

**Title : Understanding Quality in Qualitative Research in
IS: A Practitioners Road Map**

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Track

Social Issues in Information Systems

Abstract

Qualitative Research has gained dominance again in research in information systems and technology. Understanding some of the terminology has often posed a hurdle for the practitioner. This paper draws out some of the key assumptions that qualitative research is based upon and distils some the subtle facets of qualitative research to build that bridge between practice and academia

INTRODUCTION

The fundamental concern in research is truth. Propositions are the bearers of truth, the core of research (Popper, 1965, pp 18-21). Finding truth falls into dimensions of ontology, epistemology, logic, and teleology (Maykut & Morehouse, 1994, pp 3-4). Ontology is about being and its existence. Ontological truth is concerned with the reality. Epistemology relates to the origin, validity, and boundaries of knowledge. Epistemological questions search the truth of the known (knowledge), the knower (who has knowledge), and the value of said knowledge. Logic validates the truth through reasoning. The reasoning process inter-relates sequence of facts or assertion derived from demonstration or verification. For example, examining unintended consequences of redesign or implementation of accounting information systems is under logical inquiry. Teleology directs the study toward a purpose. What are the consequences of process innovation? How does the inquiry contribute to knowledge? These illustrate teleological questions. In summary, understanding truth (reality) necessarily explores fundamental ontological, epistemological, logical, and teleological questions. How does the world work (what is reality)? What is the value of the known to the knower? What are the antecedents and consequences of the known to the knower? Are these consequences expected or unexpected, desirable or undesirable, and direct or indirect? How applicable is the knowledge to other situations? How does the research contribute to knowledge?

Karl Marx was one of the very few to see the truth of innovation as the central feature of capitalism. As a machine, capitalism produces economic growth; innovation is its fuel (Baumol, 2002). Growth is essential for organisation to be sustainable in the long-run. Innovation is a requirement of such growth. In contrast to invention that builds on something new, innovation recognises an opportunity and its exploitation. The innovative process represents routine that is systematic, planned, invested in, acted upon, and reported on. One part of the routine is undertaking it. The other part is diffusing (conveying) the innovation through communication channels over a certain time. Innovators expect people to adopt their innovation through diffusion.

A way to innovate is to deploy emergent information technologies. Drucker explains that every business exists in traditional, transitional, and transformational time zones. Corresponding to the past, present, and future, traditional is the status quo; transitional is what the organisation is doing now; and transformation is building the business for the future. To plan now for tomorrow means to manage all three business time zones simultaneously. As Drucker advises, there is “no such thing as a future decision, only the futurity of a present one (Flaherty, 1999).” Technology is the prime catalyst for defining work, its nature and expectation. It is the engine of change. Information in action is the fuel of change.

Just as innovation is crucial to business, information is significant in business and market activities. Not all people and organisations have equal access to information. Nevertheless, growth of Internet and global information and communication infrastructure makes informational access easier and thereby information less scarce. Timely information is thus a competitive advantage. Marchand et al (2001, p 9) relate information to “good information behaviours and values” (Exhibit 1) which requires “good IT practices” and “good information management practices.” Effective use of innovation is a recursive spiral with good information usage behaviours and values driving good information management, which improves the capability to

deploy IT to support the tasks of decision-making and problem solving which in turn reinforce good information usage behaviours and values and information management. Information technology is a necessary enabler of information orientation.

<[Insert Exhibit 1 here.]

This paper draws the attention to qualitative research and specifically case study research method to seek a deeper truth to information technology and systems. The discussion follows in this format. The qualitative approach begins with an intention to explore a particular phenomenon, undergoes data collection and data analysis, and generally through inductive reasoning generates ideas. The strength of quantitative research lies in its reliability due to the possibility of replicating the research; on the other hand, the strength of qualitative research lies in validity due to its closeness to truth (Greenhalgh & Taylor, 1997).

Themes and Tendencies of IS Research

Information systems (IS) research generally falls into four main themes, namely: systems development, the human factor, IS policy changes, and lastly but not the least implementation of IS in business settings (Andersen & Vendelø, 2004, p3-6). The theme about systems development seeks to improve practice and working lives of people through the systems development process (eg, prototyping and pilots). With regard to the next theme on human factor, the concern is on how people use IT, how to empower them in using IT, as well as how to facilitate economic growth and enhance social welfare through IT use. The third theme covers social implications in developing countries and development of the knowledge society. The last theme is about the consequences—anticipated or unanticipated, desirable or undesirable, as well as direct or indirect consequences—of implementing information systems and the dynamics of information technology use.

Galliers and Land (2002) draw attention to two tendencies in information systems research. The research tends to gear toward traditional scientific method which often leads to inconclusive or inapplicable results. Also some institutions have tendency to advocating particular research approach regardless of topic under study.

Philosophical Assumptions (Set 1)

Certain philosophical assumptions are inherent in the positivist viewpoint. Software developer produces and people use IT with the intention of achieving expected favourable outcomes relative to certain antecedents. Their expectations are generic and applicable to other users and stakeholders. Attempts to explain unintended consequences of IT use look into both organisational and individual contexts (eg, organisations or people do not use IT as intended). Variables are quantitative and measurable. They can be studied under conditions which may be replicated. The variants of consequences are often variations in pattern of IT use, non-use, misuse or abuse. Since technology design and implementation are goal-directed activities, the purpose of a positive research is to verify proposition with the hope that the accepted theory can be used to predict consequences of IT use.

While positivism looks at reality as static at a point in time, interpretive perspective is more dynamic. Deploying IT is an intervention in a social system. It will alter the system's state. Understanding the intervention, its antecedents as well as its

consequences must necessarily account for complex and dynamic interactions, shared meanings and constructs of people to people and people to organisation. Individuals construct their own sphere of reality as to how the IT is useful to them. They have their own expectations which may be incompatible or conflicting to other users and stakeholders. As a consequence, the IT use has many instances as there are many actors involved. While unintended consequences are results of IT use, these consequences would not have occurred in absence of IT use. The intended and unintended consequences mutually affect each other and at the same they may be affected by other events or factors. In terms of causality, it is not one directional. Rather, it is multi-directional. The purpose of interpretive study is to uncover socially constructed meaning as a result of IT use and unearth why unintended consequences occur under contextually specific situation.

The third is the critical perspective. People are creators of their own worlds. They deploy information technology to alter the state of the organisation for long-term sustainability, growth, and competitive advantage. Their conscious involvement or non-involvement with regards to IT use is influenced by their expected outcomes and their perception of control toward achieving those outcomes. This consciousness is laden with value. Reinvention or IT appropriation is a likely consequence. Attempting to mitigate the risks of occurrence of unintended unfavourable consequences requires knowing the change process as well as searching for critical understanding of why unintended consequences occur and their impact if they occurred. The evolution brought about by implementation and use of IT creates causes of unintended consequences. The purpose of critical research is therefore to reconcile the knowledge and find solutions in context of IT implementation and use. Myers & Avison (2002) point out that critical research “focuses on the oppositions, conflicts and contradictions in contemporary society... and helps to eliminate the causes of alienation and domination.”

Among the three theoretical perspectives of qualitative research, positivist research is suitable for theory testing where there is evidence of formal propositions and quantifiable variables to draw inference. Interpretive research attempts to understand phenomena through the meanings people assign to them. It is suitable to theory generation. Critical research strives to resolve conflicts and contradictions. These three perspectives show that qualitative research is not necessarily interpretive as it can be positivist or critical. In similar logic, case study research can be positivist (Yin, 1994), interpretive, or critical (Ngwenyama, 2002) just as action research can be positive, interpretive, or critical.

<Insert Exhibit 2 here:

Qualitative Data Collection Methods (Set 2)

Qualitative research seeks to gain in-depth understanding of the subjective experience of particular individuals or groups. This is contrary to quantitative research where it is crucial to ensure the results of statistical analysis reflect the condition of the population from which the random sample of subjects is drawn. This brings to ways, data collection methods, of finding the people who have the experience of going through IT implementation and use.

Risks in data collection methods are bountiful. The qualitative research methods represent a movement as part of a strategy of enquiry from the underlying

philosophical assumptions to research design and data collection (Myers & Avison, 2002, p 7). The philosophical assumptions affect the choice of research methods which in turn influence the way the researchers collect their data. Case study research, action research, ethnography, and grounded theory are the common qualitative research methods. Major data collection techniques are not limited to the followings: taking notes either as a participant-observer or observer, obtaining relevant documents or audiovisual images, conducting unstructured or semi-structured in-depth interviews, undertaking projective techniques and creative group sessions (Otlacan, 2005; *Qualitative Data Collection and Analysis Methods*, 2002).

Data collection techniques in qualitative research are often flexible. The variety and flexibility of instruments and protocols are strengths of qualitative research. However in qualitative deductive research, the instruments and protocols may result to unfocused sub-standard data. In the case of positivist, deductive, and hypothesis-testing, the methods chosen must take into account the data collection techniques, protocol, and other considerations such as validity, intrusiveness or subject reactivity (Hawthorne effects), and triangulation (Mittman, 2001). Mittman (2001) and Yin (1994) address above issues in the use of qualitative research methods in hypothesis-testing deductive research.

A data collection method is action research. It is studying what's happening in our work or social environment, deciding how to make it better, and implementing the change. It merges research and action resulting to relevant research findings. The research subjects are generally willing to participate in action research because they may influence the outcomes of the project. The distinctive characteristics of action research method are: (1) the researcher is actively involved; (2) expected outcomes of the research are beneficial to both the researcher and the organisation; (3) knowledge obtained can be immediately put in to good use; and (4) the research is a cyclical process linking theory and practice (Baskerville & Wood-Harper, 2002). Issues confronting action research are impartiality, discipline, and rigour which can be mitigated by putting in place proper strategies. Baskerville & Wood-Harper (2002) provide a more comprehensive overview of action research in IS.

Several questions must be taken into account in determining the data collection method (FHI, 2005; Greenhalgh & Taylor, 1997). How are the setting and subjects selected in qualitative research? In studying the unintended consequences of information technology implementation and use, this question brings to ways of finding the people who have the relevant experience of going through IT implementation and use. What is and how does the researcher's perspective taken into account in determining the data collection method? The subjective experience inevitably connotes bias. There is no way to abolish or fully control bias in qualitative research. Moreover the data gathered such as from the observation or interviews may be influenced by the researchers or their interviewers, their beliefs of the research topic, the degree of involvement whether as independent observers, employees, or consultants. Their view, ideology, and cultural perspectives from where they come from affect the results and how the data are analysed and interpreted. What are the appropriate data collection methods? Are these methods described in enough detail? The methods affect what data are gathered. Data from observations differ from those of in-depth interviews and focus group discussions. A detail account of how data are collected describes how sensible and adequate the data collection techniques are in addressing the research question. It is important not only to the researchers themselves but to the readers interested in the research.

What are the underlying ethical considerations for data collection? The detail description of the data collection methods and protocols must include an explicit description of the measures that will be taken to protect the participants involved. This facilitates required ethical approval for the proposed research. In general, the ethical principles encompass: (1) Respect for persons mandates the researchers to recognise the capacity and rights of all individuals to make their own choices and/or to make their own decisions. (2) Beneficence requires that vulnerable populations are afforded additional protections and that the risks of the research compare favourably to the benefits. (3) Justice refers to the equal risks and benefits are equally distributed among the participants and that the participants have been equally selected. (4) Participants must be given information about the data collection using a format and language proper to their age group and level of education. (5) Strict measures must be taken to ensure confidentiality. Privacy Acts in many countries cover how the collected data will be stored, who will have access to it, and disposition of the data at the end of the study.

Qualitative Data Analysis (Set 3)

Seidel (1998) describes qualitative data analysis (QDA) as a process consisting of noticing, collecting, and thinking steps. It is iterative and progressive because the cycle repeats in an infinite spiral. It is recursive because the researchers may revert back to the previous steps. Lastly, it is holographic because each step is an entire process in itself. For example, collecting things includes noticing and thinking about those things. Noticing things is also collecting and thinking about things.

The purpose of undertaking the three steps is to make sense out of the data. Noticing means producing a record of the things noticed during or after data collection phase. It includes making observations, writing field notes, take recording interviews, or gathering documents are “noticing” activities. It extends to coding the data. An analogy is underlining or highlighting passages and marking each line or section with one or more substantive codes. In effect, noticing means breaking up data into pieces and assigning them to more substantive topic codes. Codes are means of summarising, synthesising, and sorting observations. Collecting is sorting the pieces, shifting them, naming them, and categorising the phenomena through close examination of the data. Lastly, thinking is examining the things “noticed and collected.”

Distinction between data collection and data analysis is blurred in qualitative research. Undertaking noticing, collecting, and thinking during data analysis phase is like completing a jigsaw puzzle. The noticing, collecting, and thinking steps, as explained above, are recursive, iterative, and not necessarily in that sequential order. Since noticing consists of data gathering and coding, therefore data collection unavoidably overlaps with data analysis. As a consequence, the data gathered affect data analysis. Also data analysis affects the data.

Noticing, collecting, and thinking steps in one of several approaches of qualitative data analysis. It is trial and error and labour intensive. Agar (1991, p 194 in Seidel, 1998) suggests another equally important strategy. It is to intensively examining a small bit of data rather than intensively coding data: “a little bit of data, and a lot of right brain.” This alternate process starts by reading and rereading the data record, noticing a few interesting things, avoiding intensive coding early in the analytic process, collecting one or more of these things, and intensively thinking about them.

Agar offers another alternative. It looks at coded but unsorted data and bypasses sorting and sifting process.

Given these many alternatives to data analysis and the overlapping nature between data collection and data analysis, authorities suggest the term “modes of analysis” in lieu of “data analysis” (Myers & Avison, 2002, pp 9-10). Hermeneutics, narrative and metaphor, semiotics (discourse analysis), and grounded theory are approaches or modes in gathering, analysing, and interpreting qualitative data.

Hermeneutics is concerned with the meaning of a text. It refers to dialectic between understanding the text as a whole and the interpretation of its parts, in which descriptions are guided by anticipated explanations (Gadamer, 1976). The envisioned meaning of the whole is necessary to understanding its parts; and gaining insights into its parts is essential to understanding the whole. The output of information systems can be viewed as text which needs to be interpreted and made meaningful by those who use it in ways that will match or surpass the intention of the systems’ developers. Hermeneutics gives meanings to this aspect of information systems.

Another analytical mode is the narrative and metaphor. The social interactions brought about during information systems development, implementation, and use involve symbolism in forms of myths and metaphors (as well as ceremonies, beliefs, and magic). A myth states that user involvement is beneficial and should be encouraged. Hirschheim & Newman (2002) present evidence that user involvements may raise as many problems as it solves. Another myth is that the key to successful design is the use of a top-down approach. This approach is troublesome for users who are used to bottom-up perspective. Take note that top-down approach (one myth) means discouraging users involvement (another myth). One myth contradicts another myth. If myths are intended to maintain cohesion, to legitimatise power, communication, and action, and to analyse behaviours and practices such as those mentioned in Exhibit 1, to what extent of dangers will contradictory myths pose to the situation? Metaphors connote perception of realities. They do not represent realities but simply perceived realities. Change agents use metaphors to facilitate change and maintain stability. If the metaphor was to look at systems development as a battle between the systems analyst and the users, then the only way to resolve resistance is to get rid of people who resisted (Hirschheim & Newman, 2002). Above examples of powerful symbolism describe and explain behaviours in information technology implementation and use when people face with uncertainty and complexity.

THEORIES

Good research questions direct the adequate noticing, adequate collecting, and adequate thinking processes. Adequate means just enough but not too much. The design requires conceptual organisation of ideas that needed understanding, known knowledge, cognitive data-gathering structures, and presentation outlines. The most common conceptual organization is around hypotheses. Another alternative is around goal statements to move research toward understanding and explanation. A third option is to use issues as conceptual structure and intricately wire them to political, social, historical, and personal contexts. Issues can be good research questions for organising a case study (Stake, 1995, pp 15-17). Regardless of how the hypotheses, goal statements, or issues are packaged according to the research design, the conceptual organisation of the research takes into account these

question about unintended consequences (Marchand, 2000a, 2000b; Marchand et al., 2001a; Marchand, Kettinger, & Rollins, 2001b; Markus & Robey, 2004). Theories play important roles in conceptualisation organisation. Eisenhardt (1989 in Walsham, 2002, p 104) identifies three uses of theory. Theory provides an initial guide to design and data collection. It is part of iterative process of data collection and analysis. It can be the final product of the research. In an earlier stage, the theories help in creating the initial theoretical framework. During the iterative process in data collection and analysis, the initial theories are subject to revision or elimination altogether. A final product may take into account, for example, the consequences of information technology as the products of both material and social dimension deriving from Giddens's structuration theory. Addressing directly the unintended IT outcomes, Markus & Robey (2004) compile and compare alternative theoretical statements that possibly could explain the relationship between the IT use and the unintended effects.

<insert exhibit 4>

Behaviour (cause) gives rise to direct consequence (effect) which subsequently provides feedback to the cause (the behaviour) and threatens to destabilise or change it. *Functional explanation theory* explains the unintended consequences: how behaviour intended to achieve one goal may have achieved that goal but also created undesirable unintended consequences which cannot be disconnected from the desirable intended consequences. Markus (1995 in Markus & Robey, 2004, p 83) illustrates this functionalism with the use of email. Managers use email intensively to achieve efficiency. Email has inherent deficiencies. The absence of social cues is one of the many deficiencies. Certainly email is a primary medium of communication in the organisation. At least that is what people in an organisation believe. As a consequence to that belief, people use email to communicate instead of personal interaction (such as talking to colleague next door). One unintended consequence is to use email to gather evidence of communication. Other unintended and indirect consequences are depersonalisation, mistrust, or even lack of really good and effective communication. The dysfunctional consequences are often inseparable from the benefits initially intended. People are unaware of how their behaviours cause the unintended undesirable consequences which are inseparable from the intended desirable consequences.

CONCLUSION

Innovation is a core function of organisations. It is a requirement to growth and long-term sustainability (Baumol, 2002). Karl Marx & Friedrich Engels (1848) realised this truth. A way to innovate is to deploy information technologies. Technology is the prime catalyst for defining work and its expectations. It is the change engine with information as its fuel. The growth of Internet and other global information and communication infrastructure makes access to information easier and faster. Although information is less scarce in this Internet age, not all people and organisations have equal access to it. Good information management is crucial and a competitive advantage. It is driven by good information usage behaviours and values which in turn are affected by good IT practices. A spiral relation prevails among good information management practices, good IT practices, and good information behaviours and value (Exhibit 1).

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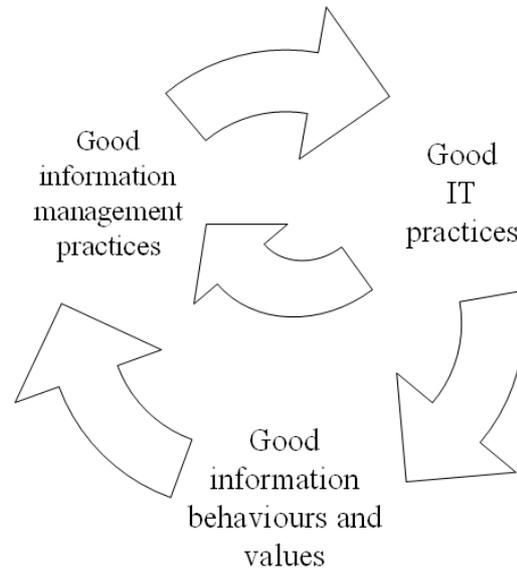
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Exhibit 1 – Information Orientation in organisations is spiral. Good information behaviours and values require good IT practices which subsequently require good information management practices. They in turn drive good information management practices.



Source: Marchand et al, 2001

Exhibit 2 – Underlying philosophical assumptions

	Research Questions	Positive	Interpretive	Critical
Ontology	How does the world work? What is reality?	The world is relatively simplistic and static. <u>Only one reality exists and can be described by measurable properties.</u> Dividing and examining parts result to understanding the whole.	Socio-psychological <u>constructs</u> involve <u>language, consciousness, and shared meanings.</u> People assign these constructs taking into account their complexity and their <u>interconnected whole.</u>	People are creators of their social realities and thereby have <u>the power to change them.</u> All scientific knowledge about the reality is historically constituted (produced and reproduced) by people.
Epistemology	What is the human being and doing (or knower and known)? What is the relationship between the knower and the known? How valuable is the known to the knower?	Independent from their reality, the researchers are observers capable to stand outside of the reality, observe, identify, and examine the <u>static reality, its value, and attributes.</u>	<u>Individuals and their world interact each other and co-exist.</u> Existence of individuals gives meaning to existence of their world, and vice versa. It is <u>not possible to separate</u> the individuals from their own realities in their unique environments.	People consciously undertake activities to change their situations or environments amidst the social, cultural, and political constraints. The social world cannot avoid being infused with “ <u>value orientation.</u> ” Thus, knowledge of the social world is value laden. <u>Theory and practice are interconnected.</u>
Logic	Does causality exist? What are the causes? What are the direct consequences? What are the indirect consequences? Is it possible to generalise the causality?	<u>Causality is one directional.</u> One event comes before the other event(s). The occurrence of an event in a particular time and place can be generalised to other time and place.	Two events may mutually affect each other and also affect or be affected by other event(s). The <u>multi-directional relationships</u> among objects and events resemble a complex web that may occur in <u>a particular time and place.</u> Any explanation is tentative to that one time and place.	Resolving the causes of alienation and domination involves reason and criticism. Rational attempts to understand the existing world. Criticism searches for alternatives and resolves reconstructed distortions. Thus, <u>reason and critique are reflexive in practice.</u>
Teleology	How does the research contribute to knowledge?	The purpose is to <u>verify propositions (theory testing)</u> that can be used to predict human activity. It uses deductive reasoning. It contributes to the preservation of “status quo.”	The purpose is to <u>discover proposition (theory generation).</u> It is to identify what is meaningful to each individual being investigated (that is, how researcher thinks, reacts, and feels) under certain contextually specific situations.	The goal is to reconcile knowledge and to <u>find solutions to existing social conditions</u> that address human desires.

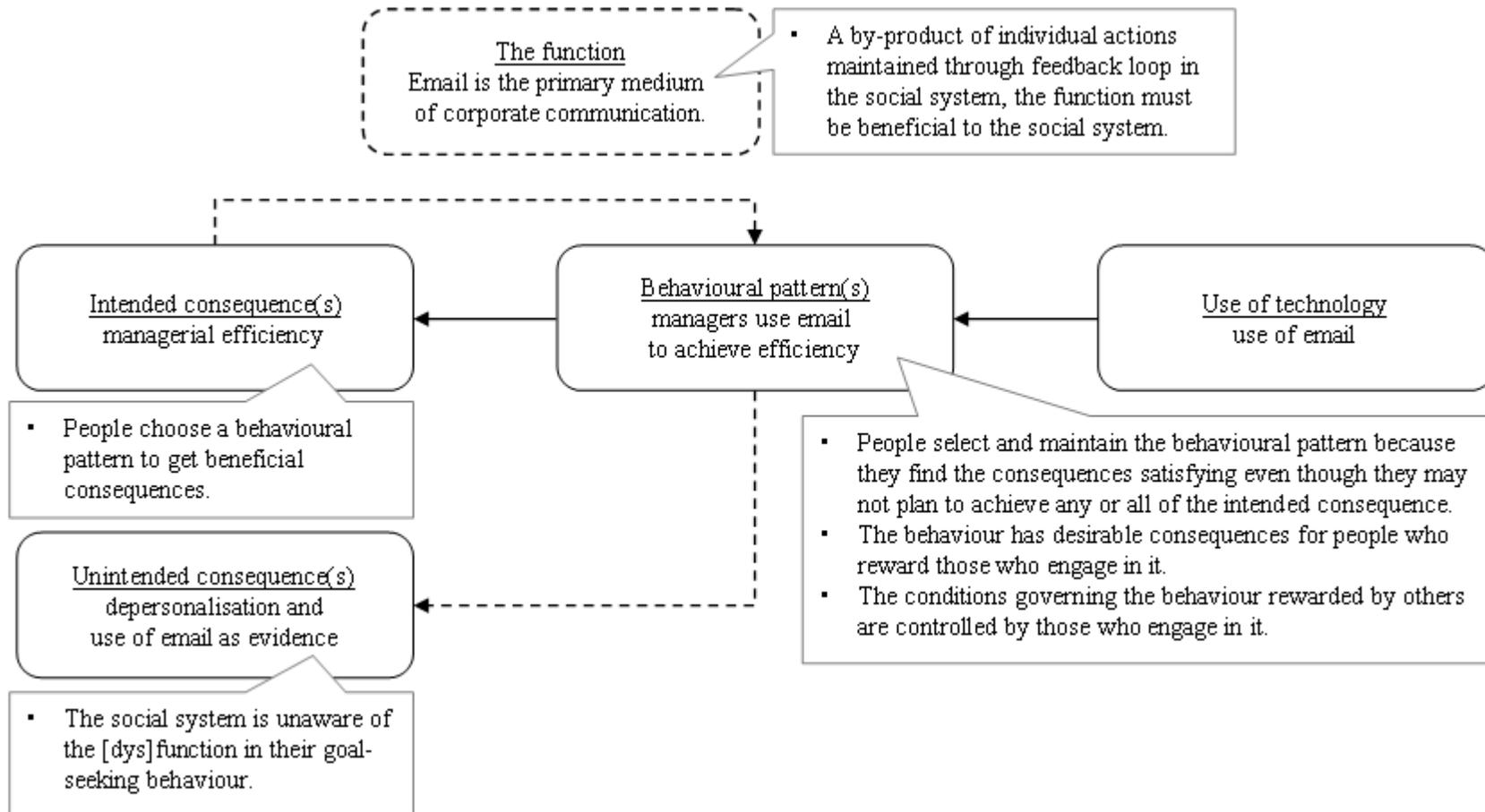
Source: Cavana et al (2001), Maykut & Morehouse (1994), Myers & Avison (2002), Ngwenyama (2002), Weber (March 2004)

Exhibit 3 – Theoretical assumptions of consequences of IT implementation and use

	Positive	Interpretive	Critical
Ontology	Introduction of technology into the work place concerns social, psychological, and technological aspects. Attempts to explain unintended consequences of IT use must consider those three contexts at organisational and individual levels.	Deploying IT is an intervention into a social system. It will alter the state of that system. Understanding IT use, its antecedents, and its consequences must account for the complex and dynamic interactions and shared meaning and constructs of people to people and people to organisation.	Organisations deploy IT for long-term sustainability. Technology development and implementation are interventions into a social system that is expected to alter the state of that system. The whole change process is produced and reproduced by people.
	Variations as to consequences of IT use are often in terms of variations in pattern of IT use such as absence of benefits as a result of non-use, misuse, or abuse in IT use of data warehousing and data mining.	One's expectations of IT use are coloured by one's predisposition.	One's expectations of IT use are coloured by one's predisposition and perception of control.
	The expectations of IT use are applicable to similar group of users and stakeholders.	IT use has instances involving actors possibly with incompatible or conflicting expectations.	
Epistemology	Designer produces and people use with the intention of achieving expected favourable outcomes relative to their pre-existing conditions. The conditions or expectations are measurable precisely in quantitative terms. These variables can be studied under laboratory conditions. It is not difficult to reproduce a "real-world" environment.	Unintended effects are results of IT use. The effects would not have been observed in absence of IT use. The individuals have their own expectations and own realities.	People involved in IT implementation and use consciously undertake activities to improve their situation even if they are faced with constraints brought about by the social, cultural, and political environments. Appropriation or reinvention with IT use is likewise as a consequence to IT use. It is value laden.
Logic	The causality is one directional. Its occurrence has general application to IT use of different time-space.	The intended consequences and unintended consequences may mutually affect each other or be affected by other events or factors. The multi-directional relationships among objects and events resemble a complex web that may occur in a specific time and place. Any explanation is unique to that one time and place.	IT use not only affects intended consequences to occur or fail to occur, it also result to unintended consequences no one intended. Attempting to resolve the causes of unintended consequences involves knowing the change process as well as searching for critical understanding of why unintended consequences occur and their impact.
Teleology	Technology design and implementation are goal-directed activities. The purpose of undertaking research is to verify proposition that can be used to predict consequences of IT use.	IT usage is goal directed activity. The purpose of the research is to be more involved with individuals to uncover socially constructed meaning as a result of IT use and unearth why unintended consequences occur under certain contextually specific situations.	The state of IT implementation and use evolves. It creates conditions that may be unintended. The main task of critical research is to reconcile the knowledge and to find solutions to existing evolving implementation and use of IT.

Adopted from Baskerville & Wood-Harper (2002), Marchand (2000), Marchand et al (2001), Markus & Robey (2004)

Exhibit 4 – [Dys]functional explanation of technology use of email in corporate communications



Interpreted from Elster (1983), Stinchcombe (1968), Markus & Robey (2004),