The evolution of an Enterprise System Implementation Methodology by adaptation through reflexivity

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Abstract

In spite of an Enterprise Systems Implementation Methodology’s (ESIM’s) potential and significance for Enterprise Systems implementation, little attention has been paid to its evolution in ES literature. Moreover, current studies reveal contradictory findings and provide a fragmented understanding. The purpose of this paper is to provide a framework underpinned by a morphogenetic approach for explaining how ESIM evolves by adaptation through reflexivity. Our qualitative study resulted in a richer description of ESIM contents differentiated by adaptation strategies through reflexivity. Four theoretically and empirically informed ESIM adaptation strategies, i.e. reorienting, embedding, aligning and connecting, with related conditions and effects are suggested. This study retains valuable insights of prior works in Information Systems Development (ISD) research, since ESIM might be regarded as one of the latest interventions undertaken in an attempt to improve the quality of an ES product and the productivity and quality of an implementation process.

1. Introduction

Although most ES solutions provide similar functionality, each ES vendor has developed its own instance of Enterprise Systems Implementation Methodology (ESIM). For instance, the “AcceleratedSAP” (ASAP) methodology, is developed and recommended by SAP as a de facto standard for implementing SAP solutions. Although the potential value of ASAP in particular and ESIM in general, is disputed [37], it is still an intriguing case for two reasons. Firstly, because time and budgets overruns in ES implementation projects have been more a rule than an exception. Secondly, regarding ESIM as one of the latest approaches in IS development and as a type of complex innovation technology, it would impose a substantial knowledge burden on adopters impeding its use [14]. Additionally, the literature on IS development methodology (ISDM) - the term used in this study to refer to previous approaches to ESIM - indicates that the diffusion of ISDM is slow and met with resistance by developers [30]. Moreover, the most recent ISDM era, i.e. from 1990 until present, is described as ‘the era of methodology reassessment’, which is characterized by a ‘backlash against methodologies’ [5].

Given a scarcity of research and contradictory findings on the value of ESIM [20; 38], there is a need to scrutinize alternative approaches for understanding ESIM and its evolution over time. This paper represents such an attempt. In particular, the purpose of this paper is to provide a conceptual framework for analysing ESIM contents differentiated by adaptation strategies emerging through reflexivity and explain how an ESIM evolves over time through a morphogenetic approach. The study is underpinned by a critical realism perspective, and answers the following research questions:

RQ 1 - Which ESIM adaptation strategies are undertaken by reflexive ES implementers in ES implementation practice?

RQ 2 - What are the conditions and the effects of ESIM adaptation strategies in ES implementation practice?

The paper continues with a presentation of prior research on ESIM and adaptation. Then, a brief description of Archer’s Morphogenetic approach is introduced and used to underpin a conceptual ESIM adaptation framework because of its insistence upon understanding and explaining change. The critical realist perspective, underlying the morphogenetic approach, facilitates the contextualization of ESIM adaptation in ES implementation and the development of a causal explanation for the evolution of an ESIM over time. This paper’s theoretical contribution is to apply a morphogenetic approach to the evolution of an ESIM and show how ESIM contents are differentiated by reflexive adaptation strategies. The article proceeds with a discussion of the implications of the findings and concludes with some promising avenues for future research.
2. Related literature

Although the potential value of ESIM is questioned, its adaptation represents a topical subject both for practitioners and research, since implementers need to grasp and contribute with implementation methodology to the implementation of ES [19].

**Enterprise Systems implementation practice**

The ES solutions were suggested to represent a *de facto* standard for the replacement of legacy systems [29]. The ES market was one of the fastest growing markets in the software industry with a penetration at 67% and the largest segment of a company’s applications budget (34%) [34]. Yet, it has been estimated that the implementation costs were often five to ten times the costs of the software [11]. Moreover, a large number of ES implementations ended up late or over budget [12; 18]. Most alarming were the examples of ES implementations being abandoned, or even leading to bankruptcy [33]. Consequently, the suitability of the knowledge base incorporated in the ISDM, which are considered to display best practices and to incorporate valuable knowledge about information systems development is implicitly questioned [23].

**Enterprise Systems Implementation Methodology**

Most ES solutions provide similar functionality, yet each ES vendor has developed its own instance of ES implementation methodology, which represents “*both a type of method engineering approach and a platform with design and configuration tools supporting that approach*” [37, p. 509]. The use of ESIM represents a critical success factor in ES implementations [12]. Yet, annotated bibliographies of ES publications in the main Information Systems journals and conferences for 1997-2000 and 2001-2005 respectively, show that studies regarding ESIM are scarce [12; 13].

Besides a limited research, some studies arrive at contradictory results regarding the potential value of ESIM in practice. For instance, as a result of applying Wijer’s framework to discuss the IS engineering process, the ASAP was considered “*a very sound method*” [38, p. 227]. Contrary to this, the use of framework to analyse the underlying assumptions of ASAP indicates the instrumental view and the bureaucratic character of the ASAP methodology as a drawback [20]. In spite of potential advantages, due to a focus on a rapid implementation of ES software, ESIM is a source of dissatisfaction for adopting organizations [37].

Although recommended for implementation of ES solutions, an effective use of ESIM in practice is demanding, and challenging to explain, due to the adaptation that is involved. While research on ESIM adaptation is unexplored, the topic has attracted attention in Information Systems Development (ISD) research. Insights from ISD research indicate that in practice methodologies are usually not used as prescribed but involve adaptation [8] or tailoring [16].

Two perspectives dominate research on methodology adaptation: a method engineering perspective based on positivist views of natural science; and a socio-organizational perspective based on interpretative views of social science [8]. While the first perspective focuses on the formal aspect of methodologies represented by their contents, e.g. approach, methods, tools and services, the second perspective focuses on their situational aspect represented by stakeholders, development process and IS solution. In an attempt to bridge the gap between these two perspectives, a third perspective with a focus on the adaptation of ISDM is advancing in literature [6; 7; 17]. Despite research efforts to explain methodology adaptation, research remains silent about potential adaptation strategies, causes and its potential effects.

3. Conceptual framework

Instead of a positivist or an interpretative underpinned research, as the studies undertaken previously on methodology adaptation, this study adopts a critical realism perspective, which is suggested to transcend the positivism vs. interpretivism dualism, and is regarded as a promising view in Information Systems [10; 27]. Situated within the broader critical realism perspective, a morphogenetic approach (MA) [1] maintains that structure, culture and agency are analytically distinct, each having relative autonomy but interact with each other. While structure refers to resource distribution, organizational and institutional positions that agents occupy as they pursue their interests, culture represents theories, beliefs, values and “*the ideas which at any given time have holders*” [2, p. xxi].

The parts, i.e. structure and culture, shape the situations in which agents find themselves involuntary by providing directional guidance. Agency concerns the emergent properties of people who have distinctive modes of reflexivity: 1) *communicative*; 2) *autonomous*; 3) *meta-reflexivity*; and 4) *fractured* [4]. When dominant, *fractured reflexivity* produces a passive agent, i.e. to whom things happen, while the dominance of *the first three modes of reflexivity* indicates an active agent with a distinctive stance towards its context. Agent’s stance varies with each dominant mode of reflexivity and is: 1) *evasive* in the case of communicative reflexivity; 2) *strategic* in the case of autonomous reflexivity; and 3) *subversive* in the case of meta-reflexivity.
The dialectical interplay between on one hand structure and culture, and on the other agency, is represented by morphogenetic cycles which consist of three phases: 1) structural conditioning at T1; 2) social interaction between T2-T3; and 3) structural elaboration at T4 [1].

Structural conditioning is the result of previous cycle and represents socio-cultural conditions in which agents find themselves. The occurrence of relationships of necessary or contingent complementarities and necessary or contingent incompatibilities within structure and culture produces different situational logics. The four situational logics that motivate agents to maintain or alter status quo are: correction, protection, elimination and opportunism.

Social interaction, as the second phase of a morphogenetic cycle, commences when one or several organized agencies with publicly articulated objectives, also named corporate agents, decide to take action and change their situation by promoting their interests. Agents act in virtue of their subjectively defined concerns. Representing what they care about most, the concerns are organically or ultimately prioritized with regard to objective circumstances created by previous cycles [1; 3].

Structural elaboration, the final phase, is represented by reproduction, i.e. morphostatic, or transformation, i.e. morphogenesis, and entails the effects of exchange and power transactions of resources. Due to differentiated resources, the transaction between agents is realized in terms of power, while evenly distributed resources involve exchange transactions. The results of this phase represent the start and the structural conditioning of the next morphogenetic cycle [1].

In this study MA helps in focusing on research efforts at the outset of the study. It provides a theoretical lens for exploring the adaptation of ESIM. Underpinned by a morphogenetic approach the adaptation of ESIM is conceptualized as an emergent process consisting of morphogenetic cycles generated by the interplay between (i) situational logics, which are produced by systemic properties delineated by structural and cultural configurations of resource distributions, and (ii) agents’ stances, which are affected by their modes of reflectivity, motivating agents to pursue different reflexive adaptation strategies (Figure 1).

![Figure 1. ESIM adaptation through reflexivity](image)

4. Research design

The research design involves an iterative research process and is based on a longitudinal case study strategy and a qualitative approach for data collection and analysis. A case study strategy, which is appropriate to capture the knowledge of practitioners and document the experience of practice when the research and theory about the phenomenon are at their early, formative stage [9] is used. The crucial case selected for examination is AcceleratedSAP (ASAP) methodology as one ESIM instance that is well documented, being presented at conferences and in research publication [20; 38]. The case facilitates familiarization with an ES implementation context and since ASAP is developed and recommended by one of the largest ES suppliers and used by consultants in ES implementations all over the world, it facilitates the findings of interviewees.
The study adopts a qualitative approach, which subsumes a combination of qualitative data collection techniques and analysis procedures. Two qualitative data-collection techniques are employed in order to gather evidence about ASAP. Secondary data consists of documents with focus on SAP implementation and ASAP. Primary data is gathered through semi-structured interviews and consists of 13 interviews with implementers with experience from working with ASAP. The interviews are referred to by numbers 1-13 in the next section. A retrospective analysis is conducted in order to describe the emergence of an ESIM from the early 1980s until 2004.

5. ESIM evolution by adaptation through reflexivity – The case of AcceleratedSAP

The case reported in this study begins in a context when the idea behind ES as an alternative to in-house IS development achieve increased salience on the market. We apply the framework developed in section 3 and describe four morphogenetic cycles that explain the evolution of SAP’s implementation methodology ASAP over time.

Early 1980s – 1987 – time for reorientation
Particularly from the early 1980s until the beginning of the 1990s, the search for one all-encompassing and universally applicable ISDM began to fade away [24] and a large number of ISDM contents emerged from practice and from research by employing theoretical and deductive arguments [5; 15]. Driven by user relationship constraints, lack of management, description and tool innovations [26] a proliferation of new approaches, methods, techniques and supporting tools are registered on the market during this time which is described by [5] as “the methodology era”. One of the few suppliers of generic software applications is SAP AG, where SAP stands for Systems, Applications and Products in data processing. From the early 1980s SAP is working with the development of a novel system applications architecture intended to replace their mainframe-based product R/2, which attracted not only large companies in Germany but also internationally [28]. By late 1980s ES ideas are rather different than the prevailing view on information systems development and the use of technology to support and automate an organization’s existing processes (interview 13).

1988 – 1992 – time for embeddedness
By the late 1980s, with its head office and product development unit in Waldorf, Germany, SAP registers a strong growth. As a global company SAP is organized with centralized management and decentralized operations through its subsidiaries around the globe (interview 1; 6; 13). Established in 1988, SAP America becomes SAP’s most important subsidiary by the early 1990s. SAP America continues to increase its cooperation with local and global consulting partners. In 1991 Deloitte (interview 10) and Capgemini in 1993 (interview 7) are added to SAP America’s existing partners, like IBM (interview 12). The relationship between SAP America and its service partners is beneficial for both. SAP focuses on product development and less on implementation services, which in SAP America’s case is exclusively managed by its independent service partners (interview 12). The service partners contribute to implementation projects with skills accumulated from previous projects, and know-how through their own methodologies. But, these methodologies are different with regard to integration, scope, content, and efficiency in SAP implementation projects (interview 1; 6; 13). In spite of this variety of complementary service and expertise, and although SAP’s products continue to increase in popularity, their implementation is far from being without challenges both for partners and customers who encounter operational obstructions and practical problems.

1993 – 1995 – time for alignment
SAP grows rapidly and by the early 1990s it “…employs over 3,600 employees and has 24 regional offices and 28 subsidiaries worldwide, including SAP America of Philadelphia…” [36], and introduces a new modular application suite, called R/3, which is based on a novel system applications architecture. Although the application is configurable/customizable, the underlying ideas are to reduce potential problems related to the development cycle and/or enable business process re-engineering. Yet, according to [31, p. 212], between 1993-1995 “North America had only a shallow base of experienced SAP consultants”. In addition, service partners use their own implementation methodologies which were better suited to system development rather than R/3 implementation. Consequently, as indicated by [31, p. 52] “consultants were wasting time on tasks that were not required. The resulting implementation mess (high costs, long project duration) gave SAP itself a very black eye”. In a report presented by [39] in 1995 the costs of external consultants for re-engineering “can range from 2 to 15 times the cost of the R/3 software.”

After the release of the R/3 application by mid-1992, SAP America’s product selling registers an impressive increase but the implementation of R/3 is challenging. SAP America extends their cooperation with their partners [35], and consultants from SAP America and from their service partners begin to
work jointly on SAP implementations. A team of consultants who participated in jointly SAP implementations since 1993 (interview 6); [22] are assigned to develop “a single implementation methodology for mid-tier companies” [25, p. 13]. The implementation methodology emerges progressively from customers’ feedback and experiences accumulated during collaborative pilot implementations by assembling ideas and theories from software engineering, project management and organization development [22].

1996 – 2004 – time for connectivity
By 1996, the outcome of the initiative taken by SAP America is represented by an implementation methodology, which is described as “a best-practices implementation toolkit, which incorporates the capabilities already embedded in SAP’s R/3 product. The toolkit provides a step-by-step roadmap comprising tools, templates, how-to’s and questionnaires for the six phases of an implementation, optimizing the process-oriented approach of R/3: project preparation, business blueprint, simulation, validation, final preparation, and go live and support… for easier, faster implementation and continuous business engineering” [35]. The implementation methodology is added to SAP’s product development portfolio and extends SAP’s complementary services.

The new implementation methodology is introduced to SAP America’s partners and customers as AcceleratedSAP, or shortly ASAP, and recommended as a de facto standard for all SAP implementations, managed not only by SAP’s consultants but also by its partners (interview 1, 4). In addition, the methodology is included in SAP’s professional services and actively promoted through TeamSAP, which is an initiative that entails a combination of vendor’s resources, including personnel and technology, and its service partners in all SAP implementations [21; 22; 32] and (interview 1; 6). A new role is added to all SAP implementations projects, namely a SAP coach whose involvement in the implementation project can vary from “the lead role in complete management of the project to simply playing the role of quality assurance advisor.” [32, p. 7].

Later on, in 1999, ASAP is integrated in SAP’s implementation life-cycle concept, with related support tools and is introduced on the market as ValueSAP. Since the possibility to visualize, automate and handle large amount of documentation was limited at its introduction, ASAP is integrated in SAP Solution Manager platform in 2003, and integrated in all SAP installations free of charge [32] and (interview 1). SAP Solution Manager offers central access to methods, tools, preconfigured content and services. The tool represents a part of SAP NetWeaver and is owned by the customer. Some of SAP’s implementation partners continue to cooperate with SAP in order to implement R/3 solutions and engage in extending and/or integrating parts of ASAP with their own implementation methodology (interview 9). Yet others are deploying ASAP and collaborate with the vendor in enhancing ASAP (interview 8).

6. Findings

In this study four different ESIM reflexive adaptation strategies have been identified: reorienting, embedding, aligning and connecting. Each strategy is generated by a dialectical interplay between:

(i) Situational logic - generated by systemic properties of ES implementation practice which are delineated by involuntary structural and cultural configurations of resource distributions. It provides directional guidance for strategic action by enabling, or constraining different courses of action.

(ii) Implementers’ stance - orientations generated by reflexivity modes and are delineated by self-determined configurations of concerns. The concerns are prioritised to be realised with regard to their situation within an enabling or constraining context

The interplay between (i) and (ii) generates potential changes in ESIM’s contents and features, and the strategy of choice that implementers might select in a situation in order to reflexively adapt ESIM in ES implementation practice over time. The four ESIM adaptation strategies are described below:

1. Reorienting adaptation strategy
The first morphogenetic cycle delineates the emergence of a fragmented content generated by a reorienting strategy taking place in a situation of corrective protection through a control of passive implementers.

(i) Situational logic – By the early 1980s there was an explosion of corrective repairs through reinterpretation of ISDM and/or IS and its development process in an attempt to resolve the inconsistencies between them. The majority of the developer population is engaged in corrective efforts directed towards ISDM contents and IS development process. The few organisations that are on the path of ES, as modular software providers, integrate general guidelines and provide training, congruent with principles and assumptions that underpin their ES solutions. Hence, imbued by the principle of technology enabled BPR, and the configuration of ES software based on a vanilla implementation, ESIM
begins to take shape as a complementary part of the ES implementation process and ES solution. The corrective ideational repairs fostered by ES providers are challenging the dominant IS doctrine on the IS market and education, and coincide with a protective integration of ES operations and roles.

(ii) Implementers’ stance – Although continuously increasing, the number of ES vendors, who are both developers and implementers of ES solutions, is still limited compared with the number of IS providers, which dominated by the early 1980s. Due to fractured reflexivity, delineated by undetermined concerns and disconcerted experiences, ES vendors are passive in their orientation towards ES implementation practice and are reorienting their concerns. Yet, they attract the interest of an increasing number of customers, who increase the legitimacy of their syncretic endeavour and improve their position on the market. They attempt to advance new ideas, but also to reuse their expertise in IS development, augmenting in this way their distress and precluding the formation and pursuit of purposive ES implementation activities. The difficulties in articulating and prioritising their ultimate concerns in relations to ES implementation confine ES providers to passivity.

The effects of a reorienting adaptation are represented by a limited ESIM content and fragmented ESIM feature with cognitive and technical transformation support. Due to limited contributions from a passive ES provider in a corrective ES implementation practice, the establishment of ESIM is slow, but complementary with ES assumptions and a technical implementation process. The ES implementation practice is morphostatic with passive ES providers whose interests are served by subordinated collectivities and an increasing number of customers.

The reproduction of a centralised organisation of interlocking roles and concentrated distribution of resources is reinforced by ES implementation ideas legitimised by an increasing number of customers consolidating the position of an ES provider with reproductive interests. As exploration and integration of operations intensifies, a differentiated access to material resources and the undermined ability to make resilient differences, due to a pronounced dependence of subordinated collectivities and customers interests, emerge as unintended effects.

2. Embedding adaptation strategy
The second morphogenetic cycle delineates the emergence of an aggregated content generated by an embedding strategy taking place in a situation of defensive protection through cooperation of evasive partners.

(i) Situational logic – An explosive demand on ES solutions and limited ES implementation resources, in terms of available expertise on the part of ES vendors, has encouraged an increasing number of consulting companies and ES vendors to join together. Due to their differentiated distribution of resources but complementary expertise, defensive alliances are initiated between the two parts who share a common interest in legitimising ES ideas through defensive protection. There is a mutual recognition of benefits between the ES vendor and its implementation partners, but both parts also have sectional interest in their own operations. Due to their differentiated material resources and operational autonomy, they are joining together on their own terms, i.e., guided by their own sectional interests and diversified services. Part of their protective efforts entails reusing available but limited ESIM contents, and adding their own contents, e.g., Project Management and BPR, and reproducing their specialised expertise.

(ii) Implementers’ stance – Differentiated partners mobilise and exchange material resources, particularly human assets and expertise. They complement their operations but on their own terms. Due to communicative reflexivity, delineated by an ultimate concern in maintaining concordant inter-relationships, ES partners are evasive in their orientation towards ES implementation practice. They conceive their operations within available but differentiated resources. Their cooperation is based on shared interests and an active, but circumventing response intended to avoid potential constraints due to lack of, or incongruent ES expertise in different implementation areas. However, at the same time, they are also renouncing potential opportunities, such as augmenting their positions and resources, and taking a proactive role in differentiating themselves and their results in ES implementation. Contentment with their position insulates against external stimuli and sustains the reproduction and efficiency of their own operations and expertise.

The effects of an embedding adaptation are represented by a horizontally extended ESIM content with aggregated and complementary ESIM features with added control and analysis support, but potential risks for inconsistencies. As the content relies on a fast aggregation of complementary, but limited ES parts enhanced by service partners own parts, which have IS development provenance, the content of ESIM presents risks for inconsistencies. The ES implementation practice is morphostatic with intensified interaction protected by cooperative ES partners with shared interests in interrelationships. They take an evasive stance towards material and
cultural differences, as well as rewards, and are actively involved in reproducing a defensive ES implementation practice.

The reproduction of a sectional organization of independent roles and differentiated distribution of resources is reinforced by systematized ES implementation ideas, legitimised by an increasing number of customers who consolidate the position of ES partners with sectional interests in ES implementation. Selective assimilation of novelty and reduced variety among implementation partners emerge as unintended effects.

3. Aligning adaptation strategy

The third morphogenetic cycle delineates the emergence of an integrated content generated by an aligning strategy taking place in a situation of protective opportunism through collaboration by a subversive team.

(i) Situation logic – ES implementation partners are joining together on their own terms and are operationally autonomous. Guided by their own sectional interests they are pursuing the opportunity to differentiate their operations and services. Hence, alternative ES implementation strategies and specialised ideas about the role of ES in organization and ES implementation processes get support from differentiated groups of ES implementers and customers. For instance, whilst an ES implementation based on vanilla strategy entails configuration of ES software, the alternative chocolate strategy involves considerable customisation of ES software. Mobilised by the ES vendor, a team of implementation partners extend underlying ES ideas and its implementation process and expose complementary and congruent ESIM contents. Specialised but complementary operations and services retain salience in practice.

(ii) Implementers’ stance – Committed to systematically accumulate and integrate differentiated resources, ES partners join their efforts. Due to meta-reflexivity, delineated by organic concerns in exposing best practice, ES partners are subversive in their orientation towards the state of ES implementation practice and concentrate in providing a specialised set of ideas and resources compatible with an ES implementation role. They collaborate and integrate diversified resources in an attempt to improve quality and raise value rationality in ES implementation practice. Their commitment to integration and protection of quality in ES implementation practice come with a price, but long-term achievements are valued more.

The effects of an aligning adaptation are represented by a vertically extended ESIM content and integrated ESIM feature with added representation support. The ES implementation practice is morphogenetic with vocational ideals sustained by collaborative partners with shared interests in value rationality. They organize and take a subversive stance towards material differences, as well as rewards and are actively involved in a continuous search for value and quality in ES implementation practice.

The transformation into a cohesive organization of interrelated roles with similar distribution of resources is reinforced by specialized ES implementation ideas promoted by a new and well-positioned ES implementation partner and legitimised by an increasing number of customers and ES implementation partners. A display of alternative values that animate the interests of passive and diversified partners emerges as an unintended effect.

4. Connecting adaptation strategy

The fourth morphogenetic cycle delineates the emergence of an infrastructural content generated by a connecting strategy taking place in a situation of offensive opportunism through coordination by a strategic team.

(i) Situation logic – A passive acceptance and support of opportunistic efforts introduced by ES partners with sectional and diversified interests and differentiated resources in ES implementation practice, is disadvantageous and affects customer satisfaction, performance in the implementation process and the quality of the ES solution. In order to show commitment for their services and customers, the ES provider takes an active position in promoting complementary resources. A platform of diversified and sectional resources is introduced in ES implementation practice.

(ii) Implementers’ stance – Concentrating on sustaining satisfactory implementation performance, ES partners are active in capitalising availabilities and circumventing constraints. Due to autonomous reflexivity, delineated by an ultimate concern on proficiency and feasible performative achievements, an ES implementation group takes a strategic stance towards ES implementation practice and accommodates specialised and differentiated resources into a comprehensive platform of service and resources. Aware of the limitations and benefits of the ES implementation, the group harnesses, the compliance of various resources, and are circumventing constraints by coordinating sectional and diversified efforts of ES partners.

The effects of a connecting adaptation are represented by a comprehensive ESIM content and infrastructural ESIM feature with organizational, coordination and production support. The ES implementation practice is morphogenetic with
innovative contributions advanced by ES partners coordinated by an ES implementation group with particular interests in task and productivity achievements. The ES implementation group takes a strategic stance towards material diversification and cultural sectionalism and is actively mobilizing and accommodating specialized and diversified resources.

The transformation into a distributive organization of distinctive roles with diversified distribution of resources is reinforced by ES implementation ideas legitimized by ES implementation patterns and an increasing number of customers. Intensification of sectional and divergent interests and reduction of interaction among ES partners emerge as unintended effects.

7. Discussion

Enhanced by insights gained from ISDM and ESIM literature, as well as empirical evidence, a potential explanation of a reflexive adaptation of ESIM in ES implementation practice over time is advanced. The framework applied in this paper exemplifies how a morphogenetic approach might be used to provide a coherent view on ESIM, and to add more precision in describing and explaining reflexive adaptation strategies. In spite of its usefulness, the morphogenetic approach is comprehensive, tending to enlarge the focus of an enquiry, making it difficult to incorporate and consider all the aspects within a limited study, like this one. Hence, the approach has been applied with regard to the research objectives of the study to describe and explain ESIM and its reflexive adaptation.

Due to a focus on ES implementation practice, the potential explanation captures only components appropriate for the objective of the study. Therefore it is partial but has been developed by corroborating theoretical and empirical evidence through retroduction which is a mode of inference in critical realism. Moreover, it fulfills the transfactual generalization criteria by explaining the situation under study by providing an account of two different, but interacting mechanisms, i.e., adaptation and reflexivity that generate potential changes in ESIM.

In addition, acknowledging the existence of a stratified reality that exists independently of our knowledge, awareness about a multitude of perceptions of reality has been enhanced through triangulation from multiple data sources. From a critical realist perspective reality exists independently of our knowledge, which is fallible and open to correction, but the corroboration of theoretical and empirical evidence indicates the significance of an alternative interpretation and the usefulness in explaining changes in ESIM.

In addition to theoretical contributions, the results from this research also help ES professionals to become aware of the characteristics of ESIM and potential ESIM adaptation strategies undertaken in ES implementation practice, as well as its potential causes and effects. The results are of interest particularly to practitioners in similar implementer positions who engage in ESIM adaptation, or are affected by such interventions, and strive to position themselves in relation to their partners and customers. Through the research, knowledge and insights that may prove useful for implementers who are interested in taking a proactive stance towards this type of interventions are provided.

8. Conclusion

The research undertaken in this study explains how ESIM evolves by adaptation through reflexivity in ES implementation practice. A morphogenetic approach, which is framed by critical realism perspective, is applied in order to answer following research questions:

- RQ 1 - Which ESIM adaptation strategies are undertaken by reflexive ES implementers in ES implementation practice?

Four theoretically and empirically grounded ESIM reflexive adaptation strategies undertaken by ES implementers with different concerns are advanced:

1. A reorienting adaptation strategy undertaken by a passive ES implementer with disconcerted concerns and corrective interests.
2. An embedding adaptation strategy undertaken by an evasive ES implementer with ultimate concern in maintaining concordant inter-relationships and defensive interests.
3. An aligning adaptation strategy undertaken by a subversive ES implementer with organic concerns in exposing best practice and advancing vocational ideals and protective interests.
4. A connecting adaptation strategy undertaken by a strategic ES implementer with ultimate concern in proficiency through task and productivity achievements and opportunistic interests.

- RQ 2 - What are the conditions and the effects of ESIM adaptation strategies in ES implementation practice?

The following conditions and effects of reflexive adaptation strategies are suggested:

A reorienting adaptation strategy

Conditions - a corrective situation delineated by an ES implementation practice, with centralised organization of interlocking roles, interchangeable
personnel, concentrated distribution of resources, and syncretic ideas that gain sponsorship from customers. Effects - a limited ESIM content, with cognitive and technical transformation support and a fragmented feature; a reproduction of ES implementation practice where undermined ability to make a resilient difference, and pronounced dependence of the interests of subordinated collectivities and customers, emerge as unintended effects.

**An embedding adaptation strategy**

Conditions - a defensive situation delineated by an ES implementation practice, with sectional organisation of independent roles and differentiated distribution of resources, and systematised ideas that gain sponsorship from customers. Effects – a horizontally extended ESIM content with added control and analysis support and an aggregated feature but with risk of inconsistencies; a reproduction of ES implementation practice where selective assimilation of novelty and reduced variety among partners emerge as unintended effects.

**An aligning adaptation strategy**

Conditions - a protective situation delineated by an ES implementation practice, with cohesive organisation of interrelated roles and similar distribution of resources, and systematised ideas that gain sponsorship from customers and are legitimized. Effects – a vertically extended ESIM content with added representation support and an integrated feature; a transformation of ES implementation practice where display of alternative values and animated interests from passive and diversified partners emerge as unintended effects.

**A connecting adaptation strategy**

Conditions – an opportunistic situation delineated by an ES implementation practice, with distinctive organisation of roles and diversified distribution of resources, and specialised ideas that gain sponsorship from customers and are legitimized by partners. Effects - a comprehensive ESIM content with organizational, coordination and production support and infrastructural feature; a transformation of ES implementation practice where intensification of divergent interests and reduced interaction among partners emerge as unintended effects.

The results of the research provide explanatory insights into the evolution of an ESIM over time and a differentiation of its content by adaptation strategies emerging through reflexivity. The study contributes to ES research and particularly to the relatively limited research on ESIM adaptation strategies in ES implementation practice. While there is much to be done on this subject, this study offers a foundation for future work that may contribute to a more coherent view on ESIM and reflexive adaptation strategies. More specifically, the next step on the agenda is to enhance the explanatory potential of the ESIM adaptation framework by formulating coherent design propositions that may provide high-level guidance for ES practitioners confronted by managing ESIM.

9. References


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