

User representation

The ‘user’ in research funding negotiation processes

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National research priorities are often the outcome of negotiations between multiple research stakeholders. These stakeholders include groups of research ‘users’, which means that the negotiation processes are no longer controlled by ‘science’. In this paper, we explore the use of the ideographic term ‘users’ in the discourse surrounding the negotiation processes between a New Zealand funding agency, a research institute and an industry body. The case study highlights the implications of translating the ideographic user collective, as it appears in policy, into an individual representative to participate in a negotiation process. The design of negotiation processes should, therefore, recognize that ‘ideal’ user representation may be an unobtainable goal.

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NEGOTIATION PROCESSES that determine national-level research priorities now occur among an expanded range of scientific stakeholders, for example, researchers in universities and research institutes, industry spokespeople and public-research funding officials. These three stakeholder groupings make up the three strands of the Triple Helix model (or metaphor) of innovation (Leydesdorff and Etzkowitz, 1998; Etzkowitz and Leydesdorff, 2000) and are the major participants in research-funding negotiation processes in many nations. During these negotiations, choices are made about funding priorities that can then be translated into research agendas and further implemented in the research system through intermediary organizations such as research councils and science foundations of various kinds.

While the intermediary organizations used to be entirely in the hands of ‘science’, the involvement of other stakeholders, such as users, industry, the environment, indigenous peoples and society in general, has become important for the content of the priorities as well as their political legitimacy. While these changes have been analysed before, in this study we focus on rhetorical, or more generally, discursive aspects.

We propose that many of these apparent stakeholder groups are identified by their labels rather than being real social groupings. Their existence depends on the labels, which are, in fact, ideographs — rhetorical devices used in political settings to add legitimacy to a point of view. Below, we will elaborate this use of ideographs as creating ideographic collectives. We note that these concepts can be used as heuristics to frame the negotiation processes involved in setting scientific research agendas at the level of intermediary organizations.

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The generic usage of 'user' and 'relevance' in the new science regimes appears to be widely accepted with little analysis of how such concepts play out in practice. In this paper, we explore the ideograph 'user' as it appears in the discourse surrounding research-funding negotiation processes, using a case study of a new priority-setting process for science funding in New Zealand managed by the main funding agency, the Foundation for Research, Science and Technology (from now on called the Foundation). We also try to shed light on the implications of its use for policy goals underpinning the negotiation processes.

In particular, the case study highlights the problem that arises when spokespersons for an ideographic collective such as 'users' have to be identified in order for a specific negotiation to take place. A practical implication is the disjuncture between the expectations of the involvement of 'user' stakeholders in the discourse describing the idealized negotiation process, and the practicalities of implementation when specific users are needed for each particular negotiation. A theoretical implication is that simplistic versions of Triple Helix analysis of government, industry and university interactions have to be rephrased as also, and often primarily, discursive interactions between ideographic collectives.

The first part of the paper briefly describes the increasing prominence of 'users' in the general policy move from pure science to strategic science, since the 1970s. Following that, the method section introduces the research project and the concept of ideographs as discursive elements, in more detail.

The case study begins with a description of the organizational and policy environment of the Foundation and its stakeholders, followed by a description of the funding-negotiation process.

This is followed by a summary of the discourse analysis that was centred on the term 'user' as it was invoked by participants in, and observers of, the negotiation process. The key ramification of the study is to bring awareness, to those who either develop research negotiation policy or are involved in negotiation processes, of the implications of translating an ideographic concept such as 'users' in policy discourse into practical application in actual funding processes.

Changing science systems

A transformation in the science system has been occurring at least since the 1970s (Cozzens *et al*, 1990) even if not accepted by large sections of the world of science until more recently. Funding constraints increased (cf. the 'steady state' research system (Ziman, 1987, 1994)), a general consensus emerged that science, particularly when funded from public coffers, must be a servant of the needs of society, and participation of a wide range of lay representatives in a number of guises became important, as an ideology and then also in practice (for example, Fixdal, 1997; Joss, 1999 and other papers in the special issue; Carson and Martin, 2002 and references therein).

The transition of the science system has been variously characterized to be a shift from the search for knowledge to the search for relevance, or from a Mode 1 to a Mode 2 of knowledge production (Gibbons *et al*, 1994), or from pure science to strategic science. While the Mode 2 claim has been criticized for its neglect of historical fact, for example, that science has long taken place in the location of application (Godin, 1998; Rip, 1997, Weingart, 1997), there is general agreement that a new regime is emerging.

Strategic science is one label given to the new regime (Rip, 1997; 2000). Strategic research has been defined by Irvine and Martin (1984) as "basic research carried out with the expectation that it will produce a broad base of knowledge likely to form the background to the solution of recognized current or future practical problems". Science was exposed to new tests of productivity and assessments of its ability to enhance the wealth and well-being of economies and societies.

With the rise of the application of evaluation techniques to science and technology (for example, Georghiou and Roessner, 2000), new terms such as 'relevance' and 'user' became part of the parlance of science, and evidence of relationships with the world of technology implementation was expected. "Pressure for relevance of scientific research, and in general, new linkages with, and interference by, the

'outside' world, have opened up the earlier protected space for science" (Rip, 2000).

Interacting with 'users', therefore, became a major plank of research policies and was viewed as an essential element of 'useful' science. "User interest is increasingly taken as a measure of the value and relevance of research" (Shove and Rip, 2000). In their study of the symbolic functions that notions of use and the user fulfil in the social sciences, Shove and Rip (2000) found that users were partly real and partly mythical, a mixture of symbolic significance and practical elusiveness and that they "have to be defined and constructed, and their characteristics vary depending upon the purposes which they, and the concept of use, are required to fulfil". In other words, users are discursive constructs rather than real actors.

This is not to say that no real users are involved. Specific users for identified technologies being developed in R&D projects have been a recognized actor in innovation processes for some time (for example, von Hippel, 1986; Mackay *et al*, 2000; Douthwaite *et al*, 2001). In general, these real-life users are more easily identifiable, at least in theory, as the concept of use has been narrowed down in more detail as a technology approaches application. The user is no longer generic and can be embodied in an individual or organizational sense.

It is the more abstract, elusive 'user' that is referred to in policies, particularly those that must be engaged in the negotiation processes for research agenda-setting and subsequent funding, that is of interest here. In this application, the term 'user' refers to broad and generalized audiences such as 'industry' or 'the environment' or even 'society'. Scientists will argue in the abstract that their particular research direction is 'what users want' and how 'relevant' their research is to the world of application.

Research policies call for evidence of involvement of users in the conduct of research, especially in proposals for research projects and programmes. In research agenda-setting exercises such as 'foresight' processes (Martin and Johnston, 1998), users are invited to participate so as to confer legitimacy as well as contribute substantially. There has been no evaluation of their role in relation to the further

uptake of the results of the foresight exercises. For the UK foresight exercises, it has been claimed that the process (rather than the specific priorities that were defined) led to better interactions between the various actors.

User involvement in agenda-setting negotiations is predicated on two questionable assumptions. First, the notion that there are user groups and that they hold a collective conviction of scientific-technological futures. Second, that it is possible to identify reliable spokespersons for user stakeholder groups, even if there is seldom a mandate from these collectives. We will not investigate the assumptions as such, but explore the discourse surrounding an actual research agenda-setting negotiation process, where the role and influence of the term 'user', and how it was perceived and invoked by certain actors, can be examined.

Research method

The material presented in this paper forms part of a larger project that sought to investigate the evolution of the Foundation's discourse.¹ A discourse is made up of the way people speak and act, the context in which these behaviours occur and the power relationships that exist between the discourse participants. Thus, discursive analysis requires an examination of both the production of texts and processes of communication as well as the interaction between actors in particular social and institutional contexts. "Discourse does not merely describe things, it does things" (Hardy and Palmer, 1999) in that discourse is employed in order to pursue plans and strategies. Thus, as conceptual ideas (categories, relationships and theories) change, new objects such as texts are produced and very different practices may be invoked (Phillips and Hardy, 1997; Hardy and Palmer, 1999).

Ideographs are a part of discourse. They were first discussed by McGee (1980) to describe the slogan-like use in political language of terms that were understood to be 'good' (like motherhood and apple-pie), but without much further specification. One commonly used ideograph is 'the people', viewed as having wishes that must be taken into account in a democracy. Other ideographs are 'liberty', 'equality', 'the rule of law', 'religion' and 'freedom of speech'.

"An ideograph is an ordinary language term found in political discourse. It is a high-order abstraction representing collective commitment to a particular but equivocal and ill-defined normative goal. It warrants the use of power, excuses behaviour and belief that might otherwise be perceived as eccentric or antisocial, and guides behaviour and belief into channels easily recognized by the community as acceptable and laudable." (McGee, 1980)

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The reference to 'users' in present-day policy discourse about science has the same features. Ideographic terms can have a non-ideographic usage, so it is the context in which they are used that defines whether they qualify as an ideograph. They are often invoked to symbolize a line of argument, a "rhetoric of control" (McGee, 1980). When ideographs are used they "do work in explaining, justifying or guiding policy in specific situations" (McGee, 1980). They can do this only in so far as their descriptions are acceptable and believable.

"The important fact about ideographs is that they exist in real discourse, functioning clearly and evidently as agents of political consciousness. They are not invented by observers; they come to be a part of real lives of the people whose motives they articulate." (McGee, 1980)

The dynamics of ideograph use have a 'vertical' and a 'horizontal' component. Vertical structuring occurs when earlier usage becomes a precedent for invoking an ideograph in a particular circumstance. "Awareness of the way an ideograph can be meaningful now is controlled in large part by what it meant then" (McGee, 1980). Invoking the 'autonomy of science' to defend certain prerogatives would be an example.

Horizontal structuring occurs when different ideographs are linked and have to be accommodated (so as to reinforce or conflict). The 'autonomy of science', for example, conflicts with the call for 'relevance of science'. The reference to 'users' helped to bridge the shift from military to civilian relevance of science highlighted in the 1971 Brooks Report (OECD, 1971). 'Industry' and 'sustainable development' have since entered policy language as well, and together these ideographs create a diffuse frame of reference for agendas for science (van Lente, 1993).

The generic usage of 'user' in strategic science policy gives the term ideographic status. The 'user' plays the role of abstract sponsor of science with an implied collective knowledge of the research and commitment to it and, in addition, the 'user' is able to articulate the 'relevance' of the research to the world of the user. Like the ideograph 'industry', the ideograph 'user' is maintained in status by its linkages to actual user groups, which occasionally are able to articulate their conception of 'relevance' through spokespeople who comment on the direction of the field on behalf of the 'user' ideograph. It is this linkage between the ideographic 'user' and the actual user that we explore in this paper.

As part of the larger research project, interviews were carried out with 42 individuals, with some key participants being interviewed a second time as the project progressed. Current Foundation staff interviewed included the Chair of the governing Board, the Chief Executive, all of the senior management team and all but one of their direct managerial subordinates, as well as a sample of other employees (designated as 'FT' after quotations).

Four managers who had previously worked for the Foundation in key senior positions were also interviewed. Twenty-three representatives of 13 stakeholder organizations were interviewed with almost all of these interviewees having a direct communication responsibility for their organization with the Foundation. As part of phase II, five key representatives of forestry industry organizations were interviewed (designated FI). Quotations from the five representatives from the Crown Research Institute Forest Research are designated FR.

A large variety of texts from before and after the dates at which key policy-change decisions were made, were examined. These included official Foundation publications such as annual reports and statements of strategic intent, discussion documents released to the public during the transitions, material from Foundation presentations to stakeholders, internal management documents, transcripts of an internal email discussion change forum and a range of communication and media material. For phase II, forest industry and FR documents were added to the secondary data set. Following a general analysis of the changing strategy discourse (for example, Davenport and Leitch, 2002), the transcripts were further interrogated with a particular emphasis on the negotiation processes and the discursive usage of the term 'user'.

The Foundation and its external environment

The story of the Foundation, and of science policy developments in New Zealand, is interesting in its own right, but we present it here as the context for our analysis of discursive interactions with, and about, users. The Foundation and its stakeholders operate in a research environment that has undergone radical changes in recent decades. The changes were implemented partly to try to rectify some local attributes that were perceived to be barriers to successful 'strategic' science.

At about 1% of gross domestic product (GDP), the total annual R&D expenditure in New Zealand is low by international standards, mainly because of what appears to be low business expenditure (about 0.3% of GDP). The Government is the major funder of R&D and the majority of R&D activities (over 70%) are carried out by the public and university research sectors. Maximizing the generation of economic, environmental and social benefit from public-sector R&D has been a major driver for change in the New Zealand research system, especially with regard to the public research institutes.

Commencing in 1984, New Zealand progressed through a period of macro-economic stabilization and structural reform, particularly in the public sector, that has been called one of the "most notable episodes of liberalization that history has to offer" (Evans *et al*, 1996). The implementation of public management principles (Boston *et al*, 1996) and the

drive for efficiency included the building of clear organizational objectives, the separation of policy from operational functions, a move from input funding to the specification of outputs and the view that the Government's interest in public agencies was as the purchaser of goods and services as well as the owner (Walker, 1996). The majority of the reforms took place over about a ten-year period and implementation in the science system has been viewed as one of the clearest examples of the reform principles.

The Foundation was created in 1989, as an intermediary organization for purchasing science outputs from the system (thus, a funder of R&D). The Foundation is a Crown entity and is not directly accountable to a Minister other than as the executor of statutory instructions issued by the Minister of Research, Science and Technology. In 1992, research carried out by primarily discipline-based Government research departments was transferred to a series of ten (now nine) Crown Research Institutes (CRIs) oriented towards economic, environmental or social sectors. CRIs operate like corporations, are governed by boards of directors and have to be financially viable, but are owned by the Government and must engage in activity for the 'benefit of New Zealand'.

In parallel with the organizational restructuring, a so-called contestable funding system was created, with several specific funds targeting different parts of the research system, through which research outputs were purchased from all research providers. As the CRIs and universities are the major research providers, this system was perceived as effectively creating a 'market' for Government-funded science. Government, using expert panels, set strategic priorities for the funds, for which research strategies were created for each output area giving more specific priorities guidance. Research providers submitted bids, which were peer-reviewed, and then advisory committees recommended allocation decisions to the Foundation's Board.

During this time, the Foundation had gradually shifted its strategic focus from grant allocation through to funding instrument management. In its first years of operation, the managers saw their task as concentrating on enhancing the quality of the research, that is, funding criteria were based on scientific excellence, which was perceived to have been erratic under the previous departmental model. Around 1995, a shift in criteria for funding occurred, moving towards 'excellence' coupled with 'relevance' to research users.

In 1999, another shift in the system was initiated following a two-year 'Foresight' process. The increased emphasis on desired research outcomes (including a set of 14 Government-sanctioned Target Outcomes announced in May 1999 (Figure 1)) led to a much stronger 'future focus', and the research was re-categorized into strategic portfolios of related work.

Policy Directions for the Foundation 1999–2002

The Government recently established four high level goals for the future development of research, science and technology in New Zealand:

1. *Innovative capacity*: Accelerate knowledge creation and the development of human capital, social capital, learning systems and networks in order to enhance New Zealand's capacity to innovate.
2. *Economic capacity*: Increase the contribution knowledge makes to the creation and value of new and improved products, processes, systems and services in order to enhance the competitiveness of New Zealand enterprises.
3. *Environmental capacity*: Increase knowledge of the environment and of the biological, physical, social, economic and cultural factors that affect it in order to establish and maintain a healthy environment that sustains nature and people.
4. *Social capacity*: Increase knowledge of the social, biological, environmental, cultural, economic and physical determinants of well-being in order to build a society in which all New Zealanders enjoy health and independence and have a sense of belonging, identity and partnership.

From its set of four high-level goals for RS&T and the results of the Foresight project, the Government announced 14 Target Outcomes, to be achieved by its purchase agents, including the Foundation. These Target Outcomes were a direct output of the Foresight process and are as follows:

- Wealth from new knowledge-based enterprises
- Innovative manufacturing and service enterprises
- Sustainable use of natural resources
- Wealth creating food and fibre industries
- Future focused global intelligence
- Infrastructure for a knowledge society
- People with knowledge, skills and ideas
- Strong families and communities
- Maori development
- Vibrant culture and identity
- Health for all
- People living in safe and healthy environments
- Healthy, diverse and resilient ecosystems
- New Zealand in the global biophysical environment

The Foundation is committed to contributing to the achievement of these goals and outcomes. It has developed strategies, resources and action plans within the Government's framework, and has designed its strategic direction to complement the contribution of other participants in New Zealand's innovation system.

Figure 1. Goals and Target Outcomes

Note: Announced in May 1999 following a two-year Foresight process

Source: Extract from the Foundation's Statement of Intent, July 1999, pages 2–3

Since its formation in 1989, the Foundation has undergone several significant periods of change in strategy as it moved from being an organization concerned with fund management, to being one that managed 'investments' to deliver outcomes

Table 1. Progressive development of the Foundation over the last decade

	1989	1995	1999
Goal	To establish an <u>organization</u> to allocate funds to research organizations	To build <u>integrity</u> in how the organization allocates funds and satisfies the <i>Public Finance Act</i> (PFA)	To embrace a new role as a leading investor, facilitator, catalyst and integrator which gives life and meaning to the Government's vision and goals for the Science Envelope
Responsibilities	An organization that satisfies the PFA	Processes Databases PFA	Generate future-focused new knowledge Foster linkages and information flows Increase innovative capacity of enterprises Promote role of RS&T in NZ's future (PFA)
Outcome	EXCELLENT RESEARCH	EXCELLENT RESEARCH & RELEVANCE	WEALTH for New Zealand through delivery of excellent research of benefit to New Zealand

Note: Emphases as in original
Source: Adapted from the Statement of Intent, July 1999

In parallel with this shift to outcomes, the Foundation reframed its primary purpose as managing 'investments' on behalf of the Government. A major internal restructuring occurred and user reference groups replaced the advisory committees in the funding decision-making process. Thus, since its formation in 1989, the Foundation has undergone several significant periods of change in strategy (Table 1) as it moved from being an organization concerned with fund management, to being one that managed 'investments' to deliver outcomes.

Forestry investment negotiations

As part of the changes instigated during 1999, the Foundation announced that it would not be calling for competitive proposals from providers for the year 2000/01. This was a major change in procedure. Instead, the Foundation invited providers to review and substantially renegotiate their research in order to form portfolios that would contribute to the new Target Outcomes. It was proposed that providers would submit their plans and subsequent negotiations were to be carried out between the Foundation managers and reference groups of research users and senior managers of each research provider.

Later in 2000, the Foundation introduced the concept of 'disinvestment', which was framed as a logical component of the Foundation's new investment strategy. The Foundation intended to review its portfolio of research programmes to identify areas where it should not remain the lead investor. The organization proposed to "work with stakeholders to wind down its investment in these areas through a structured disinvestment process that manages the risk of capability loss". A model for an exit strategy was proposed that gradually reduced the target programme's funding over a number of years.

The Foundation's investment in primary production research, which was perceived to be supporting short-term research for industries producing low-value commodity products, was the primary target of the Foundation's new strategy. Its investment in forestry research, predominantly undertaken by FR, was the first to receive scrutiny.

As its name suggests, the CRI, Forest Research, is the major New Zealand research provider for the forestry industry. The 1992, reorganization of the science system had less impact on FR than most of the other CRIs in that, other than an ownership change, the research programmes and personnel remained relatively intact. Driven by recent circumstances, including the fact that the forestry industry had struggled economically at the same time as the direction of science policy had changed, FR had decided to fundamentally rethink its research strategy and to build closer ties with its user community in order to maintain Foundation funding.

FR's first response to the Foundation's 1999 signals was contained in their research strategy entitled *The New Era in Forestry Research: initiating the strategic shifts* (Forest Research, 1999). In line with the direction provided by the Foundation, FR proposed to shift its R&D significantly up the forestry value chain and to move outside the traditional value chain to knowledge-intensive areas that would create new commercial opportunities. The New Zealand Forest Industries Council (FIC) also responded to the change in direction instituted by the Foresight process and by the Foundation's demand for increasing 'end-user' involvement in the development of research strategies, stating that a change of strategic direction had occurred that matched the new priorities established by FR.

However, by the year 2000, the Foundation was looking for evidence that FIC and FR strategies were indeed being implemented. The Foundation sent a

clear message that the NZ\$26 million (1 euro = NZ\$1.93) per annum that it invested in the forestry sector was potentially in jeopardy and that between two and five million was at immediate risk of being invested elsewhere. This 'disinvestment' message was taken up rapidly by FR and FIC and spread in the form of a paper with the dramatic message conveyed in the title: "Use it or lose it!". The message from the Foundation was presented as "To [the Foundation], the 'proper' use of Government investment lies in seeking fundamental change, and they are prepared to back high-risk, high-return R&D required to achieve it" (Forest Research, 2000).

The paper employed a rugby metaphor, with a photo of a referee remonstrating with a rather subdued-looking player, to draw industry attention to the fact that: "The price of ignoring [the Foundation's] categorical position statement is the risk of losing R&D funds to other sectors" (Forest Research, 2000). As one interviewee stated, the paper was so blunt that "even the ref is bleeding".

The paper contained other messages relayed from the Foundation, including that it expected FR to transfer a further 10–20% of its Foundation-funded R&D to radically new and innovative areas within 12 months. The Foundation's determination that the forest industry needed to further change its strategic direction for R&D was fuelled by its perceptions of the current and impending problems the sector faced. These perceptions were listed in the "Use it or lose it!" document. The forest industry was perceived to be conservative, with its R&D investment largely directed towards short-term, incremental, cost-saving programmes. The Foundation pointed to the lack of industry planning in the area of R&D and to industry's historical failure to work towards R&D targets with FR and other research providers.

During 2000, FR, FIC and other parts of the forestry industry took part in various forms of interaction with the Foundation. As part of efforts to prove that real change was taking place, for example, several presentations were made to the Foundation Governing Board by FIC and FR representatives. During this 'transitional' year, negotiations took place between a Foundation-selected user panel and FR, in which FR was expected to show commitment to change by proposing significant shifts in research direction under the security of relatively stable funding before a disinvestment strategy was developed.

The forestry sector had also been spurred into action. In August 2001, FIC published what was perceived to be a radical new research, science and technology strategy (New Zealand Forest Industries Council, 2001) that urged industry to invest in R&D for its future. In the introduction, the document was stated to be "an input into a negotiation process between the stakeholders in the forest-based industries and [the Foundation]".

The report outlined how FIC saw the investment partnership between the Foundation and the forestry industry. It emphasized the importance of

partnerships and the central role that FIC had to play in facilitating such partnerships on behalf of the forestry sector. It stated that FIC would take on the role of the 'lead agency' and establish and run an advisory body to represent the sector and 'enable' the Foundation/ sector/provider partnership. The strategy committed FIC to the appointment of its first RS&T (research science and technology) manager, who would manage and facilitate industry-level RS&T initiatives.

Elevation of the role of users

The idealized status of the term 'users' becomes very apparent in this New Zealand example of the dramatic rise during the 1990s of the significance of 'users' in the negotiations of what research would be funded and therefore was eventually conducted. The term 'users' was often used in conjunction with the term 'providers' to form the negotiation triangle with the Foundation. While 'providers' has some ideographic tendencies in usage, in comparison with 'users' it represents a specific, finite and relatively homogeneous group of research-performing organizations such as CRIs and universities. There are bodies such as FIC that can be seen as representing 'users', but as the following analysis shows, specifying who or what is meant by the term 'users' is fraught with difficulty.

The elevation of the status of users is perhaps most marked in the changing constitution of key participants in the Foundation's decision-making process. Initially a combination of scientific peer review (the form in which the 'science' ideograph translates into individual representation) and advisory committees staffed by senior researchers recommended funding decisions to the Foundation Board (which was also composed predominantly of eminent researchers). In the later phases, the 'user' has taken the place of 'science' in the funding decision-making process. For example, user representatives were added to both the advisory committees and the Foundation Board and peer review was phased out. In the most recent change period, the advisory committees have been replaced with reference groups composed entirely of user representatives who play a key role in the negotiations between the providers and the Foundation.

"The message we have been giving though is that it is in [the providers'] interest to be thinking about how their research and their research teams relate to users. ... What are their user communities? If they're interested in bringing those [research] areas to us then they need to get those relationships in place beforehand because increasingly that's what we expect. When we have the portfolios all established the intention is to try to start scheduling meetings of all the participants, along with the users, to

start getting them sitting in a room and working out what relationships and networks are going to be needed in each area." (FT)

The justification for the rise in prominence of 'users' reinforces the ideographic nature of the term. In the following quotation from a Foundation manager discussing the proposed negotiation process, strong attributions are made about the users: they are able to talk, to relate and to negotiate with the Foundation, and users can also interpret and feel, implying a collective ability to think and behave.

"The Foundation was, through its road shows, talking about this triangle of the Foundation, the providers and users. This is an important interaction and this [triangle] is how we want to relate, talk, discuss and negotiate. Applications came in from the providers so ... [previously] the application was a proxy for the relationship with the users. However, the users interpret this as not giving them any autonomy. [The users are not able to] put [a research idea] forward and shape it. They feel it's filtered." (FT)

As McGee (1980) described, ideographs are also able to "do work" in explaining or justifying policy. The same Foundation manager continued: "the only way we will achieve [the outcomes] is if we actually look at the whole picture including the users because the users will actually deliver the benefits" (FT). This can be interpreted as an example of what Shove and Rip (2000) describe as a state in which research funders succumb "to the temptation of constructing and then believing in users of their own making". In the New Zealand case, the users are depended upon to deliver the desired outcomes, despite the known vagaries of the innovation process and the problematic causal ambiguity of the Target Outcomes.

When the user is invoked in a non-ideographic way, it may well be able to fulfil these delivery expectations. For example, a forestry representative described his ideal programme design to make research relevant: "it is driven by the end user. The end user says, 'We really want to see this research

done. How would you do it? How would you design a programme?' [Then we] sit down and design it with them so it is relevant ... That actually works really well with one-to-one projects" (FI).

However, at the policy level there appears to be an almost blind faith that, if users are involved, they will then deliver. In practice, the realities of individual user environments, such as the depressed economic situation of the forestry sector during the time-frame of this attempt to involve them, meant that the individuals or organizations that make up the collective 'user' group cannot necessarily carry this burden or deliver on expectations, even if it is for their own 'good'.

Negotiation process

As the Foundation took a more proactive role as an investor, and changed its decision-making process to be driven by the results of negotiations between itself, users and providers, expectations of the ideographic collective increased. The assumption underpinning the new negotiation process was that the users held a collective conviction of their scientific-technological future, that is, that they were able to form one view of their future technological desires and the way in which research could contribute to that. In addition, the new negotiation process also assumed that each individual member of that collective firstly subscribed to this one view and, what is more, was also able to clearly articulate that view during the negotiation process.

Also underpinning the negotiation processes was the presumption that the Foundation maintained control and that the users (and providers) were participating in order to further the purpose espoused by the Foundation rather than for other reasons. In the forestry case, for example, the Foundation perceived that the FIC strategy document (New Zealand Forest Industries Council, 2001) developed in response to the Foundation's disinvestment messages, was a major step forward for the industry to be able to plan for their research-driven future. However, a different view of the strategy existed, with an element of manipulation on the users' side:

"The [large forestry companies] at this point had in their mind that this whole strategy was going to win them more funding from the Foundation. More funding, not use it or lose it, [but] more funding. They thought it was an opportunity for an increase in [forestry] funding. ... The sector, at this stage, did not see the need to have a funding commitment in [the strategy]. So [the sector] was coming up with really nice ideas about what things they wanted to do and gradually [included] principles of the partnership with the Foundation because it was actually a strategy for the Foundation to buy-in to — it was to influence them." (FR)

As the Foundation took a more proactive role as an investor, and changed its decision-making process to be driven by the results of negotiations between itself, users and providers, expectations of the ideographic collective increased

Whilst the published FIC strategy was perhaps a relatively representative document, in that the Board of FIC that approved the strategy represented a large proportion of the industry, generating 'true' representation in other parts of the negotiation process was more problematic. In order to enact the negotiations, specific representatives had to be identified to form the user reference group that was a key participant in the negotiation process. It was the Foundation's role to select these representatives, but even this task was not always straightforward. As a Foundation manager described:

"It has meant spending a bit of time trying to hunt out [representatives] where there were no overall user groups that were a huge amount of use [for the Foundation's reference groups]. ... We have always had problems in [some forestry] areas because there's no good representative group of users in the same way you find in horticulture or agriculture. There are groups that apparently represent manufacturers that are ... very much trade and economically focussed but they are not science and technology focussed. It has been very hard to get a good, rational viewpoint from the industry or industry bodies. They have been good at saying that what we fund is not any good but they cannot suggest a better alternative." (FT)

In the idealized framing of the negotiation process these participants would then represent all of the facets of their sectors equitably and with equal voice. Another Foundation manager articulated how the process was expected to happen:

"The first step is to bring everyone together and have a session where people talk about what research they're doing, whether they are users or providers, and people talk about what they see as priorities. Really it is just simply sharing information and not making any immediate decisions. It is not [the Foundation] saying we are going to use this and we're going to disinvest here but to really just start the dialogue between the different people. Ideally and obviously [the participants would include] our current contractors, current research providers, potential research contractors, people who are interested in participating and key users which range from community groups, local government, central government. There is quite a wide range. The Foundation does have a role in trying to bring together the users to try to distil some sort of view and then bring together providers and pull it all together." (FT)

However, the idealism appeared to break down in the forestry case when the negotiation process had to be implemented. It was perceived by some that there was a tendency for the actual representatives

recruited to try to influence the process, not from an altruistic concept of which user group they were supposed to represent, but by bringing parochial biases to the choice process. The Foundation was cognisant of these potential pitfalls in the process as one manager described:

"The Foundation's view needs to be a part of the negotiation because they will play a similar role to reference groups. [The process is about] a group of knowledgeable people in this sector who, having looked at what the Foundation has identified as priorities, ensure that those priorities are met. This may mean that the end users are holding things back or are expecting things that are unobtainable so that interaction has to be worked through." (FT)

Differing views of negotiation process

The perception of the success or otherwise of the negotiation process obviously depended very much on the status of the stakeholder. In other words, if the views espoused, and the resultant decisions, favoured (or at least were neutral towards) the stakeholder, the negotiation process was perceived to be representative. If the reverse was the case, then the negotiation process was belittled, mandates were questioned and, in one case, blame was also vented at the Foundation when it was perceived that bias was exhibited by the Foundation manager undertaking the selection of user representatives. To illustrate this, the following two quotations are from different FR interviewees of the same reference group negotiation — the first positive, the second negative.

"The Foundation moving to independent [user] reference groups was a good move because the Foundation is essentially trusting us without saying, 'you are not doing good science?' They are saying 'tell us about the relevance and strategic direction' as opposed to 'tell us about the detail of your research programmes'. So they were changing their philosophy and not getting hung up on the details, but rather looking at the outcomes and why you're doing it. That was a breath of fresh air." (FR)

"Why was it a disaster? Because in the final instance when [the Foundation] put together a reference group to sign off on the proposed changes, [the Foundation] could see all the contentious issues. There was even somebody from farm foresters who were the people who owned all the alternative species [that were going to be cut]. They even got someone in from the landscapes area because that was going to be cut back. There was no uniformity across the sector. Those were just small subsets of the sector being winged in by the Foundation because they thought that this was what was required.

To some extent it preserved the Foundation's view. At that point it was an unmitigated disaster. It didn't do the sector any good and it certainly didn't do us any good and it didn't do any good for the Foundation. So [we] certainly came away from that saying never again, never again, we will manage the relationship within the sector. Those priorities will have to be bought into by the sector before we go anywhere near the Foundation." (FR)

How can these two views of the same negotiation exist at the same time? Irrespective of the actual details of the negotiation process and resultant decisions, the problem underpinning these perceptions is the disjuncture between the 'ideal' and the realities of its implementation when actual individuals had to be identified to give voice to the user ideograph's presumed technological choices. At best, a representative negotiation process was seen as an ideal to strive for in the abstract by the first interviewee. At worst, the ideographic representatives were viewed by the second interviewee as trying to subvert the process to the political ends envisaged by a specific sub-sector of the larger user group they were supposed to be representing.

This subversion of process was also complicated by the ability, or otherwise, of certain representatives to voice their vision more powerfully than other stakeholder representatives in the agenda-building process. Thus, while the policy envisaged some optimal choice based on the vision of ideographic users, the outcome may be that a sub-optimal choice is the result because of the political process that ensued when the Foundation had to find a select few representatives of that ideograph.

Other questions

Other process questions arise following analysis of these examples. First what is, or should be, the process for selecting the 'appropriate' representatives of the ideographic collective and who should be involved in that process? Obviously the selection process will strongly determine the views articulated and the choices made. As can be seen in several of the previous quotations, the Foundation not only controlled which individuals were selected as user representatives, but also appeared to have a pre-conceived idea of what constituted a 'good' representative and what might represent a 'useful' viewpoint.

Thus, the Foundation does not appear to be an equal member of the negotiation process. Because it controls the process (as well as the funding) it wields a large amount of influence and, through its user representative choices, creates 'good' reference groups, which must then produce 'good' outcomes. However, such a process is open to accusations of bias in the user selection, which might undermine the whole negotiation process. The balancing act that is necessary for the Foundation to maintain

credibility cannot, as in the case of inviting experts for peer review, be kept invisible.

Secondly, how would actors recognize that the ideographic collective is not being 'fairly' represented? As we noted in the beginning, there is no 'fair' representation of an ideographic collective because it exists only through attribution. Thus, contestation may occur, but on the basis of a different articulation of the attribution, for example preference for another composition of the reference group. In the example given above, the stakeholder in question combined dissatisfaction with the outcome ("a disaster") with criticism of the composition and a claim for prior negotiations to take place with important ideographic representatives.

Possible solutions

Are there solutions to these problems? There may be lessons in how other nations have handled stakeholder representation in research prioritization processes. Foresight exercises, for example, have experimented with various forms of user representation, but there the pressure to produce decisions capable of immediate implementation has been less high than in the case of intermediary organizations, such as the Foundation, that are much closer to policy execution. The outcomes from Foresight exercises have no immediate implications, and thus the representation of users can remain ideographic.

For appointment of 'citizens' (another ideograph) to citizen juries, random selection has been proposed, but there were obstacles to implementing such an approach "especially because it so effectively circumscribes the role of political elites" (Carson and Martin, 2002). For consensus conferences, it has become usual to advertise widely a call for participation. There will still be selectivity and bias, but also a measure of openness. To apply this to representation of users would undermine the rationale of reference to users in priority setting, unless boundaries could be defined around who or what were 'users' and, in a practical sense, on the construction of a reasonably sized database of users that could be sampled for such a purpose. It may well come to that, just as the larger scientific journals build up databases of potential peer reviewers. There, the editors tend to add their own qualification of who is a 'good' reviewer in order to be able to keep some control over the selection. Similarly, actors responsible for negotiation processes for priority setting would still wish to maintain a level of control over user representation.

Another approach could involve agencies such as the Foundation breaking the ideographic collective down into smaller, potentially more coherent, collectives. This approach has been suggested as part of a modified Delphi process for consulting UK users as an element of a Natural Environment Research Council (NERC) research priority setting exercise (MacLean *et al*, 1998) in which users were classified

along a number of dimensions (for example, 'pro-active users' or 'reactive users', 'end-users' or 'intermediate users'). It has also been used for understanding the complexity of users in Computer System Development (Mackay *et al.*, 2000).

However, the negotiation process may become unwieldy and very expensive if all representatives of a large range of user groups are to be involved (MacLean *et al.*, 1998). In addition, as is evident in their description of the NERC user classification system, such a fragmentation approach does not counter many of the other implementation issues described above, in that the NERC funding body carried out the classification, selected the representation according to its own criteria or understanding of the user groups' needs and also assumed that umbrella organizations could "put forward the collective views of their members" (MacLean *et al.*, 1998).

It appears, then, that the problems raised with user representation cannot be completely resolved by any change in the policy or process, as a translation of an ideograph into views carried by individuals perceived to be representative is by definition intractable. In practice, the Foundation took a pragmatic view, based on trust that the process will win out. As a manager formulated it:

"New Zealand's a small place — you're always going to have this sort of issue. My experience with the Foundation is that, if you have good people on [the user reference groups], there are enough checks and balances. [Participants] realize when people have got vested interests and they might tolerate it to a certain degree. ... I have seen people push barrows too far and its been caught by the other people in the room. Everybody present is aware that there could be a problem and in some ways it disciplines before it acts." (FT)

Indeed, depending on context and culture, problems that are intractable in principle can usually be overcome in practice.

Conclusions

This exploration of the reforms that have happened in the New Zealand science system, and the case study of the negotiation processes instituted as the most recent instrument to make funding decisions, illustrates the roles of the ideograph 'user' in the negotiation of research funding decisions between various stakeholders. The use of the concept of ideograph, rather than the notion of a symbolic role of 'users', which may at first sight make the same point, emphasizes attribution of representation for a projected collective that cannot, in practice, be simply represented.

The puzzles and tensions, coupled with the need to maintain some practical control, are directly related to the nature of an ideographic collective that

has become rhetorically important. Similar tensions and struggles occur for the ideograph 'industry': who can, and is allowed to, speak for industry? In expert review of proposals, for example for technological centres of excellence or for projects in the Framework Programs of the European Union, industrialists must be included for their expertise and the legitimation they confer. Yet there is a limited number of 'good' industrialists available, and they are in such high demand that some of them return in committee after committee.

Governments and their agencies are often orchestrators of such processes, and thus play a double role (compare the Foundation). However, when they are called upon to represent 'government' the tensions become visible. Which government department may take the lead? Can regions speak out independent of a central government? We need not analyse the ideograph 'university' to make the point that the three strands of the Triple Helix are, in the first instance, ideographic collectives. The power of the metaphor resides in the combination of three ideographs into one horizontal structuring. Of course, in empirical studies of interactions, there can be specification of actors and interactions. Full understanding, however, requires also a study of the discourses.

The ideograph 'science' has its own ideographic collective as is clear when so-called 'peers' are mobilized for review of scientific papers and research proposals. For the Foundation, peer review was discarded as not relevant to, or capable of, delivering the new strategic purpose of research, which is to generate benefit to society. However, 'science', as represented by research providers, was still a part of the negotiations and an underlying struggle can be seen as the two ideographs vied for control of the new negotiation process. Given the limitations of the translation of the generic 'user' ideograph into representatives with a legitimate mandate to express a research agenda, the question must be asked whether the new utopian vision of optimal research priorities based on negotiations informed by user representatives is, in practice, any better than the spurned peer-review process (albeit with its own faults) representing the other ideograph, 'science'.

This paper cannot answer the question as to whether the new system produces better outcomes. What we can say on the basis of this analysis, and the larger project on which it draws, is that the

It seems that problems raised with user representation cannot be completely resolved by any change in the policy or process: in practice, the Foundation took a pragmatic view based on trust that the process will win out

search for ideal representation of an ideographic collective, as manifested in membership selection of user reference groups, might undermine the policy goal underpinning the negotiation process, which is to attain relevant research priority outcomes. The representativeness of any concrete user can always be contested, and as a response, or sometimes to preempt contestation, the membership might be adjusted to be seen to 'better' reflect the ideographic collective of 'users'. The outcomes of the negotiation process may then be more legitimate in terms of the dominant understanding of who the users are, but may not necessarily produce the most relevant priorities.

What, then are the implications for those designing and implementing such negotiation policies and processes? At best, we hope to sensitize those involved to the fact that ideal user representation is probably an unobtainable goal. While the controlling agency, that is, the agent that has the power to select individual participants, may view the result as 'good' representation, it is unlikely that it will be perceived as 'ideal' from all stakeholder perspectives. However, armed with an appreciation of the issues outlined in this paper that may surface during the process of user representative selection, those that need to implement increased stakeholder participation in funding decisions may have a greater understanding of what realistically may or may not be achievable.

Note

1. The broader research project is called 'Discourse Change and Strategy at the Foundation for Research Science & Technology'. It seeks to examine, using discourse methods, the change management process undertaken by the Foundation, both internally and from the perspective of the organization's major stakeholders, the New Zealand research providers including nine Crown Research Institutes (CRIs) and eight universities. A second phase of the project looked specifically at the negotiations in 2001 over the significant shifts in research direction and funding between the Foundation, a CRI called Forest Research (FR) and members of the New Zealand forestry industry, particularly those belonging to one of its representative bodies, the New Zealand Forest Industries Council (FIC).

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