

Grounded Analytic Research: Building Theory from a Body of Research

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Abstract. In this paper, we present Grounded Analytic Research (GAR) as a method to build theory by synthesizing empirical findings from multiple studies that has been conducted by a single researcher. GAR incorporates concepts from grounded theory, analytic research and systematic literature review. The method was applied in a doctoral dissertation work to build the theoretical concept of *Demand Sustainability* of public Internet access in the context of bridging the digital divide. We describe GAR and compare it with existing theory building methods that are similar to it in epistemology and ontology.

Keywords: Theory building, analytical research, grounded theory, digital divide, demand, sustainability, ICT for development.

1 Introduction

The call for theory building in the Information Systems (IS) discipline has been a sustained one. Successive editors-in-chief of *MIS Quarterly*, the prime journal in IS, have stressed the need for developing theories indigenous to the field [1, 2]. In its wake, came encouragements and inducements to develop new and innovative methods for theory building. A concrete example is the expansion of the journal's "Theory and Review" department in 2007. In an impassioned plea for theory development the incumbent editor-in-chief and the department senior editor called for submissions that, among others, were [3:iv]:

- *Comprehensive syntheses (using qualitative, grounded theory, meta-analytic, set-theoretic, or text mining methods) of previously published research with strong theoretical implications, and,*
- *Pure theory papers with strong grounding in prior empirical research and/or practice*

"Highly valued characteristics" of such submissions included [3:v]

- *Theoretical statements enriched by relevant findings from previously published qualitative and quantitative research*
- *Research syntheses that consider relevant qualitative, as well as quantitative, studies*

- *Research syntheses that employ set-theoretic or text mining methods as well as those that employ qualitative or meta-analytic techniques*

Clearly, the message was to develop theory through synthesizing prior work and building on it. Specific methods and approaches were mentioned. This has helped IS researchers in their quest of theory [4]. Yet, there are instances where no existing method is exactly appropriate to capture the nuances and the context of the data collected in a research endeavour which subsequently affected the process of theory building. The only alternative left is to develop a completely new method either from scratch or by tweaking and integrating existing methods.

Such was the case with the challenge we faced in developing a theory in the context of Information and Communication Technologies for Development (ICT4D) on the sustainability of public internet access points (PIAPs) as a way to bridge the so-called Digital Divide. The research was the doctoral dissertation work of the first author (FA). Our search for an appropriate method resulted in an innovative method which we term Grounded Analytic Research (GAR).

In the rest of the paper, we will first narrate the story that led to GAR through a confessional account of FA's dissertation work. Since the topic of the dissertation is inextricably intertwined with the search, this account also briefly describes the state of the art in the literature of the topic. We then move on to describe how our search led to GAR. Throughout, we use the dissertation as illustration. We end the paper by discussing GAR vis-à-vis existing methods and by reflecting on its implications.

2 The Background Story

Like in many cases, GAR was born out of necessity. FA was working on his dissertation under the supervision of the second author (SA) at a Scandinavian university.¹ The thesis was to be “paper-based”: comprised of a series of published articles, tied together in a “kappa” or an extended report (typically 70 to 100 pages). The kappa is not a summary. It presents the core of the intellectual and theoretical contribution to knowledge that determines whether the work deserves a PhD degree. The papers provide the support and the evidence for such theorizing.

Typically, a PhD candidate conducts his/her research under a planned and structured program. The research questions are first articulated in the thesis proposal, then refined as the dissertation work progresses. Data collection and the writing of the individual articles follow a pre-defined plan and route although deviations and detours are not uncommon.

Our case, however, was not typical. FA had been conducting research in the ICT for development (ICT4D) area under the overarching theme of “Bridging the Digital Divide” with a specific focus on “Public Internet Access Points (PIAP)”. He was not a doctoral student, nor was he planning to be one. Other than staying within the

¹ There was also a co-supervisor who contributed valuable insights to the dissertation work but was less involved in the development of GAR.

overarching theme, the ten papers from this body of work had little in common at first glance. After a decade or so of this work, FA was encouraged by colleagues and peers (the co-supervisors among them) to leverage his work into a doctoral degree. After all, such a lengthy body of work ought to have created new knowledge and made enough contribution to the field to be worthy of a PhD.

Suitably enthused, FA entered a doctoral program and dove with much gusto into the process of working towards a PhD. When he got down to the daunting task of writing the “kappa”, he ran into a hurdle. He did not have a predefined research question for the kappa because his individual papers had their own research questions. He had to essentially come up with his contribution to knowledge in the form of a theory or a theoretical concept to add to the body of knowledge. Over several discussions with his co-supervisors, such a concept emerged. It was “***Demand Sustainability***”.²

PIAPs have been the traditional mode for bridging the digital divide in developing countries through physical access. A model for their sustainability had remained elusive. The vast majority of the ICT4D literature had focussed on the supply side of internet access while relegating the demand side to appropriate noises in the “Discussion” and “Conclusion” segments of articles. Ironically, the need to look at the demand side had been a major refrain of researchers and practitioners in ICT4D. Opinions such as “the demand is driving the whole thing” or “sustainability could only be demand-driven” were actually heard at conferences and gatherings.

A more basic question was: “What is sustainability?” While several conceptualizations exist in the literature (such as financial social, organizational), none could adequately explain why some form of PIAPs survive while others fade away. It gradually dawned on us that sustaining demand itself could lead to viability of PIAPs. So, above all forms of sustainability, the core concept is Demand Sustainability.

The conceptualization of Demand Sustainability became the core research question for FA’s dissertation work. He now needed empirical grounding. He could of course go back to the field and gather fresh data. That would have meant essentially throwing away all the empirical work he had done already. A more reasonable way was to go back to these papers and “mine” them to come up with the required empirical underpinning for the theoretical concept. The problem was that there was no existing method that precisely described how to do it. After searching the research method literature, personal communication with well-known IS scholars, and constant deliberations with SA, a new research method was born. We call it Grounded Analytic Research (GAR)³

² The thesis also studied and refined the concept of “Supply Sustainability”.

³ In FA’s dissertation, the method was called Analytic Research. On reflection and to avoid confusing it with the existing method called “Analytical Research” we chose to rename it.

3 The Search for an Appropriate Method

The search problem could be formulated thus: *find a method to integrate the empirical findings from research conducted by the same researcher (FA) and insights from a number of articles resulting from this research that had their own research approaches and synthesize a theoretical concept called Demand Sustainability where none of the individual papers had sustainability as the central focus.*

The first method we examined was the grounded theory method (GTM), a classical method for theory generation. After studying basic GTM literature [5, 6, 7], literature on use of GTM in IS research [8, 9, 10], and some practically oriented papers [11,12], one central question emerged: “*Is it possible to start the GTM process (coding etc.) from the existing articles, and not from the primary data?*” (see Figure 1).



Fig. 1. Thesis structure: The Summary (Kappa) from [18]

The literature provided some cues. Apart from the traditional and explicitly recognised forms of contemporaneous observation and interview, it was unclear what kinds of data are acceptable in GTM [12]. Personal communication with two prominent researchers (Cathy Urquhart and Richard Baskerville), confirmed that GTM is too closely linked to primary data and to certain coding techniques. What we needed was a method to synthesize prior research which in our case comprised of FA’s ten articles.

An obvious choice was a “normal” literature review. Several guidelines exist in the literature [e.g. 13]. While these are useful and help in unearthing concepts and ultimately contribute to theory building, and while this method is at first glance appropriate in FA’s case, it misses out on one vital aspect: reflection arising not just from the papers, but more importantly, the first-hand and intimate knowledge FA has about the data. Typical literature review papers do not provide any guidelines on how to bring in the primary data that FA had collected but were not part of the findings reported in the published articles. Consequently, an important ingredient of theory building is lost. We needed a method to go beyond simply integrating past findings. We needed an additional process to add the data itself.

The search then led to a closer look at a research strategy known as Analytic Research [14] or Philosophical Research [15]. This methodology defines a purely mental pursuit. The researcher thinks and logically reasons causal relationships. The process is intellectual and the aim is for the flow of logic to be explicit, replicable and testable by others”. [15:112]. Analytic research relies on the use of internal logic on the part of the researcher who has the resources required for solving the problem *within* him/herself. No explicit reference to external data sources is necessary: the problem may be solved *logically* or *philosophically*. The emphasis is on cerebration which distinguishes it from the others.

However, GTM was not totally abandoned because of its theory building potential and suggestions that we need to be far more flexible as to what a unit of analysis might be [10:7]. Some of the principles and working methods from GTM were retained. Examples include practical oriented guidelines [10], and the iterative process described as: “The basic idea of the grounded theory approach is to read (and re-read) a textual database (such as a corpus of field notes) and ‘discover’ or label variables (called categories, concepts and properties) and their interrelationships” [11:2].

The theory building process was also informed by a number of other sources: on getting started and defining the research problem [16], the building blocks of theory development [17], and the process of analytic induction [14]. The overall method for theory building was based on a research methodology framework proposed by Buckley et al. [14] which we describe next (See Figure 2. Our path through the framework is highlighted).

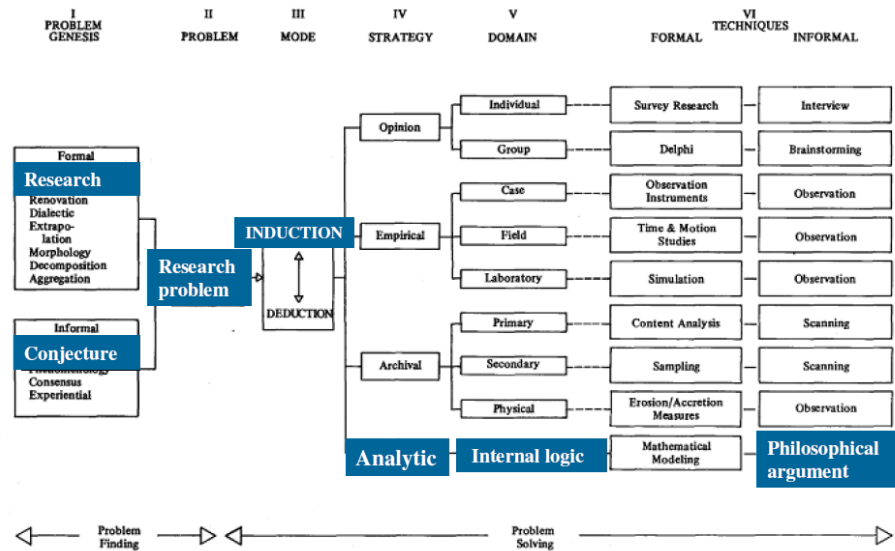


Fig. 2. A Framework for Research Methodology from [14]

4 Placing GAR in a Research Methodology Framework

In our walk through the framework, we illustrate each step by referring to our case. As we have already described the genesis of the problem, we begin with the second step.

4.1 The Research Problem

Problems may be generated formally or informally. The most productive formal approach is reviewing prior research. Our literature review revealed that a broad area of the sustainability issue was not covered. This was combined with an informal approach, where the intuitive feeling and experience of FA aroused his interest and curiosity in studying the demand side of sustainability for Internet access in developing countries. Conjecture is frequently used as a useful, informal tool in problem-finding, where the researcher has an intuitive feel regarding a potential problem area, and has a sense that the existing fund of knowledge is insufficient to solve the problem.

In Grounded Theory research, the theory-building process begins as close as possible to the ideal of no theory under consideration. In Analytic Research and general theory building research, however, problem definition up front paves the way for selecting an appropriate research strategy. An initial definition of the research question, in at least broad terms, is considered to be important in building theory from

case studies [16]. Analytic induction begins with a rough definition of a research question [5]. A literature review is often preliminary: “on the understanding that it is the generated theory that will determine the relevance of the literature. The literature review is revisited, and extended, once the theory has been generated from data”. [10:351]. In our case, the research problem arose from a combination of FA’s own experiences and literature reviews conducted by him.

4.2 The Mode: Primarily Inductive

An essential consideration is to decide whether the project is primarily inductive or deductive. We say ‘primarily’ because both modes are present to some degree in all research. In our case, the mode was primarily inductive.

4.3 The Strategy: Analytic Research

Strategy refers to the essential nature of the data and the process by which it is found and analysed. Of the four suggested avenues [14], we found analytic to be most appropriate for our case. In analytic strategy, problems are solved by breaking it down into its component parts to discover its true nature and the causal relationships among its variables. The solution lies within the interface between the researcher and the problem. This strategy best fits our research problem. The individual articles had been written by FA himself, he knew the research context intimately and had the insights to search for meaningful relationships among the available data through an orderly and disciplined investigation based on logical reasoning.

4.4 The Domain: Internal Logic

The domain, or data source, of analytic research is the researcher’s own knowledge and experience. In our case, the theoretical concept was not developed solely by cerebration; the process got support from FA’s ‘extended memory’, namely articles written from his own research. Since this is his own work, it is not in conflict with the intention of Analytic Research “The researcher has the resources required for solving the problem *within* himself” [14:26].

4.5 The Technique: Informal Argument

A variety of formal and informal techniques can be used for data analysis. The most appropriate informal technique in our case was philosophical argument because it relies on inductive reasoning. This technique is in accordance with this observation from the literature [16:532]: “Traditionally, authors have developed theory by combining observations from previous literature, common sense, and experience”. For building theory, “the building blocks of theory development” [17:49] was used:

- *What* are the essential variables and parameters of the problem situation?
- *How* are these factors related?

- *Why* does a given condition exist?
- *Who, where, when.* These temporal and contextual factors set the boundaries of generalizability, and as such constitute the range of the theory.

Logical reasoning and an analysis of the findings from the ten articles were used to find factors (What) influencing the public Internet access' sustainability in both a positive and a negative direction, and relations between the factors (How). After that, the relations and the connection to the sustainability issue was explained and reasoned (Why) and the contextual factors were filled in (Who, Where, and When).

To illustrate let us suppose that in Lombok (Where) users (Who) with some IT competence (What) visit Internet cafés more frequently than users without such competence (How) because they get more benefits from the Internet use (Why). If this is true, the users' IT competence is one of the demand side elements playing a role in Internet café sustainability.

5 The Resultant Theory

As we stated earlier, the objective of the research was to conceptualize Demand Sustainability of PIAPs in developing countries. Using GAR, findings and concepts from ten published articles (based on research conducted by FA) were analysed. The resultant conceptualization is depicted in Figure 3. ⁴ The concepts and their interrelationships came from different papers. For example, "Economic capacity" and its link to "Demand Sustainability" were based on two papers on internet café use in Tanzania and Indonesia respectively.

⁴ A full description of the theory building process is provided in FA's dissertation work [18].

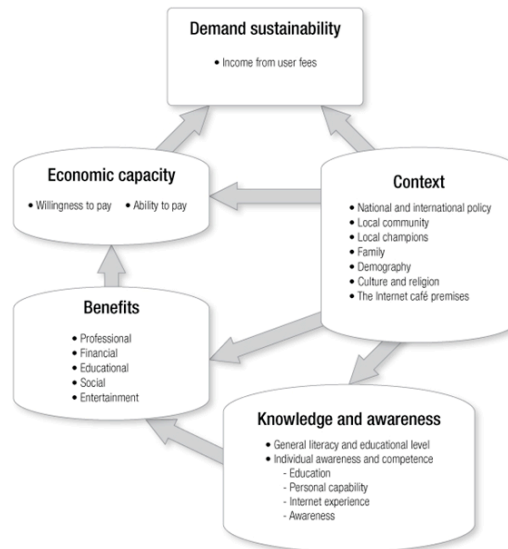


Fig. 3. Demand sustainability from [18]

6 Discussion

Grounded Analytic Research was born when we needed a method to build theory through a two-step process. Step 1 was conducting a number of empirical studies not explicitly related to one another other than being all carried out under the rubric of “bridging the digital divide”. Step 2 was going through the resultant published research articles to unearth concepts not explicitly focused on in these articles, but has lain latent in the material. The aim was to develop a theoretical concept called Demand Sustainability. We found Grounded Theory Method to be useful but inadequate for our purpose. Neither of the two conventionally acceptable sources for data in GT studies - first person observations and face-to-face interviews - fit with our data sources which were the articles.

We therefore developed GAR which combines pure reasoning with empirical data. An obvious advantage of GAR is obviation of the need to search for additional data. Instead there is a search for meaningful relationships among the data which are already available. The articles represent the researcher’s memory trace – an essential aspect of GAR – and the basis of reasoning. This distinguishes GAR from GTM. While we did use the coding procedure of GTM, it was not from raw or primary data. Rather it was “smaller ideas as a premise for a grander idea” (to quote Baskerville in a personal communication).

It may be argued that GAR’s analysis process is not primarily inductive. That is because individual papers employed both inductive and deductive approaches. As such, perhaps abductive is a better description of the process. Yet, we hesitate to

categorize GAR as such. The main reason is that reflection and reasoning are vital ingredients of GAR. Deductive approaches in individual papers simply provide the “raw material” for such reflection.

At the same time, GAR also differs from extant Analytic Research or Philosophical Research. The premise for these methods is pure reasoning and reflection. Data is not needed. In GAR the reasoning and reflection is grounded in empirical data. Although the data are seemingly secondary because they come from articles, they were actually gathered by the researcher himself and thus have the characteristics of primary data. His close proximity to the research context gave him the insights that only primary data can give. GAR does not preclude drilling down to the original data, an aspect that distinguishes it from “meta-analysis” of qualitative studies.

Thus, it differs epistemologically from literature reviews that often result in developing concepts or conceptual models by integrating multiple studies [13]. Unlike GAR, such literature reviews build on the findings and the reflections of multiple authors which the reviewer interprets and thus brings in her own thought processes and reflections into theory building. The process is purely based on secondary data. By contrast, GAR has the advantage of being based on a single author’s thought processes.

We began the paper by citing the call by Markus and Saunders [3] for submissions to the revamped Theory and Review department of MIS Quarterly. In citing them, we listed a number of methods and formats suggested by them. It is appropriate at this point to check how well GAR has heeded this call.

GAR is a method for comprehensive syntheses (using qualitative, grounded theory, meta-analytic, set-theoretic, or text mining methods) of previously published research with strong theoretical implications. Use of qualitative, grounded theory and meta-analytic methods are commensurate with GAR. It can generate pure theory papers with strong grounding in prior empirical research and/or practice. It also has some of the “highly valued characteristics” listed in their call: GAR can generate theoretical statements enriched by relevant findings from previously published qualitative and quantitative research through syntheses that consider relevant qualitative, as well as quantitative, studies and employs meta-analytic techniques such as analytic reasoning and reflection.

We see that GAR meets several of the listed criteria [3] *simultaneously*. In doing so, our paper contributes towards the search for appropriate and innovative methods for theory building in IS. We demonstrated the usefulness of GAR by building a theoretical concept called Demand Sustainability which is a meaningful contribution to the knowledge on ICT4D. We claim it is meaningful because this theory building was done as the main contribution of the successful doctoral thesis of the first author.

In the methodology landscape, these are exciting times for an IS scholar. Design research [19] is now widely accepted belying the accusation that the IS community is unwilling to accept innovative forms. Variations to established methods such as Action Design Research [20] and Grounded Delphi Method [21] are also being proposed. We offer GAR in this spirit.

Acknowledgments

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