Using Soft Systems Methodology to support Monitoring and Evaluation for Community Based Engagement

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Abstract

Fundamental to the mission of international aid agencies is the desire to foster change in the world. Judgements about the extent and merit of these changes are enabled by processes of monitoring and evaluation (M&E). A challenge facing M&E practitioners is that social change is complex, and hence the development of M&E systems to judge social change can be conceptually and practically complex.

Soft Systems Methodology (SSM) is an action research methodology developed through 35 years of applied work in which highly developed 'systems engineering' methodologies were evolved to cope with complex, ill-defined human situations — such as judging the performance of international aid programs.

This paper identifies SSM as one way to grapple with the complexity frequently associated with developing M&E information systems (MEIS). We describe how SSM can be applied in MEIS development by reporting, as a case study, its use within the Philippines–Australia Community Assistance Program (PACAP). First an overview of PACAP, the case study program.

Keywords

Monitoring, evaluation, soft systems methodology, community development

PACAP

PACAP is a long-running part of Australia's bilateral development cooperation relationship with the Philippines. It is administered by the Australian Agency for International Development (AusAID) and offers small grants assistance to a range of proponent organisations engaged in community development activities throughout the Philippines; principally in the south. Since starting in 1986, PACAP has supported over 865 projects in partnership with over 500 proponent organisations, with an estimated beneficiary caseload of around 250,000 people in poor communities. Australian assistance for PACAP amounts to some AUD$28 million from 2005 to 2010. This five-year phase of PACAP is managed by Hassall and Associates Pty Ltd, an Australian consulting firm.

PACAP is administered by a Manila-based secretariat in association with the National Economic and Development Authority (NEDA) of the Philippines and AusAID. PACAP funds are made available to local non-government organisations (NGOs), community-based organisations (CBOs), people's organisations (POs) local government units (LGUs) or other proponent organisations through one of two schemes: i) the Focal Community Assistance Scheme (FOCAS); and ii) Responsive Assistance Scheme (RAS). The RAS enables PACAP to fund individual proponent organisations directly in an ad hoc responsive way. The FOCAS involves a more strategic and long-term plan, developed in consultation with Provincial Stakeholder Committees (PSCs) in the five provinces of Agusan del Sur, Bohol, Misamis Occidental, Northern Samar and Surigao del Norte. Within each province the PSC identifies four or five strategic FOCAS initiatives each lasting between three and five years. Each FOCAS initiative is overseen by a FOCAS Management Committees (FMC). Projects funded by both the RAS and the FOCAS schemes must be approved by a PACAP Advisory Committee (PAC) and are informed by an annually reviewed Strategic Guidance Framework (SGF).

The M&E of PACAP's performance is a contractual requirement of AusAID. Further, the M&E of funded proponent organisation projects is a contractual requirement of PACAP. However, beyond the accountability focus implied in these contractual obligations, there is a strong commitment at all levels (AusAID, NEDA, Secretariat and proponent organisations) to promote institutional learning. There is a clear assumption that performance information is a necessary ingredient for effective aid delivery; and that M&E processes are the mechanism by which this information can be obtained.

M&E challenges

The term 'monitoring and evaluation' came into common usage in the aid industry over the past 20 years (Cracknell 2000). The notion of trying to measure the performance of an aid project throughout the life of the project, as opposed to simply trying to understand what went right or wrong in hindsight, was promoted by Herb Turner in the 1970s (Cracknell 2000).

There is wide agreement about the importance of M&E (Broughton and Hampshire 1997; Cracknell 2000; den Heyer 2001; Earl 2002). In fact, the development of a 'M&E system' is now a funding requirement of most bilateral and multilateral aid donors. While there are differences in wording, the broad emphasis on the supply of relevant, accurate and timely information to ensure satisfactory results for a variety of stakeholders is recognised and generally considered a high priority. The role of performance information is succinctly captured by Checkland and Holwell (1998 p. 95) who state that:

> "…information, in a general sense is then something needed in support of the purposeful action which goes on in organisations; needed that is, if the action is to be

defensible, well informed, better than simply playing hunches or randomly thrashing about."

However, beyond this broad common view, the inherent complexity of measuring social change, and attributing this to a particular project or intervention, ensures that aid agencies encounter both practical and conceptual issues in attempting to operationalise the ideals of M&E. Further, the diverse range of stakeholders associated with most aid projects ensures that M&E is inherently political — numerous stakeholders, frequently with competing values, requiring various information in myriad formats and on diverse timetables.

For PACAP, the move to a new management structure in early 2005 presented an opportunity to develop a M&E framework that met the expectations of the key stakeholders. While there was clearly a requirement to demonstrate accountability to stakeholders, there was also an intrinsic desire to promote learning.

From a M&E practitioner perspective, PACAP presented interesting challenges:

- Information about the performance of the PACAP Secretariat was considered important ('Program M&E') for both accountability to the donor and for internal management and quality assurance reasons
- Information about the performance of proponent organisation projects funded by PACAP was considered important ('Project M&E') in order to gain insights into the extent and merit of changes in poverty effected by PACAP resources
- The geographic distribution of both PACAP Secretariat staff and proponent organisations throughout the Philippines posed practical challenges
- The diverse range of technical sectors represented by proponent organisation projects posed conceptual challenges to the desire for a standardised approach to M&E.

Given the common tendency, when working within complex problem situations, to become distracted by nuance, there was a need to apply a broad methodology in the development of the PACAP MEIS. Such a methodology was needed to enable the development of a conceptual framework, which could in turn be applied to ensure that the MEIS systematically addressed the information requirements of all stakeholders. The methodology employed for the PACAP MEIS development was SSM. An overview of SSM follows.

SSM

The distinction between 'hard' and 'soft' systems thinking is attributed to Peter Checkland, who led a long-running action research program within the Department of Systems Engineering at the UK's Lancaster University. Initially, Checkland's research examined the possibility of using the well developed methods of systems engineering in management problem situations rather than in technically defined problem situations. The difficulties

encountered in this research led to the hard/soft differentiation. In discussing the origins of SSM, Checkland (2001, p. 61) reports that:

> "…systems engineering, impressive enough as a way of carrying out technological projects, failed when attempts were made to apply it…to the messy, changing, ill-defined problem situations with which managers have to cope in their day-to-day professional lives."

The notion of 'soft systems' emerged to recognise that some problems cannot be resolved unambiguously to the satisfaction of all stakeholders. These kinds of problems are features of 'human activity systems' and typically:

- cannot be easily defined so that all stakeholders agree on the problem to solve
- require complex judgements about the level of abstraction at which to define the problem
- have no clear stopping rules
- have better or worse solutions, not right and wrong ones
- have no objective measures of success
- require iteration (every trial counts)
- have no given alternative solutions (these must be discovered)
- often have strong moral, political or professional dimensions (Barry and Fourie 2001; Buckingham Shum 1997; Rittel and Webber 1973).

SSM involves learning about a complex problematical human situation, and leads to finding accommodations and taking purposeful action in the situation aimed at improvement — action that seems sensible to those concerned.

In contrast, 'hard systems' approaches involve the selection of an appropriate means to achieve an end, which is defined at the start and thereafter as a given (Checkland 2001; Yeo 1993; Barry and Fourie 2001; den Heyer 2001a). The major problem with using hard system approaches for complex systems is that they assume that an important class of real-world problems can be formulated as a search for an efficient means of achieving objectives known to be desirable, and that the search can be conducted systematically by defining the objective to be achieved (Ackoff 1979; Gharajedaghi 1999; Checkland 2001).

Checkland (2001) recalls that the methodological model provided by systems engineering seemed:

> "…very naïve and simplistic in the face of the failings, fears and farce of the actual situation. Systems engineering like the other 'hard' approaches — assumes a relatively well-structured problem situation in which there is virtual agreement on what constitutes the problem: it remains to organize how to deal with it."

SSM finds problematical, precisely what is taken as given by 'hard' systems methodologies as their objectives. SSM treats 'what to do' as well as 'how to do it' as part of the problem. According to Checkland (2001, p. 67), whereas 'hard' systems methodologies are concerned only with achieving objectives, SSM is a learning system.

Much of the literature on 'soft' systems resonated with the experience of the authors in planning, managing and conducting M&E of international aid projects. The decision to use SSM in the development of the PACAP MEIS was also influenced by two academic considerations:

- There is recognition of the relevance of 'systems thinking' to management science in general (Haslett 1998), and project management in particular (Yeo 1993; Crawford and Costello 1999). Given that the vast majority of aid is delivered through the project management approach, and given the 'soft' nature of aid projects, adopting SSM as a framework to explore aid project M&E seemed defensible.
- SSM is recommended as an approach to assist with organisational problem-solving, and has been shown to have particular merit in the development of information systems (Winter et al. 1995; Dick 1993)
- SSM has the capability not only to identify the information required, but to tailor this to reflect: a) the individual needs of the system stakeholders; and b) the relationships between players in the system (Swete Kelly 1992).

Checkland and Holwell (1998, p. 155) state that SSM is an:

> "…interpretive approach to organisational problem solving which can be used to provide a structure for action research in which desirable change and organisational learning are the aims. Frequently that change and learning is associated with the design, introduction and use of information systems."

With this background, we will now describe how SSM is used in practice.

Using SSM

In the early years of the development of SSM the process was understood to follow the sequential steps depicted in Figure 1.

Although it is helpful for inexperienced users to conceive of SSM as a seven-step process, Checkland (2001, p. 70) suggests that:

> "…as users gain experience of SSM, as they internalise it, they cease to think of it in this algorithmic fashion. Instead…they [use SSM] as an aide memoire of its principles as they fashion a form of it suitable for a particular situation."

This more 'mature' representation of SSM is depicted in Figure 2.

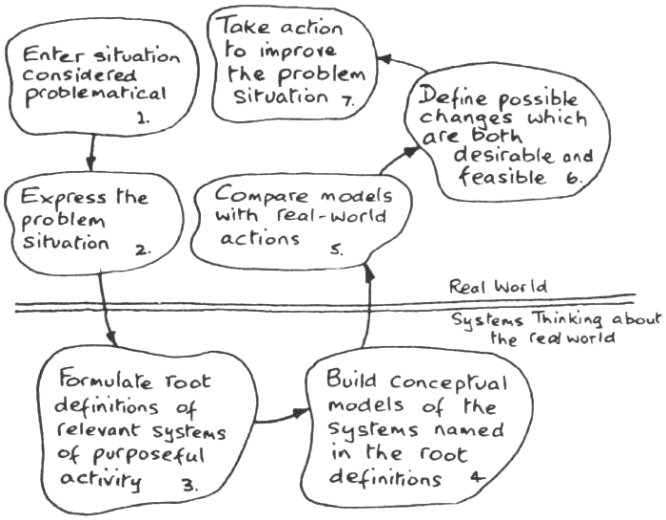

Figure 1. The early '7-step' representation of SSM (Checkland 2001, p. 71)

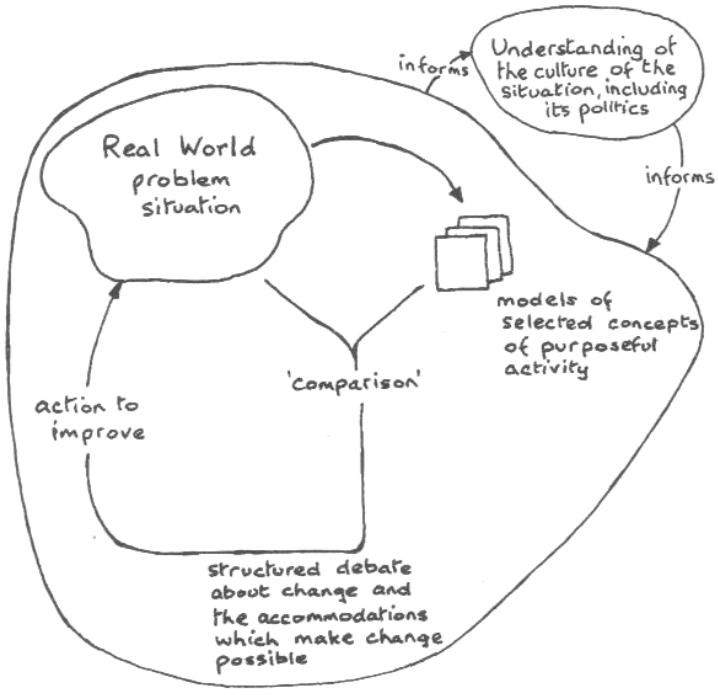

Figure 2. A representation of mature SSM (Checkland 2001, p. 72)

It is evident from Figure 1 that SSM contains two general kinds of activity. Steps 1, 2, 5, 6 and 7 are 'real world' activities that necessarily involve people in the problem situation. Steps 3 and 4 are 'systems thinking' activities that may or may not involve those in the problem situation, depending upon the individual circumstances of the study. In general, the language of the former steps will correspond to the normal language of the problem situation, while the latter steps will use the language of systems since it is in these steps that real-world complexity is unravelled and understood.

In view of the these two general kinds of activity ('real world' and 'systems thinking') and the non-algorithmic representation of SSM presented in Figure 2, Checkland (2001) proposes five broad 'stages' that are not necessarily sequential as a guide to implementation of SSM:

- Finding out
- Formulating root definitions
- Building conceptual models
- Using models, defining changes
- Taking action.

We discuss each stage in turn.

Finding Out

Normally, the 'finding out' about complex, problematical, human situations is enabled by the drawing of 'rich pictures'. According to Checkland (2001, p. 74):

> "SSM 'rich pictures' follow from the realisation that where human affairs are concerned their complexity always stems to a large degree from the existence of multiple interacting relationships. And since linear prose is a rather poor medium for representing relationships, SSM users develop their skills in drawing pictures which enable the complexity being tackled to be viewed more holistically than is possible via strings of words."

In practice, rich pictures involve the linking of key nouns within the system under study (represented by pictures) with annotated arrows (verbs that describe the nature of the interaction between the nouns). A person can develop an appreciation of a system depicted in a rich picture by starting anywhere in the picture and reading the annotations that follow. The hand-drawn character of rich pictures is believed to enhance their affective appeal. By way of example,

Figure 3 depicts a SSM rich picture describing NGO administered international aid.

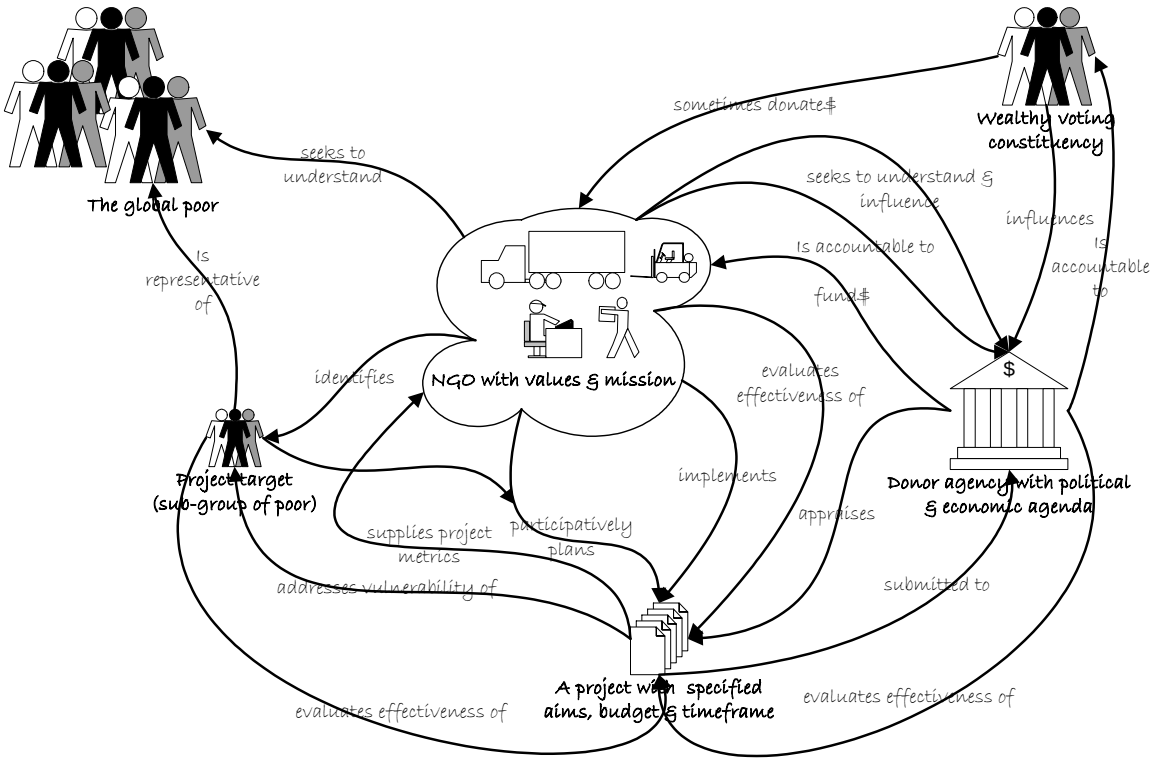

Figure 3. Rich picture of NGO-administered aid system

Formulating root definitions

The formulation of 'root definitions' stage of SSM is essentially the naming of a number of systems thought to be relevant for deeper exploration within the problem situation. In practice, the root definition is a concise statement that embodies all the elements that describe and influence a system.

Checkland (1981) has proposed a rule that ensures root definitions are well formulated. Root definitions should be constructed by consciously considering the elements of the mnemonic CATWOE, described in Figure 4.

The core of the root definition is said to be 'T', the transformation process that changes some defined input into some defined output. Checkland (2001, p. 74) reports that this concept is frequently misunderstood:

> "The usual error is to confuse the system input (that entity which gets changed into the output) with the resources needed to bring about the transformation."

In expressing 'T', the inputs must be represented in the outputs by a changed state. An abstract input must yield an abstract output. A concrete input must yield a concrete output.

Thus, well-ordered formulation of root definitions yields a handful of definitions, both 'task-based' and 'issue-based', which can then be modelled for use in a debate about change.

Formulation of root definitions Consider the following elements: CATWOE		
C	Customer	Who would be victims/beneficiaries of the purposeful activity?
A	Actors	Who would do the activities?
T	Transformation process	What is the purposeful activity expressed as: **Input** → **T** → **Output**?
W	Weltanschauung[1]	What view of the world makes this definition meaningful?
O	Owner	Who could stop this activity?
E	Environmental constraints	What constraints in its environment does this system take as given?

Figure 4. Formulation of root definitions (based on Checkland 2001, p. 75)

Building conceptual models

In the words of Checkland (2001, p. 88) SSM explores a situation perceived as problematical via:

> "…the device of modelling systems which pursue a pure purpose from a declared point of view. It accepts that real-world action will be much messier than these pure models, and uses the models to structure a debate in which different conflicting objectives, needs, purposes, interests, values can be teased out and discussed."

In this way, SSM tries to encompass cultural myths and meanings as well as testable facts and logic. It seeks to articulate a process in which an accommodation between conflicting interests and views can be sought. An accommodation should enable action to be undertaken which is aimed at feasible improvement. This means that SSM is a learning, rather than an optimising, system.

Whereas the root definitions describe a system from a range of differing human perspectives, the third stage of SSM, 'building conceptual models', is an account of the activities that a system must logically do in order to be the system named in the definition (Checkland 1981). As such, the models are conceptual — they should not be constrained by what is currently happening in the real world — they must instead logically set out what activities are necessary to fully define each root definitions.

Checkland (2001) cautions that the greatest difficulty in conceptual model building lies in maintaining the discipline to work only from the words in the root definition. Since root

[1] The usual English translation of the German word *weltanschauung* (VELT-ahn-show-ung — 'ow' as in 'cow') is 'world-view'. However, Checkland (2001) believes that this English translation is bland in comparison with the intent in German: set of values, outlook, point of view, cultural pre-conditions.

definitions are relevant to real-world activity, it is easy to start feeding into the model elements from real-world versions of the purposeful activity being treated as a system — elements not justified by the words of the root definition. He states:

> "model building should focus only on the root definition; every phase in it will lead to a particular activity in the model; every element in the model should relate to a particular part of the root definition. The aim is a justifiable combination of root definition and conceptual model. It is not expected that different modellers will derive exactly the same model from a root definition, simply because words carry different connotations for different people. What is sought is a model, which is coherent and defensible rather than 'correct' or 'valid'" (Checkland 2001, p. 80).

Each conceptual model will include an 'operational subsystem' connected to a 'monitoring and control subsystem'. The creation of an 'operational subsystem' involves assembling verbs describing the activities which would have to be in the system named in the root definition and then structuring them according to logical dependencies. An arrow from activity x (say 'obtain raw material') to activity y ('convert raw material to product') shows that y is contingent upon x. These considerations govern the assembly of the operational part of the system which would achieve the transformational process(es) named in the root definition. Checkland (2001) indicates that experience has shown that for most models seven, give or take two, activities are useful.

In addition to the 'operational subsystem', creating a 'monitoring and control subsystem' is necessary to enable the whole system to adapt and survive in a changing environment. The 'monitoring and control subsystem' examines the relative efficiency, efficacy and effectiveness of operations and takes control action to change and/or improve them via processes of learning and control. The generic form of a SSM conceptual model is represented in Figure 5.

Using models, defining changes

At this fourth stage of SSM, comparisons are made between the models and the real-world situation thought to be problematical. The purpose of this comparison is to foster structured and organised debate about changes that may bring about improvement in the problem situation. Such improvements may include changes to structure, process, attitude or a combination of parts. However, Checkland (2001) cautions that for changes to be implemented, they must meet two different criteria simultaneously. Firstly, changes must be 'systemically desirable'. That is, the changes identified through comparison of models with reality must have a logical basis. Secondly, since people are not always motivated to implement change that is justified merely by logic, the debate must find its way to 'accommodations' between people holding conflicting views. In other words, the changes must be 'culturally feasible'.

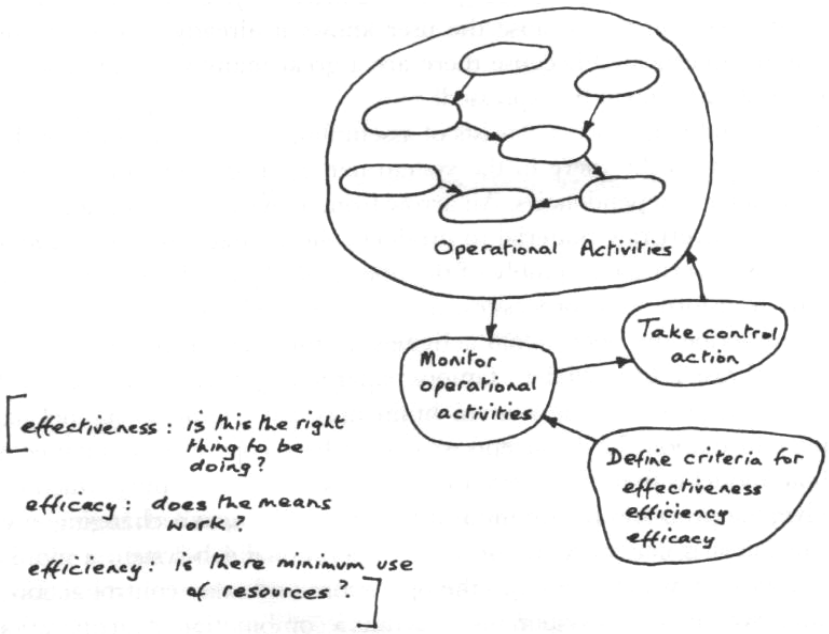

Figure 5. The general structure of a conceptual model of a purposeful activity system (Checkland 2001, p. 78)

Checkland (2001) believes that this need for both cultural and systemic desirability is something which scientists and engineers sometimes find difficult. The history, myths and meanings hidden within a human activity system are one reason why it is so important to carefully consider the *weltanschauung*[1] of each root definition and model.

Thus, each model under consideration directs attention to taken-as-given assumptions about the world, highlights alternatives and provokes rethinking of aspects of real-world activity. Checkland (2001, p. 83) reports that this is:

> "very often the point from which one recycles to earlier stages in the methodology, as learning is achieved through the comparisons between models and the real world."

Taking action

The final stage, 'taking action', occurs when systemically desirable and culturally feasible changes have been identified and accommodations between conflicting views have been found or created. The resulting 'slightly-more-structured-problem-situation' can then be addressed through subsequent SSM cycles. In fact, a 'system' to implement the defined changes may also be modelled into a coherent process via root definitions and CATWOE.

A subtle but important point is that the 'defined changes' permitted by the accommodations between conflicting views are provisional. That is, whereas the notion of 'consensus' implies final resolution of a matter, 'accommodation' implies acceptance of a model of reality only until a better model can be developed. Thus, there is a sense that SSM enables members of a human activity system to iteratively fumble towards acceptable solutions.

Having discussed how SSM can be applied in terms of Checkland's five broad stages, we will now report how SSM was used to analyse the 'PACAP system' and development of a MEIS.

Analysing PACAP Using SSM

The 'finding out' stage led to the generation of a rich picture of the 'PACAP system', depicted in Figure 6.

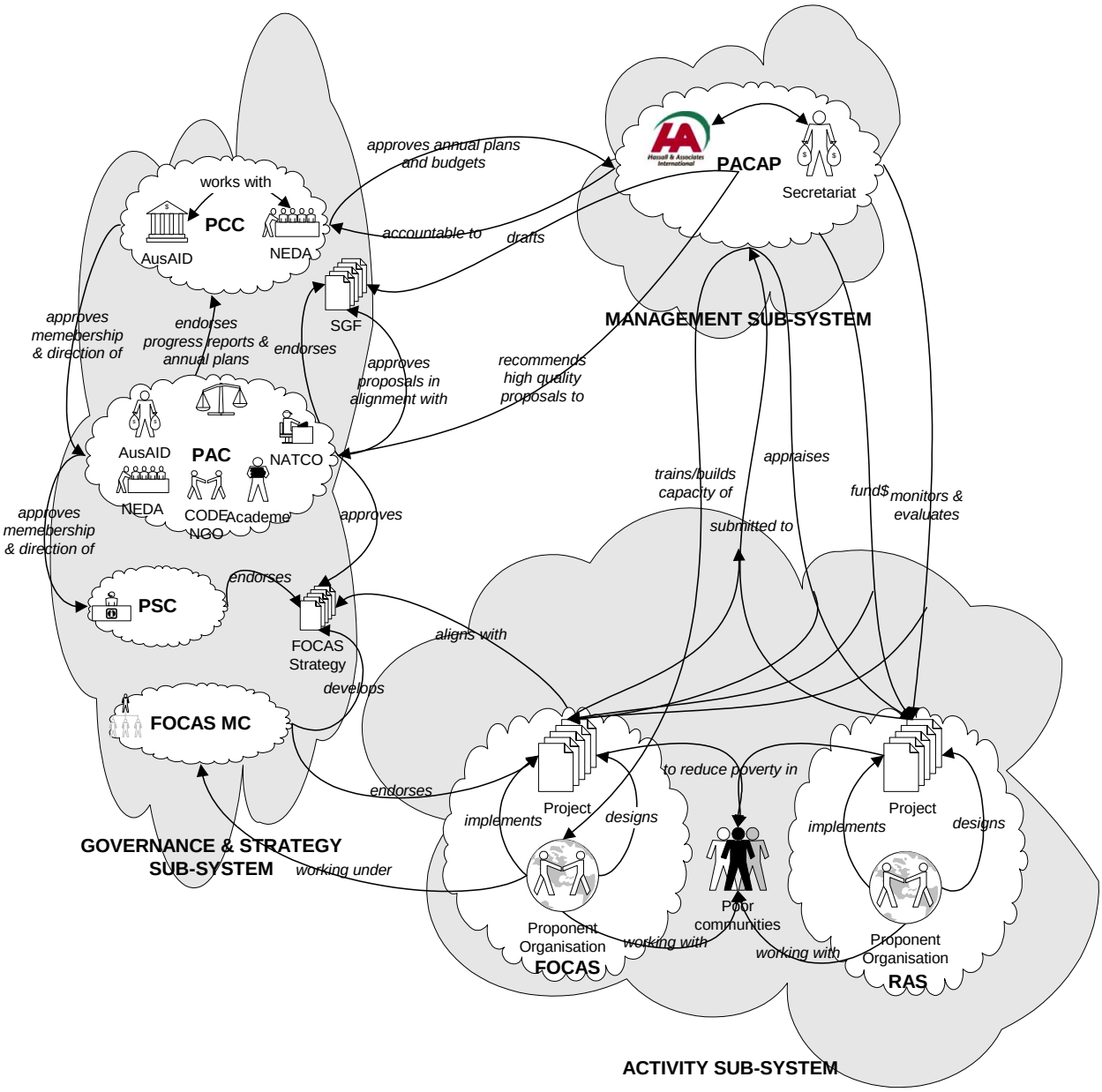

Figure 6. A 'rich picture' of the PACAP 'system'

From the rich picture presented in Figure 6 a number of root definitions were considered. Two of these will be described. The first root definition for the management subsystem was developed using the CATWOE mnemonic:

- **C:** Proponent organisations

- **A:** PACAP Secretariat
- **T:** submitted projects → funded projects
- **W:** an independently managed secretariat is an efficient and effective way to administer community assistance in the Philippines
- **O:** AusAID/NEDA (PCC)
- **E:** the willingness and capacity of proponent organisations to engage in the RAS and FOCAS initiatives.

Thus a root definition to describe the PACAP Management Subsystem may be phrased as:

> "An AusAID/NEDA system to administer a small grants funding scheme for community service organisations by engaging an independently-managed PACAP Secretariat in order to maintain or improve administrative efficiencies."

The following root definition relates to the 'Activity Subsystem' in Figure 6:

- **C:** Poor communities
- **A:** Proponent organisations
- **T:** poor communities → less poor communities
- **W:** funding (and capacity building[2]) proponent organisations is an efficient and effective way to reduce poverty in the Philippines
- **O:** PACAP
- **E:** the appropriateness of proponent organisation initiatives; the willingness and capacity of beneficiary communities to engage with proponent organisations.

A root definition of the 'Activity Subsystem' may be phrased as:

> "A system to increase incomes in poor communities by implementing discrete grant-funded projects managed by community service organisations in order to sustainably improve the livelihood and lifestyle of the community."

In analysing the PACAP system it became clear that there is an overlap between the Activity Subsystem and the Management Subsystem. The PACAP Secretariat is both an 'actor' (Management Subsystem) and an 'owner' (Activity Subsystem); proponent organisations are both 'customers' (Management Subsystem) and 'actors' (Activity Subsystem). This situation may be depicted in terms of the 'ripple effect' of social change[3] anticipated by the program as in Figure 7.

[2] Capacity building of proponent organisations is an explicit objective of the FOCAS component of PACAP.

[3] Crawford et al. (2004) discuss the application of Rogers (1962) theory of 'diffusion of innovations' using the 'ripple effect' as a metaphor of how change is effected by international aid projects.

Several key points arise from the SSM root definitions and the rich picture in Figure 6:

- The PACAP M&E system must encompass M&E processes at both the activity and management levels in order to meet the information requirements of the range of stakeholders.
- The PACAP M&E system must enable assessment of the extent and merit of the anticipated 'transformation' (T). It must also capture the impact of the 'environmental constraints' (E), as a way to provide an 'explanatory context' for the performance metrics.
- The 'weltanschauung' for the Management Subsystem highlights a predominant concern for *accountability*. The 'weltanschauung' for the Activity Subsystem highlights a predominant concern for *learning*. The consequence of this is that the PACAP M&E system must support *both* accountability and learning.[4]

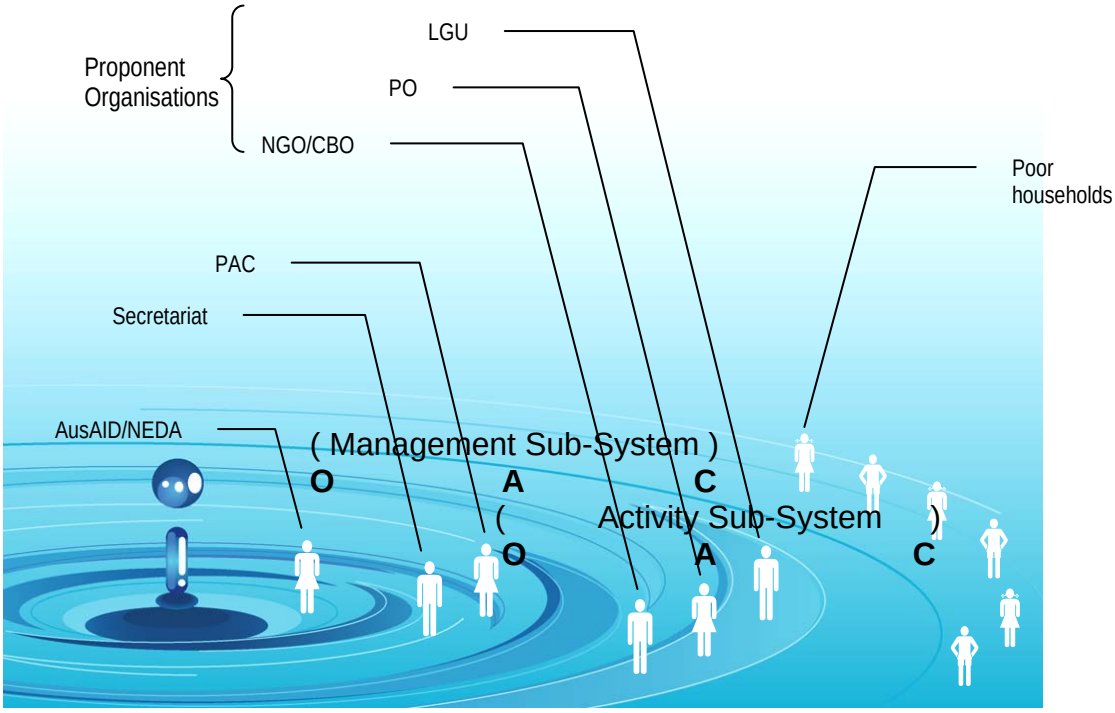

Figure 7. The overlapping of PACAP's 'Management-Sub-system' and 'Activity Sub-system'

The next stage of using SSM within PACAP involved the development of a 'SSM conceptual model', depicted in Figure 8.

Through the process of developing SSM conceptual models (Figure 5 and Figure 8) it is obvious that the function of the 'monitoring and control' subsystem of Checkland's conceptual

[4] The evaluation literature differs as to whether or not the primary emphasis of evaluation work should be for accountability or for learning. We argue that an M&E system can address both concerns with the same resources. Essentially, *accountability* is ensured through processes that make what is being *learned* transparent to interested stakeholders.

models aligns with the function of 'monitoring and evaluation systems' within international aid delivery organisations. SSM 'monitoring and control subsystems' enable the performance of 'operational subsystems' to be judged, such that learning and adaptation leading to operational improvement can take place. This resonates with the rhetoric concerning M&E within the aid industry.

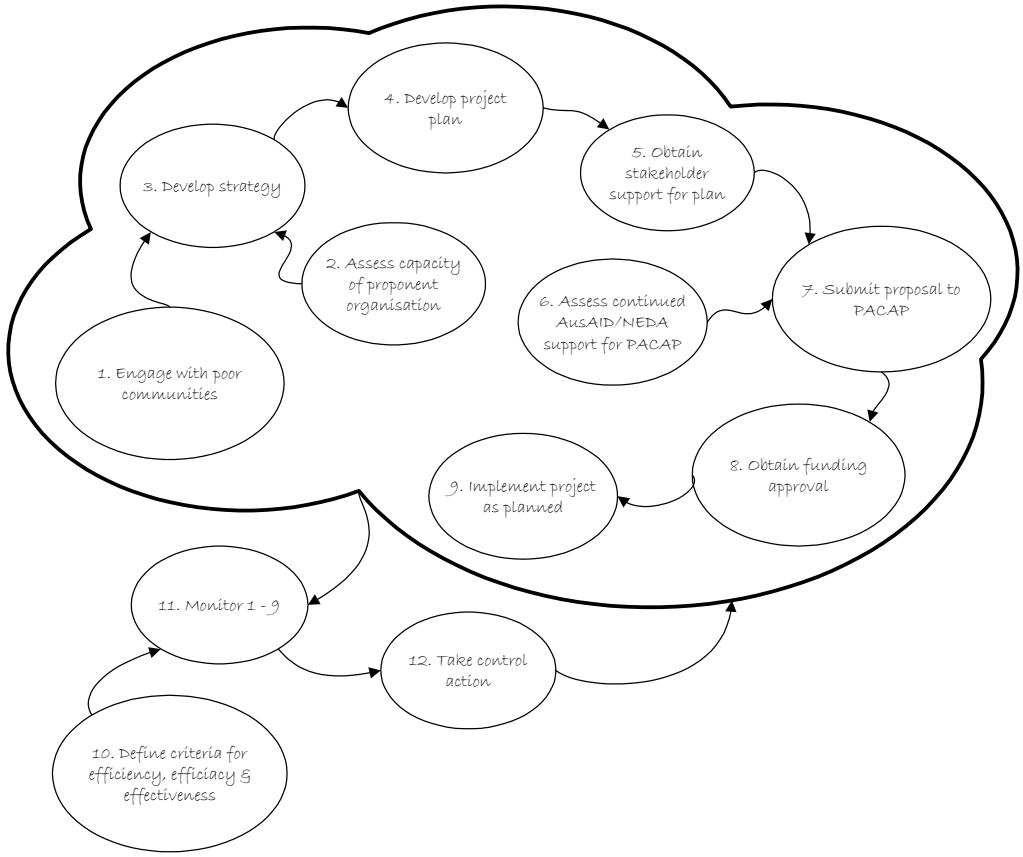

Figure 8. SSM conceptual model of the PACAP System

This understanding leads us to a deeper analysis of the 'monitoring and control subsystem'.

Defining the M&E system

Forbes and Checkland (1987) elaborate the concept of 'monitoring and control' by asking: how could the system fail? They propose three dimensions of success/failure:

- Efficiency
- Efficacy
- Effectiveness.

These terms are derived from the Latin *efficere*, to accomplish, but within the context of system (or project) success/failure, can have subtly different interpretations. Both efficiency and effectiveness are widely used in general management literature (e.g. Limerick, Cunnington et al. 1998), and aid project management literature specifically (e.g. Coleman 1987; Broughton and Hampshire 1997; Nichols 1999; Kelly 2002). However, their use has

frequently been imprecise (Cracknell 2000). Efficacy, while not as widely used, offers a third dimension to the concept of project performance. Checkland (2001, p. 78) states that "any monitoring and control subsystem must pay attention to all three of these 'Es'". We draw on Checkland's definitions of these terms but apply them to the context of the aid project M&E:

- **Efficiency** ('doing the thing right'; 'is there minimum use of resources?') — concerns cost and process management, and is a core emphasis of the managerialist paradigm in general (Rees and Rodley 1995) and project management literature in particular (PMI 2000). Much work has been done in developing methods to increase the control exerted by project implementation teams, and hence improve project efficiency. A project is efficient if it delivers the planned outputs on or ahead of time and cost estimates. Within certain constraints, the efficiency of a project is a function of the management capacity of the implementation team. Checkland's 'monitoring and control subsystem' is concerned with efficiency since a system is likely to fail to achieve the desired ends without an economy of resource usage.
- **Efficacy** ('doing a successful thing'; 'does the means work?') — concerns the merit of the theory of change of a given project. Every aid project is based on an implicit 'theory of change' (Davies 2002), or "intervention hypothesis" (Crawford et al. 2004, p. 32) that assumes that the deliverables (outputs) of the project will foster changes in knowledge, attitude or practice (KAP) among people/communities with whom the project interacts (beneficiaries). That is, the extent to which the 'means' produce the anticipated 'ends'. Efficacy tends to be the focus of most evaluation literature and is a function of the project design — the extent to which the causality of the project is grounded in well-established theory and utilises appropriate mechanisms of social transformation. A project design may be deemed efficacious when the *outputs* of the project result in the anticipated *outcomes*. Checkland's 'monitoring and control subsystem' is concerned with efficacy since the failure of a system (project) could stem from a failure of the means selected to bring about the transformation (T) expressed in the root definition.
- **Effectiveness** ('doing the right thing'; 'is this the right thing to be doing?') — concerns the philosophical and developmental worthiness or appropriateness of an initiative (Crawford and Bryce 2003). Ultimately, effectiveness is determined by the ecological, social and economic sustainability of interventions and hence is a function of the policies and strategies adopted by the project implementing agency. Whereas efficacy is concerned with the performance of a single project in fostering social transformation, effectiveness is concerned with the performance of the whole system (i.e. the whole aid program) of which any given project is a part. That is, given a project deemed to be efficacious, effectiveness is concerned with whether or not the project was worth doing. Checkland's 'monitoring and control subsystem' is concerned with effectiveness since the system under study may be deemed to have failed when it is perceived to have not contributed to high-level, longer-term goals (e.g. the agency's mission). In other words, effectiveness is a measure of the

extent to which a particular system contributes to the wider context that gives that system purpose.

The authors have also found it useful at times to consider additions to the three core 'Es'. These include **E**ndurance (is the change sustainable), **E**quity (do all actors benefit equally, or are any actors disadvantaged), **E**nvironment (does the change diminish the natural resource heritage of the actors) and **E**legance (are the actors proud of their accomplishment). These additional 'Es' can be thought of as a deeper appreciation of effectiveness or as stand-alone attributes (Checkland 2001; Swete Kelly and Gomez 1998).

Thus, given accommodations between various *weltanschauungen*, aid is likely to be effective if:

- the project as the delivery mechanism is implemented efficiently
- if the project design is efficacious
- if the project contributes to the higher order goals of the owners of the system
- if enabling external factors (assumptions) persist.

It then follows that if a M&E system is to inform judgements about the extent and merit of social changes fostered by an aid program, it must enable analysis of efficiency, efficacy and effectiveness as well as the veracity of key assumptions. Given the definitions outlined above, each of these performance criteria relate to the role or perspectives of three classes of human actor: the program implementation team, boundary partners[5] and ultimate beneficiaries, respectively. In the case of PACAP:

- **Implementation Team Efficiency** — concerns the work of the PACAP Secretariat in converting inputs (AusAID funds) to outputs (key deliverables such as capacity building training) on time, within budget and of the required quality
- **Boundary Partner Efficacy —** concerns the extent to which proponent organisations internalise the capacity building training provided by PACAP and implement funded projects as planned
- **Ultimate Beneficiary Effectiveness** — concerns the extent to which PACAP funded projects foster sustainable changes in the wellbeing of targeted communities and households, thereby contributing to reduced poverty in the Philippines.

Having identified the broad performance criteria and the sources of data (i.e. 'Subjects of Inquiry') to enable M&E of PACAP, what remained was to operationalise a system to enable meaningful debate about the performance of the program. The following section describes how SSM was used to define the M&E system mechanics.

[5] The International Development & Research Centre (IDRC) in Canada uses the term 'boundary partners' to describe pivotal human actors that sit on the 'boundary' of the 'project world' and 'the real world' (see Earl et al. 2002). Other analogous terms include 'primary beneficiaries' and 'direct beneficiaries'.

Operationalising M&E for PACAP

Once again, SSM was used to develop an appreciation for what was required. The following root definition of a MEIS was developed:

- **C:** individuals or roles ('Data Clients') who depend on certain information to perform their core function
- **A:** individuals or roles ('Data Informants') responsible for capturing and reporting the required data
- **T:** identified data → analysed data in a form relevant to the customer ('Data Client')
- **W:** performance information is an important ingredient for effective aid
- **O:** individuals or roles ('Subject of Inquiry') from whom the identified data is sourced
- **E:** implementation team staff *comply* with information system protocols; adequate *skill* exists within the team to conduct relevant analysis; appropriate *mechanisms* to disseminate information are provided; *incentives* for team members to utilise information are apparent.

A root definition an operational MEIS may therefore be phrased as:

> "A system that enables information from 'subjects of inquiry' to be captured and analysed by 'data informants', such that dissemination to 'data clients' can promote informed debate about the effectiveness of aid (but is constrained by compliance, skill, mechanism and incentive)."

The process leading to the model presented in Figure 9 proved useful to identify what was actually required within the 'operational subsystem'[6] of a MEIS. In essence, Figure 9 itemises the activities embodied in the transformation ('T') identified within the above root definition.

[6] The 'operational subsystem' in Figure 9 is essentially an elaboration of the 'monitoring and control subsystem' (step 11) in Figure 8.

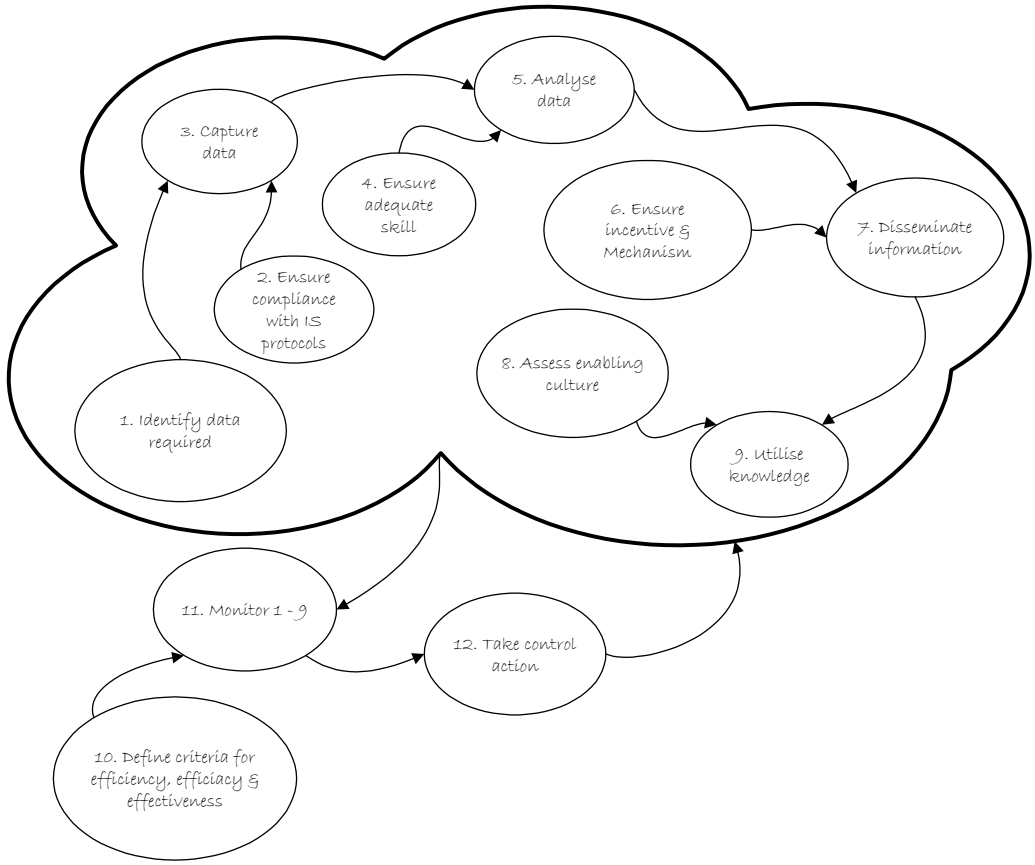

Figure 9. SSM conceptual model of a MEIS

The elements of the 'operational subsystem' presented in Figure 9 may be presented in the more accessible form of Figure 10, the 'M&E Data Cycle'.

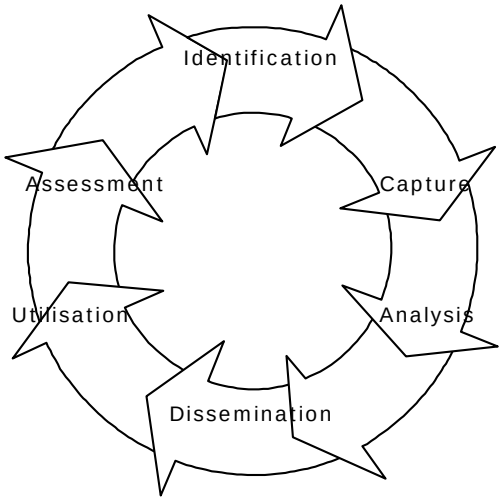

Figure 10. The M&E Data Cycle (Crawford 2004)

The first stage of the M&E Data Cycle, 'Identification', concerns identifying what particular data is required to achieve the intended purpose of M&E. This frequently entails defining indicators that are tracked throughout the life of the project.

The second stage of the M&E Data Cycle concerns the *capture* of the identified data (indicators). This may involve a range of formal and informal 'methods of inquiry' and various stakeholders.

The third stage of the M&E Data Cycle concerns the *analysis* to which raw, captured data will be subjected to draw out meaningful features and trends. Unless data is subjected to some form of analysis, its capture represents a waste of time and resources.

The fourth stage of the M&E Data Cycle concerns describing the mechanisms and protocols by which the M&E findings (analysed data) can be *disseminated* to the various stakeholders. It is particularly important that information is relevant to the recipients and received in a timely and accessible format. The concept of 'feedback' of analysis is an important, but frequently overlooked part of dissemination.

The fifth stage of the M&E Data Cycle concerns how the various stakeholders will *utilise* the M&E findings. Utilisation is embodied in the broad purpose of M&E: learning and accountability. If a use for data is not known from the outset, it is a possibility that it will remain unused — a waste of organisational effort and resources.

The final stage of the M&E Data Cycle, 'Assessment', concerns reflection about whether or not the data identified in the first stage, having been utilised, has demonstrably contributed to improved organisational learning and accountability. This final stage of the M&E Data Cycle may be considered 'meta-M&E' — M&E of the M&E system.

In the case of PACAP, an 'e-M&E' system,[7] custom-built for the international aid industry, was deployed to streamline data capture processes, automate data analysis and dissemination and enhance utilisation, thereby tackling most of the constraints commonly encountered in M&E practice as highlighted in the MEIS root definition ('E' in CATWOE).

M&E Framework

Having used SSM to analyse the 'PACAP system' and to define the operational elements of the 'M&E system', it was necessary to communicate the outcomes in a coherent overall 'M&E Framework'.

To operationalise the M&E Data Cycle defined above, it was clear that three broad elements of the system must be explicit:

- **Data —** indicators, methods, analyses
- **People —** subjects of inquiry, informants, clients
- **Time —** schedules for capture, analysis, dissemination.

[7] See <http://www.aid-it.com.au>.

These three system elements were integrated in a M&E Framework matrix (Figure 11). Essentially, *data* concerning various aspects of the program, is obtained from key *subjects of inquiry*, by specified *informants* using defined *methods of inquiry*. The data is *analysed* and disseminated to *clients* who utilise it for the purposes of accountability and learning. This data *capture, analysis* and *dissemination* all takes place within strict *time schedules*, culminating in the submission of key reports.

System element criteria for performance	**Data**			**People**			**Time**		
	Indicator	Method	Analysis	Subject	Informant	Client	Capture	Analysis	Dissemination
Efficiency				Field staff	Middle management	Senior management			
Efficacy				Boundary partners	Field staff	Middle management			
Effectiveness				Ultimate beneficiary	Boundary partners	Field staff			

Figure 11. PACAP M&E Framework

Conclusion

In this paper we have acknowledged the practical and conceptual challenges associated with the development of monitoring and evaluation (M&E) systems to assess the performance of international aid programs. We identified that the concepts that underpin Soft Systems Methodology (SSM) resonate with many of the challenges faced. After describing the generic application of SSM we reported its use within a case study program, PACAP. SSM root definitions and conceptual models were found to assist the process of developing a M&E information system (MEIS) for PACAP. The broad performance criteria of efficiency, efficacy and effectiveness were applied. The mechanics of processing these performance criteria were described in terms of a 'M&E Data Cycle'. The overall M&E system was operationalised by making explicit three system elements: data, people and time.

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