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Developing a systemic textual analysis method based on the human activity system modelling language of soft system methodology (SSM)

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Abstract

The paper introduces a textual analysis method which utilises a modified version of the Human Activity System (HAS) modelling language from Soft Systems Methodology (SSM). For ease of reference, the method is referred to as the Systemic Textual Analysis Method (STAM). The method constitutes one form of application of a wider ranging systemic methodology for qualitative research, textual analysis and document design (Hindle 2003). The research programme of STAM included a literature review of textual analysis, initial piloting of the method by the author on a range of target texts, and external testing with several different users. Following trends in hermeneutics, linguistics and cultural studies, STAM balances objective and subjective aspects of the process of textual analysis through the use of a systemic activity-based modelling language and the notion of "recoverability" (Checkland and Holwell 1998). In the form presented in this paper, STAM can be used to analyse texts which constitute formal descriptions of processes, methods or methodologies. Such analysis is intended to support critical evaluation of the texts in terms of characteristics such as content, descriptive quality, logical structure, overall coherence and completeness. The basic tenet of STAM is that a formal description of a process, method or methodology can be conceptualised as a set of activities, and therefore a HAS (Checkland and Scholes 1990). STAM opetationalises this concept in the form of a 6 step process, which runs the normal HAS modelling process of SSM in reverse. The paper gives an example of how STAM can be used to analyse a short piece of text which prescribes the process of borrowing a book from a library.

1. Introduction

This paper introduces a textual analysis method which utilises a modified version of the Human Activity System (HAS) modelling language from Soft Systems Methodology (SSM). For ease of reference, the method will be referred to as the Systemic Textual Analysis Method (STAM). The method, as presented here, constitutes one form of application of a wider ranging systemic methodology for qualitative research, textual analysis and document design (Hindle 2003).

The paper is split into two main sections. The first section introduces the research programme of STAM (2.1), the complex processes of textual analysis, interpretation and design (2.2 and 2.3), and introduces the notion of a "recoverable" textual analysis (2.4). The second section introduces the use of HAS modelling for textual analysis (3.1), describes STAM in more detail (3.2) and gives an illustrative application of the method (3.3). A final section (4) gives some brief concluding remarks.

2.1 The Research Programme of STAM

Initially, STAM was developed for the analysis of published academic texts within the discipline of Management Science. Specifically, the analysis of texts which constitute formal descriptions of processes, methods or methodologies. For example, Jenkins (1969), "The Systems Approach", which constitutes a description of a Systems Engineering Method developed at Lancaster University, would be considered a suitable text for analysis.

STAM is based upon the Human Activity System (HAS) modelling language developed within the research programme of SSM (Checkland 1981, Wilson 1984). The HAS modelling language, with its way of conceptualising systems in terms of purposeful human activity, and its utilisation of a modelling language with activities placed in logical dependencies, appeared *a priori* promising in this context.

The purpose of the textual analysis was to support critical evaluation of the chosen texts and synchronously the methods they formally described. STAM was therefore developed in such a way as to provide a rigorous analytical platform for the critical evaluation in terms of textual characteristics such as:

- Content – what activities does the text prescribe?
- Descriptive Quality – are the activities clearly described?
- Logical Structure – are activities logically ordered in the text?
- Overall Coherence – do the activities presented in the text constitute a coherent whole?
- Completeness – given a particular interpretation of the overall purpose of the method described in the text, are there any activities missing?

Such evaluation of the texts could then be used support critical discussion of a method or methodology (or a particular description of the method) and also contribute to discussion on the formal textual presentation of methods and methodologies. With textual description being the primary method for the communication of the formal identify of methods and methodologies with the academic community, support for such critical evaluation appeared to be a worthwhile contribution to the field.

The research programme of STAM was exploratory in nature. In order to develop a relatively stable first version of STAM, the research employed an 'evolutionary' approach involving a combination of:

- Literature Review – in the area of textual analysis;
- Internal Piloting – use of the method by the author on several different texts; and
- External Testing – having several different users try the method in practice.

The research programme involved the following four main steps:

1. Create an initial version of STAM using an adapted version of the HAS modelling language from SSM. This process was informed and guided by a literature review of the discipline of textual analysis.
2. Pilot the initial version of STAM on a set of methodological texts. Each pilot application was slightly different due to differences in the target texts and each generated new learning regarding the development of STAM.
3. Based on the piloting process, test a developed version of STAM with several users to see how the method would be used by analysts other than the author.

4. Finally, examine extensions and applications of STAM in a preliminary way in order to identify further opportunities for research. The research design is represented diagrammatically in Figure 1.

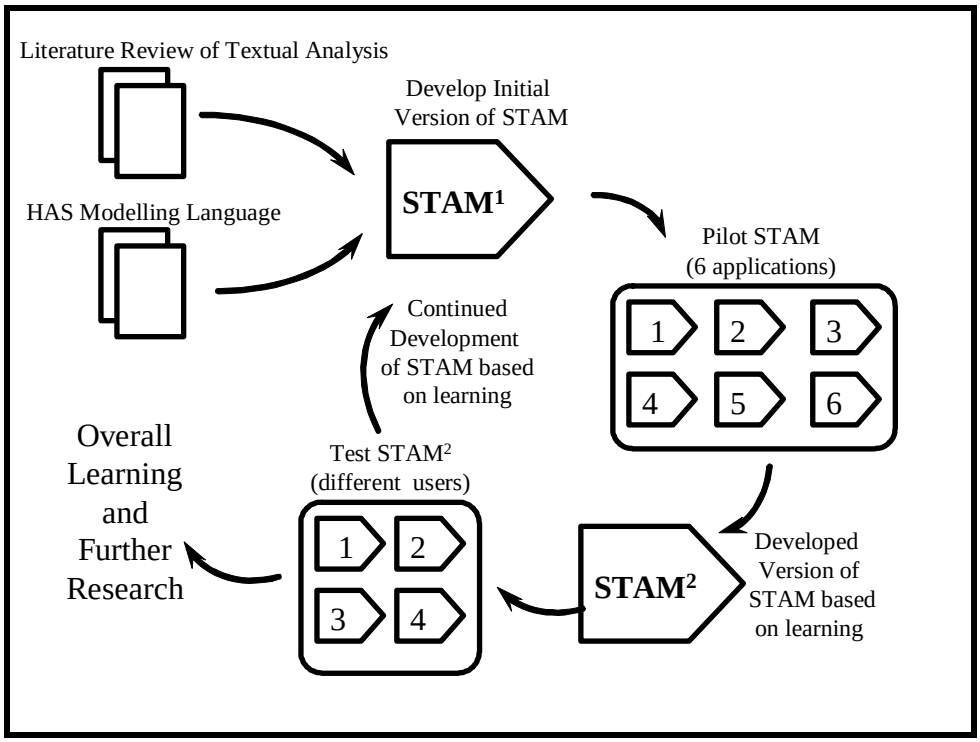

Figure 1: Research Design for the Development of STAM

Despite the primary area of application of STAM being the analysis of academic texts, the research programme has also briefly examined three other potential areas of application. Firstly, STAM can be used to support the comparison of different texts; for example, the comparison of two different textual descriptions of a particular method. Secondly, STAM can be used in a more interpretative or creative mode in order to (a) redesign existing texts, (b) design new texts and (c) generate rigorous alternative interpretations of textual data. Thirdly, it is envisaged the approach can make a useful contribution to the growing use of Problem Structuring Methods

within applied research projects. These various additional uses of STAM are not discussed within this paper.

2.2 The History of Textual Analysis

Appreciation of the process of textual analysis has a long and varied history. One might start with Hermes, the mythological messenger God of the Greeks, who, when faced with the momentous task of delivering the Gods' messages to mere mortals, needed to first interpret the Gods' messages and then translate and explicate their meaning. This was considered a 'hermeneutic' task requiring considerable expertise, (*hermeneuein*, Greek, 'to interpret'). Aristotle used the same term within the title for one of his works (*Peri Hermeneias*) where he examined the logic of statements, i.e. the grammatical structures through which subject and predicate are connected in language. However, it was not until after the Renaissance and Reformation that 'hermeneutics' became a special discipline in the hands of the Protestant hermeneuticians, and formal methods for textual analysis were developed (Mueller-Vollmer 1994).

Faced with the Catholic Church's insistence on their authority regarding the interpretation of the Holy Scriptures, sixteenth century Protestants, such as Matthias Flacius Illyricus, presented principles of perspicuity and argued for the self-sufficiency of the holy text. Illyricus argued the Scriptures contained internal coherence and continuity and therefore, if they had not been properly understood as yet, it was more a reflection on the knowledge and ability of the analysts than on the texts themselves.

The emergence of further developments in hermeneutics may be traced back to developments in philosophy during the eighteenth century Enlightenment. In a similar manner to Aristotle and the Protestant hermeneuticians, Enlightenment philosophers, such as Wolff and Chladenius, viewed hermeneutic problems as belonging to the domain of logic and set about determining a set of generally applicable rules and principles that would be valid for all fields of knowledge which relied on the practice of textual analysis. They argued the meaning of a text should not be a problematic issue as they believed language, if used properly, would always faithfully communicate the intended meaning of the author. Ambiguity of text could only be due to an incorrect use of language, unclear definition of terms or poor construction

of arguments by the author. They viewed the purpose of hermeneutics as developing principles and methods of analysis such that the reader could attain a 'perfect understanding' of the text.

Modern approaches to textual analysis within hermeneutics have developed considerably from these early views of textual analysis as being concerned with the 'correct' (or objective) analysis of texts. Contributions from researchers such as Schleiermacher, Humboldt, Droysen, Boeckt, Dilthey, Ricoeur, Heidegger and Gadamer (Mueller-Vollmer 1994, Burrell and Morgan 1979) have led to positions which include interpretive considerations. Such positions stem from a growing awareness of the subjective, linguistic and contextual influences on the symbiotic processes of textual production (the author) and textual analysis (the reader). These influences are discussed in more detail later in the paper.

A similar shift from objective analysis towards more interpretive considerations has been emerging within the discipline of linguistics (Brown and Youle 1983). As with Anglo-American analytical philosophy (Youle 1996, Martinich 1996), linguistics has, traditionally, been primarily concerned with objective and grammatical features of the text – words, sentences and paragraphs. More recently, however, linguistics has been exploring the relevance and applicability of its methods at deeper levels – coherence, meaning, interpretation and so on. These tensions are illustrated in the quotes below.

Sinclair (1994) states:

> "We should not impose our ideas on it (the text), except, perhaps, just to get started. We should only apply loose and flexible frameworks until we see what the preliminary results are in order to accommodate the new information that will come from the text."

In contrast, Enkvist (1989) states:

> "Text interpretation is a hermeneutic process. We must have a whole, a universe of discourse, before we can see how its parts fit together and cohere. In a process model this suggests a top-down heuristic."

These quotes are indicative of current debate concerning the balance that should be struck between the more prevalent analytical/positivistic and the more recently adopted hermeneutic approaches; bottom-up 'open-minded' versus top-down interpretive approaches; concerns for verification versus concerns for social relevance and so on. Such differences of perspective are directly mirrored in the research described here and help to clarify and confirm the desirability of approaches that seek to balance contrasting methodologies.

This paper will argue, following Lehtonnen (2000), it is feasible and desirable to develop a method for textual analysis which is able to 'balance' objective and subjective aspects of the process of textual analysis. Such a method, whilst unable to produce an objective analysis of a piece of text, should nevertheless be applied in the traditional spirit of objective analysis. The analysis should link closely to the physical reality of the text – the words and sentences – whilst synchronously being conscious of the interpretive and contextual elements within the steps of the analysis. A key element of the method is the epistemology, which should enable the analysis to be 'recovered' by interested observers (Checkland and Holwell 1998) so that discussion has a clear analytical platform. The notion of 'recoverability' is discussed in more detail later in the paper. It is worth noting that more interpretive uses of the method are also possible, but these are not covered by this paper.

2.3 The Process of Textual Analysis

This section outlines the process of textual analysis and identifies the key elements, as shown in Figure 2. A fundamental distinction is made between the context of production and the context of analysis (Lehtonnen 2000). Any text will be produced by an author(s) within a particular context. Elements of this context will include the author's perspective (or *Weltanschauung*), the genre of production (purpose, style, format of the text), the physical production (the text itself as a physical entity), the historical context (the culture of work / society and the author's working environment) and the language used. The total effect of

these elements (and others) will amount to a unique context for the production of each text. The context might be characterized by an analyst or historian, but never defined absolutely (objectively).

As with the context of production, the analysis of a text will take place within a particular context. Elements of this context will include the analyst's perspective (or *Weltanschauung*), the method of analysis (philosophical perspective, purpose, technique), the physical production (the text itself as a physical entity), the historical context (culture of work / society and the analyst's working environment) and the language used. The total effect of these elements (and others) will amount to a unique context for the analysis of each text; a context that might be characterized by the analyst, but never defined absolutely (Gadamer 1994).

The text links these two contexts. The text might be considered to remain reasonably consistent, but even here changes are likely between production and analysis. At the very least, the physical production of the text (in terms of paper, printing, font, form of publication) is likely to be different, unless the analyst has access to the original script of the author. There may also be changes to the wording of the text due to copy editing, translation or different versions or editions of the text.

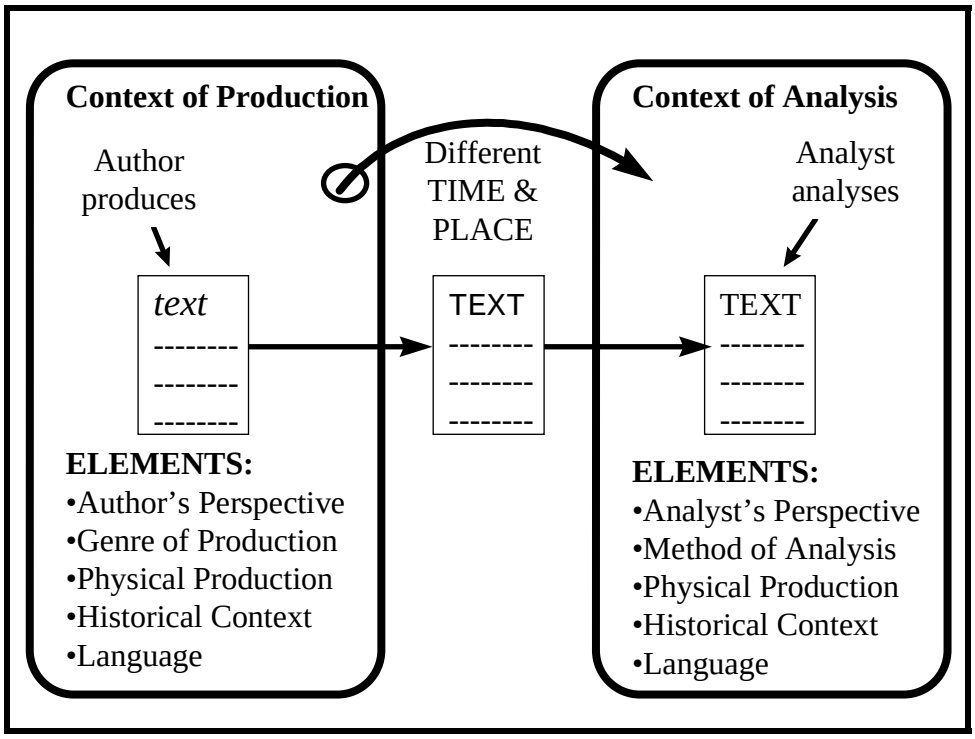

Figure 2: Elements of the Process of Textual Analysis

Traditionally, the term ‘textual analysis’ has meant the desire for an objective analysis of the text, and therefore work has focused on the context of production; i.e. characteristics of the text and its production (the author and the historical context). A relatively stable version of a text might have been accepted by a community of analysts – for example, the ‘Old Testament’ or Shakespeare’s ‘Romeo and Juliet’ – and some objective analysis may have been possible; for example word counts or sentence length analysis. A more interpretive style of analysis may have become permissible in certain communities – for example, literature analysis - where textual interpretation may be regarded as valuable or unavoidable, but the ‘rightness’ or ‘wrong-ness’ of such analysis might still be debated in a traditional manner.

More recently, appreciation of the context of analysis has been increasingly acknowledged as being a legitimate part of the process of textual analysis. Also, the role of language in shaping ideas has been examined in greater depth. Such considerations have further problematised the notion (and desirability) of an objective analysis of texts. The picture which is emerging in both linguistics and hermeneutics appears to be a recognition of the need to balance, and be conscious of, the objective and interpretive features of the process of textual analysis and ensure that approaches to textual analysis are able to make such distinctions explicit (Lehtonnen 2000).

2.4 Recoverability

In summary, many methods and approaches are evident in the literature from the fields of linguistics and hermeneutics, but there are a number of similar themes. Early approaches from both linguistics and hermeneutics tend to focus on the text itself, looking for objective features and examining the logic of language. There is an underlying assumption there ought to be a ‘correct’ (objective) analysis of a particular text so long as both author and analyst have fulfilled their roles competently.

Later approaches have examined the process of textual interpretation (reading) in much greater depth and have uncovered serious difficulties with the assumptions underlying an objective textual analysis. These difficulties include (i) separation between the context of the production of the text and the context of the analysis, (ii) subjective elements in the

interpretation of the text by the analyst (iii) the constraining (and controlling) nature of the language system being used, and (iv) the relationship between a particular sentence and the overall meaning of a piece of text (e.g. paragraph, chapter or book). Researchers from both hermeneutic and linguistic perspectives have been seeking to develop methods for textual analysis which are able to 'balance' these objective and subjective elements within a formal process of analysis. The method developed in this research has also attempted to achieve this balance.

A solution to the need for a method for textual analysis which is able to balance analytical and interpretive elements was found using the notion of "recoverability", as introduced by Checkland and Holwell (1998). Checkland and Holwell present an argument for a form of validation for Action Research which "can sustain AR [Action research] as a legitimate form of enquiry which can be defended". Their claim of validity for Action Research is based upon the notion of a recoverable research process involving the prior declaration of an epistemology in terms of which knowledge findings can be expressed.

Checkland and Holwell describe a spectrum of knowledge acquisition processes from natural science at the one end to research story telling at the other. They argue there will be different criteria along the spectrum for judging the "truth value" of the outputs of the processes from "public repeatability" in natural science (considered to be the strongest truth claim) to "plausibility" in research story telling (considered to be much weaker). The challenge for Action Researchers, they argue, is to do better than settling for "plausibility", simply because "the strong criterion of "repeatability" [of natural science] is beyond their reach" (Checkland and Holwell 1998).

> "Our argument here is that the aim in AR [Action Research] should be to enact a process based upon a declared-in-advance methodology (encompassing a particular framework of ideas) in such a way that the process is recoverable by anyone interested in subjecting the research to critical scrutiny." (Checkland and Holwell

1998 p.18)

Checkland and Holwell give an example of a piece of research conducted in the National Health Service of the United Kingdom by a multidisciplinary team of researchers from Lancaster University (Checkland 1997, Hindle et al 1995) to illustrate their notion of a recoverable research process.

> "The work used SSM in the sense-making 'Mode 2' (Checkland and Scholes 1990), with its particular framework of systemicity. The aim was to make clear to interested observers the thought processes and models which enabled the team to make their interpretations and draw their conclusions. Those observers might not accept the team's interpretations; then a debate about the work could take place which was sufficiently well structured as to be coherent. The weaker 'plausibility' criterion does not offer that prospect." (Checkland and Holwell 1998 p.18)

STAM uses the HAS modelling language in this same sense-making "Mode 2" (albeit modified) and claims to meet the same criterion of "recoverability". The form of research, however, is clearly different. Rather than use the epistemology to document a "recoverable" Action Research process, the epistemology is used to document a "recoverable" textual analysis. The use of the epistemology is different, but the recoverability criterion remains unchanged. Hence, as with Checkland's Action Research process, the textual analysis can be recovered by anyone interested in subjecting the analysis to critical scrutiny. An interested observer may not agree with a particular textual analysis, but the analysis is produced in such a way as to enable a sufficiently well structured debate.

3.1 Textual Analysis using HAS Modelling

The target texts to be analysed within the piloting process were formal descriptions of methods or methodologies. Such texts take the general format of prescriptions for action – i.e. a coherent set of actions placed in a logical order. One can therefore take the position it is reasonable to assume the prescribed actions, taken as a whole, will achieve some kind of coherent overall purpose.

The basic tenet of STAM is based on these assumptions; i.e. that a prescription for action, taken as a whole, constitutes a prescription for a process (a *set* of activities), which an observer may choose to conceptualise as a Human Activity System. For example, a text prescribing the set of activities necessary to borrow a book from a library could be viewed as prescribing a process which an observer could conceptualise as the HAS - '*A system to borrow a book from a library*'.

A text which gives a clear description of a set of activities which, taken as a whole, represent a clear transformation process (purpose), will therefore be relatively straightforward to conceptualise as a Human Activity System. And the reverse will be true. Difficulties will occur if the description of activities is unclear (to the observer) or the overall set of activities doesn't represent a clear or meaningful transformation process (to the observer).

Hence, the application of a method using Human Activity System modelling can enable a textual *analysis* – i.e. the application can surface characteristics (perhaps perceived as 'strengths' and 'weaknesses') of a text, from the point of view of an observer. Perceived strengths and weaknesses will be surfaced through the text's ability to 'fit in' with the conceptual schema of the method – i.e. the text must have clearly described activities and the set of activities (as a whole) must represent a clear and meaningful transformation process.

This conceptual framework is displayed in Figure 3. There is a text which describes some method or process, i.e. some kind of action. This text is taken to represent a set of activities by an observer which might then be conceptualised as a coherent process. It is subsequently conceptualised (by the observer) as a HAS (the exact method (STAM) is described in the next section). The application of this method will be affected by both the nature of the text (for example, the quality of description, logical structure, completeness and overall coherence of the text) and the interpretation of the text by the analyst. The application can therefore be seen to support an evaluation of the text (i.e. to generate a set of 'strengths' and 'weakness' of the text). Such an evaluation will rest on the systemic conceptual framework being imposed upon the text and the point of view of the analyst. The analysis is therefore not an objective analysis – i.e. telling us what the text *is*, in some definitive sense.

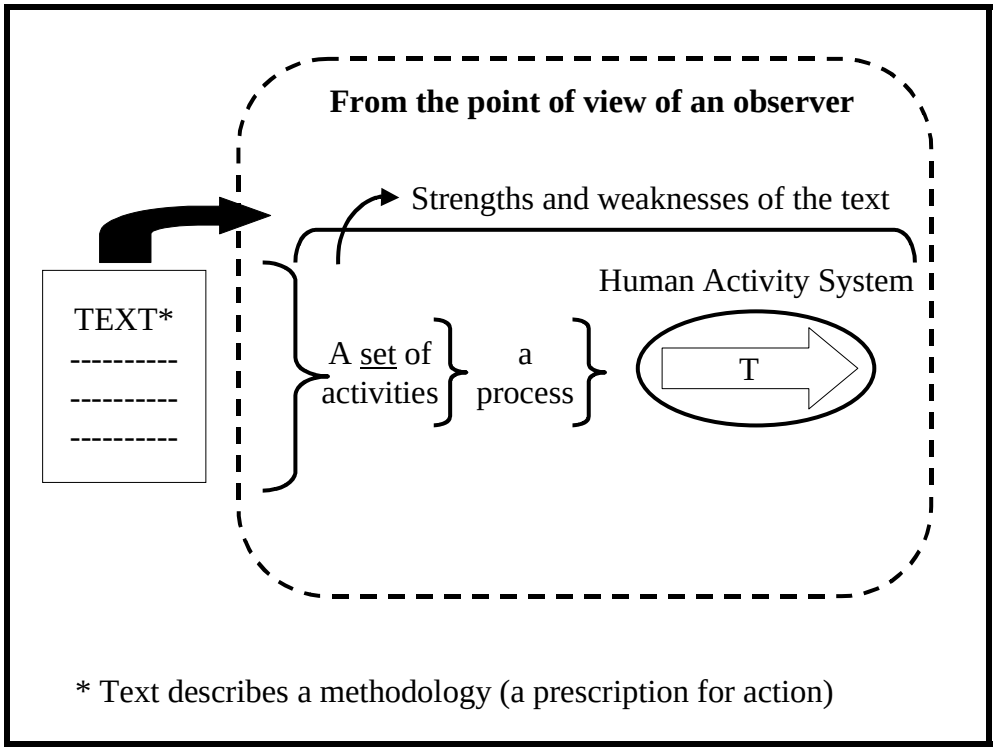

Figure 3: Conceptual Framework of STAM

3.2 A Systemic Method for Textual Analysis (STAM)

The version of STAM presented in this paper constitutes a 6-step process:

Step 1: Identify Target Text – The text to be analysed is referred to as the 'target text'. A well-specified text is required in the sense the physical boundary of the text must be clear, i.e. where it begins and where it ends. The text will be a complete description of a method or methodology (although other types of text may be possible). The text is assumed to be self-contained – contextual information relating to the production of the text or references to other texts cannot be included in the analysis. Each sentence in the target text is given a unique code for reference purposes.

Step 2: Generate Activity List – The text is studied and the activities identified in the text are listed. In principle, there are no restrictions on the number of activities within the list. The level of detail will depend on the text and a judgement made by the analyst. Only activities identified by the analyst in the text are to be included in the list. Each activity must be referenced back to a sentence(s) in the target text.

Step 3: Note Problems of Interpretation – The process of identifying activities described in the text will generate problems of interpretation. For example, the analyst may be unfamiliar with the language used by the author or may feel a particular activity is under specified or poorly described. Such problems are systematically recorded.

Step 4: Construct Conceptual Model 1 – The activities identified in Step 2 are arranged into a conceptual model using the normal rules of HAS modelling – i.e. logical dependency. No activities are to be added to the model which are not in the activity list. Activities may be discarded only if duplicated in the model.

Step 5: Infer Root Definition – The analyst studies the conceptual model and interprets an underlying Human Activity System. In other words, the analyst considers the activities in the model as a set and perceives an overall transformation process. The HAS is defined using a root definition of the format 'a system to do X by Y in order to achieve Z' (Checkland and Scholes 1990). A CATWOE analysis is also produced by the analyst in order to facilitate creation of the root definition. The intention is to represent the HAS perceived as underlying the conceptual model as accurately as possible.

Step 6: Construct Conceptual Model 2: Step 6 involves the construction of a conceptual model according to the normal rules of SSM modelling – i.e. an *ideal* type model based on the root definition in Step 5.

It is worth noting STAM runs the normal method of HAS modelling in reverse order (apart from step 6). Normally a user would start with an idea for an ideal-type HAS, define it with a root definition and construct a conceptual model. Because the HAS would be 'ideal', both the root definition and the conceptual model would be perfectly constructed from the point of view of the user – i.e. the transformation process would be clear, the activities would be distinct and the structure of the model logically coherent. The 6-step STAM process runs in the opposite direction. It starts (a) with the activities identified in the text, (b) places them in a conceptual model and then (c) infers a HAS. The analyst may encounter problems or perceive 'weaknesses' in the text at each stage of STAM – for example, the activities may be indistinct or difficult to interpret, the set of activities may form an unclear or complex transformation process, the conceptual model may include perceived 'missing' activities and the HAS may be difficult to define. Such 'problems' are vital to the success of the method, as they are

regarded as *coming from the text* (although synchronously modified by the interpretation of the text by the analyst). In other words, difficulties applying the method identifies characteristics of the text, from the point of view of the analyst. Such characteristics can then form the basis of an evaluation of the text.

3.3 An Illustration of the Method

In order to bring STAM to life, an illustration is given below. The illustration involves performing a short textual analysis aimed at identifying characteristics and weaknesses of the structure and production of a text entitled "borrowing regulations for a public library". Relevant questions when performing such an analysis might be 'what is the nature of the process the text is describing?', 'how clear is the text in its prescription?', 'is the text well structured?', 'are there any omissions in the text?'.

Step 1: Identify Target Text

The target text is reproduced below in Figure 4. The text is in English, has 11 sentences and is 150 words long. No references are made to other texts. The target text is titled "borrowing regulations for a public library" and appears to prescribe the actions necessary to borrow a book from a public library.

Borrowing Regulations for a Public Library

[NOTE: Sentences are labelled a to k in superscript for reference purposes only]

[a] Obtain details of the book required. [b] You will need the ISBN of the book or the title and author before you can proceed. [c] Use the library catalogue system to obtain the code for the book and its location in the library. [d] If the book is available, go to the appropriate location and find the book. [e] You will need a library card. [f] In order to be a member of the library you will need to be a resident of the country and have suitable identification (either a passport or a driving licence). [g] Processing of membership takes 2 days. [h] If the book is unavailable, a reservation can be made. [i] You should return the book by the due date or there will be a fine of 10p per day. [j] The loan

period will depend on the category the book is under. [k] The library is open from 9am – 5pm from Monday to Friday.

Figure 4: Target Text used for Illustration of STAM

Step 2: Generate Activity List

Step 2 involves studying the target text and identifying the activities prescribed by the author. The list of activities is numbered in the order they fall in the text and referenced to sentences in the target text. Results of the author's analysis are shown below.

Step 2 Outputs: List of Activities

1. Obtain details of the book (ISBN or title & author) (a,b);
2. Obtain code & location of book using 'library catalogue system' (c);
3. Find the book, if available (d);
4. Appreciate you need a library card (e);
5. Appreciate you need to be resident and have suitable ID (passport or driving license) to be a member of the library (f);
6. Appreciate membership process takes 2 days (g);
7. Reserve book if not available (h);
8. Return book within loan period (fine is 10p/day) (i);
9. Appreciate loan period depends upon the category of book (j);
10. Appreciate the library is open 9-5 Mon – Fri (k).

It is imperative the list records activities described in the text, rather than activities the analyst feels *ought to be there*. The intention is analytical; i.e. to systematically record activities described by the author of the text, not to 'improve' or change those activities. Any problems with interpretation of the text are noted at this point (step 3).

Step 3: Note Problems of Interpretation

The following problems of interpretation were noted during Stage 2:

- What is the ISBN of a book?
- It is unclear whether the user needs to search for book details.
- The nature of the library catalogue system is unclear (card or computer; functionality?).
- Details of book code and loan category are unclear.
- Meaning of availability unclear (present in library or held in stock?).

- Many activities are implied, but not specified (book search, joining library, etc.)

Step 4: Construct Conceptual Model 1

Step 4 involves the logical ordering of the activities in the list according to the normal rules of HAS modelling (logical dependency). Results of the author's analysis are shown in Figure 5. Some of the activities in Figure 5 are left without their logical dependencies linked to other activities. This is because it appeared to the analyst that certain activities are missing from the model.

Step 5: Infer Root Definition

Step 5 involves inferring a HAS based on the conceptual model in Step 4. To do this, the analyst studies the activities within the conceptual model and interprets the overall process those activities represent. A root definition of the form 'a system to do X' is used for illustrative purposes due to the simplicity of the target text.

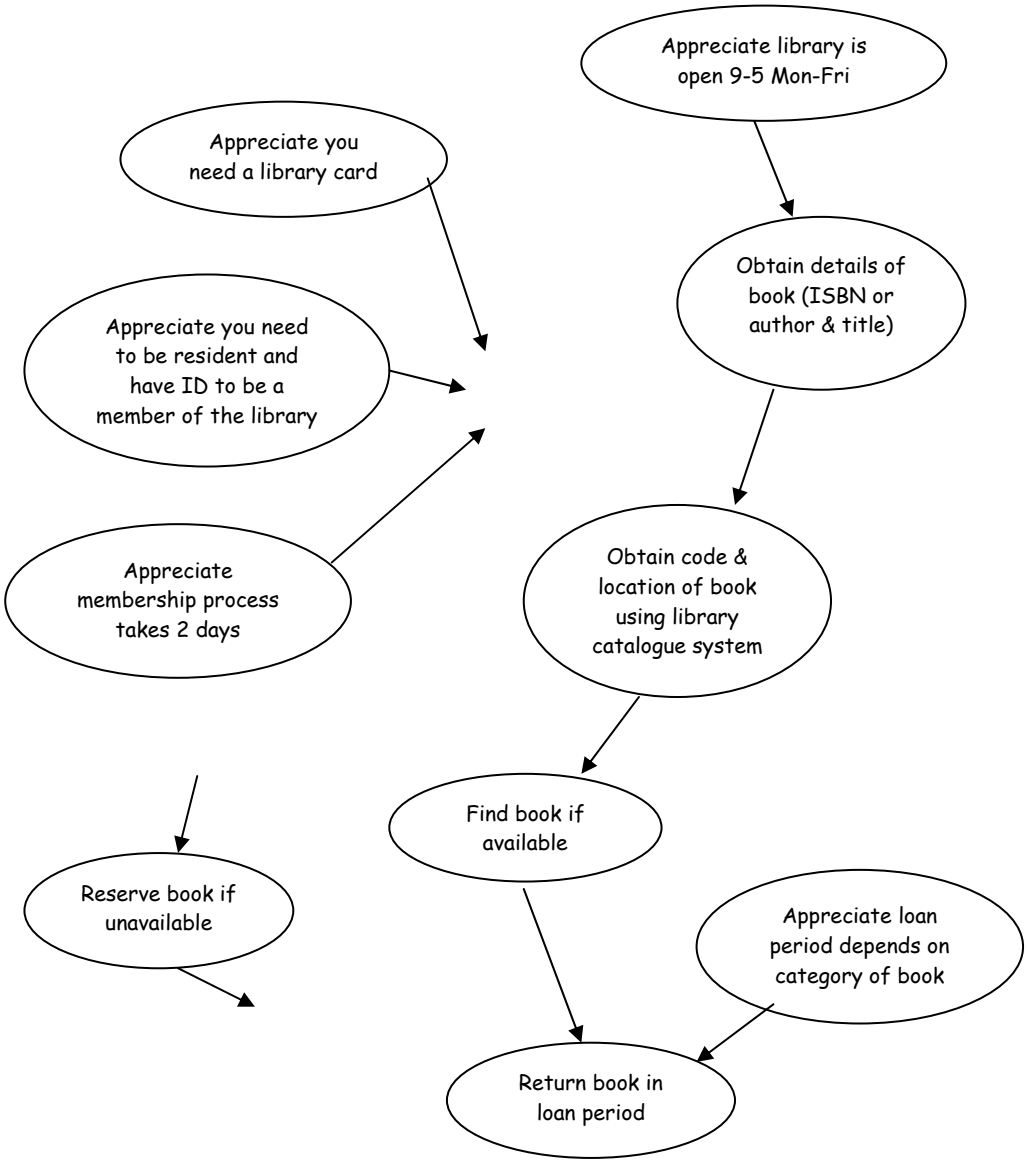

Figure 5: Step 4 Outputs - Conceptual Model 1

Step 5 Outputs: The root definition inferred from Model 1:

A system to borrow a book from a public library, within regulations.

Step 6: Construct Conceptual Model 2

Step 6 involves the construction of a conceptual model based upon the root definition in Step 5. Unlike Step 4, the model is constructed according to the normal rules of HAS modelling;

i.e. the analyst determines the activities needed to achieve the transformation process of the HAS defined by the root definition. Results of the author's analysis are shown in Figure 6.

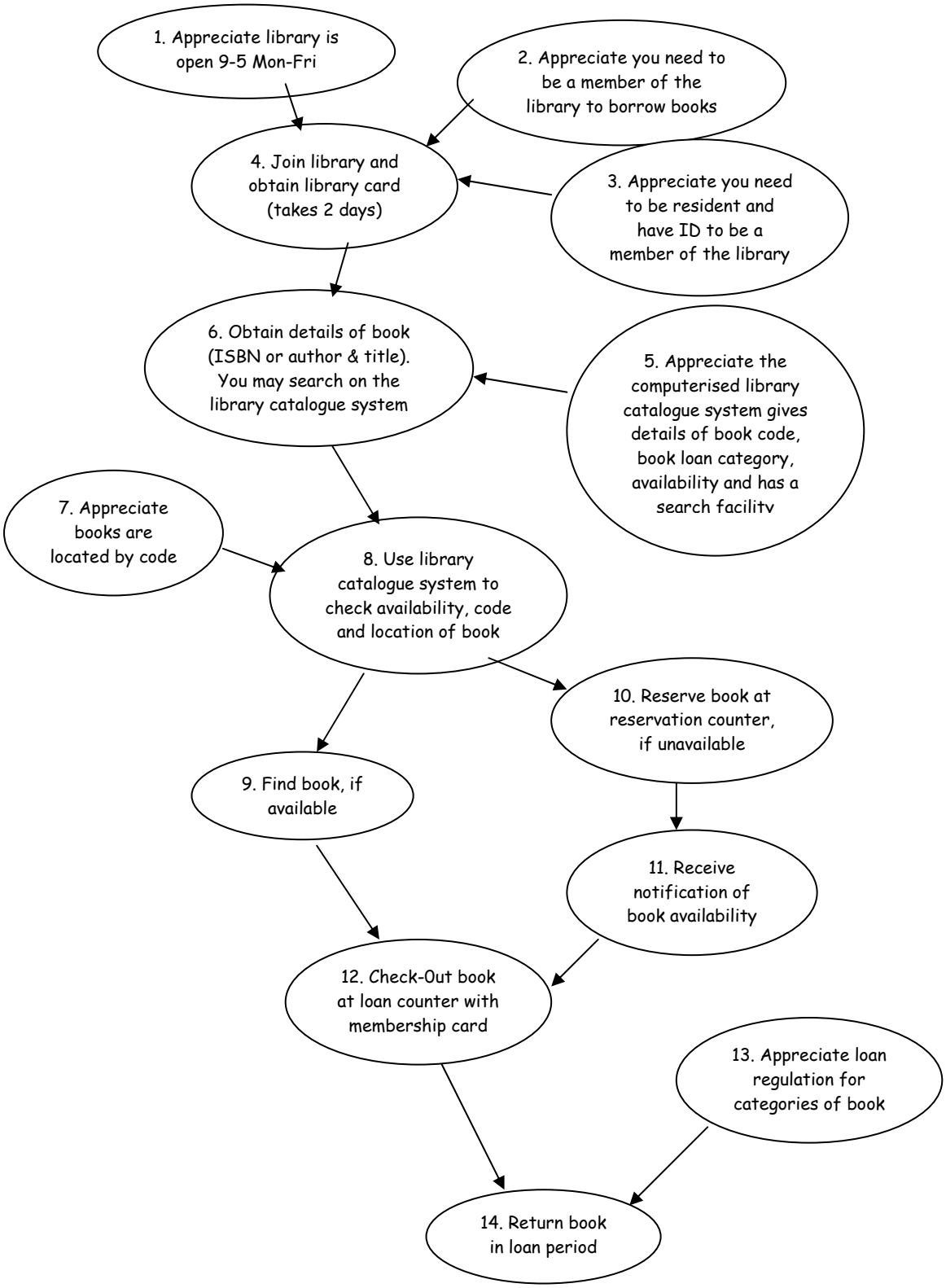

Figure 6: Conceptual Model 2

Having completed the 6 steps of STAM, the analyst is now able to evaluate the target text in terms of three sets of properties:

1. **Quality of textual description:** In Step 2, activities within the text were identified. There may be problems doing this, which may be due to perceived 'weaknesses' in the text – for example, poorly specified activities or unclear description. These problems were noted in Step 3.
2. **Logical structure of the text:** In step 4, the list of activities was logically ordered in a conceptual model. Comparison between this model and the order of the original list may highlight perceived "weaknesses" in the structure of the original text.
3. **Completeness of the text:** The inferring of a HAS and the resultant root definition and Conceptual Model 2 provide an ideal type concept with which to compare with Conceptual Model 1. Such a comparison may highlight perceived "weakness" in the overall completeness of Conceptual Model 1 and, hence, the target text.

The author's evaluation is shown below:

Author's Evaluation of Target Text based upon use of STAM:

1) It is unclear whether the user needs to search for book details. The nature of the library catalogue system is unclear (card or computer; functionality?). Details of book code and loan category unclear. Meaning of availability unclear (present in library or held in stock?). Many activities implied, but not specified (book search, joining library, etc.)
2) The basic doing activities in the text are in a logical order (obtain details of book, obtain code and location, find book, return book). However, some of the supporting activities are out of sequence and fall at the end of the text (opening times of library and information about joining).
3) The root definition concentrates on the process of borrowing a book – this is at odds with the title of the target text ("Borrowing Regulations for a Public Library"). There are a number of missing activities in Model 1 (join library, appreciate functionality of library catalogue system, appreciate books are located in library by code, receive notification of book availability, check out book). Several activities have been more clearly specified in Model 2 (obtain details of book, use library catalogue system, reserve book, appreciate loan regulations).

Overall, the application of the method has uncovered several 'weaknesses' in the target text in terms of the quality of textual description, the structure of the text and the completeness of the text. It is clear a new text could be created at this point which would avoid such perceived weaknesses. It is worth remembering the weaknesses identified in the target text are dependent upon (a) the application of the method by the analyst and (b) the assumption the

text ought to be constructed according to the underlying structure of HAS models. The analysis is 'recoverable' in the sense an interested observer can see the assumptions and interpretation involved in the author's analysis.

4. Concluding Remarks

This paper has introduced a textual analysis method (STAM) which utilises a modified version of the Human Activity System (HAS) modelling language from Soft Systems Methodology (SSM). The method, as presented here, constitutes one form of application of a wider ranging systemic methodology for qualitative research, textual analysis and document design (Hindle 2003).

Initially STAM was developed for the critical evaluation of Management Science texts which constitute formal descriptions of methods or methodologies. However, during this research, it became clear the method had other potential areas of application. Firstly, the method can enable the comparison of two or more texts – such as two texts which describe the same methodology, but are written by different authors or at different times; or two texts which describe different methodologies. STAM provides a platform for such comparison which would be rigorous and recoverable by other participants in a discussion.

A second area of further research involves a more interpretive use of STAM. The standard version of STAM takes a traditional analytical approach to texts – i.e. the underlying HAS in produced in Step 5 (inferred from Conceptual Model 1) is intended to be a structured reflection of the process described by the author of the text. The analyst is seeking to evaluate the text, as it stands. However, other possible scenarios can be envisaged where the analyst wishes to take a more creative attitude to the text. The analyst might wish to generate alternative readings of the text or might wish to improve the text (or create a new text). In such cases, several alternative HASs could be postulated (Conceptual Model 2) by the analyst in the normal creative manner of HAS modelling in SSM. Such HASs, when defined and modelled, could be used for debate or as the blue print to a new text.

A third area for future research involves the use of STAM within the research methodology of a research project. Accounts of SSM being used for research (rather than its more usual problem solving or system design application) are beginning to be reported in the literature.

Such projects tend to be using the HAS modelling language to link qualitative data to interpretive conceptualisations in a very similar way to STAM.

Further discussion on each of these areas of further research can be found in Hindle (2003).

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