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Applying action learning to resolve project management problems in a technology organisation

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Abstract
Action learning arose in the 1940s and has become a popular method to resolve difficult problems. This popularity, along with the simplicity of the action learning steps (plan, act, observe, and reflect), can be a lure to believing that success will naturally occur by just following the action learning steps in the same way as would be done in following a cooking recipe. However, as this case study reveals, when first starting out, the application of the action learning methodology can be difficult and can leave change agents and management with the impression that the methodology does not work, or it is all just too hard. This case study describes how action learning was used to improve the scheduling processes for research projects in a technology company. Detail is provided on some important considerations that are not inherently part of the action learning steps, and were initially overlooked by the author of this case study when reading action learning literature. This article should provide useful advice for any change agent who wishes to apply the action learning methodology to resolve project management problems in a technology organisation.

Key Words action learning, technology, change management

Introduction

This case study was conducted in April 2006 at an Australian technology company with a portfolio of capabilities which included engineering research and development, infrastructure maintenance and engineering services, and property interests. In this case study, the company will be known as CompanyX for ethical reasons. The names of individuals have also been changed.

At the time of the case study, CompanyX employed in excess of 4,000 people and had total assets of approximately AU$1.2 billion, earning annual revenues (including joint ventures) of almost AU$1 billion. The products and services delivered by the company were for markets in Australia, New Zealand, Fiji, the Philippines and the United States.

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The synergies in the company's capabilities were segmented into four divisions. This case study took place in one of these four divisions, known as the Electronics Division, in South Australia. Most work within the Electronics Division was project based, and was one of two types; either a development or a research project.

At the time of this case study, research projects represented approximately 10% of the Electronic Division project portfolio; however, research projects were becoming increasingly more important to CompanyX due to two primary reasons; the first was that research projects were important to the customer as a pathway to improve their future capability, and the second reason was that research projects helped to increase CompanyX's capabilities, skills, and knowledge in the marketplace. This equated to an increase of available work, and in terms of capability, a tactical advantage ahead of CompanyX's competitors if more of this type of work was obtained. The paradox in obtaining more research projects was an increase in risk to the business because these projects that had to 'break new ground' in proving a new technology or concept. In other words, because it hadn't been done before it was difficult to manage how long the work would take and how much it would cost.

This case study examines the use of action learning to improve management of time and budget for research projects in CompanyX's Electronics Division, in South Australia.

Problem background

Historically, CompanyX had successfully managed medium to large development projects for over a decade. The ongoing success in managing development projects was the result of well established scheduling processes to suit this type of work. However, these processes established for development projects were not suitable for research projects. This mismatch between the established processes and research projects was evident from the earliest phase of a project, and can be explained by examining the differences between development projects and research projects.

Development projects started with fully defined, well structured requirements and scope. The requirements and scope were usually provided by the customer at the start of a tender phase prior to project startup. These requirements were then used to generate a work breakdown structure, thus reducing the risk of investigating unsuitable technologies or prototyping unknown technologies and techniques. From this basis, a very detailed and solid schedule could be generated prior to project startup. Usually the requirement and scope for these projects remained stable throughout the project life cycle, and only changed through Contract Change Proposals; this resulted in fewer changes to the project schedule.

On the other hand, research projects were dynamic in nature, and were driven by the need to prove a new technology or concept. This meant that the scope and requirements for these projects were loose at the beginning of the project, and then developed as the project progressed and more information about the technology or concept became known. A fully

detailed and well defined schedule could not be put together prior to project startup because of this lack of detail in the project scope and requirements.

This dynamic nature of research projects created a new problem for CompanyX because the processes established for development projects could not accommodate the dynamic nature of research projects. However, in the absence of other processes to manage this type of work, CompanyX continued to apply development project processes to research projects. As a result, the processes did not cater for the constant changes required to manage a research project. Even a small change in either resources, the phasing of a task, or the addition of a new task, took many hours to update the schedule and to rework reports. This time was usually spread over a week to complete a change, review, and rework. This was mainly due to the lack of availability of cost and scheduling resource staff who had many other projects to service. Additionally, the number of issues a Project Manager had to resolve on a daily basis left very little time to rework schedules following changes to any one task. The window of opportunity to change a schedule to fit in with the monthly reporting cycle was small and this further exacerbated the problem.

Further inefficiencies occurred when the effects of changes were not fully realized until project reports were generated. By this time it was often too late to make changes to the schedule. This process led to a lot of manual changes to the reporting data, and was more prone to errors. The end result was out-of-date, inaccurate schedules that were retrospectively reworked to match what was happening in reality. Actual tasks had usually changed significantly from the schedule by the time the schedule was updated. This made the updating of the schedule a difficult task and reports generated from the schedule usually had a number of errors that required significant rework.

To gain understanding of the contributing factors, the writer of this case study held an initial meeting with two project managers of research projects and two cost schedule controllers. The outcome of this meeting resulted in the following contributing factors being highlighted:

- Complex schedules - a single task could have many predecessors or successors, with many links between them that create the relationships. When one task changed, links to other tasks also needed to be changed.

- Resource leveling to ensure the hours per week were not exceeded for each resource. This was a manual process that was done on a task by task basis.

- The requirement that the project budget must equal the contract value. Resources needed to be leveled and also required the correct number of hours to match the contract value.

At the time of this case study project, there were three research projects in progress at CompanyX, with each of them at different stages of development. The most mature project at the start of this case study was six months into an 18 month program and the least mature

was three months into a 24 month program. All three were finding that small changes in scope usually caused large amounts of rework to the schedule and changes to the budget forecasting. The time required maintaining and report against a typical research schedule had not been logged, however, an estimate of the time involved was 19 hours effort per month, which equates to roughly $1,900 per report. A more significant expense was the cost of getting it wrong, which was expressed in the following risks:

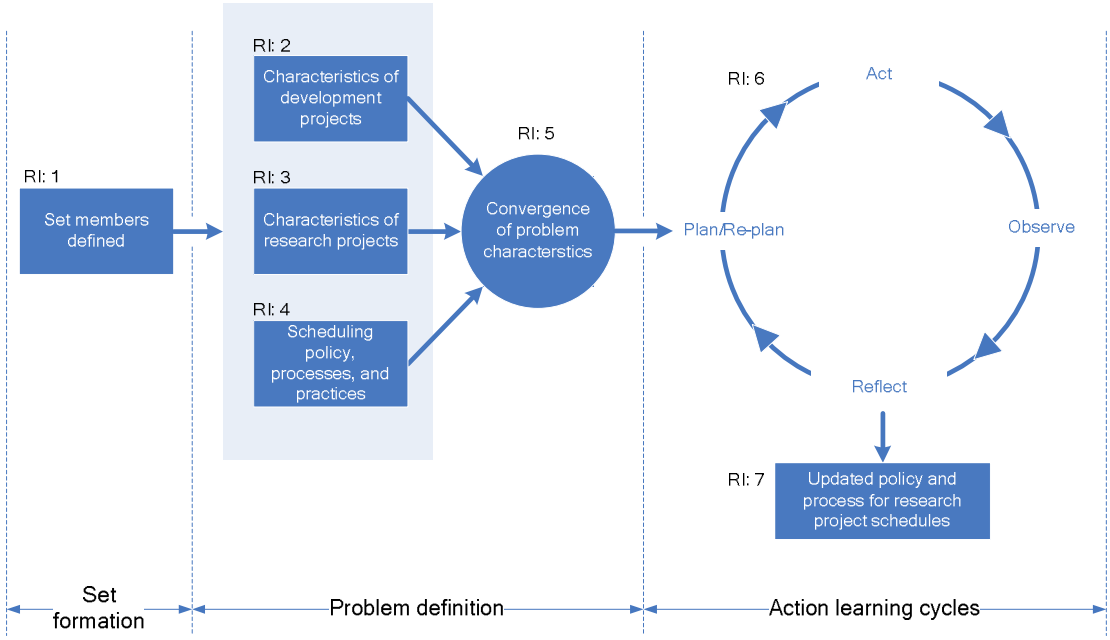
- Incorrect task allocation.
- Team members not knowing when a task should be complete.
- Disappointment from CompanyX Head Office.
- Disappointment from the Customer.
- Loss of motivation in using a process that didn't fit.

If all these risks were realised, which was possible due to the close relationships between the risks, then the cost could have risen to around $30,000.

Conceptual framework

The framework for this project consisted of three distinct phases: the set formation, problem definition, and action learning cycles, as shown in Figure 1.

Figure 1 – Conceptual framework



Source: adapted from Weinstein (1999).

In the **set formation phase** the action learning group members, known as the action learning set, were identified. The set for this project consisted of six set members and one facilitator which was within Wienstein's (1999, p.63) recommendation of five to six people for a set. The guidelines for choosing the set members were based on Rothwell's (1999, p.13) recommendations that each set member:

- possess knowledge or skills related to the issue under investigation
- represents varied viewpoints or backgrounds
- possess positive attitudes and open minds about the issue and its solutions
- need development through exposure to the issue being investigated or to the people who participate on the Action Learning team.

Following the set formation phase, the problem was examined and defined in the **problem definition phase**. In the examination of the problem, the characteristics of both development and research projects were reviewed to gain an initial understanding of the problem to be resolved. Current policies and processes were also reviewed to understand how they were contributing to the problem and what needed to change. The specific project characteristics, policies, and processes that appeared to have an influence on the problem were converged to define relationships between the individual input elements.

Once the problem had been defined in the problem definition phase, the project entered the action learning cycles phase. The **action learning method** has been used because it is able to achieve both work and learning outcomes (Riley 2009, p. 40). The method enables teams within a workplace to gain new knowledge and resolve real problems in their workplace through a process that uses cycles of planning, action, observation and reflection. The attraction of this method is its ability to engage existing resources in an organisation for tackling difficult problems while at the same time developing the knowledge and abilities of the people involved. The writer was interested in testing this method to see whether it could be used in the organisation to resolve a longstanding problem that had not previously been tackled, and if it was capable of delivering the learning and development outcomes promised in the literature.

In this action learning phase of the project ,the action learning cycle steps for planning (and re-planning), action, observation and reflection were applied. In the plan step, the set examined and questioned the problem as defined in the problem definition phase before brainstorming possible solutions. These proposed solutions were then put into an action plan to be implemented. The action plan was then implemented in the act step of the action learning cycle; during this stage the set members observed and made notes on the result of the action. The set members reflected on the observed action, and then in the re-plan step, made the appropriate adjustments to the action plan.

For this project, the action learning cycle was repeated twice. There was no particular limit on the number of cycles so long as the action learning set did not return to the same point at

the completion of each cycle, otherwise learning would not have been achieved (Weinstein 1999, p.41). At the end of the second cycle, the action learning set believed that the problem was sufficiently resolved and that the set members had increased their learning.

Purpose of the action learning project

The purpose of this project was to develop and implement a process that would improve the efficiency of developing and maintaining research schedules. A successful outcome would ultimately lead to greater cost efficiency for the management of the schedule, a more useful schedule for the project team, and greater confidence from senior management in project reporting. This could be achieved by addressing the following areas:

- Vague requirements and scope at the start of the project.
- Financial reporting required by CompanyX head office,
- Frequent changes to the project scope,
- The research teams need for important schedule information and obligation to meet milestones.

Desired outcomes of the action learning project

The desired outcome, at a minimum, was to change processes within CompanyX to make more efficient use of Cost Schedule and Project Management resources. Processing changes to project schedules should be a simple, quick process that is easy to review and therefore less prone to errors. This would also address the need for accurate progress reporting by CompanyX's head office, thereby increasing their confidence in progress of research projects through what was reported. Another important desired outcome was to provide the research project team with accurate and up-to-date information with regard to schedule requirements. A less obvious, yet significant benefit would have been a reduced risk of getting it wrong.

Findings of the action learning meetings

Meeting 1

The agenda for the first set meeting, detailed in Table 1, was distributed two days prior to the first set meeting. The meeting duration was to be two hours.

Table 1 - First Set Meeting Agenda

Item	Topic	Who
1	Present purpose of the meeting and define roles of each member.	Author
2	Style of group meeting	Author
3	Present the Plan, Act, Observe, Reflect and Replan process cycle and proposal of how to fit this into the monthly reporting cycle.	Author
4	Expected outcome of the first meeting	Author
5	Identify existing problems.	All
6	The next step.	All

The meeting started by detailing the problem, as understood by the author, who facilitated the meeting. In broad terms it was stated that this meeting was the first of a series of meetings that will resolve issues encountered while planning and maintaining schedules for research projects. It was agreed that research projects have the following characteristics:

- The primary purpose is to prove a concept.
- There is a lack of detailed requirements at the start of the projects.
- The scope is continually developing as new discoveries are made.
- Research uses new technologies or untried techniques and therefore these projects are high risk.

The reasons for selection of team members were outlined and are shown in Table 3 in Appendix A (The names of each individual used in this case study has been changed for ethical reasons). Each set member agreed that the reasoning behind their involvement was sound, and that the set would be working on a significant problem that needed to be resolved.

Without using the words ‘action learning’, the style of this meeting was explained and that future meetings would apply a questioning approach. The purpose of this approach was to avoid applying traditional techniques to the problem. Instead, questioning could be used to flush out the real issues by using the groups’ experience and knowledge to find an innovative solution. This was well accepted as staff at CompanyX often use a questioning approach to resolve issues. Because of this, there was only one ground rule set and agreed to by the members: the set should not initially focus on trying to resolve problems or advise, instead they should first raise the problems and ask questions.

An action learning cycle was drawn on the whiteboard as illustrated in Figure 2 and detail added as follows:

Plan Phase **-** At the first meeting the set was in this phase. Issues were identified through the questioning approach, noting that further questioning of these issues would be used to drill down to identify the real issues before attempting to develop a new solution.

Act Phase **-** After examining all issues in depth and then proposing a solution, the new solution is implemented.

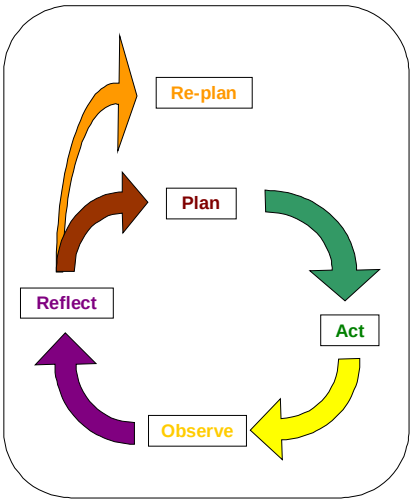
Observe Phase **-** The new solution is monitored; metrics and notes are taken.

Reflect Phase **-** Once sufficient data has been collected on the new solutions' performance, the group will re-gather to reflect on the results and determine how effective the new solution has been.

Replan Phase **–** The group uses the output of the 'Reflect' phase to further enhance the new solution.

It was understood by the set that with each repetition of the cycle, the solution should improve. As detailed in the project plan, the set agreed that this cycle would fit well into the monthly reporting cycle, and that each month of reporting would give the group an opportunity to improve through this cycle.

Figure 2 - Plan, Act, Observe, Reflect and Re-plan cycle



Source: adapted from Weinstein (1999)

Using the whiteboard, questions were asked of the set members about what the issues were. The responses were encouraging because each member had something they wanted to raise, and contribute to the learning process. On several occasions Bill proposed a solution, which tended to lead the group into trying to resolve the problem rather than ask questions. At

these times the set was advised that they were moving into resolving the problem based on advice rather than asking questions in an attempt to fully understand the problem. The group responded positively to this feedback. In general the CompanyX staff are familiar with working in groups to solve problems and the culture was already based around an action learning type of approach. In addition, the set was familiar with a structured approach when resolving problems and trying new things. While the set would occasionally stray off track, it was easy to refocus the set. Peter had a lot of experience to offer, and while he could have suggested solutions based on previous experience, he was very open to learning from others to find new solutions to these problems. Occasionally he would advise and talk about solutions, however, he responded to questions and would try and answer them as best he could. When asked why we have schedules and reports at CompanyX, he initially looked surprised. However, he was probably more surprised by his own answer.

The bottom line is that the current system is based more around reporting progress to head office. His first explanation was that the schedule is used to task the team, provide visibility to the Project Manager and for reporting to head office. This is the answer you would expect to this question. However, when asked how applicable this was to research style projects, he conceded that it was probably less useful for the team and Project Manager if it cannot be used to set tasks. In this case it was more of a financial reporting tool for head office. I think this was an important breakthrough for the set, the realisation that a process that had been in place for a long time and accepted as a suitable method for managing development projects, was found to be unsuitable for research projects. More questions followed, and after about 20 minutes the set started drilling down to what the real issues were. Overall, the meeting went smoothly and was well received. The set members learned a new way of working from their participation in this experience. Interestingly, Kate commented after the meeting that we should meet like this to resolve other issues within the organisation.

While this meeting was a success in how well the set worked, it did not complete the plan phase. All it had managed to do was to flush out what the issues were, and it was agreed that another set meeting was required to review key points recorded in this meeting and break them down further; again this would be performed through a questioning approach. It was also recognised that if the next meeting was for the same duration it could take another two meetings before we moved into the Act phase.

Meeting 2
Approximately two months passed between the first and second set meeting. This delay was mainly due to difficulties in getting all set members to attend the meeting. Like the first set meeting, the following agenda was distributed two days prior to the meeting and the duration was set for two hours.

Table 2 - Second set meeting agenda

Item	Topic	Who
1	Purpose of this meeting	Author
2	The process cycle – Plan, act, observe, reflect, and replan	Author
3	Method of process improvement: • Learning through questioning program knowledge • Defining actions • All team members to present findings of actions	Author
4	Conduct of meetings and presentations?	All
5	Team Members • Attendance and commitment levels • What will you get out of this? • Meeting durations • Availability – how will we conduct meetings if participants are not available? • Roles of members – Team members, minutes and facilitators	All
6	Review of meeting minutes and actions	All

Bill thought it would be useful to add another member to the team, and had invited Brian (Project Manager) to the set. At first there was concern that the set was beginning to grow larger than the optimal recommended set size. This concern was set aside when Bill advised the set that Brian was investigating Work Breakdown Structures for research projects, and suggested that Brian attend the meetings in place of himself. This looked like being a good idea as Bill had a tendency to offer expert advice with the tendency to close down discussion, whereas Brian was at the start of his investigations and not being an expert on the subject was more inclined to ask questions.

Bill also wanted an opportunity to mention to the set that there was a new member of the process improvement group who was working on project estimation and the set may find input from this person useful. Here the concern was that this might have led the set into a solution mode which could ultimately bypass the questioning approach. Bill was thanked for his input, and the group were reminded that this was a unique problem with no easy solution and therefore everything must be questioned. Without using the words action learning the set was reminded of the action learning cycle and that it was still in the planning part of the cycle.

In this meeting the roles of the set members were reiterated: that each person was there for a reason and that it was important for all members to feel that they can question anything. It was emphasised that each member needed to present their findings from action, observation

and reflection, and that each member would be given 'air time' (uninterrupted time in the meeting) to do this.

The attendance issue was also raised. To date, it had been difficult to get the group together. Each member had a valid reason for their inability to attend, and more than one member could not attend for each scheduled meeting. This would have made it difficult to have an effective meeting, as members were selected because of the personal learning they could gain, as well as their importance to the successful outcome of the project. It was suggested that once the planning phase was complete the commitment level would be less, because the 'act' and 'observe' part of the cycle would be performed as part of their everyday activities. Indeed, if the planning part of the cycle was effective then the action and observation parts of the cycle should be more effective than the old way of performing these activities. The set discussed whether a conference call could be used by members who could not attend in person. This was a reasonable suggestion since most of the members who could not attend meetings were out of the office, or out of the state. It was agreed however, that this method was unworkable because absent members would be focused on other tasks.

To obtain some idea of the commitment level, the set was asked what they hoped to get out of these meetings. Each member answered in turn:

Bill expressed concerns that there was very little information and processes currently in the Electronics division's Quality Management System (QMS) on Work Breakdown Structure (WBS) development. He would like to see the group assist development of a WBS template for research projects. If this could not be achieved within the group, he would like Brian to capture the ideas produced by the group to further develop a WBS template for research projects. He also indicated that the group could participate in the trial of the various WBS artefacts; e.g. the WBS checklist and WBS guide. While Bill saw this as a desired outcome, it appeared to be more of a chance to pursue his own solution. This was understandable given the effort that Bill's team had put into improving the use of a WBS, however the set had not yet reached full understanding of the problem and had not even determined if a WBS template would help to resolve any of the issues experienced with research projects.

Peter would like easier reporting. This would have the benefits of:

- less time required by the Project Manager for reporting
- time freed up for Cost Schedule Controllers to help improve other areas of Project Systems
- the Schedule and WBS representing what was actually happening, and being more accurate and efficient.

Kate agreed with Peter's needs; she wanted the schedule and WBS to be more useful. She reinforced the understanding that research projects are being run as traditional development

projects, and that research and developments projects have two conflicting drivers. For development projects, the requirements and scope are set, and primary risks have already been mitigated. A successful implementation measured by schedule and budget of known outcomes was the main driver. For research projects, the main driver is to prove a concept can be developed and therefore a successful outcome is proof that a concept works within the budget provided.

Jan wanted to see that progress reports generated by the team are easily integrated into the schedule and head office reports. She would also like to see the reporting loop closed by including feedback from the updated schedule on overall progress.

Rob's wants were very similar to Jan's. He wanted to see the WBS and schedule reflect how we do the work, but also wanted to improve how progress can be fed into the schedule and fed back to the project team in real-time. Rob commented that milestones are fixed by the contract and there is an aversion to moving them around because Contract Change Proposals (CCPs) need to be raised. CCPs can be time consuming to compile and are required to undergo an approval process that requires a number of different signatures from both CompanyX senior management and the customer. Having fixed milestones makes it difficult to schedule, because the schedule is developed around these milestones, rather than being developed around the tasks themselves.

Brian commented on the minutes from the previous meeting. He believed that the issues raised in the last meeting were internally focused. Research projects will often start late due to external factors. A late start impacts on the ability to secure suitable resources and available information, and there may be changes in costs. Brian also mentioned that he was working with the process improvement team to generate a WBS template. Brian posed the question 'why do we need a WBS at all?' He would like to see that a WBS does not hinder development. In his view he would rather develop a WBS at a particular point in time, than try and develop a full WBS at the start of the project. He also mentioned that the WBS should not be prescriptive and would like to see that it helps the development of the schedule.

The author's thoughts to the team were about less time being spent by the Project Manager in managing schedules, leaving more time to manage day-to-day tasks on the project. The schedule should be more useful for the project team in terms of updating and feedback in real time to represent what is really happening. In regard to Brian's comment about late starting of research projects due to external factors, when the project has been awarded to CompanyX, development usually needs to start before any contracts are signed and this increases the risk of a larger scope being required for the same budget.

Again this meeting was beginning to run out of time. It was agreed that at the next meeting, each set member would present the current method they use to estimate, develop, and maintain their schedule. By doing this, the set was moving from the planning to the action phase. Each member would observe and record their practice and present this at the next meeting. This would allow the set to reflect on and evaluate current methods and pinpoint

the highest ranking problems. In acknowledging the need to repeat the cycle many times, the set realised that they could not resolve all the issues at once, and that it would be better to resolve one or two problems within each cycle.

Meeting 3
For the third set meeting it was decided not to produce an agenda. Previous agendas may have been biased to the views of the author and may have delayed transition to a self facilitating set that would be able to function with minimal assistance from a facilitator. However, having experienced difficulty in ensuring attendance for the second set meeting, the third meeting was booked well in advance. Ensuring attendance for the third set meeting proved to be even more difficult than the second meeting. Again, people had a legitimate reason for not attending, such as interstate meetings and changes to the set members' calendars at short notice. The paradox was, that by resolving the issues raised in this action learning project, set members would be able to reduce their work load, freeing more time to address other issues.

Eventually a date was found that suited everyone although Mark excused himself at the last minute from the meeting claiming that he had too much to do and that he could not offer much to the set. In his view he was not a key part of the process and just the end user. In addition, he did not know all the processes in-between and believed that he didn't need to know this level of detail. It was explained that being a user of the process made him a valuable member, and that questioning is an important part of the process. Not knowing how the process worked would require him to ask questions, and through questioning he would help facilitate learning for the whole set, and ultimately a better solution for the company. Unfortunately this did not convince him to stay and the set had to proceed without his input.

In this meeting everyone presented what methods they used to schedule projects. Each project had a different method of reporting. Brian used the commercially available ToolX, to schedule a project. His project was small and was not mandatory for small projects to use the company standard tool ToolY. When asked why he used ToolX for scheduling, Brian explained that he found ToolX to be more user friendly and easier to use, although he did not know how to use all the key features such as baselining. To forecast hours and cost for the next month, Brian drew lines on the Gantt chart and interpolated the effort required between each month. The set asked why he would do this rather than use the ToolX features to do it for him. Brian explained that he did not know how to use all the features of ToolX and would need time to work this out.

One set member suggested that training may help to resolve this issue. One of the key issues that Brian reported is that there is no link between the current month and the previous month. To artificially create a link, he kept a copy of the previous Gantt chart with his estimates for reference. To maintain and report against the schedule takes a lot of time and Brian only found this useful for budgeting and not for monitoring progress. He found it hard to tell what had changed and could not get a good feel for progress from the schedule. This point was questioned by the set. They drew the conclusion that only a few

people in the organisation knew how to use best practice methods to drive the scheduling tools, and these skills were not being passed on to the larger group of users.

Kate used ToolY to manage progress. ToolY was the standard tool mandated by CompanyX for all medium to large projects. She did this by making considerable effort to update the schedule on a regular basis and through the monthly reporting cycle. In addition, Kate kept an Excel table which was a week-by-week plan with dates, task and milestone columns. The shortcomings of this method were that it did not show actual rates in terms of travel and material costs. Kate also made a high level Gantt chart in PowerPoint that has colours for each task; she found this was more visual than other methods. She did this because, in her experience, she has found that Engineers didn't like the ToolY schedule; they thought it was too detailed and hard to see at a specific point in time what the key tasks were. Peter said that ToolY tasks can be rolled up to show only the top level tasks. One of the key differences between the ToolY schedule and the PowerPoint Gantt chart was that the ToolY schedule was based around the WBS rather than being task-based.

Rob generated a Work Breakdown Structure (WBS) from tasks related to the Sub System Requirements Specification. This list was combined and then put into a spreadsheet with a WBS structure, which formed a task identification matrix. He also used a PERT (Program Evaluation and Review Technique) chart to show dependencies and estimates. This had the benefit of identifying relationships without timing. As each of the items is completed, Rob crossed them off. Jan works in Rob's team, and commented that she finds this useful to see what still needs to be done. Rob finds that this is a good method within small teams. He also suggested that if larger projects are having difficulty with planning and schedule maintenance, that they should consider breaking the project into smaller manageable teams. To determine progress, he used a spreadsheet showing a weighted percent completion. The weighting was more heavily loaded to the more difficult or risky tasks. Using a spreadsheet allowed the data to be plotted in a graph and trends determined. Rob was asked how someone would know how the trend lines were tracking against what was initially planned. Rob agreed that this was difficult in his current implementation and said that adding a target line would probably be useful.

Jan's presentation was short because she worked on Rob's team and Rob had already presented most of the material. Rather than go over the same material, she commented on the method that Rob presented from the viewpoint of an end user of the process. She commented that the PERT chart presented by Rob was useful in both the forward and reverse direction. In the forward direction it allowed her to see where the project was going, and in the reverse direction provided information about where she had been. However this did not give a clear view of the relationship with other tasks and what the time constraints were. The Gantt chart represented by the ToolY scheduling tool could provide this information, however it can be difficult to read and is often out of date. She felt that whatever approach is used for scheduling, it should apply some pressure to the team to keep the pace of the project going. She believed that if the time allowed was too great, the work would fill the time available. When there is more pressure, she works harder. Jan was thanked for her open and honest comments. Another comment added by Jan was that tasks

should be easily measurable. This was difficult for the research projects because tasks varied in complexity, and judging task progress was difficult.

Peter presented in detail the ToolY scheduling tool, and the reporting pack required from Project Managers. He was upfront about the difficulties and the limitations of the tools. While this was a valued input, it appeared to add complexity to the problem. One of the key complexities was that the tools Peter presented were mandated by CompanyX and therefore the set was required to use them. Peter was picking up the feelings of the set, and he presented some suggestions on how the tools could provide some information in a more useful way. One of the key issues to come out of Peter's presentation was that a number of different tools were used in the schedule, report, and financial facets of the project, and in general they integrated poorly. This resulted in significant manual manipulation, and whenever manual input is required, significant errors can occur.

The set had progressed significantly in their understanding of the problem. By deciding in the second set meeting to document the different processes used and return to this set meeting with the results, the set had completed the Plan, Act and Observe part of the cycle. At the end of this meeting, the set agreed to employ the use of Peter's suggestions to use the tools in more effective ways. It was also decided that the ToolX tool may be more suitable for small projects and that training would help Project Managers become more proficient at using the tool.

Meeting 4
A period of approximately two months passed between this meeting and the previous meeting. Again, there was no agenda set, because the previous meeting appeared to flow better without one. Set members appear to have learnt from the action learning approach. The ideas presented in set meeting three had helped resolve a number of issues, and the set did not need to complete another cycle. However, while the previous set meetings may have resolved a number of issues for set members below the Project Management level, a separate discussion highlighted that they had not resolved all the issues faced by Project Managers of research schedules. It was agreed that another regular meeting should be established with other project managers who manage research projects within the same Line of Business. This meant that while the issues were the same, the set members had changed. The new set members were all Project Managers.

Having had some success with the previous set meetings, and being more comfortable with the action learning process, there was enthusiasm about setting up these new meetings. The first meeting quickly identified the issues that were affecting the set members. One of the key issues was still the schedule and reporting cycle. The change in set members was refreshing because this second set was far more enthusiastic about resolving the issues. This was partly because they were closer to the problems and were keen to resolve the issues, but they also had some new ideas. At the same time they were not considered to be experts. Getting through the planning phase to the action phase was much easier. Many questions were raised and suggestions offered; all within the set were willing to act, observe and reflect. The first set meeting was only one and a half hours long, and everyone left the

meeting with an action and was keen to meet again soon. These actions resulted in significant discoveries, which have changed processes within the organisation as a result. One of the key ingredients that made this group more successful was their desire to learn. This set realised that they did not have the answers and that the best approach was to go and learn and report back to the set. The set could then reflect on these findings as a group to determine the effectiveness of the action that resulted from the plan, and to learn from each other.

Learning outcomes

Selection of set members. When starting the action learning process, it was anticipated to be a good fit for CompanyX, because CompanyX has a learning culture; however it ended up being more difficult than originally thought. This was largely due to the selection of set members and their commitment to the process and its outcomes. In the first action learning project, the set members acknowledged that the identified problem was worth resolving, and they were keen to help, but their available time was limited, and getting a commitment to attend meetings was difficult.

On reflection, there may have been another underlying issue in that the greater portion of the set could see the benefits in resolving the problem but were not affected enough by the problem. This became apparent when Mark chose to withdraw from the set due to time constraints. Because he was less affected by the problem, he was less committed to change, and thus less open to learning. When the set members changed to members who were suffering greatly from the effects of the problem, the process flowed better, and greater learning was achieved in a shorter space of time. In addition, the commitment to attend meetings changed. The new set members were still busy but they understood that a change in process that improved efficiency would free up time, and because of this they were more committed to attending the meetings.

Making learning a project outcome. The first set was exposed to more information about the internal process within CompanyX, including the history of the problem, current processes, practices and limitations. It was observed that learning was achieved through acquiring knowledge and using a questioning approach, and this was consistent with the Revans' action learning formula: L = P+Q where 'L' is learning, 'P' is program knowledge and 'Q' is a questioning approach.

The question is; did this learning resolve the problem? It appears that the set understood the problem much better, and why it was difficult to resolve. The set also made some changes as a result of this understanding but the set was reluctant to make a significant change to resolve the problem because of the difficulties involved. In a sense they became satisfied that they had done enough by first understanding the problem, and secondly making a change. In this sense their learning was somewhat limited and as a result their ability to change and learn from the process of reflecting on the change was restricted.

The experience with the second set was totally different. Both the learning and the changes were made at a more rapid pace and because of this these changes were significant, of benefit to the participants, were achieved in a short space of time, and the set maintained its momentum with sustained enthusiasm.

To maximise the learning, it is important at the outset of the project to identify that learning is integral to the process and is an expected outcome, just as much as resolving the work problem for which the team has been established. With the first set, where the term 'action learning' was avoided, the results were not as effective as with the second set where learning was identified from the start as an important feature and outcome of the project.

Conclusion

This case study reports the use of action learning in a technology organisation to examine the processes used for the monitoring and reporting of projects. The objective was to use the knowledge and experience of people within the organisation to identify the different requirements for research projects with the intent of developing more effective ways of managing and reporting research project progress and results.

This case study has shown that when action learning principles are applied in a facilitated set, significant changes can be made to resolve difficult problems. However, it was found that an integral requirement in achieving any resolution was the successful implementation of the action learning process. A poorly implemented action learning process can be very time consuming and ineffective, which in a worst case scenario would not be accompanied by learning. In the author's experience a less rigorous choice of set members made the set less effective.. This was reflected in the experience with most of the initial set members. During the action learning cycles, each of the set members achieved some degree of learning; however this did not initially lead to any significant change within the organisation with regard to solving the problem. Once the set membership was reviewed, both significant change and learning was achieved. This led to changes in scheduling techniques used for research projects, and improved efficiency. Although measurements are subjective so far, Project Managers and Cost Schedule Controllers feel that they now spend less time on managing schedules.

The success within the second set reflects the learning and questioning approach currently promoted within CompanyX. Explaining and facilitating the action learning process in an open forum encourages a more open approach from the participants and they become more conscious of their learning. Feedback from the set has been positive with members acknowledging that they had contributed to the knowledge of the organisations and for their individual development. More importantly, they felt that the action learning approach could be applied to other issues within their own work areas.

The results of this case study relate to a small action learning project implemented with a section of an Australian technology company but the lessons learnt may be applicable to other organisations seeking to resolve work problems in their organisation that affect the

efficiency and effectiveness of project management and reporting processes. Given the improved processes that were developed through the outputs of the second learning set, future research into the effectiveness of action learning could be directed to applying more rapid action learning cycles with sets consisting of stakeholders affected by the problem and who are committed to the challenges of learning and change.

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APPENDIX A

The names in the following table have been changed for ethical reasons.

Table 3 - Reason for each set member being part of the set

Name	**Title**	**Reason**
(author of this case study)	Project Manager – Project X	Project X is a software only project. Author has the responsibility for the maintenance and reporting against the Project X schedule. He was also the meeting facilitator.
Rob	Team Leader – Project X	Rob was responsible for the day-to-day technical management of Project X. He assigned the low level activities to team members and provided input to the Project Manager for reporting purposes.
Jan	Team Member – Project X	Jan performed software development activities on Project X. Her input was required to understand how schedules affect team members.
Peter	Senior Project Controller	Peter provided a Project Management service to Project Managers and provides support in the generation and maintenance of schedules.
Kate	Project Manager – Project Y	Project Y had both hardware and software elements. Kate was responsible for the maintenance and reporting against the Project Y schedule.
Mark	Team Leader – Project Y	Mark was responsible for the day-to-day technical running of the project. He managed both hardware and software elements of Project Y
Bill	Process Improvement Coordinator	Bill coordinated all process improvement activities within electronics division. Bill also offered to provide the support required to ensure that ideas are implemented and help with recording the process effectively.