

THE IMPACT OF CAPABILITY ON PERFORMANCE – EXPERIMENTAL EVIDENCE

Paul Guignard, Ph.D.

Capability Institute, Patonga, NSW 2256, Australia

Joelle Williams*, MBA

Transformation Consulting, Westlake, QLD 4074, Australia

Abstract. The impact of capability (broadly defined as what an organisation is, has and can do) on performance was tracked over 13 quarters in an Australian mining company. Capability was assessed using a survey method, and performance using KPIs. Two datasets were acquired, one supported by an active initiative programme and the other when the programme was neglected. Performance displayed a strong correlation with capability for both datasets, with the first one resulting in a sharp increase in performance. This highlights the importance of managing capability in order to maximise performance.

1. Introduction

A group in a large mining company responsible for providing accommodation in remote mining towns in Central Queensland, Australia, during the mining boom outsourced maintenance to a specialist organisation. The basis of the contract was a profit share arrangement determined by performance assessed using a balanced scorecard, thus ensuring that both parties would work together towards maximising performance.

Prior to the contract being let out, the authors had carried out a pilot study over 6 months, during which they measured capability in the supplier as a guide to understanding the drivers of performance, measured with KPIs. This pilot study, not reported here, was successful and provided the basis, supported by the mining organisation and the supplier, of including quarterly capability and performance tracking during the life of the contract. The purpose being to use the information gathered to improve performance on an ongoing basis and so increase the potential benefits to both parties.

The first seven quarters of the contract coincided with the end part of the mining boom at which time there was a change at the top the large mining organisation, a change in priorities, changes in the group responsible for accommodation and changes in the scorecard used. This gave us the opportunity of studying the impact of capability on performance under two different sets of conditions.

* J. Williams' contribution centred on client-related data acquisition and initiative management

2. Methodology and measurements

2.1 Key Performance Indicators

The sets of KPIs used in the scorecard agreed between the client and the supplier are shown below. Table 1 relates to the first seven quarters and Table 2 to the following six quarters.

Table 1: First set of KPIs

KPI	Weight
Safety risk management	10%
Safety systems audit	10%
Schedule performance	20%
Responsiveness	10%
Task completion	10%
Quality	15%
Cost of work	15%
Customer satisfaction	10%

Table 2: Second set of KPIs

KPI category	KPI	Weight
Safety, health and environment	Quality of safety observation by leaders	15%
	Zero energy hazard reporting	15%
	Zero barrier	10%
	TRIFR	10%
Task completion	Work with planning lead time	10%
Cost	Innovation	10%
	Attract and retain	10%
	Cost of work	5%
Customers	Tenant and stakeholder satisfaction	15%

The main difference between the two sets is a much stronger emphasis on safety, health and environment in the second set compared with the first one. The total weights given to safety related issues are 20% and 50% in the first and second sets respectively.

For each KPI five ranges were defined, from superior to unsustainable as shown in Table 3 below.

Table 3: KPI ranges

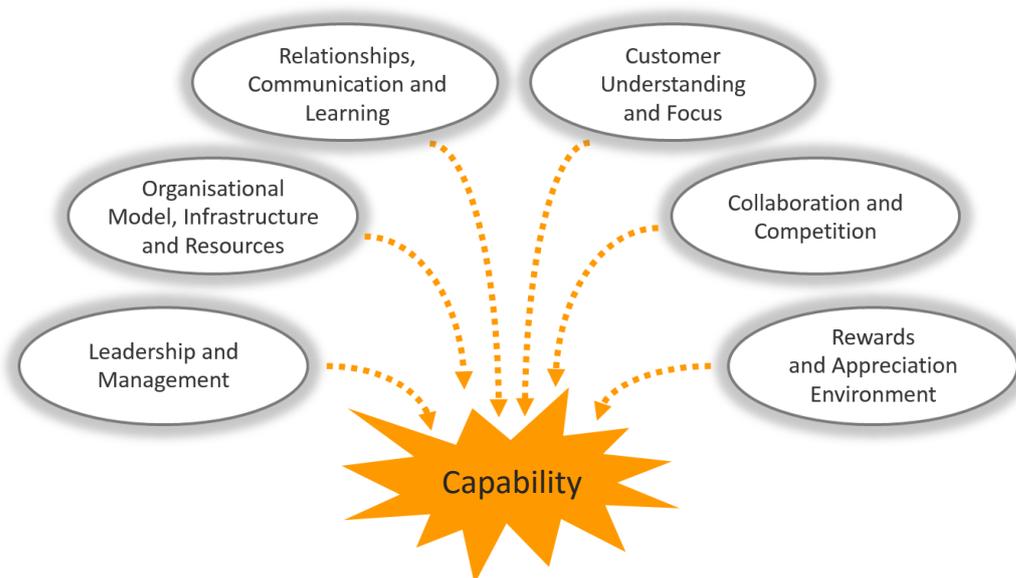
KPI range	Score range	
Superior	From 4 to 5	🟢
Excellent	From 3 to < 4	🟡
Minimum standard	From 2 to < 3	🟠
Poor	From 1 to < 2	🔴
Unsustainable	From 0 to < 1	🔴

2.2 Capability model and measurements

The capability model used is described in detail in the paper ‘Capability – The foundation of business performance’ by the same authors; only a brief outline is given here.

Capability is defined as the quality of the work environment, including infrastructure, processes and resources, and the skills and attitudes of people and teams working in that environment. A visual representation of the capability model used is shown in Figure 1. The six bubbles identify the six dimensions of the model. In addition to the dimensions, the capability model specifies three sub-dimensions to each dimension, as shown in the Table below, with each sub-dimension addressing between 2 and 4 issues.

Figure 1: Capability model



Overall, a total of 54 questions were asked each time the survey was run. A seven-point scale was used ranging from ‘strongly disagree, disagree, moderately disagree, neither agree nor disagree, moderately agree, agree and strongly agree’. The seven-point scale was judged preferable to the common five-point scale (‘strongly disagree, disagree, neither agree nor disagree, agree, strongly agree’) as it encouraged participants to take advantage of ‘moderately disagree’ and ‘moderately agree’ and thus minimise the use of ‘neither agree nor disagree’. In addition, the options ‘not applicable’ and ‘don’t know’ were also offered, and participants could enter comments freely in relation to each question.

Participants included all members of the client team responsible for the contract (from managers to administrators and supervisors) and all members of the supplier teams (from managers, to supervisors, tradespeople and cleaners). The survey was mandatory and each time, towards the end of the survey period, those who had not completed it were contacted by phone and reminded of the importance of the survey and asked to contribute. Overall the participation rate was over 80%, putting it in the high range.

Answers were mapped onto a five-point scale as shown in Figure 2 and then grouped in teams based on geography (there were four towns involved in the study), organisation (client or supplier) and function. Results were produced for dimensions, sub-dimensions and questions. Figure 3 shows a typical display for a low performing team, showing the results for the sub-dimensions.

Figure 2: Mapping from a seven-point to a five-point scale

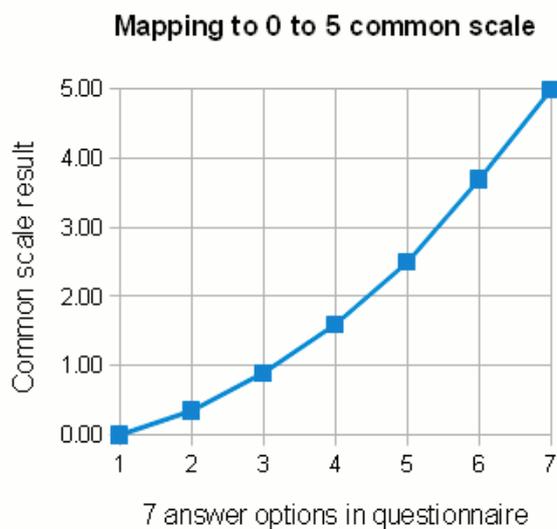
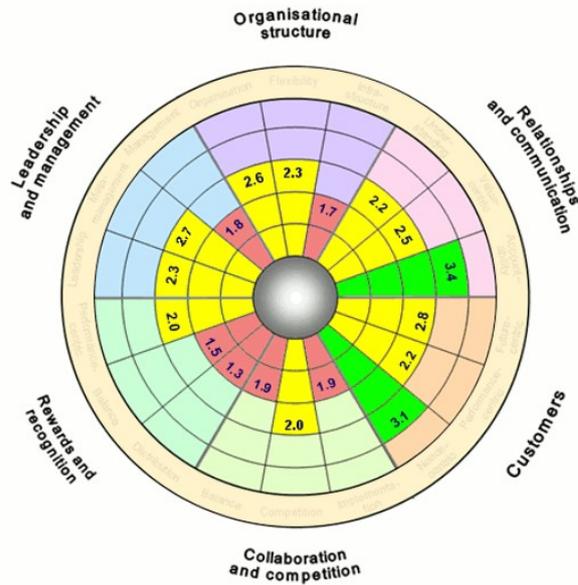


Figure 3: Example of team results



3. Results

The results are shown in Table 4 and Figures 4, 5 and 6, for the four towns and over the thirteen quarters. The data is separated in two sets as explained above. Note that for quarters 12 and 13 no capability survey data was collected.

Table 4: Capability and KPI results for 4 towns over 13 quarters

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
Town 1 - capability	1.57	2.00	2.07	2.21	1.84	2.20	2.12	2.45	2.57	2.73	1.76		
Town 2 - capability	1.82	1.82	1.91	2.24	1.92	2.14	2.45	2.32	2.35	1.61	2.26		
Town 3 - capability	1.40	1.40	1.85	2.32	2.38	2.02	1.98	2.31	2.11	1.94	1.70		
Town 4 - capability	1.24	1.24	1.74	2.33	2.94	3.23	3.14	2.85	3.03	3.35	2.37		
Town 1 - KPIs	2.28	2.39	2.27	2.51	2.76	2.80	3.12	2.97	2.41	2.30	2.06	1.81	1.86
Town 2 - KPIs	1.84	2.30	2.44	2.20	2.10	2.42	2.56	3.07	2.35	2.44	1.92	1.52	1.89
Town 3 - KPIs	1.90	2.52	2.43	2.58	2.88	3.29	3.69	1.96	1.75	1.87	2.69	1.78	1.73
Town 4 - KPIs	1.88	2.16	2.05	1.84	3.09	3.73	3.56	2.16	1.93	1.91	1.78	1.79	1.52
Capability average	1.51	1.62	1.89	2.28	2.27	2.40	2.42	2.48	2.52	2.41	2.02		
KPI average	1.98	2.34	2.30	2.28	2.71	3.06	3.23	2.54	2.11	2.13	2.11	1.73	1.75
Capability LSF	1.55	1.72	1.89	2.05	2.22	2.39	2.56	2.58	2.43	2.28	2.13		
KPI LSF	1.95	2.16	2.36	2.56	2.76	2.96	3.16	2.41	2.29	2.16	2.03		

Figure 4 shows the results for the four towns, for capability and KPIs, for the two datasets described above. The thick straight lines (in green for capability and blue for KPIs) is the least square fit based on the average of the four towns at each quarter. Although the towns varied in size and amount of maintenance work required, they are given the same weight in calculation of the averages as they each represented an instance of management and operation of equal value.

Figure 4: Capability and KPI results over 13 quarters



Figure 5 below shows the results for the two sets, for the average of the four towns at each quarter together with the lines of least square fit. Also shown are the initiatives undertaken at each quarter; in green for successful initiatives and in red for unsuccessful ones. Figure 6 shows, for the two sets, a plot of performance (or KPIs) versus capability.

Figure 5: Capability and KPI results over 13 quarters

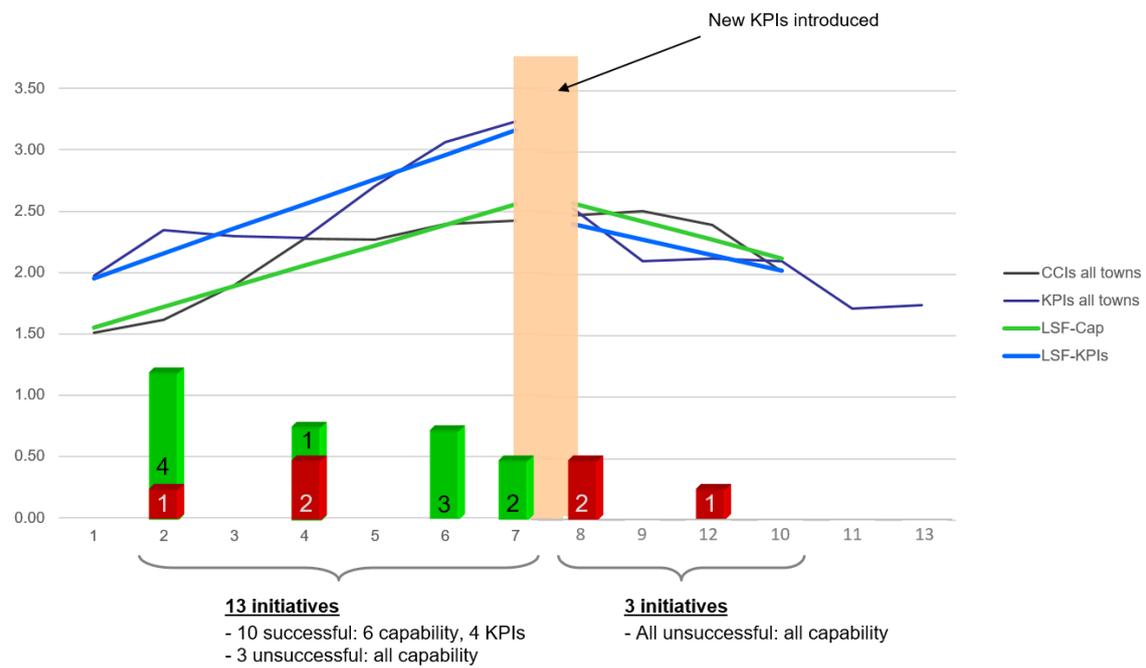
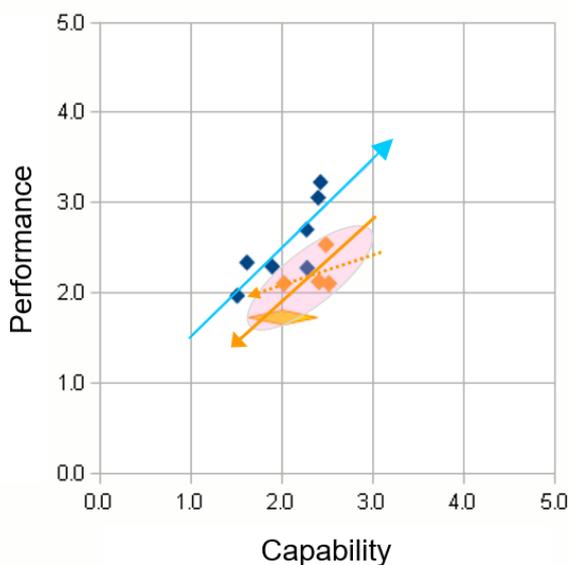


Figure 6: Performance versus capability



4. Analysis and discussion

With respect to the first seven quarters, Figures 4 and 5 clearly show a strong correlation between KPIs and capability. On Figure 6, the plot (in blue) of performance versus capability shows the 7 points from lower left to upper right. That is, the trend over time for capability was up and this was accompanied with a corresponding upward trend in performance.

Turning to the second set of data, quarters 8 to 11 in Figures 4 and 5 exhibit, for the averages of the four towns, clear downward trends. The data for quarters 12 and 13 is incomplete (no capability survey data was recorded) but the KPI trend is clearly down.

The introduction of new KPIs (Figure 5) led to a clear drop in performance (measured with these new KPIs) although the capability between quarters 7 and 8 was nearly unchanged. This suggests that interventions would have been required to bring the results up. However, this did not take place; only 3 initiatives were attempted that were unsuccessful. The lack of focus on overall performance created by the significant changes taking place in the organisation is also shown by the neglect of survey measurements in quarters 12 and 13. In comparison, during the first 7 quarters, the focus on improving outcomes for both parties was much stronger. There were a total of 13 initiatives and 10 were judged successful (resulting in the corresponding capability or KPI measurement of at least 0.5 on the common scale). As indicated in Figure 5, there were more capability-related initiatives than performance-related ones. The rationale was that the new capability could then be leveraged towards improving the processes underpinning the KPIs, thus raising performance.

The results in Figure 6, in orange for the second data set show a clear downward trend over time; the data was recorded from upper right to lower left, thus showing a clear trend over time. When only the first 4 points are considered, the line of best fit has a slope of -0.35 , clearly down. The elongated diamond (lower left) corresponds to two quarters for which only the KPI results were recorded. The capability was not measured with a survey but estimated by management. Although less reliable than the first set, the downward trend is evident, especially if one considers that the last 2 KPI measurements dropped significantly.

The results show strong correlation; they do not categorically establish that capability causes performance. However, there is strong indication that it plays a very important role:

1. The majority of the initiatives in the first 7 quarters were aimed at increasing capability.
2. The capability addressed related to the following dimensions or sub-dimensions:

- a. Leadership and management
- b. Rewards and recognition
- c. Infrastructure.
- 3. Improved capability in these areas is likely to have played a very positive role in the successful KPI initiatives that targeted:
 - a. Sub-contractor management
 - b. Job closure
 - c. Work order management
 - d. Safety risk management.
- 4. The KPI initiatives started at about the same time as the capability initiatives but lasted longer, thus the former were able to take advantage of the increased capability becoming available.

In addition, capability as defined and used here (see Figure 1) packages the main elements of contemporary management practices that are found empirically to impact positively on KPIs. Table 5 summarises the results.

Table 5: Summary of results analysis

PERFORMANCE VERSUS CAPABILITY
Increasing capability correlates with increased performance
Low capability correlates with low performance
Capability can be used as a predictor of performance success
Effective performance management implies managing capability
Managing performance without managing capability is sub-optimal

5. Conclusion

The impact of capability on performance was tracked over thirteen quarters in a mining organisation. Because of internal circumstances associated with a change of management and business conditions, the data could be separated into two sets, one during which an active initiative programme was taking place, guided by the capability and KPI measurements, and one without an active improvement program. For both datasets, performance was found to correlate strongly with capability measured with a survey. The correlation held when capability increased through the application of initiatives, most aimed at improving capability and some at improving performance. When no initiatives were successfully implemented both capability and performance decreased. The experimental results indicate that effective performance management implies actively managing capability by measuring it and by taking action to improve it when it is found wanting in some areas. This improved capability can then be leveraged

towards improving performance. Conversely, managing performance without managing capability is sub-optimal.

Reference

1. Capability – The foundation of business performance, P. Guignard, J. Williams, www.capabilityinstitute.com, 2015.