CHAPTER 5

PROCESS AND CONTENT: VISUALIZING THE POLICY CHALLENGES OF ENVIRONMENTAL MANAGEMENT ACCOUNTING

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Abstract. This chapter argues the policy challenge of environmental management accounting is getting decision-makers to understand they are dealing with a mess: a situation where disagreement and uncertainty exists. Finding shape and structure in messy situations is a pre-condition to designing and implementing effective policy. Visualising communication processes between policy makers and takers, and the content transmitted between them, supports the search for shape and structure. A series of images on process and content aspects of environmental management accounting are presented. Five images place secondary data into theoretical constructs of classical diffusion theory. Collectively, the images on communication processes and their consequences show that relying on top-down innovation through mass media distribution of advisories is ineffective in achieving widespread pro-environmental behaviour. Two images are then presented in a search to place environmental management accounting within a mapping on the causes and effects of management accounting. A tenuous link with research on how environmental uncertainty affects accounting policy choice is identified. But mainstream accounting and management conventions with respect to environmental uncertainty typically focus on environmental matters that exclude nature. Hence process and content images on environmental management accounting presented here illustrate the disagreement and uncertainty characteristics of a mess. Forming and implementing effective policy is not possible in a messy situation.

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1 INTRODUCTION

A common intent in forming and implementing policy is to achieve outcomes more effective, efficient, or equitable, than the *status quo*. Implementing policy therefore seeks change within a target population from one behavioural state to another. How such transitions occur will depend on the communication channels linking policy-makers to policy-takers (process), and what information is transmitted between them (content). Researchers will influence design and implementation since their ideas and analyses contribute to policy advice. These generalisations apply whether policy-makers operate within public or private sectors.

Perceptions by policy-makers and their advisers on undertaking the task ahead will affect choosing the information transmitted to target populations. Pidd (1996) builds on a history of dealing with complexity in policy formation and organisational management (e.g. Ackoff, 1979, Rittel and Webber, 1973, Warfield, 1976) to order such perceptions. Those seeking outcomes beyond the status quo may see the task ahead reflected in one of three situations:

- "Puzzles: situations where it is clear what needs to be done and also, in broad terms, how it should be done. A puzzle solution can be found by applying known methods.
- Problems: situations where it is clear what needs to be done, but not obvious how to do it. The problem is well defined or well structured, but considerable ingenuity and expertise may be needed to find an acceptable, let alone optimal solution.
- Messes: unstructured situations where there is disagreement about what needs to be done and why; therefore it is impossible to say how it should be done. The mess must be structured and shaped before any solution, should such exist, can be found." (Pidd et al., 2003).

Knowledge workers establish solutions to *puzzles* through experiments and case studies. A tradition among many policy-makers sees disseminating results *en masse* as necessary and sufficient for achieving behavioural change. Phelan and Basinger (1993) identify engineering solutions to puzzles disseminated during the beginnings of US soil conservation policy. They note an early example where farmers reading the US Yearbook of Agriculture were informed of means to prevent accelerated soil erosion (Hartley, 1903). Other early examples where public policy assumes a linear process of information⇒awareness⇒behaviour can be identified. Psychologists first developed puzzle solutions to prevent tobacco use among young people in the 1950s. Solutions were applied in the following decade (Aarø et al., 1998). The linear process where mass dissemination of scientific knowledge is the primary means for promoting widespread behavioural change is labelled the 'information deficit model'.

Evaluation studies soon found the information deficit model to be ineffective as an instrument for implementing public health policy (e.g. Thompson, 1978, Good-

stat, 1978, as cited by Aarø et al., 1998). Policy advisers working in environmental fields (e.g. Baker, 2001, Kollmuss and Agyeman, 2002, Napier and Napier, 2002, Scott and Gough, 2003) similarly present evaluation studies and other arguments to show the information deficit model is generally ineffective in achieving pro-environmental behaviour.

Marks and Godfrey (2001) summarise the challenge where policy implementation rests on disseminating researchers' perceptions of rational behaviour thus: "One cannot conceive of a linear relationship between research evidence and its implementation in practice. Implementation is a function of the relationships between the nature of the evidence, the organisational, professional and social and resource context in which changes are to be implemented and the facilitation of change processes. Tailored action plans are required that offer consideration of these different aspects."

Nevertheless, key top-down initiatives of recent past for promoting adoption of environmental management accounting (EMA) practice identify the information deficit model as a key element in action agendas (e.g. Office of Pollution Prevention and Toxics, 1994). More recently Savage et al. (2002) studied eighteen cases of EMA promotion by government agencies at local, regional, national, and supranational scales. Their findings show mass dissemination to be the only policy instrument common to all cases. More than three quarters of guidance documents listed in the EMA Research & Information Center (EMARIC) library catalogue circa early 2004 were funded by central government agencies. A project facilitated by the UN's Division for Sustainable Development, funded by the governments of the US, the UK, Germany and Austria, and managed by the International Federation of Accountants, should see another application of the information deficit model to EMA promotion in 2004. The international accounting community will be the policy target (Savage, 2004).

Pidd's 1996 consideration of decision support system (DSS) tools, and their selection according to categories of puzzles, *problems*, or messes, sees problems as well-defined and structured situations where ingenuity and skill should be sufficient to provide a solution. Is EMA practice a well-defined and structured situation?

One possible meaning of the phrase 'environmental management' is to have power or control over surrounding conditions. The prospect of managers having dominion over nature (Passmore, 1974), and other environments, seems irrational in today's world of turbulent societies, chaos, and climate change. Castree (2002) signals the futility of differentiating between environmental, cultural, economic and social issues, and their respective policy domains. Kolk and Mauser (2002) offer reasons why academics are shifting their search for describing the environmental aspects of business behaviour from 'environmental management' to 'environmental performance evaluation'. Lambe (2002) describes the agenda to be faced by the accounting profession in dealing with risk, uncertainty, and intangibles. He provides

useful distinctions between the comfort zone of 'counting' favoured by accountants, and the profession's need to join others skilled in 'giving an account' through ways meaningful to markets and managers. Burritt (2004) signals the frustrations in trying to define what is and what isn't EMA practice, advocating a shift from 'learning by learning' to 'learning by doing' as a way forward in promoting its adoption.

Forming and implementing EMA policy cannot therefore be seen as a well-defined, stable and structured situation where applying ingenuity and skill will lead inevitably to the outcomes sought. Should today's EMA policy-makers and their advisors act as if the situations they face are puzzles or problems, then the literature scan conducted so far suggests the behavioural changes they seek are unlikely.

Within Pidd's (1996) categorisation, the challenge in forming and implementing effective EMA policy seems to be getting makers and takers to recognise they are dealing with a *mess*: a situation characterised by disagreement as to what needs to be done and why, and where designers have to find shape and structure before they can devise worthwhile solutions. Baker (2001), Glasser (1998), Lachapelle et al. (2003), Reid et al. (1996), and Salwasser (2002) represent many researchers and practitioners recognising design and implementation of environmental policies means dealing with a mess. Gray (2002) similarly identifies discourse on social and environmental finance and accounting practice at the enterprise level as a mess, requiring systems thinking to share and improve understanding of fundamental issues.

But are words sufficient for communicating ideas on complex policy and management tasks when confronting messes? Horn (2001) joins Pidd (1996) by also acknowledging and building on the work of other scholars advocating machine/human interfaces to create shape and structure in the social messes of public policy and organisational management. He does so through creating a visual language combining text, shapes, and images (Horn, 1999). Tufte (1992, 1997) publishes scholarly examples on using visualisations to deal with complexity, including how to improve giving an account to decision-makers. Tegarden (1999), with Dull and Tegarden (1999), reviews a scant research literature considering the impact of visualisation techniques on accounting practice, and reports some experiments. Campbell (1998) also reports an experiment on using graphic tools to communicate environmental risk to decision-makers. A practical innovation built by Engel (undated) uses visualisation to support the efforts of small to medium sized enterprises (SMEs) implementing environmental management systems.

The balance of this chapter continues a search begun through a series of working papers (Osborn et al., 2002, Osborn, 2003a, 2003b) for giving shape and structure to the mess of promoting EMA. It does so in two main sections. Shapes to reflect the *process* of diffusing EMA are next presented at various levels of policy implementation. Shapes to reflect *content* relationships between EMA and related branches of accounting and other management practice are then offered. Their presentation should aid understanding key perspectives on forming and implementing EMA

policy at jurisdictional and enterprise scales. A summary concludes this chapter by urging readers to confront the challenge of shifting EMA policy from messy situation to solvable problem.

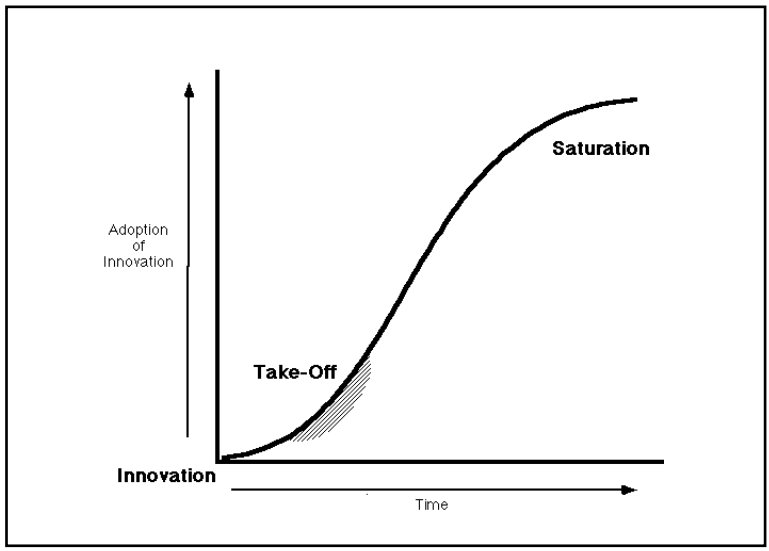
2 SHAPES REFLECTING THE PROCESS OF DIFFUSING EMA

At jurisdictional and enterprise levels the formation and implementation of EMA policy can be considered as the process where makers and takers negotiate a dialogue on diffusing, adopting, and implementing, an innovation: "*an idea, object, or practice that is perceived as new by the individual or other unit of adoption"* (Rogers, 2003 p. 12). Now in its fifth edition, the work by Rogers (2003) is used here as the standard reference to theoretical developments in, and empirical studies on, diffusion of innovations. Theoretical constructs for visualizing the process and consequences of communicating on innovation diffusion are applied here to EMA policy and practice in four ways. Examples build on secondary data from the public record, combined with some personal observations from working with Australian local governments.

2.1 Reaching Critical Mass Along an Innovation Adoption Curve

"The critical mass occurs at the point (on an innovation adoption curve) at which enough individuals in a system have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining." (Rogers, 2003 p. 344).

The innovation adoption curve typically follows an S-shaped, or sigmoid, path over time (Figure 1). The curve has been demonstrated subsequently in thousands of empirical studies on innovation diffusion across diverse research fields in developed and developing countries. Policy-makers, and their advisors, generally, should be able to translate the outcomes sought from a target population, and the instruments chosen to achieve those outcomes, into milestones along its distance. Judging and testing which instruments are likely to most effective and efficient in reaching take-off (1st inflection, critical mass, tipping) point should be key elements in any policy design.



Osborn et al. (2002) identify five key points along the classical innovation adoption curve of Figure 1, using desktop analysis to measure progress in implementing EMA promotional policies at global scale. The five points are:

1) The origin of the Innovation Adoption Curve as the point in time of policy implementation.
2) A lag will occur between public policy implementation and the flow through of behavioural change required in target organisations by, say, promoting pro-environmental behaviour through EMA. Monitoring policy performance can, or should, include periodic surveys tracking growth in the number of innovators, and begin as close to the point of policy implementation as possible.
3) A second observation point should be used to estimate an annual rate of adoption by units within the target population.
4) Classical theory and empirical studies (Gladwell, 2001) suggest the take-off interval identified in Figure 1 will occur when the innovation under consideration has been adopted by 10-20 percent of the target population. A critical mass point of 15 percent seems appropriate.
5) Estimating the size of the target population at saturation can lead therefore to estimating the size of the policy target.

A visualisation adapting the classical innovation adoption curve to enhance understanding of diffusion and adoption of EMA practice at global scale is provided in

Figure 2 as an example of this approach to policy analysis. Placing promotional efforts and opportunities into the curve can provide shape and context to the mess of EMA policy with relatively little resource allocation.

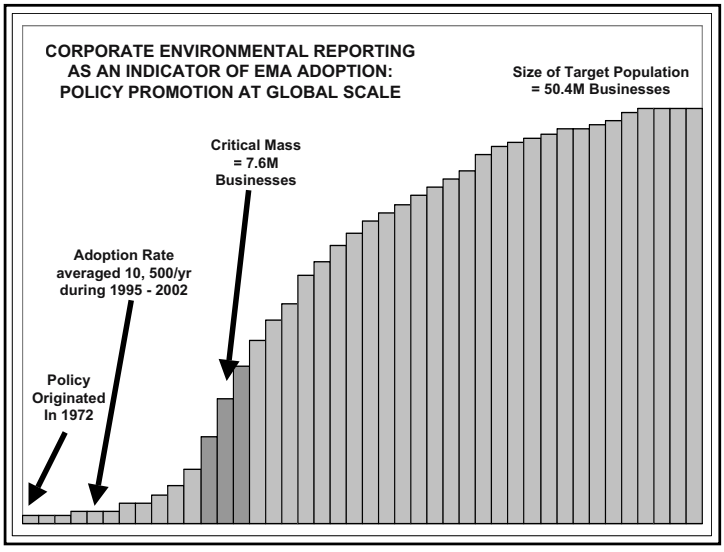


Figure 2. *Applying the Classical Curve to EMA Promotional Policy, Source: Osborn (2003b)*

Policy commitments to promote what is now known as EMA can be identified in the UN's 1972 Action Plan for the Human Environment. Opportunities to adopt this innovation by following advice disseminated en masse in the accounting literature were provided in the mid-1970s (Mathews, 1997). Counts on the number of businesses participating in various corporate environmental reporting (CER) schemes were first available in the public record from the 1960s and 1970s through Pollution Release and Transfer Registers. However, Osborn et al. (2002) used the onset in 1995 of ISO 14001 and other CER schemes as their first point on the interval for estimating an adoption rate.

By 2002 the cumulative total of adopting units engaged in CER activities indicative of EMA practice reached some 85,000 businesses at global scale: *equivalent to 0.2 percent of the critical mass target*. Results thus contribute to the body of evidence cited previously in this chapter as to the ineffectiveness of the information deficit model as a policy instrument for behavioural change.

2.2 Accelerating Adoption Rates Through Authority and Contingent Innovation-Decisions

"We distinguish between three main types of innovation-decisions: (1) optional innovation-decisions*, choices to adopt or reject that are made by an individual independent of the other members of the system,* (2) collective innovation-decisions, *choices to adopt or reject made by consensus among the members of a system,* (3) authority innovation-decisions*, choices to adopt or reject an innovation that are made by relatively few individuals in a system who possess power, status, or technical expertise. A fourth category consists of a sequential combination of two or more of these three types of innovation-decisions*. Contingent innovation-decisions *are choices to adopt or reject that are made after a prior innovation-decision."* (Rogers, 2003 p. 38).

Key stakeholders at global scale consider past, present, and future trends in environmental governance (World Resources Institute, 2003). They see greater efforts in balancing the application of policy instruments as necessary for healthier citizens and healthier ecosystems, including a return to applying the command-and-control instruments of the 1970s. A visualisation contrasting the diffusion consequences where innovation decisions are policy instruments for environmental governance is offered here. This example uses secondary data from Australia to compare adoption rates for two 'soft' environmentally sound technologies by contrasting between optional and contingent innovation-decisions.

Osborn et al. (2002) differentiate CER practices by businesses from their engagement in statistical environmental reporting (SER). There are two main differences between CER and SER to consider from a diffusion of innovation perspective. One of the former involves disclosure of identity. The latter does not, thus making identification of possible lead innovators or product champions difficult. The other is that the extent of engagement by businesses in SER is likely to be much greater than occurs in CER. The two forms of engagement are similar in many other respects. Business engagement in CER can be expected to provide evident improvements in environmental performance. Similar outcomes are also possible by entities applying their skills from SER (Osborn, 2001).

The adoption and implementation by a business of, say, ISO 14001 standards is an optional innovation decision. The International Standards Organisation conducts and publishes surveys annually on issue and non-renewal of ISO 14001 certificates. Information then available enables researchers and others to track the diffusion of this innovation through social systems: be they nations, industries, or firms of similar size. Growth in the number of entities adopting ISO 14001 illustrates an optional innovation decision in this example.

In 1995/96 a small number of Australian local governments began estimating their environment protection expenditures in pilot studies conducted by the Australian Bureau of Statistics (ABS) (Savage, 2002). In that same year the first Australian

business gained an ISO 14001 certificate. The pilot studies showed compiling estimates on environment protection expenses and revenues under activity classifications agreed to by the international community to be a relatively easy task. The ABS was encouraged therefore by some local authorities to make future collections mandatory for significant proportions of the industry, thus ensuring regular collection and publication of continuous, comparable, and credible environmental information. By shifting from an optional innovation-decision to an authority innovation-decision, the diffusion of SER through the Australian local government sector represents a contingent innovation-decision.

Figure 3 is offered as another visualization yielding shape and structure to the mess of EMA policy. Contingent or authority innovation-decisions can be an efficient means of reaching the critical mass point along an innovation adoption curve. They can also be effective in raising environmental performance and improving ecosystem condition, if takers of the authority decision are supported by capacity building initiatives. Figure 3 assumes all ISO 14001 Certificates held in Australia have been issued to manufacturing establishments. While untrue, the assumption seems reasonable for illustrative purposes.

2.3 Positive Adoption Decisions Are Made Primarily Through Interpersonal Communication

*"*Mass media channels *are means of communicating messages that involve a mass medium, such as radio, television, newspapers, and so on, which enables a source of one or a few individuals to reach an audience of many…*Interpersonal channels *involve a face-to-face exchange between two or more individuals. Mass media channels are relatively more important at the knowledge stage, and interpersonal channels are relatively more important at the persuasion stage of the innovation process."* (Rogers, 2003 p. 205).

Much of the discourse on design and implementation of EMA practice considers manufacturing businesses within the northern hemisphere. Analysis of EMA practice tends also to be limited to individual entities. The discipline and constructs of classical innovation theory necessarily take a holistic perspective, and considers diffusion and adoption of ideas, objects, or practices through a social system.

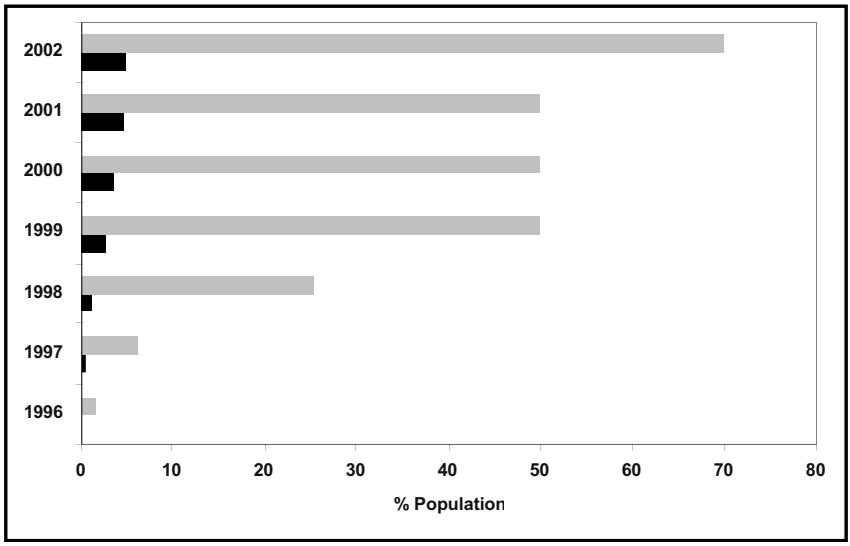


Figure 3. *Consequences of Optional and Contingent Innovation Decisions: Australian Manufacturing and Local Government Establishments. :Source: OECD (2001), Meadows et al. (1999) and ABS (2002)*

The Community Innovation Surveys (CIS) conducted among developed nations similarly take a systems view, using well-tested methods to publish robust inferences on outcomes from diffusion and adoption processes for systems and sub-systems of, say, business establishments operating in manufacturing and service sectors. Results from CIS2 conducted within the European Economic Area during 1996-97 provide useful insights into the challenge of designing policies to promote adoption of EMA practice. The shapes and words provided through Figure 4 offer a first layer of visualisations from CIS2 into the policy challenge of EMA in the European manufacturing sector. The size of sub-bars is in all cases relative to the size of total population of manufacturing establishments.

Roughly half of near 185,000 businesses making up the system of European manufacturing identified themselves as innovators during the 1996-97 survey period, and were split almost evenly between those undertaking product innovations and those making process innovations. The proportion of manufacturing businesses citing economic objectives (such as reducing labour costs) as very important drivers of innovative behaviour is roughly three to four times greater than a comparable measure where environmental objectives (such as reducing environmental damage, material and energy consumption) are seen as very important. Identifying this gap adds another dimension in structuring the messy challenge of EMA policy.

The generalisations of classical diffusion theory state interpersonal communication is more relevant to the adoption decision than mass dissemination. CIS2

results support classical theory. Note particularly at the foot of Figure 4 the differences between information sources as drivers of innovation. Again a result supporting those who see public policy relying on the information deficit model as ineffective in achieving behavioural change.

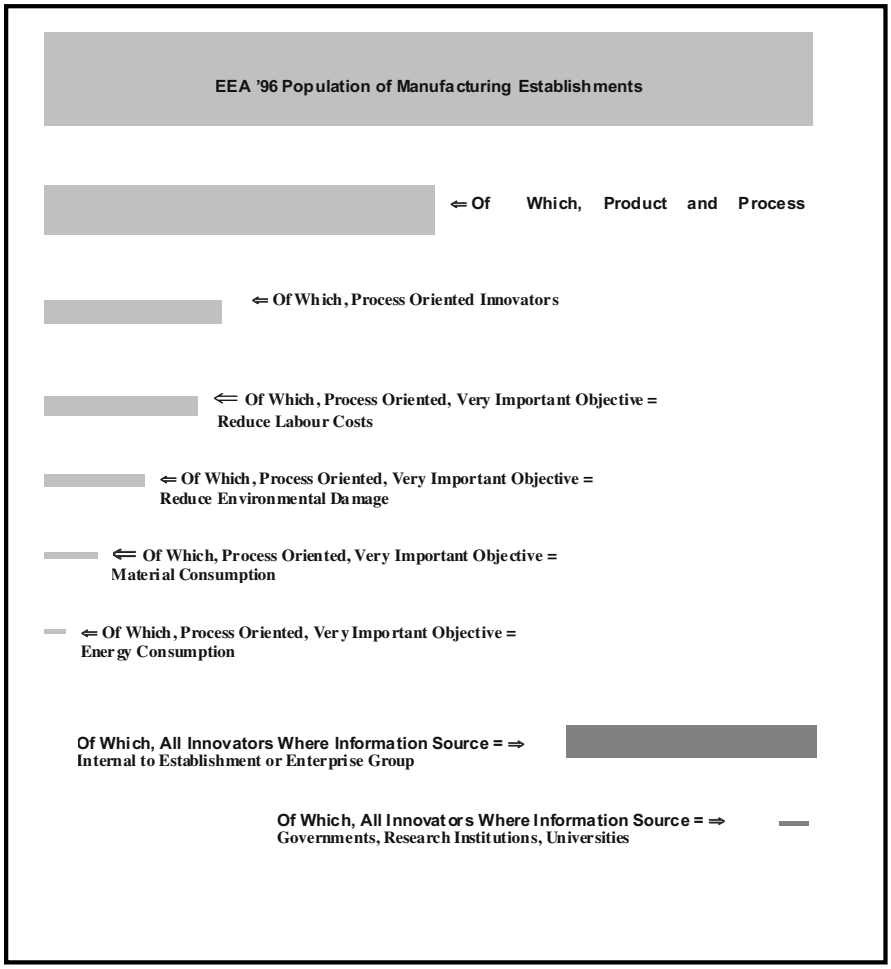


Figure 4. *Visual Insights into EMA Innovations in European Manufacturing.. Data Source: European Communities (2001)*

2.4 Implementing Organisational Innovation: The Decision Episode Framework

"In deciding whether or not to adopt or reject an innovation, individuals depend mainly on the communicated experience of others much like themselves who have already adopted a new idea. The subjective evaluations of an innovation flow mainly through interpersonal networks. So we must understand the nature of networks in order to understand the diffusion process." Rogers, 2003 p. 331. "Agenda-setting occurs in the innovation process when a general organizational problem that may create a perceived need for an innovation is defined…Both the innovation and the organization usually change during the innovation process." Rogers (2003 p. 434).

Swan et al. (2000) apply a decision episode framework to understand the communication networking necessary for the process of diffusing, adopting, and implementing organisational innovations. The framework connects three key elements:

1) A pool of organisational innovations;
2) A group of external stakeholders with some knowledge of their application; and
3) Those in a potential adopting organisation who will consider the fit of possible innovations to their own agendas.

Through mass media channels of communication, potential users within an organisation will have, at best, a fuzzy image of the innovations likely to be relevant to their needs. Employees thus span beyond their organisation's boundaries to network with other individuals holding skills and experiences similar to their own. Consequences of boundary spanning with change agents and other external stakeholders include better understanding as to the intent and design of innovations within the pool, and of those possibly relevant to an organisation's needs. Through interpersonal communication with change agents and others, the adopting organisation imports innovations from the pool across its boundaries.

An innovation is by definition an idea, practice, or object that is new to a potential adopter. Its newness means that its adoption, implementation, and usage will always be accompanied by some degree of uncertainty (Rogers, 2003 p. 6). The decision episode framework acknowledges the presence of uncertainty in the process of diffusion, implementation and usage internal to the firm. It does so by visualising episodes of negotiation and transition in personal or team agendas where relationships may be complementary or competitive.

Section 1 of this chapter argued for accepting the EMA policy challenge as a mess: a situation where disagreement is widespread as to what is and is not EMA practice. Figure 5 adapts the visualisation of the decision episode framework drawn by Swan et al., 2000 by placing an illustrative set of process innovations into a pool considered by the Eurobodalla Shire Council as it adopted environmental accounting.

Selection for this example is based in part on an EMA case study (Osborn, 2001), and partly from the author's direct observation.

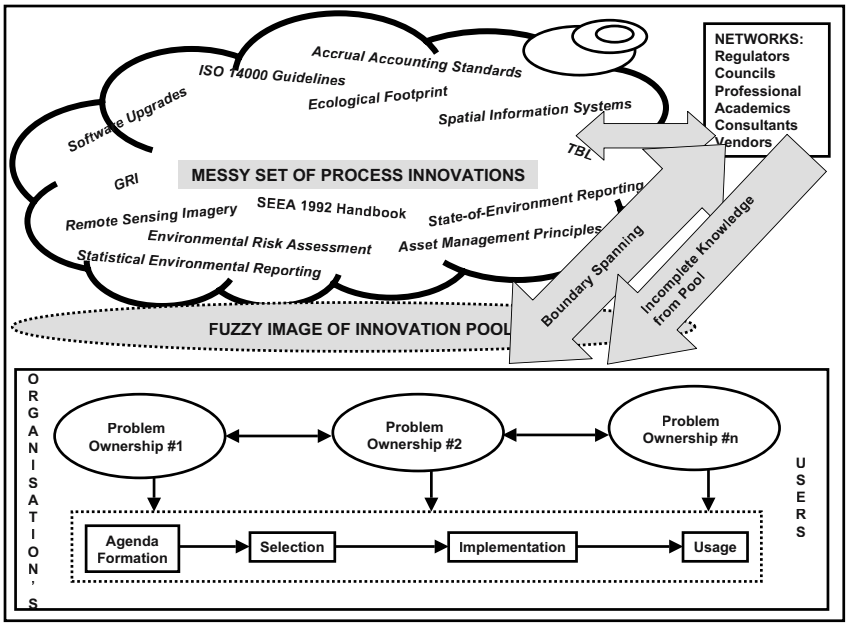


Figure 5. *Eurobodalla Council's EMA Decision Episode Framework – late 1990s: Adapted from Swan et al. (2000)*

Collaborative research studies are underway in many places to design and diffuse toolboxes where relatively large sets of process innovations (instruments, tools) are given shape and structure. Some examples include a set of some 46 concepts and instruments for sustainable organisation development (Schaltegger et al., 2002); a set of some 50 communication and information tools for public participation in European river basin management (Maurel, 2003); and a set of some 60 tools for engaging citizens in managing Australia's coastal zone (Coastal CRC, undated).

Among many offering authoritative definitions, the Business and Sustainability Group of the Tellus Institute identifies EMA as a collection of practices (or set of tools): *"How organizations identify, collect, estimate, analyze, and report materials and energy flow information, environmental cost information, and other cost information for internal decision-making is a key driver in shaping their environmental performance. These practices – collectively known as Environmental Management Accounting (EMA) – help both business and government organizations identify*

operating inefficiencies and opportunities for management and technology improvements as well as cost reduction. In addition to assisting in internal decision-making, EMA also provides a more accurate and comprehensive set of information for measuring and reporting company performance to external stakeholders such as customers, finance providers, government, the local community, and others." (Tellus Institute undated). An authoritative specification as to the contents of an EMA toolbox as elements in an innovation pool could yield shape and structure: the pre-condition for shifting the formation and implementation of EMA policy from mess to problem.

3 SHAPES REFLECTING THE STRUCTURAL CONTEXT OF EMA

Does EMA adoption by an organization as a process innovation require radical or incremental change? Is it embedded and well distributed through the system of mainstream management accounting practice, or isolated? Visualisations can provide some answers to such questions.

Luft and Shields (2003) provide another example of using shapes to comprehend and communicate complex situations. They do so by using graphics to map the causes and effects of management accounting. Their review of six journals yields some 270 articles providing theory-based evidence, making visualisations of relationships between more than 500 variables possible. Of these variables, only one – Environmental Uncertainty (EU) – seems to be to what can be distinctively labelled as an EMA variable. EU appears as a contingency theory variable in four of nine thematic maps presented by Luft and Shields (2003). In their work around half of the links between EU and another variable are direct, the balance are indirect, arriving at their final connection through a branch. EU appears marginal therefore in its influence on causes and effects in management accounting practice. EU segments from each of the four thematic maps have been extracted from Luft and Shields (2002), and appear here as interconnected quadrants in Figure 6.

The sampling and analytical methods used by Luft and Shields (2003) suggest, at best, those engaged in the empirical studies they reviewed do not perceive environmental uncertainty as a significant element in a comprehensive and systemic mapping of management accounting. The next, and final, step in this search for shape and structure in the messy challenge of EMA policy takes a closer look at the possible meanings of EU. Which among the many surrounding conditions considered by management accounting practitioners and interested researchers are recognised as influencing accounting policy choice, and therefore its practice? Two examples from accounting literature, and two from management, provide information sufficient for closing this chapter's argument.

Gerhardy (2002) builds on visual frameworks from prior research to develop an extended contingency model for analysing the relationship between accounting and the environment within which it is practiced. He identifies five primary classes of envir-

onmental variables influencing the development of accounting systems within nations. Garratt (2001) is an advocate for action learning within business organisations, and sees a company's board of directors as responsible for policy learning. In doing so they must identify changes occurring within six primary classes of environmental variables. Morrison (1992) describes environmental scanning as a method enabling decision-makers both to understand the external environment and the interconnections of its various sectors to an institution's planning and decision-making processes. The scanning method proposed for planning an institution's future typically relies on three primary classes of environmental variables. Harrison (2003) reviews the accounting and other literature prior to demonstrating the validity of measuring perceived environmental uncertainty, and sees two primary classes of environmental variables.

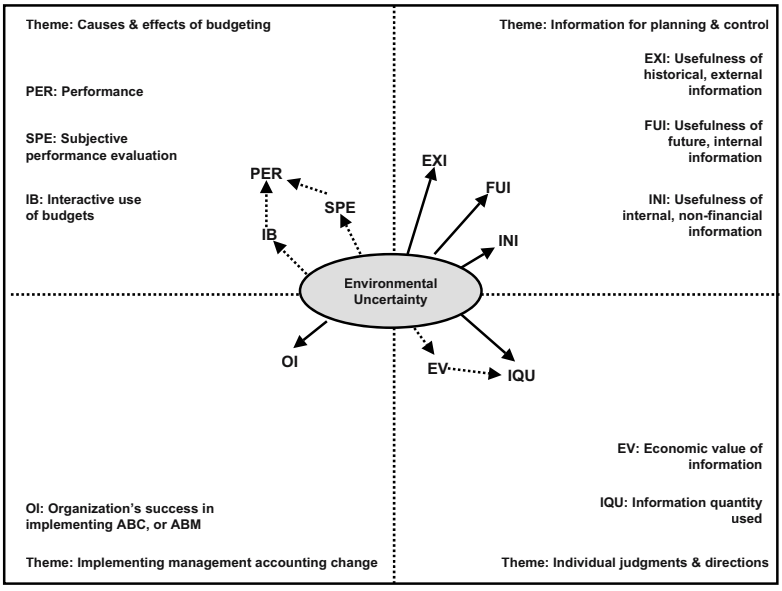


Figure 6. *Relationships between Environmental Uncertainty and other management accounting variables: interpreted by author from Luft and Shields (2002)*

These examples seem collectively to identify a set of environmental variables commonly found to, or believed to, affect accounting and other policy choices for informing decision-making. The set so derived is reflected in Figure 7, extending into the secondary classifications. Results suggest concerns as to a firm's impact on ecosystems are unlikely to compete effectively against other environmental variables affecting accounting policy and practice. From what appear to be a few isolated experiments Lewis and Harvey (2002), and Ozanne and Mengue (2000) provide contrary evidence to suggest researchers can sample around, say, 150 manufacturing firms,

and find examples where managerial concerns over ecosystems are sufficient to affect accounting and other behaviours.

4 SUMMARY

This chapter argues the situation of forming and implementing EMA policy at jurisdictional and enterprise levels is neither puzzle (for which formula-based solutions are sufficient), nor problem (where ingenuity and skill may eventually provide a solution), but a mess (where searching for shape and structure is a pre-condition to finding solutions). A visual language combining text, images, and shapes through readily available computing technologies can provide shape and structure to social messes of policy design and organisational management. Sections 2 and 3 offer seven visualisations on process and content aspects to the messy challenge of EMA policy. The visualisations yield the following insights into policies for diffusing EMA practice between and within organisations:

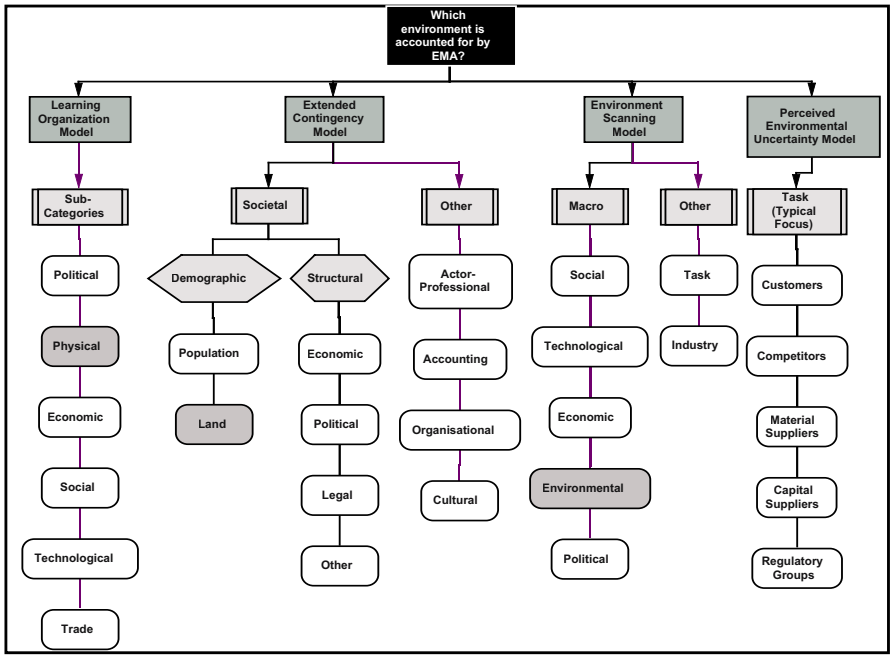


Figure 7. *Classes of Environmental Variables Affecting Accounting Policy Choice: Adapted from Gerhady (2002), Garratt (2001), Morrison (1992), Harrison (2003)*

- The innovation adoption curve of classical diffusion theory can be a useful device for analysing secondary data on cumulative totals of businesses engaging in activities indicative of EMA practice. The device is illustrated using EMA promotional policies and innovation diffusion opportunities starting at global scale in the early 1970s. Engagements by businesses and other organisations in CER are used as an indicator to evaluate policy performance. The performance indicators show a gap at global scale (possibly some 7.5M businesses) between adoption progress to date and critical mass policy target that cannot be closed by using ineffective policy instruments. Results support other evidence showing the information deficit model to be ineffective as an instrument for behavioural change.

- Classical diffusion theory identifies three types of innovation-decision. Of these, the authority innovation-decision will clearly diffuse an idea, practice, or object through a social system at rates much faster than can be obtained through optional or collective innovation-decisions. Differences between policy instruments in terms of their impact on adoption rates are illustrated in this chapter with examples from Australia's manufacturing and local government industries.

- Effective dialogue between maker and taker yields good policy outcomes. Effective dialogue between a potential adopter with another person of similar skills and experience, and some knowledge of the innovation being considered, will yield higher rates of adoption than can be achieved using mass media communication. An illustration is provided using mid-1990s data from Europe's manufacturing industry. The European Community Innovation Survey may well be an important source of data in future considerations on designing EMA policy.

- EMA practice is both a process innovation and an organisational innovation. Empirical studies in European manufacturing industry have led to the construction of a decision episode framework for understanding and illustrating the process of organisational innovation. The framework connects three key elements: an innovation pool likely to be too complex for any individual to understand; change agents with some knowledge of some elements in the pool; and a person able to span the boundaries between his or her organisation by networking with change agents. An illustration based on a case study and personal experience of the author applies the decision episode framework to the process of an EMA innovation pool considered by the Eurobodalla Shire Council of New South Wales.

The visualisations in this chapter also consider the contextual structure of mainstream management accounting practice, and illustrate the search for structure and shape to EMA in two ways:

- A systemic mapping on causes and effects of management accounting by Luft and Shields (2002) shows connections across some 500 variables identified through a review of theory-based evidence. Of these variables, only one – Environmental Uncertainty (EU) – seems related to EMA practice. Shapes showing the limited number of connections between EU and other management accounting variables are presented against four of the thematic maps created by Luft and Shields (2002). The analysis illustrates the probability of very weak connections between mainstream accounting practice and EMA.

- A key belief behind the development of EMA practice, and of public policies promoting its adoption, is that raising the environmental performance of organisations will improve eco-system condition. Research to establish which among many possible EU variables may affect accounting policy choice has necessarily led to attempts in taxonomy. Four classifications of environmental variables from within the accounting and management literature are presented. The visualization suggests the already weak connection between EMA and mainstream management accounting variables is diluted further when the many contexts within which EU affects accounting and other policy choices are identified. Few acknowledge or place importance on the nexus between environmental performance and eco-system condition.

Looking at the challenge of forming and implementing EMA policy as a mess requiring shape and structure necessarily leads inquiry beyond the immediate interests and discipline of scholar-practitioners in accounting. Social marketing, social network analysis, grassroots rather than top-down innovation, information and communication tools for informing and engaging publics, the shifting sands of environmental governance, visual language, and above all, using metrics to meet both horizontal comparison and vertical integration functions, are among ways and means for discovering shape and structure in EMA.

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SECTION 2

EXPLORING EMA IMPLEMENTATION ISSUES