Health and Safety system change through user-based design

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Abstract

The paper describes an action research process involving the use of Integrated Administrative Design, a user-based design methodology which enables stakeholder group participation in the design of administrative processes. An application of the process is shown in the redesign of an employment health and safety system in a large government agency. The process describes how a small design team worked with a community of practice of health and safety practitioners and several representative stakeholder user groups to redesign the system. It concludes with an evaluation of progress from the viewpoint of user groups, and an assessment of the methodology, recommending its potential application for use in other organizations.

Key words: change practice, administrative design, occupational health and safety

The paper describes an action research process involving the use of Integrated Administrative Design, a user-based design methodology that enables stakeholder group participation in the design of administrative processes. This action research took place in the Compliance division of the Australian Taxation Office (ATO). The ATO employs around 22,000 people, of which around 10,000 are employed within the Compliance division. In 2005/06, this division consisted of ten separate business lines and each line had a separate Health and Safety Committee, set up under the requirements of the Occupational Health and Safety (Commonwealth Employees) Act 1991. During this time, a series of internal audits carried out on the health and safety systems within the division found a wide range of inconsistencies and problems with these systems, with only two of the lines receiving favourable ratings for meeting Comcare’s health and safety requirements.

In September 2006, a restructure and integration of support functions within the Compliance division occurred, aimed at obtaining a more consistent delivery of services, and improving the efficiency and effectiveness of the HR, finance and business support functions. One of the functions integrated was the health and safety support function, and the change involved a proposal to abolish the ten line-based health and safety committees and replace them with one committee. The author’s responsibility was to put this change into action, as part of his management role in human resources. In October 2006, after discussion with the newly appointed manager of health and safety for the Compliance division, the author decided that it would be best to re-design the system and use an internal ATO
methodology titled *Integrated Administrative Design* (IAD). The IAD process was developed in the ATO in 2000 and was originally titled *Integrated Tax Design*. It was then used for the purpose of developing taxation administrative systems. It was later further developed in 2002 and renamed IAD, to enable the design of other administrative systems.

**Design of administrative systems**

Simon (1996) states that design involves human beings using knowledge to create what should be, things that do not yet exist. He notes that design “is the principal mark that distinguishes the professions from the sciences” (p111). Hevner et al. (2004) distinguish between behavioral science (goal: to comprehend reality) and design science (goal: to design and/or change reality) and consider them complementary approaches. A philosophy has developed around design, as put forward by Romme (2003:562), in that design is “based on pragmatism as the underlying epistemological notion”. He explains that design research “develops knowledge in the service of action” and that design thinking nature is “normative and synthetic…directed toward desired situations and systems and toward synthesis in the form of actual actions”.

Romme (2003:562-3) combines his work with that of Nadler and Hibino (1990) and outlines three values and ideas that define the content dimension of design inquiry: (1) each situation is unique; (2) focus on purposes and ideal solutions; and (3) apply systems thinking. The first “implies that no two situations are alike; each problem situation is unique and is embedded in a unique context of related problems, requiring a unique approach” (Romme, 2003:563). The second “opens the door to the creative emergence of larger purposes and expanded thinking. It also leads to an increase in considering possible solutions”. Nadler and Hibino (1990:140) note that “Even if the ideal long-term solution cannot be implemented immediately, certain elements are usable today”. The third, systems thinking, “helps designers to understand that every unique problem is embedded in a larger system of problems” (Romme, 2003:563). He also puts forward four other ideas that define the values and ideas regarding the process of design: (1) limited information; (2) participation and involvement in decision making and implementation; (3) discourse as medium for intervention; and (4) pragmatic
experimentation. Romme notes that the first, *limited information*, guards against excessive data gathering and helps in that “too much focus on the existing situation may prevent people from recognizing new ideas and seeing new ways to solve the problem” (p563). Participation is crucial as “Involvement in making decisions about solutions and their implementation leads to acceptance and commitment”. Discourse is important as “the design process should initiate and involve dialogue and discourse aimed at defining and assessing changes in organizational systems and practices”. Finally, he notes that “pragmatic experimentation is essential for designing and developing new artifacts, and for preserving the vitality of artifacts developed and implemented earlier” (p563).

IAD is a design methodology that is very much aligned to the thinking outlined in Romme’s (2003) article, as IAD is based on a philosophy that representative groups of users of an administrative system should be involved in the design of the system. This approach in the ATO is called *user-based design*. The ATO’s IAD process has seven design principles, which are compared to Romme’s seven values/ideas on design in Table 1.

**Table 1: The application of Romme’s values/ideas in IAD**

<table>
<thead>
<tr>
<th>Romme’s seven values/ideas on design</th>
<th>How IAD principles are related</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Each situation is unique</td>
<td>Each project under IAD is seen as a <em>unique</em> situation within a particular context, and so requires a design process that takes this into account.</td>
</tr>
<tr>
<td>2. Focus on purpose and ideal solutions</td>
<td>Each project is very much driven by the intent or <em>purpose</em> of the proposed change and attempts to design an <em>ideal solution</em>.</td>
</tr>
<tr>
<td>3. Apply systems thinking</td>
<td>The IAD methodology pulls in <em>systems thinking</em> about the context of the situation, its potential impact on other systems and uses systems techniques in the design process.</td>
</tr>
<tr>
<td>4. Limit information</td>
<td>The IAD process uses <em>limited information</em>, so as not to overwhelm new and innovative thinking with old patterns of behaviour.</td>
</tr>
<tr>
<td>5. Participation and involvement</td>
<td>IAD uses a high level of <em>participation</em> through the <em>involvement</em> of user groups in design and implementation</td>
</tr>
<tr>
<td>6. Use discourse</td>
<td>IAD uses extensive <em>discourse</em> in the workshops with user groups and other stakeholders.</td>
</tr>
<tr>
<td>7. Pragmatic experimentation</td>
<td>IAD is involved in considerable <em>pragmatic experimentation</em> and testing.</td>
</tr>
</tbody>
</table>
The IAD Methodology

The IAD methodology is outlined in the ATO’s Design Guide (2004) and consists of six major steps. The first stage is intent formulation, which is not considered a static part of the cycle, but a “living, ongoing process, potentially extending through all stages” (ATO, 2004:0.9). It is important in this stage to undertake collaboration with key stakeholders, and that the people involved want to cooperate. The second stage is blueprinting, which is a “high level design of the entire change” (ATO, 2004:p.09). This stage is largely undertaken by the core design team and is aimed at giving organisational decision-makers enough information to approve the proposed changes and move to the next stages. The key part of this stage requires the designers to establish and meet with various user groups to hold a series of conversations that develop the design thinking in relation to the specific needs of the users. Emerging from these discussions should be designs of user pathways, which are shown as diagrams “as a sequence of interactions the user will have…in both transitioning with the change and in their ongoing interactions with the change” (ATO, 2004:2.16). The third stage is to design products, which includes designing specific services for communities and user groups. This part of the process incorporates the conceptual design and prototyping of products identified to deliver the user pathways mapped in the blueprinting process. The process involves the use of design workshops that involve user groups in transforming the intent to workable designs for products and services. The fourth stage is to build products, including training staff and developing detailed process maps and guides. All of these would be built in accordance with the design specifications arising from the third stage. The fifth stage is to test user pathways, which is where testing occurs to assess the interaction of all the products and services to understand the combined impact on user groups, and any problems are ironed out before the change is implemented. The sixth and final stage is to implement change, where the system is handed over to the administrators and community to use. Evaluation during implementation is a very important component of this stage, as this is where any emerging problems can be identified and final corrections can be made. Following implementation, a post-implementation review would be conducted to evaluate the ongoing operation of the new system.
In setting up a design team, it is important to have the distinctive contribution of three ‘voices’ of design. The first of these is the voice of intent, a person who is usually the project sponsor. It is their role to see that the design realizes its intent. This person needs to carefully exercise judgement about design options, and to take accountability for the design decisions and quality of the final products and services. The second is the voice of experience, a person who brings a practical and focussed view on the design intent. This voice speaks of practicality and feasibility, and understands impacts and consequences on the existing systems. The third is the voice of design, a person who can provide expertise in the IAD process, and who can concentrate on building openness, flexibility and adaptability, and can challenge existing thinking and promote self-discovery. This concept of ‘voices’ is similar to narrative theory of workplace stories outlined by Czarniawska (1997); and by Letiche et al (2008:647), who discuss the importance of using an individual’s experience and knowledge in a dialogic form as a “directly experienced narrative”.

The IAD process has been used successfully in the ATO over the last few years, particularly in the design of new or revised taxation administration systems, in response to government legislative and policy changes. Its internal use in human resource management to design a health and safety system had not been tried before this project.

**Health and safety systems**

Health and safety systems are created in organisations to prevent work-related injury and illness of employees. Systems approaches to health and safety use both preventative and reactive strategies to manage the system effectively (Makin and Winder, 2008). They are also designed to be proactive and integrated into the organization, incorporating continuous improvement (Robson et al, 2007) and require top management involvement and support (Zeng et al, 2008). An effective system helps drive a safety culture in the organization (Fernández-Muniz et al, 2007). Zink (2005:543-4) notes that critical success factors for these systems include the need to for them to be integrated into existing management systems, with strong support by top management, working in harmony with existing safety committees, and focusing on long-term strategic solutions. It is this critical understanding of
harmony and integration, with a strategic and proactive focus that was important to the redesign of the Compliance division health and safety system in the ATO.

The ATO system is generally in line with successful health and safety structures internationally, such as in Scandinavia, where they have three different collaborating structures: Safety Committees; independent and autonomous safety representatives; and experts on OHS (Lindøe and Olsen, 2004). The overall ATO system has all of these structures in place. However, its safety committees were somewhat fragmented, and communication within the system needed significant improvement. Many of the line-based committees were operating at a level that was too low to influence behaviour change within the workforce, and many of the employee representatives focused on site issues, rather than work system improvements. In this context, Hall et al (2006) found that the involvement of employee representatives that sought external knowledge about safe work processes and actively persuaded management to accept changes actually gained more improvements to health and safety in the workplace than those looking narrowly at just the ‘shop-floor’ type of safety issues. This view of employee representatives was certainly an aim of the ATO change, in lifting the committees from local to systemic issues, such as risk assessments, work processes and safe work systems. The ATO already had in place site safety forums and employee health and safety representatives who look after the local issues, such as faulty equipment and local hazards.

In redesigning the ATO system to become more effective, one of the indicators would be a reduction in risks. Mearns and Håvold (2003:410) have stressed that health and safety risks can “only be managed and never entirely eliminated”, implying that organisations “have to keep constant vigil to determine potential weaknesses in their health and safety systems, in order to keep risks as low as reasonably practicable”. In this context, the redesign needed to address the minimisation and mitigation of health and safety risks. Other factors to be considered in the redesign are also outlined by Mearns and Håvold (2003:422), who noted from their research that there were certain leading indicators that improved safety performance in terms of accidents rates. These were “installation of safety climate and health and safety management practice”, in addition to “communication and
workforce involvement”. They saw that both workforce involvement and management commitment had the most impact on reducing accidents and incidents. Other factors reducing incidents included a focus on health and safety auditing and health surveillance and health promotion activities.

In designing the new system, all of these factors became critical considerations. The new system needed to build a climate of health and safety management practice, improve communication, management commitment and workforce involvement, focus around the impacts of auditing, and enhance intelligence pathways and health promotion activities.

**Designing the new system**

The design work was commissioned in October 2006, and responsibility for its implementation was given to the author, as HR director for the Compliance division of the ATO. There were three action research cycles during this time. Each cycle was delineated by a major reflection or review of what had been accomplished. Most of the design work occurred during the first cycle, from October 2006 to February 2007. In the first action research cycle, a small design group was formed, who would lead the design of the new system. The small group included the author, the health and safety manager, one health and safety coordinator, and an information designer. The author took on the role of the voice of intent, the health and safety manager and coordinator took on the role of the voice of experience, and the information designer took on the role of the voice of design. The also author established a reference group, which commenced in November 2006, and would meet weekly by phone hook-up. This group would become a key body to discuss ideas, evaluate proposals, and obtain quick communication across the Compliance division of the ATO.

The design team set out to map the different user groups of the system, and develop a process to work with representative user groups. It also decided to pull together a two day workshop, where various representatives of some of the user-groups would come together to discuss the issues associated with the design, and come up with some alternative models. The workshop was held in December 2006 and consisted of three union representatives, three line-based human resource managers, two health
and safety advisers, the design team, and several other stakeholders. The author outlined the intent of management at the outset of the first workshop. This initial workshop was quite exploratory, and four different design models were suggested and discussed, along with the reasons for each model. The group developed an agreed set of advantages and disadvantages for each model. It was agreed the models would be referred to the Compliance Executive for a decision on a preferred model, which would then proceed to more detailed design.

During this time, the design team met with various user groups to establish user pathways under the proposed changes. Some of these pathways involved significant changes to the current state, whereas others required minimal change. It was noted at these meetings that the three voices needed to be evident. The intent often needed to be clarified up front by the author, so that the users worked within the original intent. The voices of experience came out from the user groups as they put forward their ideas and discussed problems under the existing system, and identified potential problems and issues with the new system. At these workshops, the voice of design challenged thinking, sought clarification, and asked difficult questions. This proved invaluable, as it helped the users see through the existing system and help them release into thinking about how it could be better with the new system. Various user pathways were developed and appeared in diagrammatic form and were added to the blueprint, which was gradually being written. One of these pathways is included as Figure 1.

The blueprint document, which arose out of these discussions, described the intent of the project, outlined the communities of user groups, showed the various user pathways interacting with the new system, and described the various products and services being provided by the new system. It also outlined the project risks and mitigation strategies, identified connections with other systems, outlined a communications framework for the project, and described an evaluation framework for the project.

Following the writing of the blueprint, the author’s Health and Safety team had moved into the design products stage, including developing key documents for the new forum. A draft Health, Safety and Wellbeing Plan was developed, as was a draft Charter for the proposed new committee. A proposal incorporating the newly developed documents and an outline of the various options was submitted for detailed discussion to the Executive. The Executive requested further design work on a preferred
option, and endorsed a proposal to set up an interim committee, with a view to commence ongoing planning for the proposed changes.

Figure 1: User pathway for line health & safety professionals to identify and escalate an issue

The second action research cycle commenced in February 2007 with the initiation of more detailed design work, following reflection on the direction provided by the Executive. Coincidentally, there was an opportunity to undertake further changes, as changes to the Act became effective from March 2007. The author suggested that the interim committee be established in the same manner as that intended by the changes to the Act, to ensure goodwill with union representatives, and to achieve engagement of senior management representatives. The Executive agreed with this, and the first planning workshop was held in March 2007, attended by six management and six union representatives, as well as the design team. The blueprint, plan and charter were further developed and refined. Further work was commissioned and another planning workshop was agreed for May. A further report was written by the author for the Executive, who approved the new design, subject to an increase in membership to seven management and seven employee representatives. At the May planning workshop, it was clear that the transition to a new Committee was proceeding well, and a
Chair for the new Committee was appointed. The Committee requested further design work, with proposals to come back to the first Committee meeting in June.

The action research process had entered its third cycle in June, with the formal commencement of the new Committee, based upon reflection and changes suggested at the planning meetings. The IAD process had now moved into the build products stage and a Committee agenda was established on that basis. Following discussions with the reference group, the author developed a proposal that the Committee accomplish its work through five working parties, based around specific health and safety strategy areas. These areas were: (1) health and safety assurance; (2) risk management; (3) communication; (4) education and product development; and (5) issues management. The Committee agreed and allocated one management and one employee representative to each of the working parties, supported by members of the Health and Safety team. The new system was ready to be fully tested with pathways established at the June meeting. After this meeting, a reflective discussion occurred and some changes were suggested to the process. Following this meeting, an e-mail was sent to all Compliance division staff, informing them of the changes and inviting comment on the draft plan and blueprint. Responses were collated and suggested changes were discussed and evaluated at the network meeting, with some incorporated into revisions of the plan.

The project then entered the implementation stage, as the design had largely been completed and built, feedback had been sought, prototypes had been trialled through the Committee, and users informed.

**Participation builds support**

The processes involved in the IAD design and action research undertaken in this project involved substantial participation. Participation is a fundamental principle of action research. For example, West and Stansfield (2001:266) state that “Attention to the notion of collaboration is vital in action research”. Also, Reason and Bradbury (2001:2) note that action research is “only possible with, for and by persons and communities, ideally involving all stakeholders both in the questioning and sensemaking that informs the research, and in the action which is its focus”. The process of
generating knowledge through participation is reinforced by Brulin (2001:441), who notes that knowledge “that aspires to...be of practical use has to be developed jointly with the users of the knowledge”, so “researchers have to form knowledge in interactive relationships with practitioners”. In another commentary, Dick (2002:164) states that “there is a spectrum of participation from which one can choose” in action research, which “may be done with the style and level of participation that suits you [the action researcher] and your participants”.

Whilst it is noted that participation is an essential part of action research, its use in large organisational change projects can be somewhat problematic. This is due to the sheer numbers of people involved or impacted by major change in organisations. In an effort to become more participative, organisations have used techniques such as industrial democracy and representative boards to enhance participation. As it is not possible to involve everyone as a collaborator in co-design of change programs, it is more likely that action researchers may involve people in different ways and at different times of the project. This is where Dick’s (2002) spectrum idea is most useful. At different times of this project, a range of different participative techniques were used.

At the time this paper is written, the health and safety redesign project had been fully implemented for 12 months, and the participatory process involved in it had generated enormous goodwill. In particular, comments by union officials commended the process used by the design team to bring about the change. The union officials appreciated the way internal user groups were consulted and had direct input into the design of user pathways and product development. They also noted the way in which a synergy developed on the intent of the new system, and how all parties were working in cooperation to achieve a design that would be viable and workable. Senior management within the Compliance division also gave positive feedback about the design of the new system, and the goodwill and cooperation it had established in the course of the design process. In fact, in July 2007, it was mentioned as a significant achievement in the Compliance division’s annual performance report. Feedback from HR managers within the Compliance division of the ATO was also very
positive, and they noted that a high level of cooperative behaviour had developed within the HR community as a result of the process of design.

The participative approach of action research and the IAD process enables cooperative behaviour and goodwill to develop. The author noted that at the start of the redesign process, some of the union representatives and some other stakeholders held quite different views to the original design intent. Many of these views were based around the voice of experience, which was coloured by previous history in the organisation. However, during the participative process, these views were moderated through the engagement and involvement of the stakeholders in the design, bringing about a shared understanding of how the new system could work in practice. In this regard, the author, representing the voice of intent, listened to the other voices, and adapted the design to meet user needs, whilst still upholding the project intent. In particular, it was the dialogue and a common aim of ensuring the best possible safe and healthy work environment for the employees of the organisation that enabled cooperative behaviour to occur.

**Results of the intervention**

The implementation group expected improved health and safety outcomes from the implementation to occur over a period of two years. However, a review was conducted one year after implementation, and preliminary results were collected from health data and feedback from user groups.

**Organisational data**

Data was obtained from Comcare statistics of successful claims lodged, time of work, and overall cost of claims. This data was compared to the same data in the previous year. However, some caution should be noted, as the Comcare legislation was amended from March 2007, eliminating claims for accidents occurring to or from work. Organisational data indicated that this effect would reduce claims for workers’ compensation by around 15%. This effect should therefore be discounted from the most recent data. The implementation of the change process in the organisation and the author’s health and safety team during this time resulted in a focus on risk assessment and mitigation, health education and communication, and an intensive effort in early intervention and prevention. All of
these factors have contributed to improvement in health and safety outcomes. Table 2 indicates the change in claim data between the two years. The Committee were pleasantly surprised by the reductions in injury rates, time off work and accepted claims. Taking into account the change in legislation, the injury rate reduced by 40%, the incapacity rate reduced by 56%, and the number of accepted claims reduced by 29%. Although a direct causal relationship is not claimed by this paper, there is strong evidence that the outcomes of the redesign, and the renewed and consistent focus on health and safety in the workplace has contributed to the improved outcomes.

Table 2: Comparison of injury rates, claims and incapacity between 2006 and 2007

<table>
<thead>
<tr>
<th>Injury rates</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury rate per 1000 employees</td>
<td>26.7</td>
<td>14.1</td>
</tr>
<tr>
<td>Corrected injury rate after law change</td>
<td>22.7</td>
<td>13.6</td>
</tr>
<tr>
<td>Incapacity rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incapacity 5 days and over per 1000 employees</td>
<td>9.5</td>
<td>3.7</td>
</tr>
<tr>
<td>Corrected incapacity rate after law change</td>
<td>8.1</td>
<td>3.6</td>
</tr>
<tr>
<td>New accepted compensation claims rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New accepted claims</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>Corrected claims after law change</td>
<td>34</td>
<td>24</td>
</tr>
</tbody>
</table>

*User group feedback*

Representative user groups were asked to complete an evaluative questionnaire relating to the redesign health and safety system. The three user groups contacted, line management representatives, health & safety professionals, and union representatives all showed a positive response to the new system, compared with the old. Table 3 summarises the views of the three user groups surveyed. Although responses varied between the groups, all indicated that the new system was better on a range of indicators.

Table 3: User group evaluation of the redesigned Health and Safety system

<table>
<thead>
<tr>
<th>Response summary on improvements*</th>
<th>Health &amp; Safety professionals, n=17</th>
<th>User group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant</td>
<td>28.6</td>
<td>30.4</td>
</tr>
<tr>
<td>Moderate</td>
<td>36.1</td>
<td>53.6</td>
</tr>
<tr>
<td>Minimal</td>
<td>18.5</td>
<td>10.7</td>
</tr>
<tr>
<td>None</td>
<td>5.9</td>
<td>5.4</td>
</tr>
<tr>
<td>Declined</td>
<td>1.7</td>
<td>0</td>
</tr>
<tr>
<td>Not sure / no opinion</td>
<td>9.2</td>
<td>0</td>
</tr>
</tbody>
</table>

* A percentage average of seven questions is shown in the table.
Using IAD to design occupational health and safety systems

The author’s positive experience in this process has led to the recommendation of this paper that IAD should be used to design other occupational health and safety systems. The new system generated a higher level of management commitment and involvement, and improved the focus around the minimisation of risks, as well as improvements in safe work systems. The goodwill generated by this approach seemed to flow into the activities of the working parties, resulting in improvements to health and safety outcomes, such as a reduction in accident rates and time-off-work rates. The improvements have occurred within a 12 month period, but would need to be monitored over the next two or three years to ensure that the outcomes have been sustained. What is clear is that the rigorous process involved in IAD imposes a methodology that is thorough and highly engaging. Its use of participation builds community support and goodwill. Feedback from stakeholders indicates that it is highly successful at involving various user groups. It makes implementation much easier, as it enables up front evaluation of user engagement, so there should be less resistance to change, less errors and ‘work-arounds’, and fewer implementation surprises.

It is recommended for future research that IAD be implemented in other organisations for a variety of administrative design processes. It has potential to be used in other parts of the public sector, and in some service sector industries.

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