

After the Assessment: Actions and Reactions of 22 Small Australian Firms

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Abstract

As part of the SPICE phase three trials, a large group of small Australian firms were assessed using the RAPID assessment method. This paper summarises the organisational and project characteristics of the group, and the results of the assessments. About eight months after the assessments, follow-up meetings were held to determine the extent to which firms had implemented the assessors' recommendations and improved their processes. The actions reported varied: one firm improved the capability level of seven of the eight assessed processes; many others reported improvements to a lesser extent, while some firms provided reasons why no action had been taken. The discussion considers the readiness of small firms to undertake an assessment-based software process improvement (SPI) program, and also identifies lessons learnt from this experience.

1. Introduction

The SPICE trials have been well supported by the Australian software industry, in particular through the efforts of the Software Quality Institute at Griffith University. A software process improvement (SPI) program, based on ISO/IEC TR 15504, was conducted during 1999/2000. The program was based on rapid assessments of one day duration. The results of this program, which forms a major portion of the Australian contribution to phase three of the SPICE trials, are reported in this paper.

There is growing interest in the emerging 15504 standard for software process assessment; it has been

estimated that approximately 1,260 SPICE-based software process assessments were conducted during the 22 months from September 1996 to June 1998 [1]. However, there is little reported about the actions taken by small firms after an initial assessment. As well as providing empirical evidence of the effectiveness of underlying SPI models, such an analysis would help identify lessons learnt to improve the assessment standard and to help small firms use an assessment to improve their software processes.

In the late 1980s, two thirds of all SPI programs faltered or failed after the initial assessment due to flawed strategy, lack of commitment, lack of follow-through, not measuring improvements, and lack of crisp SPI objectives tied to business objectives [2]. However, these results, and indeed most of the empirical studies on SPI relate to large well-resourced organisations. It has been noted that very little is known about the experience of small software development firms in regard to SPI [3].

The RAPID (Rapid Assessments for Process Improvement for software Development) process improvement program was funded by Software Engineering Australia Limited (SEA) Queensland and involved a total of 24 organisations. SEA was formed in 1999 as a not-for-profit association to improve the capabilities of software developing organisations in Australia. Although initially funded by the Australian Federal Government, SEA is now moving from government funding to a model of self-sustainability. Recently, SEA has established a partnership with the European Software Institute (ESI) to head its representation in Australia, New Zealand and South East Asia [4]. Each state-based resource centre offers a range of facilities, including information services, education and training, technical problem solving and process improvement activities [5]. Apart from SEA membership and the time commitment (in-kind contribution) of staff at

the organisations, the participating firms incurred no further costs. Two of the 24 firms were provided with mentoring through the Showcase program, and are not included in the analysis presented here. The results of one of the Showcase assessments were presented at an earlier SPICE conference [6]. This paper focuses on the 22 firms which had an initial assessment and then a follow-up meeting after about eight months.

After the background and methodology of this study are described, the findings are presented. Firstly, the organisational characteristics of the firms are presented. Then the process capability levels for the assessed processes are summarised. The final outcomes as determined at the follow-up meetings are then presented. The discussion examines the actions taken by the successful firms, the reasons for lack of action, and the reactions of the firms to the assessment and overall program. Finally, the conclusion comments on the success of this program and highlights the critical success factors identified.

2. Previous Research

Many small firms hesitate to implement a SPI project as they are afraid of initial cost (direct and indirect) as resources are scarce [Larsen & Kautz cited in 7]. Recent studies of the adoption of SPI by small firms reveal these fears are well-founded. For example, from their experience with over 200 small businesses throughout the US, Brodman and Johnson summarise problems experienced by small organisations in using CMM: “documentation overload; unrelated management structure; inapplicable scope of reviews; high resource requirements; high training costs; lack of needed guidance; unrelated practices” [8]. This is backed up by Richardson who concluded, from a study of Irish software development organisations, that “from the point of view of the small indigenous software development company, current software process models were cumbersome, costly, failed to present a comprehensive improvement strategy and did not show the effect of practice improvement on all processes” [9]. The appropriateness of ISO/IEC 15504 for small firms was queried after phase 2 of the SPICE trials with concerns raised about whether the capabilities stipulated in ISO/IEC 15504 necessarily improve project performance in small organisations [10].

However, some researchers have proposed suggestions in the form of lessons learnt and critical success factors to overcome the problems of SPI for small firms. In relation to the SPI model and procedure, a flexible, tailored

assessment and improvement approach is recommended, focussing on improving the technical rather than organisational issues of processes. The value of highly respected, external technical help or mentors is recognised. In small firms, resourcing is a key issue and is closely related to change management. Therefore, the SPI program should be carried out with clearly assigned and documented roles, responsibilities and resources, backed up by senior management support, financial resources and performance conditions. The value of unanticipated side effects of the SPI project is also acknowledged, as is the advantage of small firms networking with others in their environment [7, 11-13].

Although there are many different suggestions about how to make SPI succeed in small firms, there is strong consensus in the SPI field that more research is needed about small firms and SPI [14], so that more qualified advice can be given to these firms [3, 15].

3. Methodology

In this section, the RAPID assessment instrument, which was derived from ISO/IEC TR 15504, is described. The procedure followed for the RAPID assessments is then detailed.

The RAPID assessment instrument is based on, and conforms with, the technical report (TR) version of 15504 which was released in 1998. The RAPID program was based on the TR version as it was the current version at the time. The TR 15504 reference model (part 2) has two dimensions, “one to define the processes to be assessed, the other describes the scale for measurement of capability” [16]. The process dimension is directly aligned to ISO/IEC 12207 (software life cycle processes) and defines the purpose and expected outcomes of each process.

The second dimension of the reference model, the process capability dimension, includes five levels of capability based on nine process attributes. When a process is assessed against these attributes, the achievement of the attribute is rated on a four point scale: not achieved, partially achieved, largely achieved; fully achieved. After each process has been rated, then the process capability level is determined. A capability level is defined by a set of attributes that work together to provide a major enhancement in the capability to perform a process. The levels constitute a rational way of progressing through improvement of the capability of any process [17].

The reference model (part 2) of TR 15504 was adapted to create the RAPID assessment model [18]. As each

RAPID assessment was restricted to one day, the scope of the assessment was limited to eight key processes, as listed in table 1. These processes were selected by the RAPID project manager on the basis of expert judgement. As shown in table 1, all five process categories of TR 15504 are represented.

The process capability dimension was also constrained to meet the limitation of one day assessment. Although SPICE provides for capability levels from zero (incomplete) to five (optimising), only questions relating to levels one to three were included in the RAPID assessment model, enabling rating levels of level 0 (incomplete), level 1 (performed), level 2 (managed) and level 3 (established). The RAPID method collects evidence only by interview, but participants may illustrate issues under discussion by reference to documents.

Table 1. RAPID processes, codes and categories

Process	Code	Process Category
CUS.3 Requirements Gathering	RG	Customer-Supplier
ENG.1 Software development	SD	Engineering
MAN.2 Project Management	PM	Management
SUP.2 Configuration Management	CM	Support
SUP.3 Quality Assurance	QA	Support
SUP.8 Problem Resolution	PR	Support
MAN.4 Risk Management	RM	Management
ORG.2.1 Process Establishment	PE	Organisation

The initial assessments were conducted from August to December 1999, with two trained SPICE assessors undertaking each RAPID assessment, one in the role of team leader and the other as support assessor [19, 20]. Firstly, the assessment sponsor completed a demographic questionnaire, then a plan was compiled jointly by the team leader and the support assessor, and agreed to by the sponsor. The team leader and support assessor conducted one-day on-site interviews with key people involved in managing the software development effort of the organisation. For each of the eight processes examined, the assessors followed the script of the assessment instrument to determine the extent to which the process attributes have

been achieved. A draft report was prepared identifying strengths, weaknesses, process attribute ratings and capability levels, and recommendations for concrete improvement actions. The draft report was sent to the assessment sponsor with a request to confirm that the assessment team had accurately recorded the information discussed. Any changes suggested by the assessment sponsor were discussed with the team leader and then the final assessment report submitted to the organisation sponsor and the Software Quality Institute.

The follow-up meetings are not part of the RAPID methodology, but were planned to be conducted six months after the assessments to determine the extent to which firms had implemented the assessors' recommendations and improved processes.

4. Findings

4.1. Profile of firms

Prior to the initial assessment, the sponsor at each organisation completed a demographic questionnaire. Analysis of the responses, summarised in table 2, provides an overview of the organisational and project characteristics of the 22 firms.

Many of the firms indicated that contract and part-time staff were involved in their business. To compare staffing levels, part-time and contract staff were counted as half an employee and the total staff headcount calculated. Most of the firms were small: 18 of the 22 firms had a staff headcount of less than 50, the other three between 50 and 60 staff.

Each firm was asked how many staff played a technical role, and how many a support or administrative role in the organisation. To compare the proportion of technical staff to total staff, the percentage of technical staff was calculated. As shown in table 2 the mean proportion of technical staff is 71% of staff. In response to a question about the number of staff with more than five years experience, 15 of the 21 firms which responded stated that more than half of their staff had in excess of 5 years industry experience.

Overall, the level of formal education of staff employed in the 22 firms was high. Of the total number of 341 staff employed (including full-time, part-time and contract), almost half of all the staff (47%) had post-graduate qualifications. However, when the proportion of staff with post-graduate qualifications is examined across all 22 firms, the distribution is far from even: ten of the 22 firms did not have any post-graduate qualified staff, and 12 of the 22

firms reported that all their staff had either graduate or post-graduate qualifications. The firm with the lowest level of education reported that seven of the nine staff did not have university qualifications.

Table 2. Summary of organisational and project characteristics

Project/ organisational characteristics	N	Min	Max	Mean	SD
Staff headcount	22	2	65	15.6	4.0
Proportion of technical staff	22	33%	100%	71%	19%
No. of projects in progress	21	1.0	34	5.5	7.1
Number of employees per project	21	0.5	10	3.3	0.5
Project duration (months)	21	0.3	60	10.4	2.9

The 22 firms were working on a total of 114 projects with the firm average being 5.5 projects per firm in progress. Not surprisingly considering the number of small firms, most project teams were small: 3.3 staff per project. The project durations varied from seven days to 60 months with the mean typical duration of 10 months.

Table 3. Business sectors of firms' clients

Business Sector	N	%
Manufacturing, automotive, distribution/logistics	15	17%
Public utilities and public administration	13	15%
Construction and mining, petroleum, agriculture	11	13%
Telecommunications & media	10	11%
Finance, insurance and banking	9	10%
Information Technology/software	8	9%
Leisure and tourism, travel	7	8%
Consumer goods and retail	6	7%
Defence and aerospace	5	6%
Education	2	2%
Health and pharmaceutical	2	2%
Total	88	100%

Sponsors were asked to identify the industry sector for which their organisation delivers or acquires software, and a wide range of sectors was reported. Six of the firms focussed their efforts on a single industry sector such as

education or mining, but the others, as shown in table 3, developed software for a broader range of business sectors, with manufacturing, automotive, and distribution and logistics attracting the most attention, followed by public utilities such as electricity, gas and water, and also public administration.

All except one of the 15 Australian participants in phase two of the SPICE trials were certified to ISO 9000 [21]. The group reported here varied in that regard: only two of the firms in this group of 22 responded that they had ISO 9000 certification, although another was in the process of gaining certification. The firms reported the use of a variety of applied technologies as shown in table 4. Typically, each firm used a combination of at least three of the development technologies.

Table 4. Technologies Applied by Firms

Technology	Number	%
Object Oriented	16	24%
Internet	14	21%
4 th Generation Language	13	19%
Client Server	12	18%
Real Time	8	12%
Scripting	5	7%
Total selected	68	100%

To summarise the organisational and project characteristics, most of the group of 22 were small firms with an average staff headcount of about 16 staff, educated to graduate level, with experienced staff in a mainly technical role, using a variety of technologies and targeting a wide range of application domains, and without ISO 9000 certification. On average, each firm was currently undertaking about five projects, with duration of 10 months, staffed with a team of three people.

4.2. Assessed process capability levels

A striking feature of the RAPID assessments was the extent of senior management involvement. In 14 of the 22 firms, the Managing Director participated in the assessment. Although a variety of weaknesses and strengths were observed across the group, three common problems recurred in many of the firms: competent staff were relied upon rather than documented processes; testing was performed in an ad-hoc manner and needed to be

formalised; and measures to record problems and development effort were non-existent or inadequate.

A total of 176 process ratings were recorded during the initial assessments, eight processes for each of the 22 firms. As shown in figure 2, most of the processes were rated at level 0 (30%) and level 1 (46%). This shows the group of 22 firms exhibited lower capability in comparison to the participants in phase 2 of the SPICE trials (20% at level 0; 42% at level 1) [22].

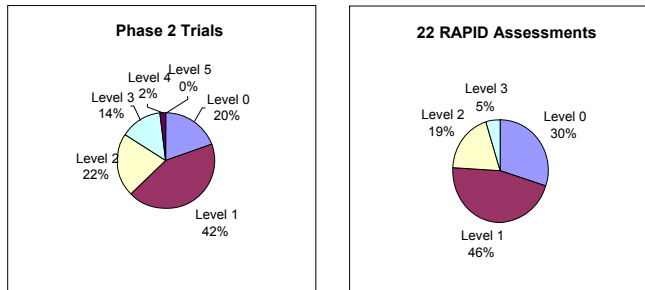


Figure 2. Capability level distribution

Overall, there was a wide variation in the capability levels for the 22 firms, as shown in Figure 3. The requirements gathering process exhibited higher capability compared to the other processes in almost all cases. 11 of the 22 firms were rated at level 2 (managed) or level 3 (established) for requirements gathering. On the other hand, the most incomplete process was process establishment, rated as level 0 (incomplete) at 15 of the 22 firms.

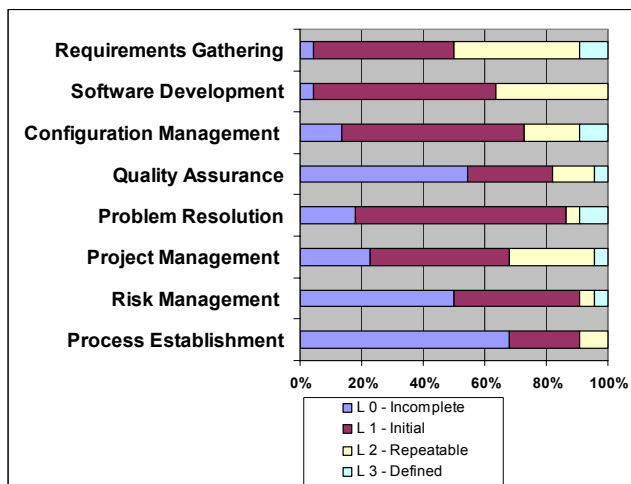
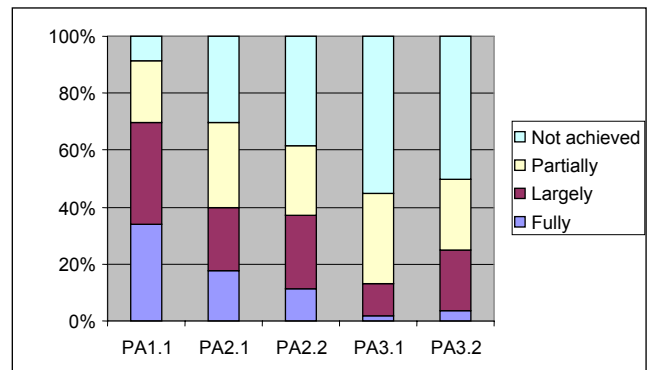


Figure 3. Capability levels by process

It was expected that larger organisations would exhibit higher levels of capability but this was not the case with the firms in this sample. However, analysis did reveal a positive association between the proportion of experienced staff at a firm and its summed capability levels (Spearman's $\rho = .505$; $p < .05$). In a similar way, firms with a higher proportion of graduate or post-graduate staff exhibited higher process capability compared to those with less qualified staff (Spearman's $\rho = .440$; $p < .05$).

A summary of the frequency of attribute ratings (fully, largely, partially or not achieved) is presented graphically in figure 4. As expected from any rating system based on maturation stage theory, lower levels are characterised by greater achievement of attributes compared to the higher levels. For example, there were 60 instances where the level one process attribute was fully achieved, but only three where the level three process definition attribute were fully achieved. Consistent with the findings from phase 2 of the SPICE trials [10], the process resource attribute (PA3.2) is more often highly rated than the attribute measuring process definition (PA3.1) (Process definition).



Process Attributes:

- PA1.1 Process Performance
- PA2.1 Performance Management
- PA2.2 Work Product Management
- PA3.1 Process Definition
- PA3.2 Process Resource

Figure 4. Frequency of process ratings for each process attribute

4.3. Follow-up meetings

Initially, it was planned to hold each follow-up meeting six months after the initial assessment, but in actual fact, the elapsed time between the initial assessment and follow-up meeting ranged from seven to 16 months. From the group of 22 companies, nine were formally reassessed, and

six of these had improved some of their process capability levels, the other three exhibited improvements, but not enough to gain a higher capability level rating. A further 11 firms participated in the follow-up meetings, but were not formally reassessed. Of this group, six firms reported that they had implemented some of the recommendations. Five firms did not report any improvement, but provided some interesting reasons why the recommendations had not been actioned. Only two organisations withdrew from the program.

5. Discussion

A comprehensive summary of the results from the RAPID program is presented in table 5. To maintain confidentiality, the firms are not named, but numbered from #1 to #22 to enable them to be referred to in the discussion. The firms were rated with up to four stars in terms of the extent of improvement achieved and then grouped according to the number of stars awarded. The staff headcount at each firm is presented, and then the initial assessment capability rating for each of the eight processes. The processes are represented by a two letter code as listed in table 1. For the six firms where the capability level was assessed at a higher level at the follow-up meeting, this is indicated with an arrow symbol in table 5. The mean capability level at the time of the initial assessment was calculated, and then a summary comment about the outcome of the follow-up meeting is provided.

To facilitate discussion, the firms which completed the program are grouped according to the success of the outcomes of the program:

★★★★ This group comprises six firms which were formally reassessed and had increased the capability level of at least one of the eight processes;

★★★ This group of three firms were formally reassessed and improvements were reported to some of the eight processes, but not enough to increase the capability level of any process;

★★ These six firms were informally reassessed and reported limited improvements;

★ Completed program: five firms contacted but reported no improvements as a result of the assessment.

5.1 Actions resulting from assessment

The six firms in the ★★★★★ group increased in their capability levels, as shown in table 5. The extent of improvement varied from a maximum of seven of the eight

processes to a minimum of one process. The headcount of these top performing firms ranged from six to 55, and as shown in table 5, the extent of improvement is not related to headcount or their capability rankings at the initial assessment. The processes showing the greatest extent of improvement were software development, configuration management and project management, although capability level improvement was recorded for all eight processes.

The ★★★ group comprised three organisations which recorded improvement to specific processes, but not enough to step up a capability level. The achievement of attributes improved from partially to largely for quality assurance, configuration management, process establishment and project management processes.

All the firms in the ★★ group provided positive feedback regarding the value of program. The improvements recorded by the follow-up assessor were not specific to the eight processes, and included the development of templates; assessment and implementation of tools; review of business goals; formalisation of testing procedures; and establishment of measures such as actual effort.

Only one of the follow-up meetings recorded as estimate of the investment made by the firm. One of the ★★ firms reported that the program consumed 155 hours of staff time and included the purchase of Visio software. Most of the firms did not know the extent of resources involved because they did not have a measurement process in place.

5.2 Inaction since assessment

There were five firms which completed the program but did not report any process improvement. These firms were assigned to the ★ group. When asked why the recommendations had not been implemented, a wide variety of reasons were provided:

- business problems, such as failure in business partnership, relocation of business, burglary of premises;
- personal problems such as family sickness, marriage break-up of directors;
- high staff turnover including loss of key staff;
- lack of SPI expertise, specifically the need for mentoring.

It was pleasing to note that 20 of the 22 firms completed the program, with only two firms failing to have a follow-up meeting. In one case the follow-up meeting was not held as the firm cancelled its SEA membership after the initial assessment. The other firm could not be contacted as it had ceased to operate prior to the follow-up meeting.

5.3 Reactions to RAPID program

Comments from the firm sponsors were gathered through feedback questionnaires and by the follow-up assessors. Most of the firms enthusiastically commended the RAPID program, commenting that it was an effective introduction to SPI; that it provided an accurate review of the current status of development processes; and that it motivated them to improve their planning and documentation. Many expressed regret that they were unable to put more resources into implementing the recommendations, but the timing of the program clashed with two urgent deadlines: the modifications for year 2000, and the introduction of the Australian Government's Goods and Services Tax (July 2000).

Two of the firms (#2, #10) had hoped to be included in the more intensive Showcase program, and lost motivation when funding for that program was reduced. Negative comments were made by only one firm (#17). Firm #17 was the largest included in the program, and felt that a one-day assessment was too brief to be of any real value.

5.4 Readiness for SPI

After analysing reports which indicate that the vast majority of organisations in the US and UK are at the initial level of capability maturity, Smith et al. [23] assert that it is clear that only a handful of companies are ready for SPI "because their software health is so bad (that is if they have any development process at all)" [23]. They go on to warn that in order to be ready for SPI, a visible and defined software process must already be in place.

Applying this advice to the RAPID program, it is interesting to consider the performance of the eight firms who, at the time of the initial assessment, exhibited a mean capability level above level 1 (initial). As shown in table 5, three of these eight firms (#1-3) are included in the six firms of the ★★★★★ group, having achieved sufficient improvement to increase the capability level of some of the eight processes. One of the firms with relatively high capability (#7) is included in the ★★★ group and was close to achieving higher capability level ratings for two processes. Two of the other highly rated firms (#10, #16) experienced seriously disruptive events which they reported prevented them from implementing the recommendations from the assessment. Of the two remaining high level firms, #17 expressed the opinion that the RAPID assessment was too brief to be of any value. The other high level firm (#21) did not participate in the follow-up meeting due to the lapse of its SEA membership. It appears then that the firms with higher process capability were more successful than firms

with an average capability level in the range of zero (incomplete) to one (initial).

However, some of the firms with low initial capability were also successful in the program. The gains achieved by the three low capability firms (#4-6) in the ★★★★★ group were certainly more modest than those of the higher capability group, but still a notable achievement. Furthermore, seven low capability firms (#8, #9, #11-15) reported that they had successfully implemented some of the recommendations, citing improvements in terms of defining their methodologies, developing templates, recording problem reports, and formalising testing.

Earlier (in section 2), a list of critical success factors previously compiled by other researchers was presented. Evaluating the RAPID program and its associated outcomes against these factors provides the opportunity to validate these factors, and learn lessons from this program. Although the RAPID model was not tailored individually for each firm, it is an adaptation of the more complex 15504 model to suit small firms. The trained assessors were respected by the firms, with some firms (#2, #10, #19) stating that further improvement would have realised if mentoring had been made available. As far as resource issues, many firms commented that they were unable to allocate sufficient staff to the SPI program (#4) or to attend training. If the program had not been externally funded by SEA Qld, it is unlikely that any of the firms would have embarked upon SPI.

On a more positive note, the RAPID assessments were carried out with clearly assigned and documented roles, responsibilities and resources, but some change management issues were explicitly mentioned by two firms: firm #18 found it hard to unfreeze the current processes; firm #19 encountered difficulties in promulgating the improved processes to development teams in distributed locations. Senior management commitment was evident at the start of the program, but waned in some firms due to management restructure (#18) and change in business direction (#14). The value of unanticipated side effects of the RAPID program was mentioned in terms of providing the opportunity to review the business goals of the firms (#14). As well as providing funding for the RAPID program, SEA Qld has facilitated networking opportunities for local developers through training programs and a special interest group for firms interested in SPI.

Table 5. Capability levels and outcomes

Id#	Status	Staff	RG	SD	CM	QA	PR	PM	RM	PE	Mean CL	Outcome
1	*****	5.5	1↑	2↑	3	0↑	3	2↑	0↑	0↑	1.625	Improved 6 processes a total of 9 levels
2	*****	55	2↑	2↑	1↑	1↑	1↑	2↑	3	1↑	1.625	Improved 7 processes a total of 8 levels
3	*****	10.5	3	2↑	1↑	2	1	2	0↑	1↑	1.375	Improved 4 processes a total of 4 levels
4	*****	6	1	1	1	0↑	1	0↑	0	0	0.5	Improved 2 processes a total of 2 levels
5	*****	12.5	1	0	1	0	0↑	1	0	0↑	0.375	Improved 2 processes/2 levels GST and Y2K impact
6	*****	15	1	1	1↑	0	1	1	0	0	0.625	Improved 1 process 1 level
7	***	17.5	1	2	1	0	2	2	1	0	1.125	Improved QA, PE processes, and documentation
8	***	5.5	2	1	0	0	1	1	1	1	0.875	Increase in staff, # of projects.
9	***	60.5	1	1	0	1	1	1	0	0	0.625	Multiple sites - difficult to implement changes
10	**	6.5	2	2	2	1	1	3	2	2	1.875	Relocated. Improved CM
11	**	3.5	2	1	1	1	0	1	0	2	0.25	Some changes implemented
12	**	16	2	1	1	1	1	1	0	0	0.875	Adopted new methodology. Too new to assess
13	**	3.5	1	1	2	0	1	1	1	0	0.5	Disrupted by break-in at premises. Reduced operation.
14	**	8	2	1	1	0	1	0	1	0	0.75	Business focus change, sold product distribution rights
15	**	10	1	1	1	0	0	0	0	0	0.375	Lost key staff. GST big impact
16	*	2	2	2	3	2	3	2	1	1	2.0	Major non-business issue affected owner
17	*	65	3	2	2	3	1	2	1	1	1.875	1 day assessment too brief to be valuable
18	*	7	2	1	1	0	0	1	1	0	0.75	Management restructure. Changed business focus
19	*	7.5	1	1	1	0	1	1	1	0	0.75	Need mentoring, difficult to unfreeze current practices
20	*	6	0	1	1	0	0	0	0	0	0.25	Too busy due to Y2K and GST
21		17	2	2	2	1	1	1	0	0	1.125	SEA membership lapsed, no follow-up
22		4	1	1	0	0	1	1	1	0	0.625	Firm ceased to operate

Note: capability levels are as at initial assessment and arrows indicate increase in level of capability; mean capability level is also at initial assessment.

6. Conclusion

Although only six of the 22 firms increased in terms of capability levels, a further nine reported improvements to their development processes. The consensus was that the program provided a practical introduction to formal SPI and provided a solid foundation for further SPI initiatives. This conclusion challenges the view that SPI is not feasible unless the firm has visible, defined processes. In this program, ten firms with low initial capability benefited from the RAPID assessment and exhibited improvements. The success of this program indicates that a SPICE-based mini-assessment is an appropriate way for small organisations to get started on SPI.

Analysis of the reactions of the participants of this program reinforces the importance of commitment by senior management, the necessity to involve external assessors and mentors, and the requirement to manage the impact of the SPI program on staff involved.

Future research is needed to explore the role of mentors: small companies need external assistance as they have scarce resources and limited opportunities to keep up-to-date with the state-of-the-art research and practice [3]. Both of the firms which participated in the more extensive Showcase program exhibited strong improvement, with one firm improving the capability of 11 of the 16 processes assessed [6]. The Showcase participants acknowledged the benefits of the on-the-job training and assistance provided by the mentors.

As well as detailing the capability of 22 small Australian software firms, this study provides an interesting insight into the actions, reasons for inaction, and reactions of the firms as far as implementing the recommendations from the assessment.

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