Theory Modelling - Action Focus when Building a Multi-Grounded Theory

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Abstract

This paper addresses the need to describe and visualize theories. The paper follows the principles of Multi-Grounded Theory (MGT), which is a modified (extended) version of the Grounded Theory (GT) approach. An important part in developing a multi-grounded theory is theory modelling. This means describing the theory, which is under construction. Theory modelling is an important aid in the abstraction and conceptualisation process. The purpose of this paper is to introduce a modelling technique for illustrations of both the theory under construction and the final theory; i.e. theory diagrams.

Keywords: theory modelling, theory diagram, action focus, multi-grounded theory, grounded theory.

1. Introduction

This paper addresses the need to describe and visualize theories. The theory constructor needs theory descriptions when developing the theory and also when communicating it to others. Theory descriptions can, thus, be seen both as a tool for structuring thoughts and ideas during theory development, and as a way to make developed theories possible to use, question and refine by others.

The paper follows the principles of Multi-Grounded Theory (MGT), which is a modified (extended) version of the Grounded Theory (GT) approach. MGT emphasizes three grounding processes; empirical, theoretical and internal grounding (Goldkuhl and Cronholm, 2003). This paper aims at introducing an important part in developing a multi-grounded theory: Theory modelling. This means describing the theory, which is under construction. As stated by Goldkuhl and Cronholm (ibid.) and Cronholm (2002), a weakness in GT is its lack of good illustration techniques. The purpose of this paper is to introduce what we consider to be a suitable way of illustrating both the theory under construction and the final theory; i.e. theory diagrams. The use of diagrams in GT theory development is well acknowledged (Strauss and Corbin, 1998). No formalized description techniques are however presented. Our contribution here is an action oriented way to model a (multi-)grounded theory.

Theory modelling is an important aid in the abstraction and conceptualisation process. If we relate this to GT it is used mainly during axial coding (Strauss and Corbin, 1998). In MGT terms it is used during the "building of categorical structures" (see below). A theory diagram is a graphical description (model) of abstracted categories and the relations between them. The structuring of categories in theory diagrams is here based on an action perspective, which is emphasised in both GT (ibid.) and MGT.

We use empirical examples from a qualitative and interpretive case study to illustrate theory modelling. When analysing our data we followed the MGT approach (and thus partially GT).

Based on a pragmatic thinking we have organised our data in categorical structures of conditions → actions → results/effects.

After this introduction, the process of theory development in MGT is described and related to GT in the second section. This is followed by a more thourogh dicussion of our action focus and socio-pragmatic models for explanation in section three. In the fourth section we use two empirical examples to introduce the notion of theory diagrams. In the last section we present our conclusions regarding the benefits of using theory diagrams when building a multi-grounded theory.

2. The Process of Theory Development

From the initial GT approach (Glaser and Strauss, 1967) it has emerged different versions of GT. The version of Strauss and Corbin (1990, 1998) is less doctrinaire and more open to the use of other theories and pre-categories than the original. Goldkuhl and Cronholm (2003) build their MGT approach on GT by Strauss and Corbin, by adding three grounding aspects into a combined view allowing both inductive analysis of data and some deductive use of other theories. In the MGT approach theory is grounded in (ibid.):

- Empirical data (preferably collected in mainly an inductive way) – empirical grounding
- Pre-existing theories (well selected for the theorized phenomena) – theoretical grounding
- An explicit congruence within the theory itself (between elements in the theory) – internal grounding

According to MGT, theory development consists of four stages (ibid.). (1) *Inductive coding* corresponds to open coding in GT, i.e. to inductively and open-minded let the data "speak". (2) *Conceptual refinement* is a divergence from GT. In this stage a critical reflection on empirical statements is conducted. Ontological and linguistic determination is also done in this stage. (3) *Building categorical structures* implies that categories are combined into theoretical statements, which corresponds to axial coding in GT. (4) *Theory condensation* corresponds to selective coding in GT, but with the difference that there is no claim to find one single core category in MGT. Before this last stage of MGT, the three grounding processes listed above take place.

Related to these four stages of MGT, theory modelling belongs mainly to the stage of building categorical structures. In GT it relates to axial coding. Strauss and Corbin (1998) suggest the use of diagrams in the process of axial coding and they also present some examples of diagrams. However these diagrams are not systematically shaped and not built in the methodology in a proper way. There is in GT a lack of systematized description techniques for theory modelling which we try to cover through this paper on theory modelling.

The value of using diagramming in the process of theory development is acknowledged in literature. For example, in reviewing her own experiences of using GT, Urquhart (2001, p 121) states *"Drawing diagrams for the study was invaluable from two perspectives. First, it was a way of visualising relationships between categories. Secondly, it was a way of breaking out the necessarily linear nature of written theoretical memos."* She also states (ibid.) that the diagrams are important personal tools as well as tools for communication with others, which exactly corresponds to our experiences. *"When explaining the ideas to others, the diagrams proved to be a useful tool. More importantly […] they provided a different vantage point from which to view the developing theory, which was helpful during coding periods where conceptulisation seemed to plateau"* (ibid.). Urquhart (2001 p 135) presents an example of a diagram that she has used in her coding process. This is a kind of general conceptual model, which mixes conceptual relationships of several different kinds. Below we will present theory models with a clear restriction to socio-pragmatic relationships.

3. Socio-pragmatic Models for Explanation

Strauss and Corbin (1990) suggest the use of an action paradigm model when looking at empirical data. They describe this model (used in the analysis step of axial coding) in the following way (ibid. p 97): *"In axial coding our focus is on specifying a category (phenomenon) in terms of the preconditions that give rise to it; the context (its specific set of properties) in which it is embedded; the action/interactional strategies by which it is handled, managed, carried out; and the consequences of those strategies."* We find such an action paradigm model useful for coding purposes and we have adopted the main features of it. The use of such an action paradigm model is however controversial within the different GT traditions. This is one of the core issues where Glaser (1992) formulates strong criticism towards the Strauss and Corbin variant of GT[1]. Glaser interprets the use of such a paradigm model to be forcing pre-categories onto data. Urquhart (2001) reports practical problems using such a paradigm model in the coding process. *"Put simply, I found it difficult to apply the coding paradigm, and the relationships between codes and categories hard to discover."* (ibid. p 115).

We have adopted a kind of action paradigm model in our MGT and theory modelling approach and we will try to explain the reasons for it. First, however, let us make a comment on its use within the GT tradition. One strong influence on the development of the GT approach was the pragmatic and qualitative perspectives of symbolic interactionism and American pragmatism[2]. This can also be seen in Glaser and Strauss (1967), where they stress the significance of a grounded theory to be used for improvement of practices in a substantive area. They acknowledge the influence of John Dewey, one of the great scholars in the pragmatic tradition (ibid., p 249). We think it is hard to apply a theory, as a theoretical instrument as Dewey (1931) puts it, in a social practice for its improvement, if the theory has no references to actions, action conditions or possible effects at all.

GT has been accused for an unclear ontological position (e.g. Bryant, 2002). This would be true if all pre-conceptions are left out from an analysis. In the GT variant of Strauss and Corbin (1990, 1998), there is an acknowledgement of pragmatic ontological assumptions to be used. This is how a use of their action paradigm model should be interpreted. The social world is a world of actors and actions, conditions for actions and effects of actions. This is an ontological position that we adhere to (Goldkuhl, 2001; 2002). Glaser and Strauss (1967) themselves acknowledge the need for a perspective held by the researcher when entering the empirical field and analysing the data[3]. There is huge difference between applying general categories (as actions, conditions, effects) and a very specific theory with narrowly defined categories. In the latter case, we fully agree that there is risk of forcing categories onto data.

[1] We have however problems to fully understand the very strong criticism Glaser (1992) raises against the use of the action oriented coding paradigm in Strauss and Corbin (1990), since it only seems to be a slight modification of the primary coding family presented by Glaser (1978, p 74) himself ("the six C's").

[2] Anselm Strauss had a background in the qualitative and interactionist tradition of the Chicago School (Glaser and Strauss, 1967; Strauss and Corbin, 1998). In Strauss (1987, p 110) he emphasises the pragmatic background for GT: *"...the American Pragmatists (especially Dewey and Peirce), whose thinking pervades the grounded theory approach to qualitative analysis"*.

[3] *"The researcher does not approach reality as a tabula rasa. He must have a perspective that helps him see relevant data and abstract significant categories from his scrutiny of the data"* (ibid. p 3).

Using general action categories is just a way to help the analyst to systematize data and see what is in it.

Strauss and Corbin (1990) have perhaps made their action paradigm model a bit too detailed and technical. They distinguish for example between causal conditions and intervening conditions and there is a very strict linear model from causal conditions via phenomenon, context, intervening conditions, action/interaction strategies to consequences. Such a structuration does not seem to be necessary. It is perhaps this kind of complexity that has led to practical problem, which Urquhart (2001) reports on. We suggest instead a much simpler action model; basically consisting of conditions → actions → results/effects. Actually, in the revised version of their book *Basics of Qualitative Research*, Strauss and Corbin (1998) have also simplified their action paradigm model.

In our model we also add the possibility to categorise conditions/effects as *external* circumstances or *internal* strategies, motives, experiences and knowledge (confer the socio-instrumental pragmatism ontology model by Goldkuhl (2002) which is used in the MGT approach).

We do not just categorise individual actions as isolated building blocks, but rather adopt a socio-pragmatic approach emphasing the interactional (conversational) character of human action (e.g. Sacks 1992, Linell 1998, Goldkuhl 2001). This means that one type of action (an "initiative") and its results can give rise to actions ("responses") by other persons.

4. Theory Diagrams – Two Empirical Examples

As stated above, we use empirical findings from a previously conducted case study to exemplify the use of theory diagrams. The purpose of the case study was to examine and question the thesis of data stability in databases, i.e. a research issue belonging to the field of information systems. Data stability here implies that the data structure, around which a database is built, can be kept unchanged when the database once is developed. The data structure is designed during data modelling activities conducted before developing the data base and its applications. A primary reason for data stability is to establish an efficient (data-driven) information management; i.e. information is made accessible, no redundant data occurs, maintenance is facilitated, etc (Ward et al., 1990).

4.1 Data Collection

The case study was conducted in two Swedish organisations; a construction firm and a municipality office. The organisations had, at the time of our study, been adopting a data driven approach for a period long enough to be able to show a distinct data-driven IS solution. The case study revealed examples of how the organisations used different strategies to obtain stability in databases. In the case study, we aimed at illustrating and discussing these strategies in order to explain some consequences of data stability. This paper is focused on data analysis and theory development; the revealed strategies will not be discussed in detail but only used as examples. Results from the research have been presented elsewhere; e.g. in Axelsson (2001) and Goldkuhl (1994).

The case study research was conducted with a qualitative and interpretive approach (Walsham, 1995), including both theoretical and empirical analyses of data stability. Data collection was based on qualitative interviews. A guided interview principle (Patton, 1990) was used because of our research aim to inductively explore strengths and weaknesses in the studied organisations. The interview questions were formulated based on our general research interest and from literature studies on databases and systems architecture. The research design can, thus, be defined as interplay between deduction and induction, i.e. following a MGT research approach (Goldkuhl and Cronholm, 2003). The interviews covered the following issues:

- Functionality of information systems
- Possibilities to change information systems
- Transparency of information systems
- Responsibility for information systems

Data was collected in different ways. We conducted individual interviews with managers, systems developers, and users. The interviewees were chosen so that they represented different organisational groups and units. While studying, for example, an order system we interviewed users who conduct order registration and managers responsible for these activities as well as systems developers responsible for the order system. We also conducted organisational analyses and modelling seminars together with several representatives from the organisation. These seminars resulted in documentation of e.g. business processes, organisational problems, strengths, and goals. Participation in these analyses and seminars resulted in deep understanding of the studied organisation. Data was also collected from observations of users interacting with their information system, and from document studies; such as data models. The observations were done during the user interviews so that the user could exemplify from his or her working tasks while answering our questions.

4.2 The Construction of a Theory Diagram

The empirical data was categorised according to a socio-pragmatic perspective, mentioned above. During the theory development process, we structured our categories diagrammatically in "action chains" based on a specific theme. The theme of a theory diagram can be seen as a main category in GT terms, i.e. the phenomenon to be explained in the axial coding process. During our theory modelling we found four themes, which we interpretated as four different strategies that organisations developed in order to obtain data stability. In accordance to GT and MGT, we made conceptual abstractions from the empirical cases aiming at an analytic generalisation (Yin, 1989). Different categorised phenomena were related to each other as causal-pragmatic relations in contextual action chains, i.e. what we here call action-oriented theory diagrams. The phenomena are empirical findings that we labeled through our conceptualisation. The findings originate from interview statements, observations, and studies of documents. We have translated the findings into short sentences covering the major meaning of a certain phenomenon. The diagrams can be seen as models of the focused issue and its action context. These models act as "theory fragments" and, thus, constitute building blocks for a larger theory on the studied subject. In this way, the data analysis result can be seen as a theory in progress. It can also be used as theoretical building blocks for other scholars working in the same area. This also follows the GT thesis that a theory should be modifiable and extensible.

In the theory diagrams, we use different labels to indicate the role of each category within the action chain, such as "precondition" or "action". These labels are derived from the action-oriented structure of preconditions, actions, results, and effects, mentioned above. We have tried to label the categories as distinct as possible in order to make the action chain logical, understandable and easy to follow. Thanks to this distinctiveness we can separate between e.g. intended and unintended effects, known and unknown effects, or primary and secondary effects. The latter couple indicates that an effect might cause other effects. By labelling our categories we also increase the transparency of the theory diagrams, making them easier to understand and to question for others than the theory constructor. This is an important feature of a theory discription since scientific results must be shown to and judged by other scholars in order to be evaluated. Thus, transparency increases the credibility of the result. In the theory diagrams it is also possible to detect conflicts between categories. It might e.g. be a conflict between two intended effects that makes it impossible to reach both of them in the same time. By using operators like “AND” and “OR” it is also possible to visualise complex relations between different categories.

We call the relations between categorised phenomena “causal-pragmatic relations”. This is to be interpreted as a rejection of defining social relations of this kind in a deterministic natural-scientific way. If there is a move (through a causal-pragmatic relation) from one phenomenon to another in the described action chain, this is due to interpretations and/or deliberations of some actors and not due to a deterministic necessity.

4.3 Two Examples of Theory Diagrams

Let us now use empirical findings from the case study to give two examples of how theory diagrams can be constructed. In this section we first give a textual description of the situation in each of the studied organisations. Then we present a theory diagram explaining the same situation. In the theory diagrams it is possible to recognise the situation with its certain conditions and problems. The theory diagram, though, gives a more distinctive picture of preconditions, actions, results, and effects thanks to its action focus. The categories from the empirical data are here combined into theoretical statements. Empirical sentences regarding a certain phenomenon have first been detected during the inductive coding and then critical reflected, questioned and re-formulated during the conceptual refinement. During the theory modelling, the categorical structures are built by using the modelling technique of theory diagrams.

The data modelling at the construction firm did not result in a straight mapping of the reality. In some cases, the aim was also to generalise concepts to a more abstract level. The reason for this action was that the construction firm had an affiliated company (a decoration company). The decoration company was not supposed to use the same database as the construction firm in the near future, but the managers considered this as a possible opportunity later on. The decoration company had some similarities concerning business practices compared to the organisation we studied, but there were also many differences.

A possible future integration of these two organisations’ databases affected the data modelling at the construction firm. Parts of the resulting data model were made too abstract to really fit the existing organisation at the construction firm. Instead, the construction firm was seen as a “special case” of the data model, due to this *anticipated generalisation* of concepts. Creating a data model based on anticipated generalisation means that the data model might resist future changes. It would be possible to use the database for other situations than it was originally developed for. There will be no need for changes in the database as long as new “special cases” are covered by the generalised data structure. This strategy implies striving for generalisation of data (i.e. creating abstract categories) with the intention to make the existing organisation a special case of the data model.

This discovered strategy means that future organisational changes do not have to result in database changes. The strategy may, though, have consequences for users of the information system. It might result in a gap between the database and the users’ organisational languages, since the database consists of concepts that do not fully correspond to the concepts used by different user groups.

In figure 1 below, this strategy’s vital statements in terms of motives and other preconditions, actions, results, and effects are illustrated in a theory diagram.

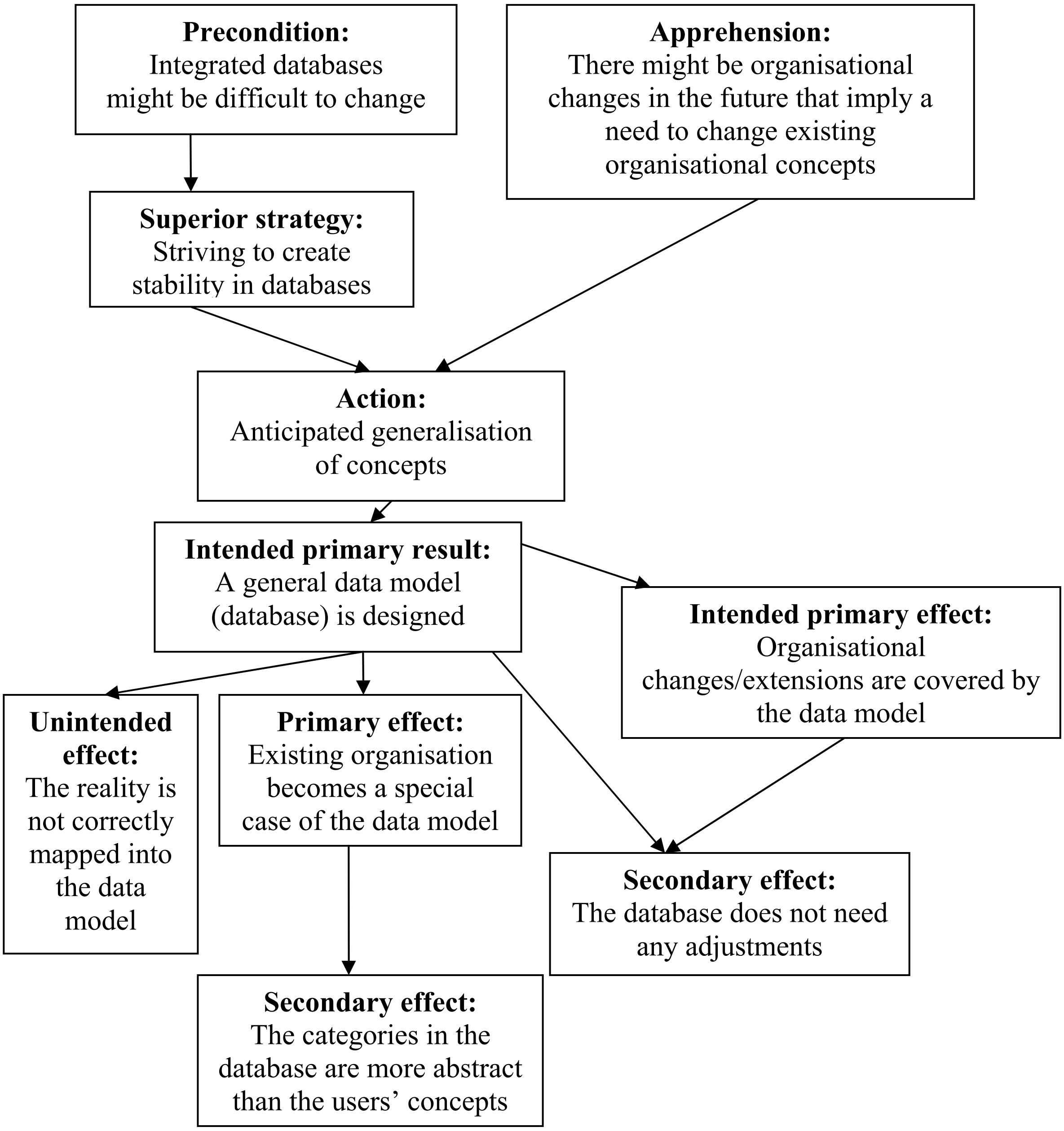

Figure 1. Theory diagram describing anticipated generalisation of concepts

The next empirical example derives from the municipality office, where we studied an information system for official registration of documents. The user groups in this organisation worked with health and environmental inspections at for example industries, restaurants, shops, or e.g. lakes and watercourses. The inspector groups were highly specialised in different issues concerning such inspections. In this organisation, there only existed manual working routines when an integrated information system should be developed with a data-driven approach. An integrated database was developed for different organisational units with so far very varying (individual) ways of working. To be able to achieve such a database a generalised data model had to be created, that could be used by all different user groups. This is not the same as the anticipated generalisation, described above. In this case, a totally new data structure was constructed to be valid and usable for all user groups. This meant that the concepts in the data model, to a large extent, were new to all groups. An important precondition for this information system development process was that the new concepts should be used by everyone in the organisation; i.e. a new concept standard was introduced.

The introduced data structure had four levels; object, business, commission, and document. The object level corresponds for example to a building or a lake, where inspection should be performed. Due to this *constructive standardisation*, a structure was developed that could be used by all actors regardless of their specialisation. Thus, this also meant that all user groups had to adjust themselves to these new, and to some extent more abstract, concepts.

This data structure implied some problems. The different organisational units were not fully supported in their work by the new structure. Since the aim was to develop a general standardised structure for all groups, some specified concepts for different user groups were left outside. As an effect of this, some users had to use manual register files beside the information system. Users were forced to do extra work when translating between manual and computerised structures. This way of action also resulted in some redundant information storage.

In figure 2 below, this strategy's vital statements in terms of motives and other preconditions, actions, results, and effects are illustrated in a theory diagram.

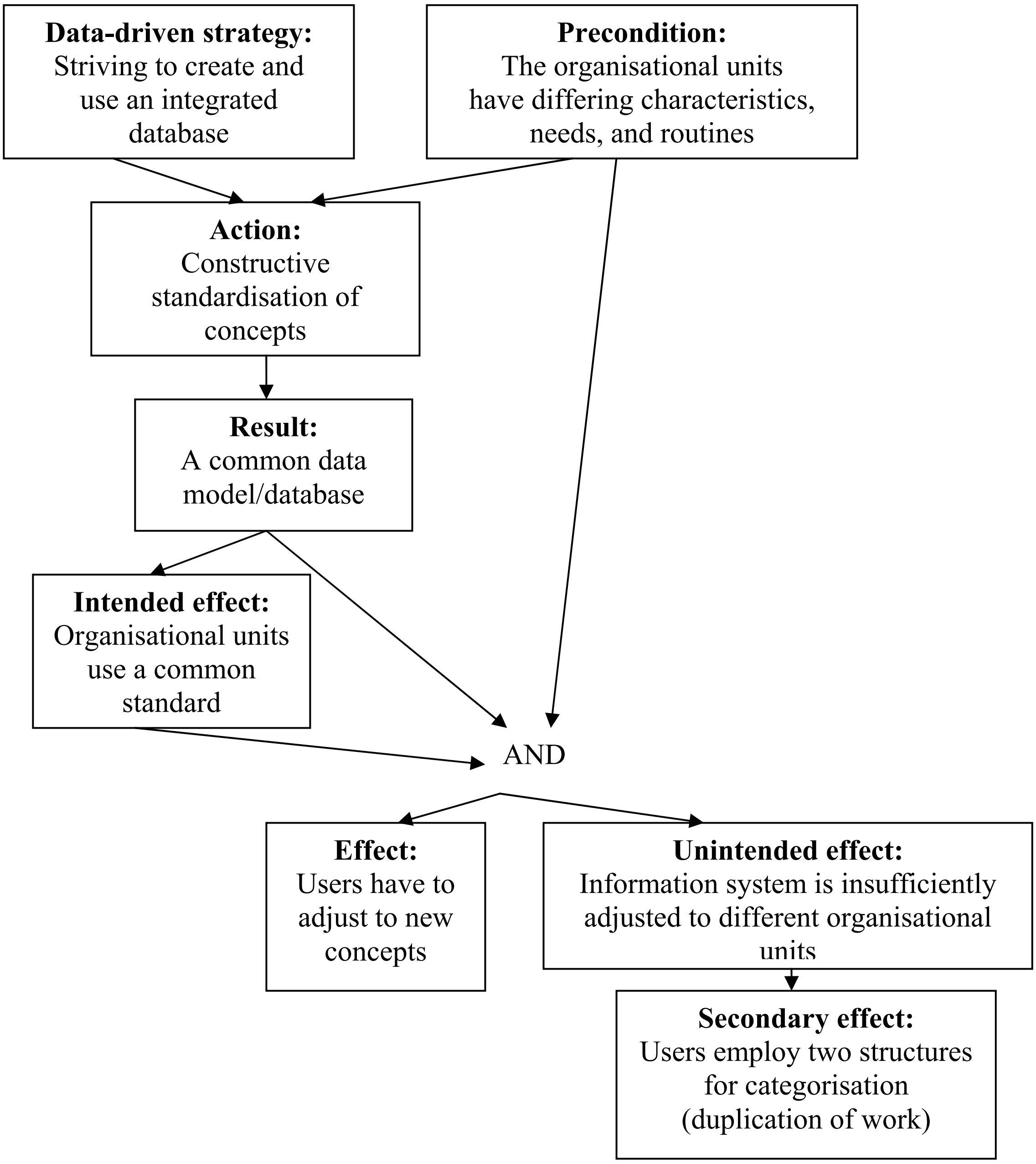

Figure 2. Theory diagram describing constructive standardisation of concepts

The theory diagrams above show two different strategies to obtain data stability, that we have discovered when analysing and comparing the empirical findings from our case study. This way of conducting comparative analysis is a fundamental activity in GT and MGT, which here has been supported by using the theory diagram technique.

5. Conclusions

In this paper we have showed how action oriented theory diagrams can be used for theory modelling in MGT. According to our comprehension, theory diagrams seem to be a suitable modelling technique in this context. Thus, we argue there are several benefits with using theory diagrams to support theory modelling:

- Lack of systematized illustration techniques has been a major weakness in GT approaches, which is addressed by theory diagrams. Besides theory diagrams, there are also other types of diagrams and models that are useful in theory modelling, such as concept diagrams and goal diagrams. This paper focuses on theory diagrams, but this should not be interpreted as this diagram type is the only useful illustration technique in MGT.

- One of the three grounding processes in MGT is internal grounding, where the consistency and congruency between the elements of the theory is examined. We argue that theory diagrams serve as an important aid during the internal grounding of a multi-grounded theory. A reason for this statement is that a systematic investigation of the conceptual structure of the evolving theory is easier to conduct when the textual presentations of the theory are accompanied by graphical illustrations.
- Thanks to its distinctiveness in category labels, the theory diagram makes it possible to distinguish between different kinds of preconditions or effects, for example, that otherwise maybe would have been viewed as similar or exchangeable. Thus, we argue that the action-oriented labelling of the categories (theoretical statements) adds logical understanding to the theory.
- By using theory diagrams, both the process and the product of theory development are easier to understand and question. This kind of graphical aid is useful for the theory constructor but also for the target group of the theory. The clearness that graphical illustration can give is important both during and after theory construction. Hence, the transparency in theory construction increases both the quality of the theory development process and the credibility of the result.
- An important activity during a MGT process is making comparisons between different empirical findings, theoretical statements, etc. We think that graphical illustrations of the theory under construction facilitate such comparative analysis during the different stages of theory development.

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