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Action Research—
Collective Insight & Enduring
Organisational Change

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Title of the study

Total quality management as the basis for organisational transformation of Indian Railways—a study in action research

Purpose

India opened its economy to global forces in 1990. By 2000, only the more efficient companies, both in the public sector and in the private sector, remained viable. However, the huge Indian Railways with its

1.5 million employees remained largely untouched by the winds of liberalisation. The only organisation-wide change attempted in its 150-year-old history was the ISO 9000 and ISO 14000 certification that many units of the Indian Railways underwent from the late nineties.

Accordingly, one of the objectives of this research was to assess the suitability of total quality management (TQM), via the International Standards Organization (ISO) 9000/2000 quality accreditation, for bringing about organisational transformation in the Indian Railways.

The literature review had shown that although there was a general understanding about the critical success factors (CSFs) of TQM, no model had been developed from these CSFs that an organisation could use to take it up the TQM path. Thus, another objective of this research was to develop a generic model for taking an ISO certified organisation towards TQM and then to particularise it to the Indian context.

TQM and culture and TQM in bureaucracy—especially in the Asian context—have been under-researched areas. Thus, while contextualising the model for India, the TQM-culture fit and TQM-bureaucracy fit, in particular, were kept in mind.

Keywords

Action research, organisational learning, Indian culture, mixed methods research, total quality management (TQM), spiral vortex model

Methodology

THE OBJECTIVES OF THIS STUDY required developing an understanding of a broad range of issues about which no prior research had been done. It has been suggested that to get broader insights into the issues being investigated the researcher should mix research methods (Ticehurst &

Veal 2000). Hence, both qualitative and quantitative approaches were used as dictated by the needs of the situation.

The research was divided into three stages.

Stage 1

Survey A. To begin with, it was necessary to see whether there was any researcher bias in the selection of TQM as a possible philosophy for the transformation of the Indian Railways towards an excellent organisation. Thus the research began by asking senior members of the organisation a series of open-ended and pre-coded questions to assess the 'as is' and 'should be' status of organisational values and practices. For this, a questionnaire (Khandwalla 2002) that had been used in the Indian context to judge the policies and practices that yield performance excellence in a competitive and liberalised environment was used. The simultaneous use of open-ended and pre-coded questions to the same set of respondents enabled the researcher to validate the conclusions. An open-ended question provides the respondents freedom to give their opinions. This can provide dimensions of information that Likert Scale-based questions may not be able to elicit. For the answers to the question were expected to throw light on the organisational policies and practices of the Indian Railways which, in turn, could explain much of what this study was to subsequently uncover. Thus, the more ways by which answers to the first question were tapped, the more reliable the conclusions would be.

The questionnaire was given only to managers with more than 30 years work experience in the Indian Railways as they were the ones who could be said to have enough exposure to the strategic part of the organisation to do justice to the full questionnaire.

Survey B. To assess the impact of Indian culture on the organisational values of the Indian Railways personnel, a Likert Scale-based quantitative survey was done using an established instrument. The

respondents were selected from three age groups: less than 30 years old; between 30 and 50 years old; and more than 50 years old. This enabled the researcher to assess the impact, if any, of liberalisation on the organisational values of the Indian Railways personnel. The rationale was that those who were less than 30 years old in 2005 were about 15 years old in the early days of the liberalisation of the Indian economy while those who were more than 50 years old were about 15 years old in the late 1960s and early 1970s, when socialism was at its peak in India. Thus they represented two contrasting generations that had spent their formative years in two different time frames.

Stage 2

Survey C. To assess the impact of ISO 9000 and ISO 14000 certification on different units of the Indian Railways, a survey of selected units of the organisation was carried out. The questionnaire used consisted of open-ended and close-ended questions and had earlier been used for similar purposes in the Indian private sector.

Survey D. A quantitative instrument, the 'TQM transition questionnaire', was developed, tested for its reliability and validity and then administered to the heads of the quality wing/heads of the units selected for survey C. They were asked to evaluate the unit on the basis of 'one year before ISO certification' and 'today' so as to get a measure of the transition the unit had made towards becoming a TQM organisation after becoming ISO certified.

Stage 3

A unit of Indian Railways was picked for ISO certification and an in-depth study of this unit was done so as to triangulate the findings, develop additional hypotheses and merge these in order to develop a model that could be used to take an ISO certified unit towards becoming a TQM organisation. Since the focus here was the progressive assimilation of

core values of TQM, it was necessary to select a research methodology that would facilitate both organisational learning by a group as well as academic learning for the purposes of this research. Given the now understood importance of contingency factors such as the change process and its manner of facilitation, as well the behavioural factors in TQM implementation (Melan 1998), action research (AR) seemed to be the natural choice to take care of the 'full range of variables which may not otherwise emerge' (Westbrook 1994, p18). AR develops context-specific knowledge that is evolved by the participants. Their collective insight promotes transformational or paradigm changes (Suderman, et al 2000, p571). For context-sensitive Indians (Kumar & Sankaran 2006a), it was felt that the research process should aim at getting multiple representations and presentation of evidence in forms that were open to multiple interpretations.

Further, the literature review had shown similarities between Indian and Japanese cultures. Thus, there was enough theoretical underpinning to believe that a bottom-up approach of ISO implementation might be better for developing learning capacities so as to internalise the TQM values of customer satisfaction and continuous improvement. The relationship between change and AR has been considered as a 'bottom-up approach specially designed as a response to the theory-practice gap' (Suderman, et al 2000, p571).

Accordingly, the AR methodology was used here. A model was also developed to test the rigour of the AR. To further validate the conclusions drawn from the AR cycles, AR was done in another unit of the Indian Railways.

A final way of validating the model was the use of convergent interviewing with the same respondents who had participated in survey A.

Findings

SURVEY A SHOWED THAT the 'should be' organisational values and practices for the Indian Railways were in line with those espoused by TQM. Survey B showed that both the managers and the staff of the Indian Railways were conscious of their organisational status. The staff members were dependent on their superiors; however, they were not interested in having a personal relationship with them. Survey C showed that, in contrast to Western countries, there was no resistance to change in the different units of the Indian Railways. Survey D showed that a multi-tier corrective and preventive action (CPA), reinforced with a reward and recognition system, intervenes positively in the transition of an ISO certified organisation towards TQM.

The learning that occurred in different parts of the research was integrated into a model for transforming an ISO certified unit towards TQM. The model shows that there is a sequential relationship among the CSFs of TQM. The way to initiate an ISO organisation towards TQM is by framing process-based quality procedures and objectives. Process-based quality procedures and objectives lead to the development of a team orientation in the context of TQM implementation. More specifically, the compulsion of implementing a CPA makes people leave their traditional moorings and begin their socialisation outside their 'professional caste'. The model hypothesises that, in the context of leadership, the *guru-shishya* (teacher-student) relationship with the leader is conceptually similar to the 'intellectual stimulation' factor of transformational leadership. This 'personalised relationship', with a more equitable slant, can be elevated to the status of the 'individualised consideration' factor of transformational leadership. The 'nurturant task' leadership model of India is conceptually similar to the contingent reward factor of transformational leadership. Using these adaptations of leadership, the reinforcing effect of successive improvement inculcates a feeling of team spirit among members of different functional groups. Successive CPAs supported by a suitable reward system and an Indianised version of leadership (Kumar & Sankaran 2007) create

a spiral vortex (Figure 2.1) that continually pulls the organisation towards achieving TQM. Further, propagation of customer satisfaction as a value, and not just as a measurement (as in a customer satisfaction index), is key to replacing some of the dysfunctional traditional Indian values that do not fit in a liberalised economy.
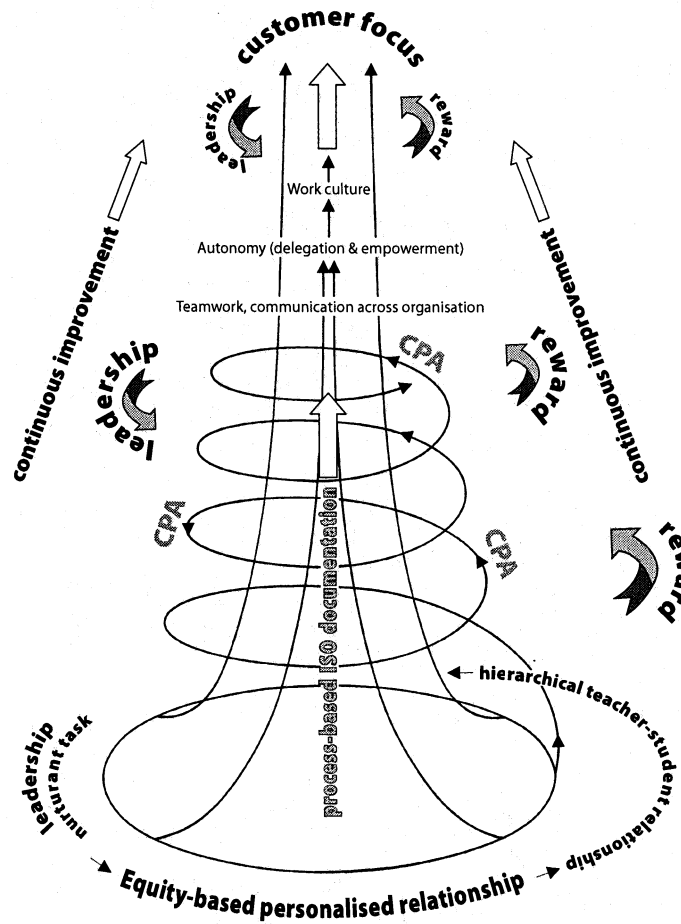

Figure 2.1: The Spiral Vortex Model for implementation of TQM in India using the ISO framework

Limitations

The spiral model developed in the research did not incorporate two CSFs of TQM—values and ethics, and strategy. To that extent, the model is limited. Also, all the data collection was done within the Indian Railways. Although care was taken to define values as specific to the Indian Railways, the extrapolation of the conclusions to other organisations needs to be qualified. Study of more ISO certified units would further strengthen the model's validity. Another area for future research could be to do a factor analysis of the 'TQM transition questionnaire'.

Researcher's retrospective

Genesis of the research

The research was undertaken primarily for pleasure—the pleasure of satisfying my curiosity about the way in which India is changing and how this change could be leveraged to the advantage of the Indian bureaucracy. I used the rich tapestry of the Indian Railways as an *experimentum crucis*, where I could experience, measure, modify, and finally sit back and enjoy watching people 'go beyond their design limits and in some cases reach beyond the boundaries of realism and realise their full human potential' (Weisbord 1987, p374).

Process

The gaps were identified by me through the literature review. Stages one and two of the research were done wholly by me. Stage three, which involved AR, was divided into three phases. The first phase was when I was physically present at the railway unit. The second phase was when my co-action researchers continued on their own based on their learning from the first phase. During this period, I was, however,

available as a guide when required. The third phase was when the co-action researchers were able to bring about a level of improvement that brought them many accolades. During the third stage, guidance from me was not available to them. The basic idea behind this progressive withdrawal of the researcher was to inculcate in them a sense of autonomy, to cease their dependence on a mentor/guide/leader so that they could work on their own and become self-propelled 'transformational teams'.

All 16 research units of the DBA were completed within 20 months of the program. The remaining five months were used to repeat the AR in another railway unit which served to further validate the model developed.

Strengths and limitations of the methodology

This research shows it is possible to do theory building from mixed methods research. Although it was divided into different stages, the research remained focused on the overall objective primarily because it was not bounded by a particular research methodology. Further, a deliberate intra-methodological and inter-methodological confirmation was used to validate the findings of the research. In this regard, it may be useful to share with the reader the model that was used for the purpose of theory building (Figure 2.2).
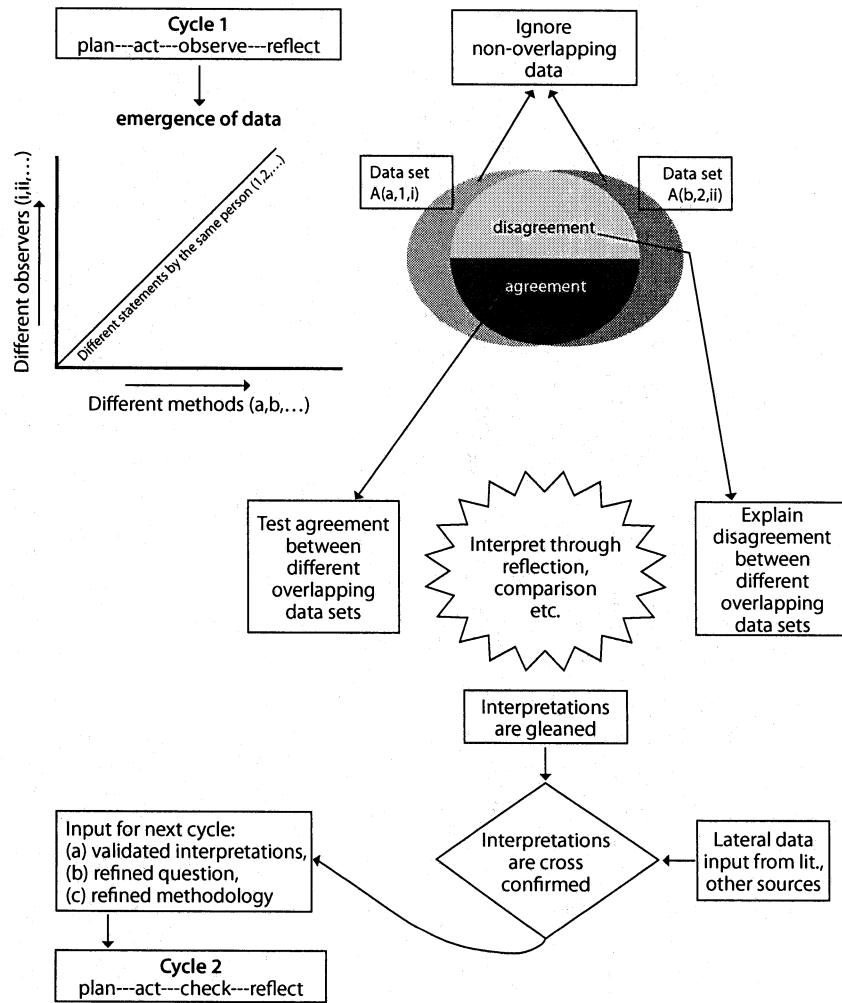
Figure 2.2: Model for validation of learning that occurred in each cycle by using
different methods, different sources of data and different types of data

The progressive weaning of the action researcher is a useful method within the AR methodological umbrella that other action researchers can try in order to create enduring change. Another unique feature of this research was the use of the concept of design of experiments in a qualitative manner. That is, the selection of different railway units in stage 2 was based on the presence/absence of different intervening factors that could explain the substantial differences in the 'TQM transition score' without getting into the statistical analysis. The factors thus identified were useful in developing the model during stage 3 of the research and later in validating the model.

Strategies for gaining resources

The research began by first securing clearance from the top management. Then an unsuccessful attempt was made to pick up representative units to research within the countrywide organisation. However, the research proposal was perceived as my private agenda camouflaged as being beneficial to the organisation. And the general response was, 'Even without you, this organisation can take up TQM implementation'; and 'Even though you have been allowed to take up this study by the Indian government, there have to be reasons justifiable to *me* so that *my* unit can spare time for you'.

Hence, I asked myself, 'Why should these bureaucrats waste their time for me?' So, instead of soliciting units for research, I decided to advertise my intent and allow the unit heads to assess its value purely from their own perspectives. This way, units that had a latent need to improve their quality-related practices were picked up. I used the relatively neutral and learning-oriented ambience of the central training institute of the organisation to advertise my proposal during different training courses and waited for the responses to pour in. But even after this, access had to be reworked for each unit, each hierarchical level of a unit and, as subsequent developments showed, for each different 'purpose' at each hierarchical level of a unit.

The research design weaved different components of the research together. This pretty much determined what to include and what to exclude. In the AR phase, the AR cycles were not framed as general problem-solving sessions. Rather, the emphasis was to seek only questions that were related to the objective of ISO certification for the units.

Reflection

As a manager, I learnt two major things from this research. The first was how to deal with Indian employees in a Western organisational set up. Today, Indians have made their mark as software experts and knowledge workers in business process outsourcing centres, and India is a preferred destination for setting up manufacturing outposts. Almost all these are knowledge-based activities. Today, knowledge is a raw material just as land, labour and capital were in the industrial era. The Indian ethos of the *guru-shishya* relationship that has been discussed in this research is perhaps the basic reason why Indians are able to grasp knowledge so easily. I can now say that an understanding of this Indian ethos and how it can be seamlessly blended with Western models of team working and transformational leadership has great practical significance for Western organisations based in India. The second thing I learnt was that I could now identify which characteristics of Indian bureaucracy needed adaptation for initiating a TQM-based reform (Kumar & Sankaran 2006b).

The study enabled me to broaden the contours of soft systems methodology by linking it to an Indian-specific cultural dimension called 'context sensitivity'. I could now argue that it was because of context sensitivity that there was no resistance to change during ISO implementation in the Indian Railways. This also explained why, post-liberalisation, Indians have been able to make a mark in the world. It also enabled me to develop tools to reinterpret the actions of people in organisational settings (Kumar & Sankaran 2006c), debunk the myth

of hierarchy being dysfunctional for TQM and appreciate the fine dynamics of hierarchy and collectivism in TQM implementation (Kumar & Sankaran 2007). I could now draw similarities between action science and an Indian theory of action propounded in the ancient Indian epic, the *Gita* (Kumar & Sankaran 2006d).

It made me realise that perhaps AR is a richer way of undergoing the PDCA (plan, do, check, act) loop (Kumar & Sankaran 2006e). For if a 'learning bias' is added to the PDCA loop, and one begins looking for data (with a view to analysing, understanding and benefiting from them in subsequent PDCA loops), the basic skeleton of action learning is already there. The thematic similarity among different data and frequency of occurrence of different sets of data need to be 'reflected upon', instead of 'regressed upon' (as in regression analysis), and then one arrives at learning. Here, mind, in contradistinction to mathematics, is the processor that processes perceptual or cognitive data as against classificatory, ordinal, interval and ratio data. As against mathematical modelling, mental models (Checkland 1999) are used to make sense of the perceptual or cognitive data. From there, a progressive loop of learning through subsequent intra-organisational or inter-organisational validation and, at a larger scale, through intra-methodological and inter-methodological validation gives rise to a theory whose theory building will be perhaps more eclectic in approach than conventional theory building and where the experiment of scientific research is replaced by the intervention of the AR.

At a practical level, I feel that if one wants to go for large-scale organisational transformation, it is better to opt for insider action research (IAR) provided some basic conditions are satisfied, namely, that the insider action researcher has good organisational credibility; the change direction is the latent need of the members of the organisation and the IAR is merely articulating this need; there is a critical mass of organisational members who are familiar with the proposed path; and there is a benign leadership that is not averse to the proposed direction of change. Hands-on involvement by the leaders is not necessary, however,

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because the chemistry of AR creates its own momentum for change. The insider action researcher can understand the bias, subtle shifts, nuances of different gestures and statements and, to that extent, the data analysis can be richer and the intervention more economical in terms of the time taken. Because of his/her prior exposure to the organisation and its undercurrents, it is also possible for the researcher to do the analysis post hoc, which can lend further richness to the data analysis. The insider's ability to empathise with the researched world can aid the change process, making it more authentic, acceptable and enduring.

It is true that the aspects of access, politics and conflict are critical but an external consultant will initially get no easier and, more importantly, no deeper access than an insider action researcher. After the initial buy-in, the insider action researcher and the consultant are both on their own. In fact, in the Indian context, one can use one's organisational status as a resource for getting the initial access. However, one needs to be conscious of the ethical dimensions of this.

I now realise that my role in the AR project was to manage the boundary and help others gain the skills. The research mixed training, problem solving and purposeful focus so that people learnt just what they needed and when they needed it (Weisbord 1987, p373). The 'reflection after action' was perhaps the richest part of the intellectual journey for me in this research. I came to appreciate why theory building requires a qualitative grasp of the different shades of data that a quantitative approach would have missed.

Although the initial motive for doing this research was pleasure, what I had not bargained for was that it would become a hobby. The feeling of managing fruitful change was so intoxicating that, even after the DBA had been successfully completed, I lapped up another opportunity for AR in another railway unit and used it to further validate some of the findings and to perfect the particular approach of AR wherein the researcher makes his presence progressively unnecessary. When I started this research, I was looking for a research methodology that could make use of every significant cue around me. 'The richness of

data around me and the intellectual fascination of putting theory on it' (Coghlan 2001, p219) made me adopt the AR methodology. I wanted to grasp the data lying around and wring it until it gave insight. AR methodology was, indeed, the most economical way of doing this. I am fairly convinced that had I used any other research methodology, I would not have been able to come up with a number of research hypotheses, develop a model for change and also validate it.

Supervisor's comments

I MET MADHU IN 2004 when he came to Tweed Heads to attend a DBA workshop and start his DBA. At that time I was requested by Southern Cross University to be his principal supervisor supported by a local supervisor in India, but it did not turn out that way. Because of administrative issues and lack of time on the part of the local supervisor I became Madhu's sole supervisor.

Madhu and I had a lot in common in terms of background and interests. We were both professional engineers from India. He was planning to do research in a public sector organisation and I had also worked in a public sector organisation in India and was aware of the issues in such organisations. We were both attracted to AR and I, too, had been an insider action researcher in an organisation during a time of major change when I did my doctorate. Moreover, I had been involved in implementing total quality management (TQM) in an organisation in Singapore that involved accreditation to ISO 9000. Madhu and I also shared an interest in systems thinking. Thus it was a perfect match, but the main issue was the distance. On top of this, Madhu could not make another visit to Australia as his funding was not sufficient for this.

When Madhu came to Tweed Heads he attended a presentation by Adjunct Professor Bob Dick about using AR as a research methodology and made up his mind to use it to implement TQM in his organisation. Madhu and I had a brief discussion about it at the time and I described

how I had used AR in my own doctoral research. The thematic concern Madhu had for his research fitted an AR approach well.

When Madhu went back to India he sent me his plan for his AR cycles. I became apprehensive at this stage as the research methodology seemed to lean towards positivist research. I realised that Madhu was facing the same problem that I had during my doctoral research. We both came from scientific and engineering backgrounds and our natural tendency was to lean towards methods used in the natural sciences. Even the language used sounded 'positivistic'. I recall discussing the survey parts of the research with my colleague Dr Mark Manning, and later cautioning Madhu about using mixed methods as I felt the research effort would be huge and I was unsure how we could support him from a distance for data analysis. But Madhu convinced me of the logic of his approach and we went ahead with some minor adjustments.

At first I was surprised at the speed at which Madhu carried out his data collection and analysis but then learnt that he had been granted study leave by his organisation. So although he was doing research in his own organisation he was able to take time off to do his study. We were expecting to meet up again in Tweed Heads after he had collected most of the data for the first two stages of his research. But, then, Madhu ran out of funds to travel to Australia.

Fortunately, I had to visit India at this time to do some work for SCU's Enterprise Development and Research Institute. I asked Madhu if he could travel to Bangalore in South India from Varanasi up North where he was based, a distance of 1,500 km. He agreed. So we caught up at the Indian Institute of Science, Bangalore. We covered a lot of ground and I felt confident that Madhu would be able to write his thesis comfortably, which he did.

I was in a bit of a quandary when I had to recommend examiners for Madhu. Although I had lived out of India for more than 25 years, it was difficult for me to pick out the finer points of the English language as I had also been brought up using 'Indian English'. I suggested that

Madhu get the help of a professional editor but I don't think this helped much as the editor was also from India. So I decided to recommend two examiners who had visited or lived in India and who would be tolerant of the writing style as well as understand the organisational issues that Madhu had to deal with in his research. For the Indian bureaucracy is one of the more dubious legacies of the British Raj. The examiners were happy with his thesis and it was completed in just over two years which is a remarkable achievement for a thesis completed overseas with the internet as the main medium of communication. This shows how efficiently Madhu carried out this research. He kept me on my toes as well regularly sending me chapters of his thesis for review.

While we were waiting for the examination results, Madhu started writing papers from his thesis, encouraged by the support promised by the Graduate College of Management's publications project. He managed to write several papers that have been presented in national and international conferences and prominent AR journals, such as *Systemic Practice and Action Research (SPAR)*. It was a bold move on Madhu's part to send a paper to *SPAR*, where the review process is very tough. However, the reviewers appreciated his application of action science to investigate the events of the *Mahabharat*, an Indian epic (Kumar & Sankaran 2006c). We are still writing and publishing papers together. I think among my DBA candidates Madhu has been one of the most prolific publishers.

In the end, Madhu's use of mixed methods has resulted in a thesis that blends theory and practice very well and stands as a very good example of AR. I can empathise with Madhu when he says that he enjoyed doing the research (his job did not require him to undertake the project). It was similar to my situation when I did my doctoral research while I was working in industry—a sort of mid-life crisis when we get this itch to contribute something significant to our disciplines.

What Madhu's research shows is that an effective supervisor-candidate relationship can be maintained if both parties are willing to put in the

right effort. His example also shows how a candidate can be supported to publish from their research. Madhu has so far published eleven papers, mostly from his thesis. The thesis is also an excellent example of insider action research (Coghlan & Brannick 2001). It also shows the successful adaptation of AR to an Eastern culture.

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Researcher's profile

Madhu Ranjan Kumar is the Chief Materials Manager at the Indian Railways. Since 2006, he has presented five papers in international refereed journals, three papers in international conferences and three papers in national conferences. In 2005, Madhu was a Consultant to the World Bank (International Finance Corporation) in quality management and vendor development. Before that he was a Consultant to Indian small and medium enterprises in organisational transformation, organisational learning and quality management.

Supervisor's profile

Shankar Sankaran comes to academia with more than 30 years of experience in management positions in Asia, the Middle East and Australia, and has managed large engineering and IT-based industrial projects. He was a director of a Japanese multinational company in Singapore before he joined the Graduate College of Management at Southern Cross University in 1999. In 2006, Shankar moved to the Faculty of Design, Architecture and Building at the University of Technology Sydney, where he is an Associate Professor of project management. However, he continues to be a supervisor in SCU's DBA program. Shankar's research interests include project management, knowledge management and action research. He is the founding editor of the *International Journal of Health and Ageing Management* and is on the editorial advisory board of *Action Research*.