

Ten Guidelines for the Implementation of Information Systems: Research in Progress ¹

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Abstract

This paper reports some preliminary research findings from an ongoing research program on the Successful Information Systems Implementation. A preliminary Model for Implementation of Information Systems (IS) is presented here in terms of ten precepts for IS-implementation. Its focus is on organizational and user aspects of an IS-implementation, where the objective is to secure that the users of the to-be IS will use the deployed IS as intended; hardware, software, and other aspects of the information technology itself are not accounted by this model. The key challenge addressed here is the many reported failures of IS-implementation as derived from organizational challenges rather than technology itself. The proposed model is framed within the so-called Organization Information System paradigm that regards an organization and its IS as one conceptual unit rather than considering it as an adjunct to the organization. Therefore, an IS-implementation is here contextualised within a process of organisational change. The core of the presented model is a mechanism of organizational change of an IS-implementation, called the “Effect-Behaviour-Resource-Influence Loop”. In this, it is the Influence of the Resources – human and machines – that changes the Behaviour that in turn leads to the change of Effects, toward the desired state. Further, the proposed Model also provides three requirements of any organization to be subjected of an IS intervention; these are the “user Motivation”, the “user Capability”, and the “user Ability”. The proposed model is an outcome of a set of case studies of IS-implementations, conducted in an Action Research mode. The key contribution of this model is its empirical experience and its comprehensive approach to an IS-implementation, rather than an analytical focusing on a few variables only. However, the proposed model is still in its hypothetical phase of theory development and needs both further cross-fertilisation with various theoretical bodies as well as additional empirical experience, where validations and modifications are made.

¹ A previous version of this paper was presented at Information Systems and People: Implementing Information Technology in the Workplace. ItAIS 2006: III Conference of the Italian Chapter of AIS. Università Bocconi – Milan, Italy. 26th – 27th October, 2006

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1. INTRODUCTION

This paper presents some preliminary research findings from an ongoing research program on *Successful Information Systems Implementations*. A preliminary Model for Implementation of Information Systems (IS) is presented here, characterising some key drivers for a successful information systems implementation.

Over the years, numerous of investigations, both academic and professional, have reported a significant amount of IS implementation failures (e.g. Lyytinen & Hirschheim, 1988), where a variety of failure-causes have been suggested, ranging from hardware and software-code, via functional IS-specifications and models, IS-architectural design, and ending with the users, their working activities and culture. In the present account, the latter mentioned aspects are focused: i.e. the aimed IS-users and their organisation. In this, the overall generic research question is: how to generate an IS-implementation that results in the desired new effects? Hence, solely technological aspects of IS-implementations are outside the scope of this account. Therefore, the here presented model resembles closely findings from organisational change management studies (e.g. Palmer et al., 2005) yet without being simply transferred from that field. While the here presented guidelines are empirically grounded in IS-implementation work, the close resemblance mentioned is here understood as a measure of positive validation of the content generated in this research program.

Further, while the various available studies investigate the IS-implementation failures in terms of one or several causal variables and their relations; they do not provide a comprehensive prescription for how to successfully carry out such an implementation (Lyytinen & Hirschheim, 1988; Ginzberg, 1990). The focus of the proposal presented herein, on the other hand, is a concrete set-up of practical items needed in order to generate a successful IS-implementation – such a comprehensive account seems to be a rare contribution, e.g. Ginzberg (1990).

In summary, the objective of this research programme is to have generated empirically grounded and stable procedural factors that guide IS-implementation work, while its purpose is to contribute to an increased rate of successful IS-implementations.

The here proposed Model for Information System Implementation is suggestive and still in its hypothetical stage of theory development, and induced from a dozen of IS-implementation cases; therefore additional empirical experience is needed for its validation and further development.

Further, the here proposed IS-implementation guidelines are partial for an IS-implementation work, at least for two reasons. Firstly, due to the deliberate elimination of all technology aspects needed, secondly is due to the limitations of the research work as such, as it is still ongoing and not finalized, and as hardly any research project may ever be totally conclusive, particularly in such complex questions as an IS-implementation is.

The following section accounts for the methodological approach utilised in the formulation of the here proposed model. Thereafter, the received theoretical foundation of the here proposed model is summarised. Then the very proposed Model for Information Systems Implementation is presented in terms of its two key parts: the ERBI-

Loop, and the MCA-Conditions. The text ends with a summary of the contribution and some suggestions for its further development.

2. RESEARCH APPROACH

This section provides a short account of the approach employed in this research; this includes the Research Objects, the Research Mode, the Received Theoretical bodies assumed, and finally the Data Collection method utilized.

2.1. Research Objects

The here presented Model for Information System Implementation is an outcome from a set of real-life cases (twelve) of actual Information Systems implementations, conducted over a period of several years. These implementations were conducted in the context of two major international companies, within its various affiliates in the Nordic Region. The deployed Information Systems included the so-called Financial Management Information Systems, Customer Relationship Management Information Systems, and Enterprise Resource Planning Information Systems.

2.2. Research Mode

These cases were conducted in an Action Research mode, which is today a well-established approach to inquiries to be carried out in social settings (Lewin, 1947; Blum, 1955; Foster, 1972; Clark, 1972; Susman & Evered, 1978; Hult & Lennung, 1980; Argyris et al. 1982; Eisenhardt, 1989). Although there are a variety of approaches in Action Research, its central feature is that the researcher is immersed in the research situation itself; it is a situation that is natural in the sense that it has not been artificially created for the research purpose only, as is commonly the case at laboratories used within the natural sciences. In such a situation, the researcher assumes two distinct roles, one as a natural participator in the situation, the other as a research worker investigating the situation at hand. This means that Action and Research are conducted at the same time. From a meta-theoretical point of view, Action Research rests upon underpinnings from phenomenology and more recently from constructivism, rather than logical positivism or critical rationalism.

The here employed approach to Action Research is based on the action research program developed over the last 30 years at Lancaster University, in the UK (Checkland, 1991; Checkland & Holwell, 1998). The Lancaster approach comprises three central components:

- An *Area of Interest* (A) that is to be investigated; in the present case the marketing and sales operations.
- A *Framework of Ideas* (F) about A that may include theories and hypotheses; in the present case it is the tested postulates, as derived from the received theories, as well as the leading questions regarding marketing and sales operations (all specified below).

- A *Methodology* (M) to investigate A with the help of F. Figure 1 illustrates the relationship between these components.

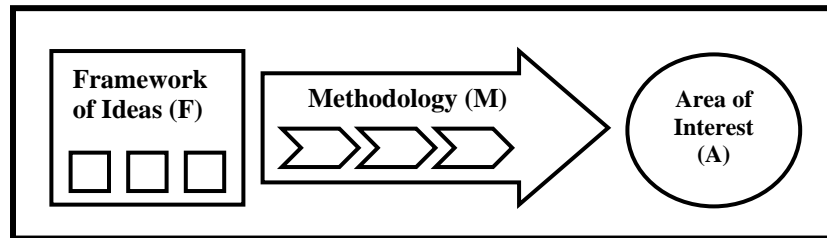


Figure 1. Illustrates the main components of the action research approach used for development of the Framework for Constitution of Modelling Processes. A Methodology (M) is used to apply a Framework of Ideas (F) to an Area on Interest (A).

2.3. Received Theories

The Framework of Ideas was informed both by experienced empirical issues, needs and challenges of IS-implementations and by relevant theoretical bodies. While the primer is constituted by various empirical issues and dilemmas faced during concrete IS-implementation work as found in the literature and in our practical work, the theoretical components employed are the Organization Information System Paradigm, the Systemic Enterprise Theory, and the Idealized Design Methodology for organisational development – these are accounted shortly further down in this text.

2.4. Data Collection

The research data was gathered by three action researchers who employed a common procedure, where a proposal is defined, consequent actions were conducted, and the following effects were monitored and documented in a research diary; this gave rise to a set of *plan-act-monitor iterations*. As the space limitations provided by an article-based presentation does not allow the actual data gathered to be presented here at all, only a summarising version of the very results is presented. The full account of the model and its found data will be presented elsewhere.

3. RECEIVED THEORETICAL FOUNDATIONS

Given that this research program explicitly assumes an interpretative-constructivist notion of scientific theory constitution, rather than a positivistic one, there is a need to attempt for an explicit articulation of the theoretical components that have influenced and shaped the formulation of the research questions and their answering. The following lines present three theoretical bodies that have explicitly influenced the formulation of the here presented model, these are the Organization Information System paradigm, the idealized Design approach, and the Systemic Enterprise Theory.

3.1. The Organization Information System Paradigm

The here proposed Model for Information System Implementation rests upon the precepts provided by the so-called Organization Information System (OIS) paradigm (Landry & Le Moigne, 1977; Le Moigne, 1986; Le Moigne & Sible, 1986; van Gigch & Pipino, 1986; van Gigch & Le Moigne, 1989; van Gigch & Le Moigne, 1990). This, in turn, builds upon H.A. Simon's conception of organization as information processing behaviour (Simon, 1976a, 1976b) and the design of the artificial where an organization and its information system are regarded as design objects (Simon, 1969). One of the key messages of the OIS paradigm stipulates the conception of an organization and its information system as one conceptual whole. This to be contrasted to the conventional Management Information System paradigm, where an IS is conceived as an adjunct to the organization (Le Moigne & van Gigch, 1990). This switch of conception of the object of concern – from solely an IS to an organization and its IS – has implications for the conception and execution of an IS implementation, which will be articulated in the following sections.

3.2. The Idealized Design Approach

An implication of the conception of an implementation as an organization and its IS asks for methodological support of organizational development. Frequently, development and implementation of an IS aims to contribute to the development of the organization and its operations, whether in some minor and limited aspect or a major development. The question therefore emerges: how to develop an organization and its operations, in a systematic manner? While there are numerous of contributions available, provided both by academics and practitioners, the development of the here presented Model for Information System Implementation was conducted in the context of the Idealized Design methodology, as conceived by R.L. Ackoff (1981). This is not the place to present this methodology extensively, the key working phases of organizational development will suffice to be presented, as they provide the context or frame for the here presented Model for Information System Implementation. According to Ackoff (ibid.), Idealized Design of organizations should include the following five key phases: (1) identification of the *Current Situation* of the organization, (2) design of the *Desired Situation* of the organization and its information system, (3) derivation of the *Implementation Plan* for the new organization, (4) *Execution* of the implementation plan, and (5) *Evaluation* and Adaptation of the implemented organization and its information system.

3.3. The Systemic Enterprise Theory

Given the above presented assumptions of regarding an IS-implementation as an organisational development and change, a question emerges. How to instrumentally conceive an organisation as to support efficiently the desired IS-implementation?

While there are numerous of contributions to answer this questions, provided by organization studies, operations research and other disciplines, the here proposed model is informed by the recent *Systemic Enterprise Theory* (SET). In short, the SET (Eriksson,

2004) provides a set of categories (or constructs, or ontologies) of an organization and its operations, and their interrelations. This is a descriptive theory aimed to account for the richness of an enterprise and to support a generation of insights in any enterprise. Briefly, the key enterprise constructs include: consumer, output and their channels, processes with their activities, rules, inputs and their channels, suppliers, goals, and various resources, such as active actors – people and machines – and organizational decision-structure, culture, and other. These constructs informed the formulation of the Effect-Behaviour-Resource-Influence Loop presented below.

4. INFORMATION SYSTEM IMPLEMENTATION MODEL

This section presents the here-proposed Model for Information Systems Implementation. The model may be understood in its two inter-related parts: the EBRI-Loop, and the MCA-Conditions.

The firstly mentioned stands for Effect–Behaviour–Resource–Influence cycle, and articulates four deliberately related change aspects to be considered during an IS-implementation. Secondly, Motivation, Capability, and Ability conditions account for qualities to be addressed within and organisation that is subjected to an IS-implementation. The relation between the two is that the MCA-Conditions must be positively secured in order to execute and EBRI-Loop positively to perform a successful IS-implementation.

The Model for Information Systems Implementation is presented here in terms of a set of precepts, where each precept recommends a certain practice to be conducted during an IS-Implementation. These precepts are organised into three groups: the Founding Precepts, the EBRI Precepts, and the MCA Precepts. The primer refer to some contextual assumptions taken for an IS-implementation, while the two latter refer to the two key areas respectively, of the here presented model.

4.1. The Founding Precepts

Precept #1: Organization and its Information System.

Consider an IS-Implementation as a change of the organisational context that the IS embedded within. By *consider* it is here meant that all conceptual analysis, design and planning as well as practical work should address the organization and its IS in a coherent and comprehensive manner. By *organisation* it is here mean its various aspects as provided by the above accounted Systemic Enterprise Theory, hence: goals and objectives, rules and norms, receiving actors, outcomes and their channels, processes and their activities, inputs and their channels, providers; and the various resources, such as organisational structure and culture, decision-making and financial structures as well as roles with their profiles and then machines.

Precept #2: IS-implementation phases.

Consider an IS-implementation in terms of five working-phases of organisational development, namely Analysis, Design, Planning, Execution, and Evaluation. According to the above mentioned Idealized Design approach to organizational development, five key phases should be regarded: (1) Analysis of the current situation of the organization and its information system, (2) Design of the desired situation of the organization and its information system, (3) derivation of an *Implementation Plan* for the new organization, (4) *Execution* of the Implementation plan, and (5) *Evaluation* and Adaptation of the implemented organization and its information system. While the here proposed model relates to all the mentioned five phases, its content addresses particularly the (3) formulation of an Implementation Plan, (4) the Execution of that plan, and the (5) Evaluation and Adaptation of that execution. Further, the here proposed model presupposes the existence of (1) conception of the Current Situation and the (2) design of a Desired Situation, however it does not contribute conceptually with regard how the two latter mentioned should be conducted, as it is outside its scope. Figure 2 illustrates the five phases mentioned.

Analysis of the current situation should result in a characterisation of the organisation at hand in terms of the mentioned constructs provided by the Systemic Enterprise Theory, which includes information, IS-machines, issues and opportunities.

The Design of the desired situation should results in a similar characterisation yet its content should articulate the desired situation rather than the current or other. The two mentioned results provide a gap between the what-is and the what-should-be.

This gap, in turn, constitutes foundation for a derivation of an Implementation Plan for the new IS. Such a plan is to provide detailed specification of the type of activities needed to be executed in order to generate outcomes that constitute the desired situation. Further, the specification of those execution activities should be accompanied with the resources required in order to conduct these activities, all this along with timelines, key success factors, risk management, metrics and other typical aspects of an IS-implementation plan.

Next, the IS-Implementation Execution phase is the time when the plans face the reality of an IS-implementation. The key here is to actually deliver the various component of the desired situation, as guided by the implementation plan. Yet, some other crucial inter-mediate deliverables, particularly in complex projects, is updates of the Design of the desired situation as well as of the Implementation Plan, as caused by insight that emerge during the very execution work of an IS-implementation. These emergent insights may be that the actual current situation is in some crucial manner different from the one characterised in the Analysis, and similarly that the Design of the desired situation is in some manner not relevant or preferred and need to be altered. As a consequence of these changed of the analysis and the design the very Implementation plan may also be subject to modifications.

Finally, the Evaluation-phase is crucial, in our experience, for successful IS-implementations as its role is to identify what has been implemented actually, then to compare this with what was planned to be implemented, to identify any divergence between the two and possibly to find learning-lessons as well as solutions to issues

identified. Indeed, the Evaluation-phase is crucial to the key generic objective of all IS-implementations: to generate a successful IS-implementation. This is so, as without a follow-up and an evaluation, one can not really know whether an IS-implementation was successful or not. In this, we have observed that too often, the initial conception phases of an IS-initiative do not formulate explicit and operational intention-statements which are needed as a reference point for an evaluation.

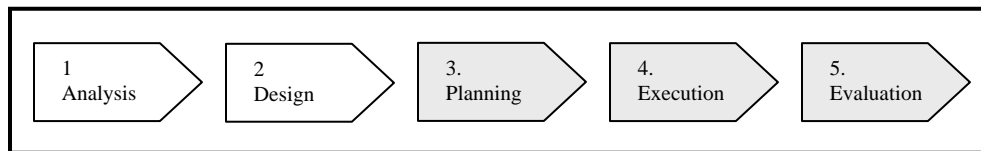


Figure 2. Illustrates the five phases of organizational development as proposed by R.L. Ackoff in his Idealised Design. Phases (3), (4), and (5) provide the key context for the implementation of an organization and its IS. This represents the change actors' (subject-systems') activities in order to change the organization (object-system).

4.3. The Effect-Behaviour-Resources-Influence Precepts

While the above mentioned phases, of an organizational development and its IS-implementation, account for what kind of activities the actors that conduct such an implementation have to do, the second key question is how does this work should be conducted. To this end, a conception of an *organizational change mechanism* as a driver for IS-implementation has been elaborated. This mechanism conceives the change in terms of its: Effects, Behaviour, Resources, and Influence, and the interrelations between these; hence in short the "EBRI-Loop". The following lines present this loop.

Precept #3: Define the desired Effects of IS-Implementation

Defined explicitly the desired effects, of the organisation and its operations, that are aspired to achieve, after that the IS-implementation and its organisational change is finalised.

Starting with the Effects, it is assumed here that organization change initiatives seek some performance effects to be reached, which motivates the very change initiative. By performance effect it is meant any property of the organization or its environment, in terms of the desired value of that property, after that the change is conducted. For example, an organization change may aim for lower operating costs, higher revenues stream, higher degree of customer satisfaction, higher level of product margins, shorter production or invoicing process lead-times, fewer leave of absence days among the staff member, or lower rate of IS malfunctioning experienced by its users, among many others.

Our experience has shown that if the desired performance effects are not defined explicitly, and in a well-justified manner, the ability to reach these targets of the change initiative is lowered significantly, which also reduces the opportunity to execute a successful implementation. Indeed, it is very difficult to assess if an IS-implementation is successful or not if the aimed effects are not specified in a manner that may be monitored and measured.

Another key experience here is that even if the desired performance effects are well defined in a justified fashion, the very conduct of the organizational change may generate new knowledge and insights, when the organization in its change unfolds or is disclosed, which may justify re-formulation of the set performance effects desired. Hence, there may be a need for a dynamic management of Effect Definition and Monitoring.

Precept #4: Define the desired Organisational Behaviour

For an organization, in order to generate any performance, it must execute a certain behaviour that gives rise to some results. Behaviour is here understood in terms of the working processes and their workflows that are executed by an organization's Resources, in this context understood as their Actors. Two principal Actors are distinguished here: the human-actor and the machine-actor. The primer account for the staff members or employees of an organization, that conduct various tasks and activities that are part of the mentioned processes. The machines may be robot systems, manufacturing systems, and information systems. These execute various functions and process information, which are part of the mentioned processes.

An example of a process is the *invoice-payment* that may be constituted by a set of activities, such as *reception* of an invoice, *verification* of the invoice received, *approval* of the invoice verified, etc. In this, the human-actor secretary may execute the verification; a functional manager may execute the approval, while an enterprise resource management system may execute the reception activity, as well as store the verification and the approval.

One importance of the behaviour of an organization is to understand it as an intermediate link between the desired performance effect, on the one end, and the actors that generate the behaviour, on the other end. A second experience is that if the behaviour (here processes and their activities, tasks and IS-functions) are miss-conceived for the effects that are aspired, then there is a significant risk that the resources that are to execute these processes, here the human and machine actors, will not be able to success very well, no matter how well their capabilities are.

Precept #5: Define the desired Resources

The next component of the here proposed organization change-mechanism are the Organizational Resources. While organizational resources may be of various types, such as production material, facilities, financial resources, in this context the focus is only upon the mentioned Actors that execute behaviour of an organization, by means of the processes, and their constituting activities, tasks, and functions. The two types of Actors distinguished here – human-actor and machine-actor – may be characterised in various manners. This characterisation may be in terms of the type of (i) outputs or results an actor is supposed to generate; the type of (ii) activities, tasks or functions that an actor is supposed to conduct; the type of (iii) physical capabilities an actor is supposed to possess, the type of (iv) cognitive capabilities an actor is supposed to manifest, and finally the

type of (v) affective properties an actor is supposed to possess – the latter is relevant only for the human-actors.

The importance of the five mentioned distinctions of actor-characterisation comes from the fact that it is by means of influencing these characteristics that a change in organizational behaviour may be generated, and thus the desired performance effects. A second importance of these five characteristics is depending on the organizational situation faced, they show different degree of relevance and instrumentality in the aspirations for changing depending on the type of organization and its current situation. Some examples will illustrate this.

Example of outputs generated by actors may be an approved invoice by the actor functional manager, or invoice status information by an information system. By derivation, examples of activities conducted by actors may then be conduct of an approval of an invoice, and retrieving the status information of an invoice. Example of physical characteristics may be a staff member's ability to lift 50 kg loads or a robot systems speed in its production arm. Then example of cognitive capabilities of a human actor may be the ability to speak fluently various languages or to calculate differential equations. This ability of a machine, such as an IS, may include processing speed, and memory capacity. Finally, the affective characteristics account for the attitudes and values of human-actors, which influence their conduct of activities, and thus the organizational behaviour and the performance effects.

Depending on the organizational setting and the very actors, these characteristics may have different relevance for the conduct of organizational change. For example, when the organization is a research and development unit of a major corporation, the characteristics of high relevance to influence are the outputs to be generated by the employees and the cognitive capabilities inherent in these staff members – e.g. number of new molecules designed in a pharmaceutical laboratory. In this example, the physical capabilities typically lack relevance as well as the exact activities to be conducted, as the latter may not always be pre-planned in a research process. On the other hand, in the production facilities of a car manufacturing plant, the key characteristics would include physical capabilities as well as the activities to be executed.

Precept # 6: Define the means of Resource Influencing

The fourth component of the here proposed change-mechanism for IS-implementation is the Influencing; it is understood here as the driver for the generation of the desired change. The logic of this is that it is by influencing the actors of an organization, in the desired direction, these actors may conduct the right activities and hence processes, which in turn will give rise to the desired organizational behaviour, which then generates the desired performance effects. There are various tools that can be utilised in order to generate the change of the actors.

A central tool for the change of human-actors is the education and training that aims to provide them with the relevant capabilities to execute the relevant tasks and activities. The same capabilities are established within machine-actors by means of engineering, such as software engineering aiming at providing an IS the desired functionalities and information content.

Yet another tool for the influencing of human-actors is the exposition of relevant signals. An example of this may be the leaders of an organization that use a new IS in their daily work, and thereby giving good example for the employees of the organization, which is a motivating factor.

Two other motivation generating tools are the incentive systems and the regulation systems, or policies. Incentives may be conceived in terms of various bonus systems, based on salaries, for instance, if a worker uses a new IS implemented, as intended, then she or he may be given another monthly salary. Regulations on the other hand are stipulations for desired behaviour, which may ultimately lead to corrective measures when the stipulated behaviour is not conducted; example of a rule for sales representatives is to report all customer interactions conducted into the new IS.

Precept # 7: Define and Manage the interrelation of the EBRI-Loop

The EBRI-Loop presents four interrelated complements of the change mechanism for IS-implementation: the desired performance Effects, the organizational Behaviour needed to generate these effects, the Resources needed to execute this behaviour, and then the various Influence tools to make the resources act as intended.

A typical challenge of the execution of this EBRI-Loop successfully, is the identification of the right aspects of the four components and then to secure the validity of their interrelations. A second challenge is to secure the resources needed to execute the EBRI-Loop, ultimately counted in financial terms. As these resources are typically limited, the question emerges: which influencing tools should be used in order to success with the change, given the available resources? Yet another related challenge of an IS-implementation is that it often causes some operational disturbances in the organisation subjected of this IS-implantation, which may lead to an overall lower performance, such as lowered revenue rates or increased costs. The question in this respect is to identify these disturbances prior the change and handle them in a deliberate manner.

Yet another challenge, experienced too frequently, is the fall-back syndrome. This implies that when the behaviour and effect of an organization has been advanced from state one to state two, as desired, the organizations tend to fall back to the state one, soon after state two was reached or just before, particularly when extra stress is put upon the organization, such as tighter budget constraints, which may be caused by the costs of the conducted organization and IS-implementation.

Finally to mention in the context of the ERBI-Loop, there is a need for yet another key activity to be conducted, it is the management activity of the EBRI activities. This includes their monitoring, analysis and evaluation, design, signalling, and again monitoring, etc. As the experience shows that complex implementation seldom will be realised exactly as the initial plans stipulates – whether due to insufficient planning or to emergence of unpredictable conditions – there is a need to continuously re-evaluate and re-plan the whole implementation work, with the assumption that it is better to adjust the plans to the actual situation rather than the vice versa...

4.4. Implementation Needs

The above discussed Influencing tools already suggest that there are some specific needs to be fulfilled in order to conduct a successful IS-implementation. The here proposed Model for Information Systems Implementation stipulates three such generic organizational needs, that constitute organizational conditions for implementation; these are the Motivation, the Capability, and the Ability – in short the *MCA-Conditions*. The overall role of the three organizational MCA-conditions is to enable a successful execution of the above-discussed EBRI-loop for organization change.

Precept # 8: Establish Implementation Ability

Starting with the latter, the *Ability*, it refers to the operational space within the organization that is required in order to be able to execute the work needed to do the implementation of the organization and its IS. As mentioned above, the implementation may imply operational disturbances in terms of the conduct of its daily operations, when the actors – human and machine – must execute non-routine implementation activities, such as education, training, tests of IS:es, etc, which means that the ordinary activities may not be conducted. Experience has shown that it is not unusual that an involved worker may need to allocate 20-60 % of the working time on the non-routine implementation activities, and hence reduce the time available for the routine operations. This temporal operational disturbance must be planned for and a budget needs to be assigned, which here refers to the Implementation Ability of the organization.

Precept # 9: Establish Implementation Capability

Capability refers here to an organization actor's capability to execute the desired tasks and functions, hence give rise to processes and organizational behaviour. In human-actors, the capability may be characterised in terms of the relevant skills and knowledge of task conduct, and the relevant value set needed to promote the execution of those tasks. In terms of an IS, the capabilities refer typically to the right functionality, the right information, and the right technical performance. The establishment of the relevant capabilities was discussed above and is typically made by means of education and training for human-actors and by deliberate engineering for machine-actors. Starting with the primer, the two key processes to secure that organization's staff members have the right capabilities is recruitment of people that already possess the desired capabilities or internal development of people, through mentioned education and training processes. Experience has shown that a key challenge of any non-trivial IS-implementation is to secure that the to-be users of the new IS have the right capability of using the new IS.

Precept # 10: Establish Implementation Motivation

Motivation is a key characteristic of people in the organization; hence the to-be users of the to-be implemented IS. It refers to peoples' willingness to change their behaviour in order to conduct the desired activities. Various incentive structures, policies and

regulations, as well as strong entrepreneurial leadership, may influence and drive the motivation, which in turn will drive the behaviour.

5. THE CONTRIBUTION AND NEXT STEPS

The here proposed Model for Implementation of Information Systems represents an empirically driven conceptualisation of actual experiences conducted in a dozen cases of IS-implementations. Secondly, this conceptualisation has a comprehensive, or holistic, and qualitative approach to the IS-implementation, rather than analytical in the sense where two or more variables and their interdependences are investigated and justified by means of statistical methods. In this holistic aspiration to IS-implementations, the proposed model builds on the Organization Information System proposal, where the organization and its IS are regarded as one conceptual unit.

On the other hand, at this moment the proposed model can only be regarded as suggestive or hypothetical and asks for further empirical experience in the search of its confirmation or the opposite. Therefore, further research actions must include empirical use of this model in a controlled manner, where its various components are either validated or suggestions for modifications are generated.

Secondly and related, the here proposed model has limited exposure to the various available theoretical contributions within the area of IS-implementation, which require their identification, critical review and then allocation within the here proposed model, in order to further develop it and then test in new empirical contexts of IS implementations; this work is currently in progress.

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