of the implementation can be increased in the run-up to certain activities. Thereby, potential resistances can be mitigated [Ko90, Ra08]. The high importance of communication was already shown in [Al85] study, which [Ag98] mostly confirmed more than a decade later. To improve strategy implementation he proposes „communication, communication, communication". "This seemingly simple suggestion was mentioned more frequently by CEOs than any other single item. The reason it is repeated three times is to reflect exactly what was said by a number of these company presidents." [Al85].

Information Technology: The objective to implement IT itself can be a major problem for an IT strategy implementation [Go06]. Increasing complexity and IT impact almost every part and process of an organization nowadays. In this context, existing data processing methods can be a problem for change. Furthermore, [Al85] and [Ag98] find insufficient information systems to control implementation as a problem for the successful implementation.

2.3 Findings

The consequences are multifaceted. On one side, existing problems lead to wasted resources or missed strategic chances. On the other, resistance occurs because of inadequate execution. Under consideration of different influencing factors, there is a lack of the gestalt perspective especially in information systems literature [Go99]. Thus, we conclude that future research needs to account for the process as well as the factor component. [Lu81] differentiates between process and factor models, which complement each other. Thereby the process view is immanent in process models whereas factor models focus on significant aspects of implementation success [SG84].

A strategy implementation approach therefore requires two important components: guidelines[1] and techniques to support the overall implementation process. The latter should be associated with the previously derived problem dimensions planning, organization, human resources, communication, and IT. Guidelines can support the execution of techniques. Second, a systematic and structured implementation process is necessary to support every person involved in decision-making facets within IT strategy implementation. "Managers sorely need and want a logical model to guide execution decisions and actions." [Hr06].

[1] Guidelines can describe how to conduct a technique or describe general rules during the implementation process.

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4 Feature Comparison

4.1 Deduction of Features

To answer the question if and how existing approaches to IT strategy implementation deal with the derived problems (which can be construed as requirements) we use a feature comparison. This is a technique to conduct a comparison based on predefined criteria or a checklist. In comparison to other empirical research methods, the easy and quick appliance is a clear advantage [SR98]. Defining the criteria clearly, the feature comparison allows for an objectified, comparatively easy and problem oriented generation of research results. In contrast, an important deficit is the possibly missing objectivity. [SR98] point out that the definition of criteria is a subjective activity often based on assumptions. We overcome this disadvantage by deriving the choice as well as the characteristic of all features based on empirical evidence. Table 2 shows all features.

The first feature is based on the approach of ME. We identified numerous approaches, which transfer ME to the formulation and description of economic methods (e.g. [Kr08]). [GA08] for instance adapt the approaches of ME on IT-Governance-Frameworks, both arguing ME to be the core of a design science oriented information systems research. Thus, we turned to ME literature based on [Mc08] research. He compares strategy and software building processes. Hence, we transfer the approach of ME and stipulate that an approach to IT strategy implementation be aligned to the components of a method.

We account for this based on the consequences derived in section 3: Having a method for IT strategy implementation positively effects execution success. Methods require all tasks and activities necessary for planning, designing and implementing information systems. It has been evidenced that methods can be described by activities, roles, results, techniques and a metamodel [Br05]. An activity is a functional execution unit generating one or more results. Activities are structured hierarchically and are arranged in a sequence. The whole sequence defines the process model of a method. Roles or organizational units execute activities, whereas roles are an aggregation of activities from an executer perspective. Techniques are detailed instructions on how to generate results. The metamodel describes and structures the conceptual data model of all results.

Feature	Description of requirements
ME modules	Is the approach comprehensive (in terms of method engineering) and comprise a process model, activities, techniques, roles and results?
Effectiveness	Does the approach support a structured and targeted course of action? [MS95]
Efficiency	Is the approach efficient from an economic perspective (e.g. amount of steps and resources needed)? (March and Smith, 1995)
Ease of use	Is the approach easy to understand and therefore useful for practitioners? [MS95], [HE04]
Flexibility	Is the approach useful for different situations and therefore customizable? [MS95], [HE04]
Logic	Is the approach logical? [MS95], [HE04]

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Feature	Description of requirements
Consistency	Is the approach consistent? [MS95], [HE04]
Implementation planning	Does the approach consider activities for planning and detailing the implementation as well as controlling it? Are any guidelines given?
Organization	Does the approach account for organizational aspects of implementing strategies (e.g. responsibilities for implementation and anchor within existing organization)?
Human resources	Does the approach allow for potential resistances during strategy implementation? Is there any consideration of resource management?
Communication	Does the approach specify any communication activities and/or techniques?
IT	Does the approach account for any specifics on information technology and its implementation?

Table 2: Features for comparison

We derived the generic features *effectiveness*, *efficiency*, *ease of use*, flexibility, *logic and consistency* from well-known design science works by [MS95] and [He04]. The former saying: “However, the aim is to determine "how well" an artifact works, not to prove anything about how or why the artifact works.” [MS95]. The remaining features comply with the problem dimensions derived in section 3. These comprise implementation planning, organization, human resources, communication and IT as shown in table 2.

4.2 Selection of existing approaches

Our literature review follows the general guidelines for conducting comprehensive literature reviews in [WW02]. We started with a database search (EBSCO, Sciencedirect, etc.) and went through titles and abstracts of leading relevant IS and business journals manually. Additionally, we “went backward” by looking up references from filtered articles and “forward” by identifying articles, which referenced already filtered articles. Overall, we could identify 10 approaches. However, we found only a few authors dealing with the implementation of IT strategy. This is surprising since *“[..] without plan implementation, the whole planning process is thrown into question.“* [Br04] and implementation is an essential part of the complete strategic process [Ra08]. However, a number of works understand implementation planning as a part of the strategy development process (e.g. [Me97]).

We argue a strategy implementation also comprises activities of planning the implementation and thus we include those approaches to increase our population. But we exclude those approaches not covering implementation at all or trying to preserve completeness by a short treatise (e.g. [HS09], [Li00]). To avoid a one-sided examination in terms of information technology to transfer knowledge to the IS domain, we also consider general approaches to strategy implementation. In this respect, we include the most important and well-known approach in German literature by [Ko90] as well as two representing process approaches in the English-speaking literature by [No99] and [PR07].

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4.3 Assessment and implications

We compare the different approaches in relation to the other approaches whereby we achieve a more homogenous result than by focusing on one approach at a time. Table 3 illustrates the results; we differentiate between not fulfilled (-), partly fulfilled (O) and fulfilled (X). One can assess the approaches to fulfill the requirements in a very differing way, but none fulfills all. Every approach has been mapped to ME components, allowing for a better comparison and to build a basis for an initial design cycle as step 2 in the DSRM process model.

Most approaches not fully fulfill the requirements regarding ME. We could find out that techniques (e.g. [Ca06]) and roles (e.g. [Me97], [Ko90]) not provided in detail in most cases. Surprisingly, by providing necessary detailed instructions on how to generate them, results are provided more frequently. Moreover, despite the fact that almost all approaches do specify activities and arrange these in a sequence, the results provided are not linked properly in a metamodel. An explanation could be that most approaches referring to strategy implementation are not grounded in ME but in a less structured way.

Nevertheless, ME components and therefore the ME approach proved to be a good framework to allow for an objectified comparison. Additionally, a structured and logical approach to IT strategy implementation to guide execution decisions is necessary [Hr06]. Therefore, the theory of ME offers a valuable structure for this purpose. For this reason, we argue for the need of a new approach to IT strategy implementation based on ME.

In contrast, nearly all approaches comply with most generic requirements derived from design science theory. Conspicuous exceptions are efficiency and flexibility. Thus, on one hand it turned out that efficiency cannot be assessed a priori, and one would need to apply all approaches and compare these regarding the amount of steps and resources needed to implement a strategy.

Therefore, we can conclude that a new approach to strategy implementation needs to consider efficiency, but we cannot use this feature in our comparison. On the other hand, flexibility is partly fulfilled by just a few authors, but this can be lead back to general approaches in which detailed work instructions are usually missing (e.g. [No99]).

Furthermore, [PR07] approach has more the characteristics of a study book than a methodological approach to strategy implementation. In contrast, [Ko90] proposes a flexible, fairly easy to use and consistent approach to strategy implementation but its missing specifics of information technology. Hence, we conclude that all generic requirements should be considered in a new approach to IT strategy implementation to comply with design science theory. Furthermore, efficiency can be understood rather as a guideline than as a requirement. The most differing picture appears when it comes down to the requirements derived from problems existing in practice (cf. section 3). It is conspicuous that only few authors focus on a successful implementation regarding well-known problems. Especially implementation planning and communication seem not to be focused on consequently. Most authors do not consider these in detail or assume that the appropriate activities and procedures are already in place.

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There seems to be a clear gap between strategy development and strategy implementation in terms of conducting the first step towards the implementation by actually planning and communicating it.

Taking the essential significance for the whole strategy implementation into account, it is even more surprising that in terms of communication, only [Ko90] and [Ca06] show appreciable approaches. The described tools and models in both approaches mark enrichment in overcoming those problems, but a consideration during the whole implementation process is not fully done. It also seems that most approaches in the domain of IT do not take account for the role of communication at all.

Additionally, the organization plays an important role in any implementation project only appropriately considered by [Ko90] and [Me97]. Both deliver a role model. Surprisingly, they also only partially consider the role of human resources in terms of resistances and user participation. Solely, [Ko93] and [No99] have considered this dimension more extensively. As a conclusion, we call for a more detailed focus on existing problems in practice regarding IT strategy implementation. Only an approach to consider all factors, implementation planning, organization, human resources communication and information technology can overcome this issue and provide a valuable contribution to future research and practice.

Feature (respectively requirement)	**[SS02]**	**[MI99]**	**[Me97]**	**[Ch09]**	**[Ko90]**	**[PB07]**	**[Wi03]**	**[Ca06]**	**[Ko93]**	**[No99]**
ME components (overall)	O	O	O	O	O	O	X	O	O	O
- Process model	X	O	X	X	X	O	X	X	X	O
- Results	X	O	X	O	X	O	X	O	O	-
- Activities	O	X	X	O	O	O	X	X	X	-
- Techniques	O	-	-	O	O	O	O	O	O	-
- Roles	-	-	X	-	O	-	O	-	-	O
- Meta model	-	-	-	-	-	-	X	-	-	-
Effectiveness	O	O	O	O	X	-	X	O	O	-
Efficiency	-	-	-	-	-	-	-	-	-	-
Ease of use	O	X	O	-	O	-	X	O	O	O
Flexibility	-	-	-	O	X	O	-	-	-	O
Logic	X	X	X	X	O	O	X	O	X	O
Consistency	X	X	X	X	X	X	X	X	O	O
Implementation planning	O	O	O	O	X	O	-	-	-	-
Organization	-	-	X	O	O	O	O	O	-	O
Human resources	O	-	O	-	O	-	O	-	X	X
Communication	-	-	-	-	O	-	O	X	-	O
Information technology	X	X	O	X	-	-	O	O	O	-

Table 3: Feature comparison of existing approaches to IT strategy implementation

5 Design of a Process Model for Implementing IT Strategy

The design of a method for implementing IT strategy is the central activity in our research methodology (cf. section 2). The first step in our research-in-progress is to describe the design of the process model in this research paper. A detailed metamodel as well as a role model and a documentation model will be subject to further research.

A process model is the fundamental component of every method. It structures the sequence of activities. This sequence is determined by the content (results), which allows for the actual construction of the process model. Hence, we created a total portfolio of all activities derived from the compared approaches in section 5. To structure these, we used proven theories by [Wi68] and [Ko76] as well as scientific findings in strategic management, software implementation and project management. In doing so, we were able to derive fife different phases. In further breaking down each phase, we identified similar content and dependencies by comparing result documents. Accordingly, we could design process sub-models by creating a sequence of activities within each phase. We then integrated all phases and activities in one comprehensive process model (cf. figure 2).

As part of the first phase *Pre-Implementation*, the analysis of the IT strategy (as the result of all IT strategy development related activities) and the implementation environment (e.g. organization structure) depicts how profound the desired change will be. Implementation complexity, quality of the IT strategy as well as a feasibility study will lead to agreed implementation objects. This step allows for the identification of important implementation carriers and responsibilities throughout the organization. The objective is to install a first anchor in terms of content and human resources needed to implement the IT strategy.

The purpose of the second phase *Implementation planning* is to first derive and agree on specific implementation goals and initiatives by taking all stakeholders into regard. The IT Balanced Scorecard (IT-BSC) can be used as a technique within this activity. To fulfill the given goals within a set timeframe, it becomes necessary to define and evaluate an implementation plan. This plan consists of a number of different projects to be detailed and bundled to programs. Resource requirements and business cases need to be defined for every project. Hence, a comparison and prioritization creates the basis for a detailed implementation plan. According to the plan, an adequate coordination structure [Hi02] as well as an adequate implementation tactic [Nu89] needs to be determined. Finally, the project teams need to be brought together. It is of high importance to remediate existing conflicts and to prevent new ones [No99].

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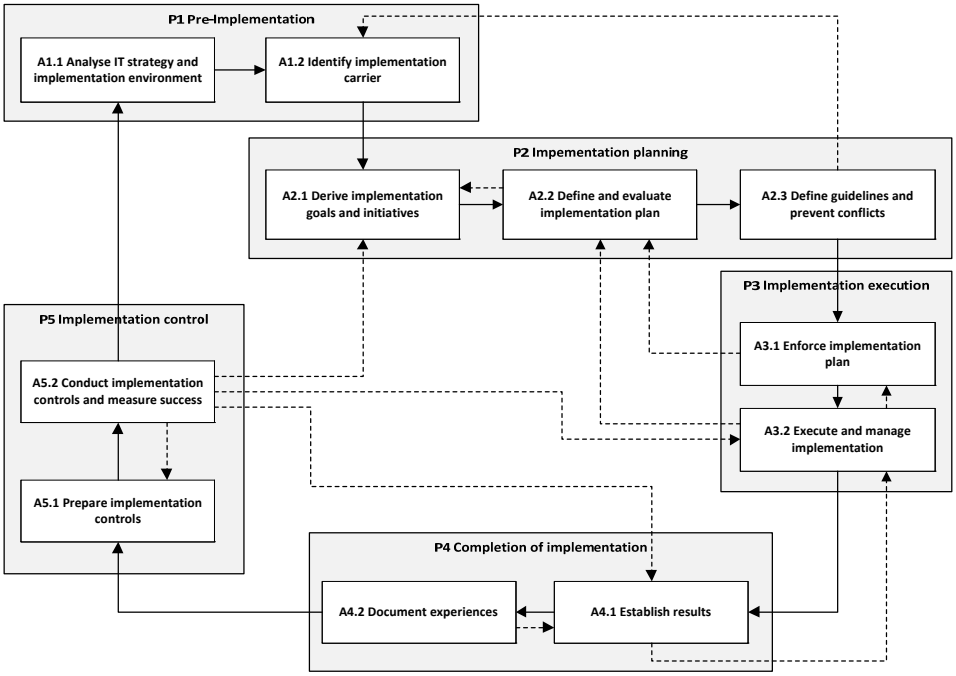

Figure 2: Process model for implementing IT strategy[2]

According to the results of the previous phases, the phase *Implementation execution* puts emphasis on the enforcement of the implementation plan. Initially, the focus is on soft facts, which the implementation success fundamentally depends on [Ko90]. To avoid fear of change, potential behavioral resistances, and divergence in objectives, all impacted personnel need to be treated according to their situation and interest. Therefore, the audience is to be identified and divided up into target groups. A comprehensive communication plan comprising target group appropriate information details is to be developed and maintained centrally. A structured and systematically conducted communication can help to avoid implementation problems concerning human resources. In the further proceeding of an IT strategy implementation, activities of enforcement will decrease, while activities of execution and management will increase [Ko90]. Since *"[..] project management skill is crucial for successful implementation"* [Mi99] and projects set *"[..] IT-strategies in motion, forming the basis for execution"* [Ma04], we emphasize the establishment of a multi project management [Da08]. There is a need to agree on general project management (PM) procedures to allow for a common understanding of PM throughout the organization in terms of standardized and measurable procedures. Measures need to be chosen in a way to provide a central control instance with the necessary information needed to conduct an overall implementation control. Additionally, all involved roles should be encouraged to establish informal networks to cut through bureaucracy. *"Through such channels resources can be pooled more effectively, decisions made more rapidly"* [No99].

[2] Solid arrows show primary directions, whereas dotted arrows show additional connections.

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The phase *Completion of implementation* comprises all actions necessary to establish the results within the organization. First, there is the need to agree on the dimensions of IT strategy implementation: the time dimension and the detail dimension. The time dimension differentiates between *installed*, *completed* and *benefits*, whereas installed marks a simple installation (e.g. without user training) and benefits can be considered as the effect of the change (difference of the current and proposed way of work is done) [Go99]. The detail dimension refers to the implementation content, which may be the whole plan, one or more projects or even one or more systems in one project [Go99]. In our definition, the whole plan needs to be completed. Hence, trainings for future users need to be prepared and executed; lessons learnt need to be documented. Additionally, according projects need to be dissolved to allow for a new resource allocation.

The last phase *Implementation control* is about setting up appropriate qualitative and quantitative control measures to allow for a continuous implementation control and navigation. Measurement of the actual implementation state at any time during the implementation allows for an early identification of discrepancies. Therefore, possible causes can be identified and corrective actions can be taken. Implementation control acts as the central component in our process model and can therefore influence activities within previous and following phases.

6 Conclusion and further Research

In this paper, we have identified specific requirements for the design of a comprehensive and methodological approach to implement IT strategies. By doing this, we analyzed empirical research and could aggregate the results to five problem dimensions, which we further defined as requirements to a new approach. However, this conclusion is subject to some limitations. First, the studies have been conducted in different geographical regions and cultures. Second, some surveys are only based on a low sample (e.g. [Ag98]) and third, some do not give any information on weights (e.g. [St01]) or rankings (e.g. [Go99]). However, we could not find any evidence on those issues impacting our results. Further, the results of all examined works match the derived implementation problems.

Nevertheless, this constitutes a good foundation for our research-in-progress, in which we have taken the first fundamental step (construction of the process model) towards the design of a comprehensive method for implementing IT strategy. Our process model can help in identifying weaknesses and areas of improvement in a company's IT strategy implementation process.

In a first case at an energy utility company, the process model was perceived as an easy to use and helpful tool to implement IT strategy. Common problems like implementation planning, organization, human resources, communication and information technology were taken into account in more detail. The approach allows for a better understanding of implementing IT strategy in corporate environments as well as its monitoring and control. In this way, it can contribute to the investigation in terms of a methodological implementation of IT strategy.

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We will use the constructed process model in further case studies. By conducting these as part of our research-in-progress, we will add empirical data to further construct and support our method in terms of the given requirements (e.g. role model). Thereafter we fulfill the claim for a practical problem orientation as the basis for an application-oriented science within the field of information systems [Go03] and an important guideline which should be followed in design science IS research [He04].

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