Rational Thinking in Complex Qualitative Business and Management Research Using Systems Methodologies

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Abstract: This paper describes the application of Systems Methodologies when dealing with complex qualitative business and management research studies, when seen in their true light, as "wicked projects". It will demonstrate the power, flexibility and effectiveness of these approaches. This paper focuses on studies undertaken by mostly part-time postgraduate students on Business and Management related degrees who are managers in their full-time roles. Such research studies in the "messy" real world often deal with complex, difficult, unstructured and ill-defined problematic situations, with many stakeholders, multi-perspectives, uncertainties, soft factors. Hence "wicked projects". Systems methodologies and Soft OR (Operational Research) are very suitable approaches for structuring the research project, gathering data, carrying out rigorous analysis, and enabling clear, unbiased and rational thinking. They provide the researcher with a fully informed holistic approach. They have been employed successfully by the author, when supervising, or in collaboration with students undertaking research studies or dissertations. Soft systems methodologies are not mainstream, and thus are often ignored in university research methods courses, and rarely mentioned in business research methods books. Yet they help the student design the project, help the supervisor guide the project, enable clear communications between the participants in the research, and aid collaboration. They are highly efficient and effective, and will deliver "joined-up thinking!" The paper will describe the studies carried out, and methods and techniques chosen. They have proved of real value to the students, not only in their degrees but also in the learning and development needed for their ongoing managerial roles, to the organisations in question, and to advance knowledge in the particular field.

Keywords: Systems thinking, Holistic integrity, Problem structuring methods, Soft OR, Applied business research, Dissertations

1. Introduction

I have taught Soft Systems Thinking for more than 20 years to British university postgraduates and undergraduates on Business School degrees. Soft systems thinking overlaps Soft OR (Operational Research) and Problem Structuring Methods (PSMs). It adds rigour and rationality to a holistic, pluralist approach in practical interventions, in order to tackle challenging, strategic level problems in the always complicated, difficult real world. Ackoff (1979) coined the term "mess" for these systems of changing, interconnected problems. Rittel and Webber (1973) called them "wicked problems".

Operational Research (OR) overall comprises a range of powerful approaches to support people taking difficult decisions or solving complex problems. These approaches can be split between i) traditional "hard", quantitative methods, and ii) "soft", qualitative methods.

After a few years, it became clear to me that soft methodologies ought to be equally useful for high quality Business and Management applied research studies. The researcher could be an academic or a student, but equally might be a manager carrying out a research project, or taking important decisions within their organisational role. Soft OR-research-based "interventions" pursue action, organisational change and improvement. Equally, they pursue practical knowledge, of area and of method. Thus, I equate the goals of OR with those of Applied Business Research.

But, as business research methods, soft systems /soft OR methodologies are anything but mainstream. They are ignored in typical university business school research methods courses, and almost never mentioned in the most referenced business research methods books. Very occasionally they appear at Business Research conferences!

Yet I have used these methods or encouraged the use of them, as the main research methodology, for around 20 years, when supervising, guiding, and working with managers and professionals, carrying out dissertation projects as part of their professional Business-related degrees at the University of Hertfordshire's Business School. These wide-ranging projects have been highly successful.

The paper describes what is a de facto Action Research programme, made up of these studies over the years, and will aim to show how valuable soft systemic approaches and techniques are for effective applied Business and Management research of all kinds and scales. We will make use of Checkland's FMA schema that can represent any research, and the learning gained, given a declared framework of ideas (Checkland and Scholes 1999). ***See Figure 1.***

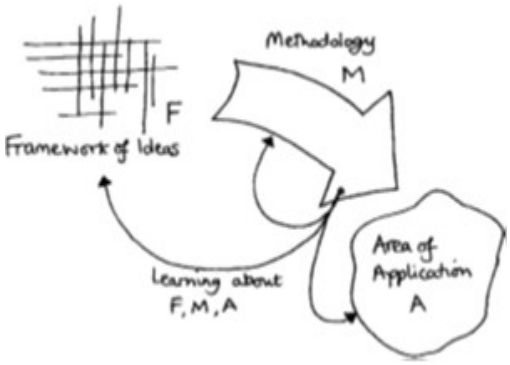

Figure 1: Checkland's view of "any research"

2. Applied Business and Management Research and its Challenges

Given the particular situation, many choices must be made in the course of Business Research, and these *are major challenges facing the researcher* (Saunders et al 2019, Alvesson and Sandberg 2021). The researcher's own values, beliefs, experiences, training and research community determine paradigm choice, which in turn influences theory building, and the research methods chosen - the "research strategy," and then research design or the framework for data collection and analysis techniques, and hence interpretation of results, findings and conclusions (Bryman and Bell 2015).

Mantere and Ketokivi (2013) stress the importance of creative, cognitive reasoning and the role of abduction in Management research, rather than computation and deduction, and that human rationality in computational reasoning is inevitably limited. It is *cognitively idiosyncratic*, and depends on the researcher (Mintzberg 2005). The academic researcher's thinking thus shares many features with that of the manager; it cannot be invariantly objectively rational. But "scholars" are trained to be methodologically rigorous and thus their role should be to help practitioners / managers in the process of gathering, and interpreting evidence, rather than providing evidence on which managers should act (Mantere and Ketokivi 2013). Eden (1982) argues for researcher or consultant to aid the manager or client with *problem construction*, rather than problem solving

I will argue that we must then provide this idiosyncratic, interpretivist and imaginative research with a rational base, and thus bring intellectual rigour to the subjective.

It is clear that Business and Management research is messy! (Saunders et al 2019). First, in terms of the *subject matter*, as the real world of business is often chaotic, turbulent, confusing, (Mitchell and Rich 2020), and full of "wicked problems" (Brown and Rich 2020).

Second, the *research process itself* is complex and not linear, involving many conceptually different steps that require a variety of skills, including a high level of creativity *(*Rich, Brown and Banerjee 2019). It is messy. There are many things that can go wrong with research projects (Bryman and Bell 2015). We need awareness of the "complexities involved in conducting high-quality qualitative research" especially, (Cassell et al 2009).

Business and Management Research must have both theoretical and methodological rigour and practical relevance, to be pragmatic science, and thus valuable knowledge to managers (Saunders 2019, Mingers 2015). Bateson (1980) argues for a balance between rigour and imagination, Pidd (2003) for both analysis and insight. The author argues for a transparent clear basis, or representation of complex problem situations, in order to achieve imaginative, insightful but rational thinking.

Thus, for success in complex applied business research, we need both procedural rationality (Pidd 2004) and procedural justice (Eden and Ackermann 2004). Why? They are the essential elements if we are to achieve any degree of what I have called *"holistic integrity"* (de Villez 2021).

Pursuing holistic integrity means explicitly and in practice, pursuing the best result possible overall, an outcome with the fullest integrity, for the whole problem or wider situation in all its dimensions. Hence it will have a holistic and not just a partial integrity, whether it is research, a project, a dissertation, important decision, or problem resolution; so, really, anywhere where effective, rational thinking matters. Yet we are usually happy with an outcome that has only partial integrity, something that can prove very unsatisfactory and risky, and even disastrous, in a mess!

3. The Masters / Professional Degree Dissertation

The Dissertation is the research component of postgraduate or undergraduate degrees. With Management Masters or MBA degrees, Fisher et al (2004) see it as a major project where the student identifies an issue of managerial / organisational or business concern, and researches it. It contains a thesis, an argument supported by evidence and literature. Usually done in the latter half of a one-year full time degree, or in the second year if on a part time basis, most work is done in concentrated periods and over a few months. Much of the author's experience is with mature students taking degrees on a part time basis, who are managers in full time roles, and for their dissertations are tackling problems they face in their current roles within their own organisations.

Writing about students doing Business /Management Research projects, Cassell (2018) identifies a need to "manage the complexity as associated with the current managerial climate", and Mitchell and Rich (2020) speak of " a chaotic and demanding Business environment". The Business or Management dissertation process is bound to be a complex, "messy" activity, especially the intellectual part of it (Riley et al 2000). It must be tackled systematically. It has a basic logic, a certain number of steps, but these don't constitute a linear process (Rich, Brown et al 2019). Vos et al (2019) identify the challenges facing the Business postgrad student and supervisor engaged in a dissertation.

Qualitative analytical processes can be messy and ambiguous. Accepting and dealing with this is similar to the creativity needed for managing complexity, strategy, and innovation. Cassell et al (2009), and Cassell (2018) argue that the experience of carrying out research, and especially qualitative research, as a student, can be seen as essential for a manager's development in a wide range of different skills and capabilities.

For Grant (2003), dissertation supervision is a complicated, uncertain practice, which involves an unpredictable pedagogy. Macfadyen et al (2019) identify the functions required of the supervisor: to challenge, nurture and maintain standards, thus a three-sided holistic model of supervision. There is a need to tailor the approach to each student's motivation, readiness and situation.

4. Business Research Seen as Wicked Projects

Real-world issues of any importance are "wicked problems". There is always a tangle of issues and no consensual problem formulation, giving rise to complexity. Within the field of project management*, a "wicked project"* is a project which tackles a wicked problem, and therefore the project process and activities will have some or all of the characteristics of a wicked problem (Finegan 2010). Thus, any Applied Business and Management Research, including dissertations in this field, can usefully be viewed as wicked projects! To be successful, the project's context, purpose and desired outcome must be fully understood, and the researcher's capabilities and those of any facilitator / supervisor and participants taken account of. Then it can be tackled in the right manner, using the right approach and methods.

5. Research Approach and Researcher Capabilities Needed

We have identified the key elements needed for a high quality, messy real-world applied business research project: holism, pluralism, rationality, relevance and imagination, thus giving to the overall project outcome a degree of *"holistic integrity."* We need a research philosophy, an approach, methods and techniques that can cope with the content, the complex real-world issues, and that will best support the difficult, challenging messy research process.

The researcher must also have the required skills, knowledge and capabilities, as identified above. This applies to all types of researchers: the academic or scholar, managers in their roles, managers as students, and academics guiding / collaborating with managers.

We need methods that will give procedural rationality (Pidd 2004) and procedural justice (Eden and Ackermann 2004), if we want buy-in by managers or clients, acceptance of recommendations, their implementation and tangible change. Methods must accept that the researcher is engaged in a cognitive and creative activity rather than a computational one (Mantere and Ketoviki 2013), and so help the researcher in this endeavour, by being transparent, recoverable and defensible, and matching appropriate qualitative research criteria.

We want methods that enhance our research, that can handle dynamic complexity, the connections / relationships, so crucial within any problem situation. And we need a range of methods to work well in different phases of an applied, intervention type research project (Mingers and Brocklesby 1997), and approaches that will get us to do more interesting and imaginative research, as advocated by Alvesson and Sandberg (2021). For

successful interventions, the involvement of participants /stakeholders is essential, and facilitation skills from within the researcher team are a must therefore, to manage the process as a well as the content.

With the *dissertation* form of applied Business Research, especially, we need methods that will help communication between all the parties involved, and I would argue, via model use, to ensure clarity and transparency, and enable us to be efficient and effective. This is because of the limits and difficulties peculiar to the dissertation: the constraints on time, access to participants and information on the situation, and less likelihood of a take-up of recommendations.

High quality qualitative research requires sensitivity to context, commitment, rigour, transparency and coherence (Cassell and Symon 2004). We have seen also how the experience of doing research, and teaching the right research methods can develop the very capabilities in Business students that they will need in their future roles (Cassell 2018, Mitchell and Rich 2020, Brown and Rich 2020.)

The outstanding candidate for research methods to employ in applied business research is the powerful range of methodologies known as soft OR (Operational Research), or PSMs (Problem Structuring Methods). They have been developed to explicitly tackle real-world wicked problems and messes, and carry out action research type interventions of all kinds, that conventional research methods / hard OR methods are so ill-equipped to do.

6. Soft Systems Thinking / Soft OR

Soft OR comprises methods for representing problem situations in ways very suited to effective analysis and manipulation and thus to explore, understand and address important, complex matters of concern. The term "soft" here means taking a qualitative or interpretive but powerful, flexible and effective stance. A soft model is a tool to support clear, unbiased and effective thinking and the basis for coherent discussion or debate (Pidd 2003), as it represents the different views about the world, rather than a single assumed "objective" reality. Soft methods and techniques are often more clearly defined, made more explicit and employed more rigorously, and certainly with greater transparency, than mainstream, conventional, hard approaches.

Thus, the soft OR approach is very suited to the individual researcher or research team working in difficult, messy multi-perspective situations, where the outcome, the research or dissertation success or failure emerges from the complex whole. "[The methods] ……provide the researcher with a fully informed holistic approach that can be used flexibly and indeed tailored to the problem situation at hand" (de Villez 2016).

Smith and Shaw (2019) argue that studies using PSMs can meet the tests of validity for qualitative or mixed methods research. Welch (2012) maintains that a holistic stance for effective research in Business and Management fields is needed.

Soft systems approaches typically used in the studies in question are Soft Systems Methodology (SSM) (Checkland and Scholes 1999), SODA (Eden and Ackermann 2001), and qualitative System Dynamics (Sterman 2000). Soft OR techniques and models such as cognitive and causal mapping (from SODA), root definitions and conceptual models (from SSM,) and causal loop diagrams (from SD), must be used correctly to ensure a rigorous and so effective process. Other techniques include rich pictures, semi-structured interviews, and comparison tables.

Different soft OR methodologies can be used together, thus "mixed methods". They can be used with quite different and more mainstream research methods such as Lean, or statistical analysis. Good examples of successful PSM/ soft OR-based applied mixed methods research are the studies of Hindle and Franco (2009), Holm et al (2013), Ufua et al (2018).

The use of soft models is one essential element of Soft OR and PSMs. Another key ingredient is facilitation. With models, facilitators and stakeholders, we can determine coherent strategies and ways to problem resolution.

6.1 Soft OR Methodologies and Techniques

6.1.1 The soft systems methodology

The soft systems methodology approach is illustrated in the diagram in ***Figure 2.*** It is a structured, pluralist approach to organise our thinking and make us rational. Building systemic activity models of imaginary or wished for activities, with the stakeholders, stops us focusing on and trying to solve what we think the problem is! Instead, each model gives us the *right* questions to ask in the situation, and forces us to explore and discover the real problems. We can then use stakeholder experience and knowledge to negotiate what can be done to improve or resolve the complex issue.

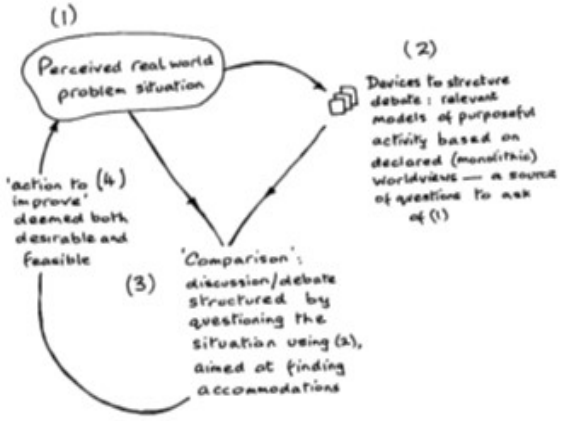

Figure 2: From Checkland and Poulter (2006). The Stages in SSM. Approach

Rich pictures capture, pictorially, in a single snapshot the main entities, viewpoints, structures and relationships in a situation, the main activities, current recognised issues / concerns and potential ones, as in ***Figure 3.***

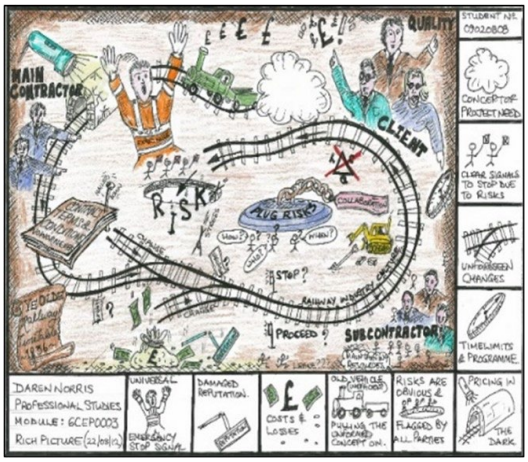

Figure 3: Rich Picture Example (SSM). Norris (2012)

The SSM purposeful activity model, is first fully defined in words in the "root definition", and then as a diagram, in the systemic, structured "conceptual model", that contains all the logically necessary linked steps. ***See example in Figure 4.*** This becomes the sound basis for checking on the real world, and taking a holistic approach, so, not leaving this to the inherently fallible, biased and parochial human being. By creating models for different stakeholder views, we gain pluralism also, the other main ingredient of a systems approach (Reynolds and Holwell 2010).

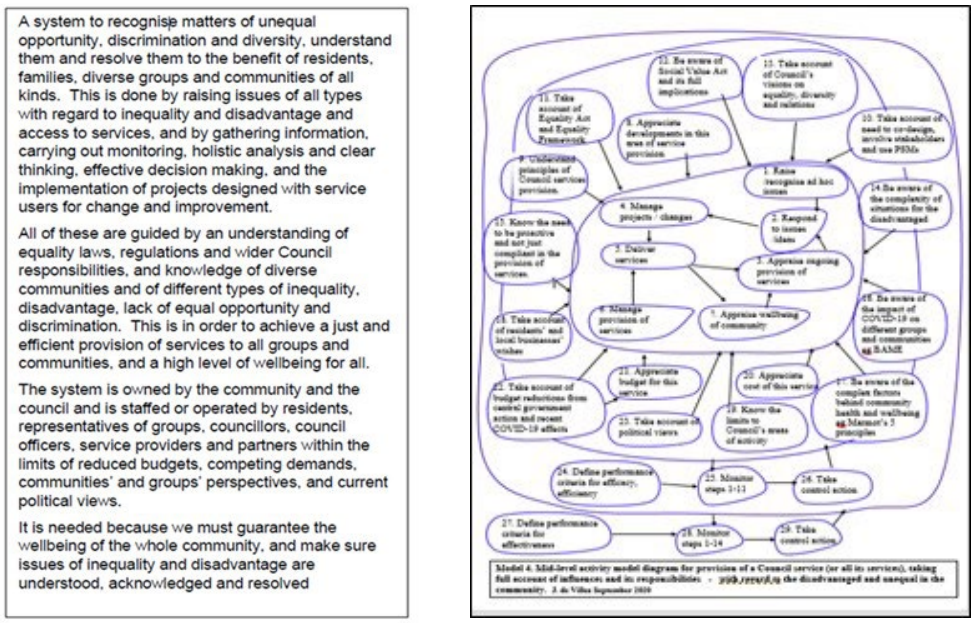

Figure 4: SSM activity model to understand and tackle Inequality and Disadvantage among Ethnic Minorities during the COVID pandemic - Created August 2020 by the author for a UK county council

6.1.2 The SODA methodology

The SODA methodology employs cognitive mapping, following strict rules and guidelines, to capture and structure individual or group ideas on an issue or a problem situation, and their causal logic - how all these ideas are causally linked together. Individual or team / group semi-structured interviews are the usual means of gathering ideas from stakeholders. This *causal map* becomes a very effective tool for clear, creative and rational thinking by a group or team. ***See Figure 5.***

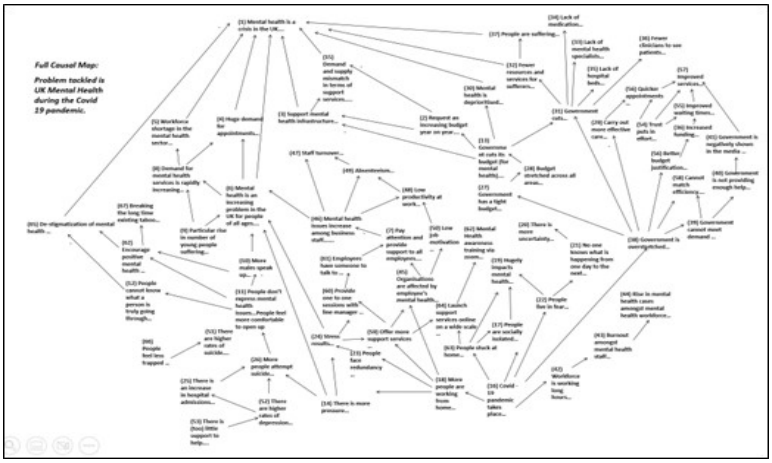

Figure 5: A Causal Map (SODA)

6.1.3 Qualitative system dynamics

Qualitative System Dynamics uses the Causal Loop Diagram to model loops of causality. Made up of connected variables, it demonstrates how the variables interact. Thus, a systemic view rather than our usual blinkered, linear view of complex situations. ***See Figure 6 below.*** It enables "a shift of mind", to an understanding of system behaviour, and that way we can shape / determine a wished-for future.

All soft OR can be used in two ways. *"Mode 1"* use is where the researcher is following a clear methodological framework, and stages; whereas "*Mode 2*" is a more flexible, more internalised use - to tackle a particular task,

when faced by the researcher in the research project. We should see both modes in use by any "serious researcher" in an intervention type project! (Checkland and Scholes 1999).

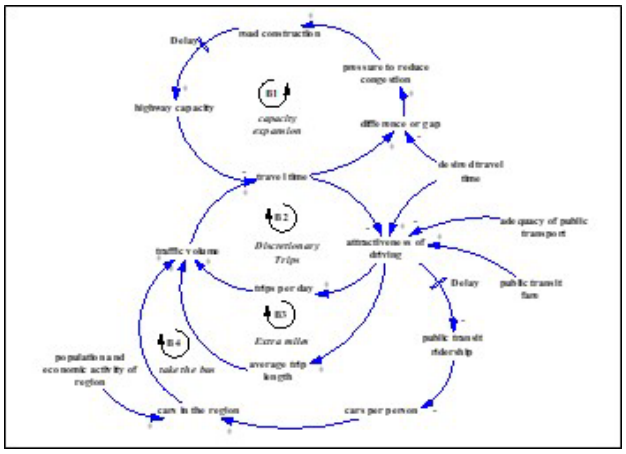

Figure 6: A Causal Loop Diagram (System Dynamics). Adapted from Sterman (2000)

7. Analysis of the Dissertation Projects

Taking up again Checkland's FMA view of any research, from section 1, for the studies under examination here:

The ***F or Framework of ideas*** or paradigm /philosophy is pragmatic, but will include soft systems ideas /systemic thinking.

The ***M or Methodologies*** embodying the framework of ideas, and their associated techniques. These are essentially Soft OR methodologies, so, SSM, SODA, qualitative SD, and CSH (Critical System Heuristics), but also hard OR and other methods combined with these eg statistical or Lean approaches.

One third of the 32 dissertation projects carried out between 2005 and 2020, and examined here, use one Soft OR approach, but two thirds use several different approaches, so are "multi-methodology". Of these, some use several soft OR approaches, some soft OR / hard OR, some soft OR and other Business / Management /Organisational Research methods ie. statistical analysis or Lean. See ***Table 1*** below for the number of times each approach, and each technique is used.

Table 1: Methodology and technique use in the 32 Dissertation sample

Methodology/ Methodologies	Number	Techniques	Number
Soft Systems Methodology (SSM)	11	SSM: Rich Picture	18
SODA	4	Root Definition	25
SODA / SSM	8	Conceptual Model	25
SODA /System Dynamics	1	Comparison Table	24
Statistical Analysis /SSM	4	SODA: Cognitive Maps	16
Statistical Analysis /SODA /SSM	2	SYSTEM DYNAMICS: Causal Loop Diagrams	1
Heuristic Inquiry Diary, /Statistical Analysis / SSM	1	PEST analysis	1
Lean /PEST /SODA /SSM	1	Lean: Value Stream, Flow Analysis	1
		Semi-structured Interviews	27
		Surveys / Questionnaires	5
		Statistical Analysis	5
		Heuristic Inquiry Diary	1

Lastly, we have ***the A or Areas of concern /studied/investigated***. The research carried out in these projects is Business or Management-related, and in most cases, is into problems directly facing the researcher, as manager or professional, at the time.

Projects range widely over messy problem situations of all kinds: from Three-way Collaboration in the Railway Construction Industry to Training Teachers to Cope with Autism, from Leadership in Fire and Rescue Services to Fraud and Corruption in Saudi Arabia Mega–Projects, from Access to Child and Adolescent Mental Health Services to Tackling the Black Student Attainment Gap in post 1992 UK Universities.

The Researchers involved. Most of the researchers are mature postgraduates or undergraduates in current or very recent middle or senior managerial, or other professional roles. Most are part-time students.

Dissertation Activities. To analyse what typically goes on within the above studies, we can divide up the sample's Soft OR-based intervention-type research projects into four phases, following Mingers and Brocklesby (1997). The four phases comprise *Appreciation, Analysis, Assessment and Action.* ***See Table 2 below.***

Table 2: Drawn by author. Traditional dissertation project stages contrasted with the sample's Soft OR-based dissertations viewed as 4 phases (after Mingers and Brocklesby 1997) **32**

TRADITIONAL DISSERTATION – STAGES – (iterative)	***SOFT OR - based intervention dissertation project - PHASES - (iterative)***
FEBRUARY - *choose area / submission of information on Area for Dissertation; Allocation of Supervisor – so pre-start.*	***APPRECIATION:*** *Declare Framework of Ideas and Method; Design Study / Approach Gather information / Data Secondary Data collection - Literature Review Primary Data Collection*
MARCH: Complete ethics application + start 1. Introduction.	
APRIL: *Finish* ***1. -*** *Introduction;* ***2.*** *Do* ***Literature Review.***	
MAY: *Finish Literature review;* ***4a.*** *start* ***Data Collection.***	
JUNE: 3. Complete Methodology.	
4b. *Carry out* ***Data Analysis.***	***ANALYSIS: of data =*** *findings/ results and make sense of situation*
JULY: Complete Data Analysis and 5. present Results/ Findings.	
6. Discuss Findings and write 7. Conclusions.	***ASSESSMENT:*** *discuss findings + results; Assessment = discuss conclusions /what changes to make*
AUG: Complete Conclusions.	
SEPT: 8. Make Recommendations. + References, Abstract, Complete Project and Submit.	***ACTION*** *= recommendations; implement changes; study outcomes.*

The Dissertation Activities in practice:

1. Appreciation of the situation. *So, what is happening?* There is initial identification of the problem to be tackled by the student researcher, plus design of the dissertation study eg using SSM. We discuss and agree how to work together! The input needed from myself, as supervisor, will differ with each project and student, but the approach is very much a collaborative one.

A comprehensive literature review is done. Primary data collection aims to capture the "situation as experienced by practitioners and expressed by actors in the situation" (Mingers and Brocklesby 1997). Semi-structured interviews are always most effective for this, but sometimes it is done in these projects via survey and questionnaire. The concerns are discovered in this way, together with those raised by the literature, and the researcher / student in their role or organisation. The students use rich pictures and relevant systems, and cognitive mapping, from SSM and SODA respectively, to represent participant stakeholder views, ideas, the perceived situation, the concerns.

2. Analysis of the information to understand why the situation is, the causal mechanisms and underlying relations that maintain it, and the history that has generated it. *Why is it happening?* (Rosenhead and Mingers 2001). I would see this as "constructing" the problem, thus making it clear (Eden 1982). We create *intellectual devices (soft OR models),* to enable analysis or explanation of the phenomena. These are boundary objects, thus clear, transparent tools to create good communications, and a common understanding between people from different backgrounds.

In these projects, SSM's relevant systems and comparison tables, and SODA's maps, have most often been the basis for analysis, but causal loop diagrams (from system dynamics) have been used too. They all work very well. SSM has proved especially good at integrating very different kinds of information, (as Cassell and Symon 2004).

3. Assessment of possible explanations. *How can it be different?* We now interpret the results of the above analysis. Here student and supervisor discuss possible resolutions to the problems, using the agenda created in the analysis stage via mapping or SSM comparison tables, hence the changes needed, and what is desirable, feasible, and can be agreed.

Our models enable a clear view of the whole situation, the connected features, the different aspects, or problems. They provide the basis for structured, rational, and informed thinking.

4. Action - outcomes /actions, changes if needed. *What shall we do?* At the end of the study, we have the dissertation outcomes, the changes, any actions. Recommendations go to the client or interested parties. The dissertation is submitted and is assessed / marked by academics. Marks are perhaps the primary goal or outcome for the student researcher!

See Table 3 *below, for what takes place, and what methods have been used and for what purpose, in each phase of this set of Soft-OR based dissertation projects.*

Table 3: The range of methods typically used in each phase plus any actions /outcomes/ changes

1. APPRECIATION	2. ANALYSIS	3. ASSESSMENT	4. ACTION / OUTCOMES
Use Activity Model (SSM) to design the study. Literature Review; existing documents/ data review. Informal discussions/ conversations. Survey / questionnaire. Semi-structured interviews. Cognitive Mapping (SODA). Rich Pictures (SSM). Heuristic Inquiry Diary.	Statistical Analysis of Primary Data. CATWOE Analysis, Root Definition, Conceptual Model, Comparison Table (SSM). Rich Picture Analysis (SSM). Cognitive Map Analysis (SODA). Causal Loop Diagrams (System Dynamics). PEST analysis. Value Stream /Flow Analysis (Lean).	SSM model / Comparison Table-based Integrated and structured Discussion of Findings/ Results / Changes. Cognitive Map-based Discussion of Findings / Results / Changes. Causal Loop Diagrams-based Discussion of Findings / Results / Changes. Statistical Analysis- based Discussion of Results.	Submission of Dissertation report. Make evidence- based / Soft OR Model-based Recommendations. Disseminate findings / recommendations. Changes / Improvements to an organisation's goals, its approaches, and processes. Researcher skills and other skills and capabilities enhanced for professional role / career. Improved shared understanding and insight among study participants and colleagues within organisation in question. Increased academic and practitioner knowledge and understanding of Study Area, the power of / limits of Soft OR Methods and other approaches, and the suitability of a Soft Systems / PSM Research Framework. Use knowledge gained in university learning and teaching.

8. Evaluation

Here I evaluate the dissertations making up this overall body of work, and thus what has been achieved using such methods over time, and what has been learned.

The framework for this is based on that of Midgeley et al (2013). They argue that we cannot evaluate *research method* (M) independently from the *purpose* (P) it is put to, the realised *outcomes* (O) *or* the *context* (C). Therefore, these are four necessary foci to *evaluate any inquiry or research project*.

The researcher's role, or whole research team role, must be included here too as a key element to project outcome or success. The researcher's identity, relationships, characteristics and abilities can all significantly affect the "trajectory of an intervention" (Checkland and Scholes 1999).

8.1 The Context

Every one of these dissertations has a different context, as each student is tackling a different real-world issue facing them in their current roles and of immediate concern. Always the context will both enable and constrain. Time often becomes a limiting factor, as does access to participants for the study, and where "buy-in" by organisational decision-makers / senior staff has not been achieved.

Student inexperience in applied business research and using research methods is usually the case, but these particular mature students, in professional roles, have demonstrated a range of other very valuable attributes and skills, that have proved essential for project success. These include motivation, a professional approach to their work, inside knowledge of their organisation, who to recruit and then how to work with the study's participants, plus ability in interviewing, coherent thinking and writing etc.

In a few projects, where students were weaker, less mature or without work experience, and not in full time roles and thus researching unknown areas or organisations, the outcomes were less successful.

The supervisor has always played a crucial part, as guide and collaborator, in determining research question, philosophy, methods, process and outcome. The supervisor brings to the party soft systems / OR expertise, and experience of facilitating dissertation projects using these Soft OR methods. Supervisor knowledge of, approach to, and experience with methods and supervision, have been key factors.

These projects do need a collaborative approach within the research team to work well. Equally, they are ideal where a collaborative approach is needed! Sometimes, as above, with weaker students, or with stronger students researching from the outside a new organisation or industry, projects can require a lot of input from the supervisor e.g. help with modelling.

8.2 Purpose

Meet ethical criteria, and deadlines; and deliver a high-quality dissertation that matches the stated objectives, satisfies the immediate academic audience of first and second markers, and mark criteria.

Get as close to ideal research as we can, given the context, via procedurally rational and fair research processes, in order to achieve as high a degree of ***holistic integrity*** as is possible.

Deliver both applied business research aims: to engage with the theoretical and practical. Give real value for knowledge and learning. Move towards situation improvement or problem resolution.

8.3 Methods

Given the time constraints, we are looking for efficacy, efficiency and effectiveness of method in what are important, complex, real-world problem situations. We must see situations clearly in order to understand fully what is going on, before identifying what constitutes the problem or problems. We conclude that the soft systems approaches, and rigorous soft model-based analysis used in these studies, give us all of these. We have used them to design the project, as well as handle the content. They have structured our thinking, the problem, the project. They have always added clarity, especially at the project front end, and so speeded up projects, and often delivered exceptional outcomes.

The strengths and abilities of each student researcher have determined the degree of support and collaboration needed from the supervisor in the use of these particular research methods. But these projects have shown there is always a need for an informed outside view with Soft OR approaches and soft systems thinking. The supervisor, experienced in these methodologies, facilitates the overall project, the stages and the student researcher's progress, whilst the student directly works with participants within these stages eg interviews, modelling etc.

Soft systems methods have proved very suitable for these dissertation research projects, when used in both Modes 1 and 2 by student and supervisor, and with other methods, as above. Students have easily mastered their basic principles, and often for more than just one soft OR method, and then used them very effectively. We tailor these adaptable and flexible methods to fit the problem. Often, the more imaginative, confident, and motivated students have hit on innovative uses of these techniques and tools, eg a series of rich pictures to capture data from individual interviews.

8.4 Realised Outcomes

The desired outcomes of applied Business dissertation projects are these:

i) valuable theoretical learning, practical knowledge; **ii)** evidence-based recommendations that can lead to improvements or changes; **iii)** achieving appropriate *holistic integrity* via approaches delivering procedural rationality and justice; **iv)** development of skills and capabilities for students as managers; **v)** successfully meeting the university or academic requirements, thus gaining high marks towards their degrees.

These projects demonstrate that the use of Soft Systems Thinking / Soft OR methodologies, techniques and tools can go a long way to help us achieve all these outcomes, in a wide range of challenging, time-constrained situations. Marks are usually very good! And, clearly, these mostly successful dissertations, with their findings, outcomes and reflection, have impacted each researcher's knowledge and skills, and contributed to organisational clarity, shared vision, insight and understanding of the particular area of concern. Some projects have delivered significant, tangible changes or improvements within the life of the project or soon after.

9. Conclusions

Following Checkland's FMA schema, what has been learned from this programme of dissertation studies stretching from 2005 until 2020?

About the A, these very different areas of application: we have learned much and understood more fully, on a rational, holistic, pluralist basis.

About the M, soft methodologies and associated techniques: they have proved their worth and appropriateness for these studies, and for this messy real world.

About the F, the soft systemic thinking ideas: this is a very suitable framework, with which to both tackle real world issues, and deliver knowledge in business and management related spheres.

***Possible improvements**:* More time for projects; more buy-in from decision makers in researched organisations; more potential supervisors with Soft OR experience and skills.

It is possible to generalise these findings overall not only to all Applied Business Dissertations but to all Applied Business / Management/ Organisational Research. Indeed, I would argue they apply to all real-world projects, decision making and problem solving.

Soft systems thinking via soft OR is needed, if relevant research, research that leads to real-world recommendations, project outcomes, solutions and decisions, is to be fully ethical. If it is to have what I have called "holistic integrity". Human beings cannot be rational in a computational sense. In unaided research, whether it's a formal declared project, or a manager in their everyday roles, we cannot know the "unknown unknowns" or the real problems, and often we tackle the wrong problem, and then our project or decision outcome has little value.

10. Recommendations

Applied Business and Management Researchers, from dissertation student, through academic to manager in their everyday role, should discover, learn and adopt these methods, where valuable, in their thinking, researching and decision-making activities. They work well with and thus complement existing, more traditional Business Research tools and ways of thinking. They will deliver improved project /research outcomes, decisions, and solutions that have the highest level of *holistic integrity* possible for the particular situation. Let's see them included much more in Business Research Methods books and Business School Research methods courses.

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