

ORGANISATIONAL STRATEGIC DRIVERS AND CORE COMPETENCIES APPLIED IN THE SOUTH AFRICAN MINING SECTOR

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ABSTRACT: This paper compares the organisational strategic drivers of a South African mining house with those of industries abroad. It furthermore compares the key competencies or capabilities of the mining house with those of the overseas industries. A Delphi panel participants comprising of nine experts - with a combined experience base of over 130 years - provided the data. The strategic drivers as well as the key competencies of the South African mining house showed marked similarities to industries such as petrochemical, engineering and construction industries abroad. While safety enjoys higher priority in the South African mining environment than in comparable industries abroad, there is room for improvement in the level of prioritisation of projects that takes place within project portfolios. The degree of authorisation given to project teams within the South African mining house to execute the project strategy is lower than that in comparable industries abroad while the level of business focus and business awareness within the South African mining project teams is relatively high. The correlation between strategic drivers and core competencies was weaker than would be expected.

Key phrases: *execution performance, financial performance, key competencies, organisational culture. safety key strategic drivers*

1 INTRODUCTION

Project management principles have been around for centuries and have been used as a means of managing a temporary endeavour classified as projects (Project Management Institute 2008:5). It is only in recent years that the profession has been recognised and developed by organisations such as the Project Management Institute (PMI), into a professional management style, within the broader management arena.

The project management style is synonymous with specific management competencies, required to lead project teams in achieving their goals and objectives. The development of the organisation to include a project section alongside the operations eventually developed into what is known as the project management office (PMO). PMI and the International Project Management Association (IPMA) confirm that management of projects goes beyond the field of project management and that organisations should embrace the field of management of programs and portfolios in order to be able to deliver more through projects than just “on time”, “on budget” and achieving the technical requirements (Aubry, Hobbs & Thuillier 2007: 328, Blomquist & Müller 2006:53, Kerzner 2009:60-63, Kloppenborg, Tesch & King: Conference paper; Toor & Ogunlana 2012:228-229).

By making use of the management of programs and portfolios the project pipeline would create additional value for the organisation. Blomquist and Müller (2006:53) also pointed out that the role of portfolio and program management as a subset of middle management, is to act as a subset of Corporate Governance.

1.1 Background

The modern trend for managing organisations focuses strongly on value creation for the shareholder (Armour & Mankins 2001:23; Finegold, Ali & Winkler 2011:251), and organisations realising that, in order to achieve the constant value growth, their management processes and organisational capabilities need to be migrated to a new level to facilitate implementation of such a strategy. Armour and Mankins (2001:23) defined managing for value (MFV) to be a “holistic management approach that would encompass redefined goals, redesigned organisational structures and systems, rejuvenated strategic and operational processes, and even revamped human resource practices”.

They concluded that whenever organisations implemented the MFV strategy, the result would be an enhancement in the shareholder and shareholder value as well as an improvement in the quality and speed at which decision making takes place. The end result of the implementation of MFV frequently transformed corporate behaviour and culture. In order to create value, certain variables need to be present and drivers which have a greater influence need to be identified (Hall 2012:1046)

Dietrich and Lehtonen (2005:386) pointed out that the role of projects has developed into an important vehicle in strategy realisation and Dye and Pennypacker (1999:45-54), Cooper, Edgett and Kleinschmidt (1997:43-44), Englund and Graham (1999:52-53) as well as Spradlin and Kutolowski (1999:28) emphasised the importance of linking projects to the organisational strategy. To be able to maintain the growth pattern, develop new ideas and concepts to keep expanding the organisation and ensuring a sustainable future, the natural evolution to the single growth project is the project pipeline. Some project pipelines may include programs, “grouping related projects together to accomplish more than just the separate project deliverables combined.”

The aforementioned change in focus from the organisation towards a project driven growth strategy brought about a change in the focus areas of the organisational strategic drivers. Where such change of focus has occurred, the question arises whether different industry sectors changed in a similar manner. It also needs to be determined whether project management styles or way of practice have evolved differently in different industry sectors. By making use of proper project portfolio management, Blichfeldt and Eskerod (2008:363) highlighted the fact that poor resource planning or over-allocation of important resources to less important projects would negatively affect the project and organisational performance, resulting in affecting the execution of the projects and strategy.

The investigation of existing theory suggests that several studies have been conducted on the nature of projects, their purpose as well as the change influence imposed on organisations. Cooke-Davis and Arzymanow (2003:472) investigated the maturity of project management in various industries, and pointed out that during the 1980's several papers were published on the organisational culture, and the World Congress on Project Management in 1990 recognised that the organisational culture was influencing the project management culture, although found not to be that easy if the culture want to be changed for the better (Cooke-Davis 1990:473; Haalien 1994:473).

Thomas and Mullaly (2008:24), together with several other authors, suggested that organisations should apply a project management style appropriate to the type and nature of projects conducted in their industry sector, and Cooke-Davis, Crawford and Lechter (2009:99-109) took this discussion further by developing the Project Management System (PMS) Value Driver Portfolio Model in order to link specific project types to specific configurations of value drivers.

1.2 Strategic drivers

Crawford and Cooke-Davis (2010:Conference paper) investigated the key organisation's strategic drivers, related to a specific industry sector or project type, but only investigated the key strategic drivers in six industry sectors namely Engineering and Construction, Pharmaceutical, Finance, Energy, IT and Telecommunication, and Petrochemical. This led to the deduction that there was an opportunity to conduct a

similar study in the mining environment in order to facilitate the comparison of the findings in their research to the impact of the Mining sector strategic drivers as well as the key competencies or capabilities found applicable to the project management style employed within the Mining sector.

In the study by Crawford and Cooke-Davis (2010:Conference paper), financial performance was mainly linked to a combination of revenue, profitability, share performance and return on investment. Execution performance, on the other hand, strongly appears to be linked to schedule performance. The results from the study were closely related to that of Armour and Mankins (2001:25), listing financial performance as one of their top four drivers. The objective for this study can be divided into two sub-objectives, the first being *to identify the key organisational strategic drivers within one of the larger mining houses in South Africa*, and the second being to determine *the key competencies or capabilities found in the project management style employed within this South African mining business unit*.

The study method suitable for such a specialised small group is a qualitative research method and the Delphi method was selected as the research vehicle.

2 STRATEGIC DRIVERS AND KEY COMPETENCIES

From literature, two relevant constructs emerged; one related to key competencies required within the general and project management function, the other being the key organisational strategic drivers.

2.1 Key management competencies

For this study the aim is to build on the existing theory developed by Crawford (2006:74-86), Crawford and Cooke-Davis (2010:Conference paper) as well as that of Cooke-Davis and Arzymanow (2003:471-478), merging them into a usable model relevant to the modern view of what the core capabilities of the organisation should include. Cooke-Davis and Arzymanow selected ten groups or domains where the project culture could influence the execution of a project, referred to as *organisational capabilities* in this paper. The organisational capabilities considered were the following:

- Project culture.
- Organisational leadership.

- Business culture.
- Multi-projects management.
- Project management structures, methods and systems.
- Degree of authorisation.
- Location of information.
- Matching the team to the projects.
- Capability of the project management staff.
- Strength of the projects vs. functional management.

It is important to understand the broad interpretation of the different “domains” before it can be used or analysed in the study.

2.1.1 Project culture

The project culture can be described as the pervasiveness of the culture within the groups of people working with, or for projects. This domain will be represented by the word “Projectisation”.

2.1.2 Organisational leadership

Organisational leadership and, in short, “Leadership” refers to the level of commitment shown by upper management to develop or grow the project management capability.

2.1.3 Business culture

The business culture refers to the level of business focus and business awareness and exhibits within the project team. “Are decisions more focused on the business case rather than the technical project aspects and to what level in the organisation is there an understanding of the business goals that would be achieved by means of the project?” This domain will be represented by the word “Business”.

2.1.4 Multi-projects management

The domain multi-projects management refer to the level of prioritising that takes place within the portfolio. “Are projects prioritised according to their strategic fit in

relation to the organisational strategy and does the project allocate resources based on the prioritisation?" The word "Multi-projects" will represent this domain.

2.1.5 Project management structures, methods and systems

The domain project management structures, methods and systems are referring to the question "Does the organisation use systems, methods or processes in the management of the projects and how widely these systems are used within the organisation?" The domain group will from now onwards only be referred to as "Systems".

2.1.6 Degree of authorisation

The degree of authorisation is summed up with the word "Authorisation", referring to the degree of authorisation given to the project team to be able to execute the project strategy.

2.1.7 Location of information

The word "Information" will represent this domain; the level of control over information exercised by the project.

2.1.8 Matching the team to the projects

The matching of the team to the projects domain will be represented by the phrase "Team types" and provide an understanding of the level of capability the organisation exhibit in matching the specific project phases to a specific project team size or structure.

2.1.9 Capability of project management staff

Capability of project management staff refers to the level of competency and availability of competent team members within the organisation and will be represented by the word "PM capability". Take note that this domain is not only focussing on the competencies of the project manager but on the complete team.

2.1.10 Strength of project management vs. functional management

This domain refers to the level of which the organisation has moved from a pure functional managed structure to a pure project based management structure as described by the PMI (2008:28). The collective noun used is "Matrix".

2.2 Key strategic drivers

In a similar fashion to what was done with the key organisational competencies, the organisational drivers identified by Crawford and Cooke-Davis (2010: conference paper) and used in this study are:

- Financial performance.
- Execution performance.
- Schedule performance.

Schedule performance is related to execution performance and will be listed as part of execution performance.

- Innovation.
- Predictability and meeting commitments.
- Cost efficiency.
- Customer satisfaction.
- Adding value for customers.
- Meet customer expectations.
- Growth.
- Ability to deliver strategy.
- Market awareness.
- Reliability of end product.

The following sub sections will be grouped under the section *Financial Performance*:

- Revenue.
- Profitability.
- Share performance.
- Return on investment.

3 RESEARCH METHODOLOGY

The management of a single organisation, e.g. a mining company, lends itself to qualitative research methods that may include case studies, interviews or the Delphi technique. Due to the limited size of the target sample available, the Delphi technique was chosen as the research vehicle for this paper.

The Delphi technique has been in use since 1940 and developed into a well-known and widely used method ranging from the medical science, policy formulation, the social sciences as well as management science. The use of the Delphi method specifically in technology forecasting started in 1944 when General Arnold asked Theodor von Karman to forecast military capabilities that would be required in future (Cornish 1977:84)

In their book "Gazing into the Oracle", Adler and Ziglio (1996:3-5) state that the Delphi method is used to support judgemental or heuristic decision making. Helmer and Dalkey (1963:458-467), the founders of the method, were asked by the RAND Corporation to develop a set of procedures to improve forecasting in the 1960's. Following its inception, the method has been adopted in several technology based research applications such as the medical industry (Hasson, Keeney & McKenna 2000:1009-1013; Xiao, Douglas, Lee & Vermuri 1997:208-210) and information systems (Okoli & Pawlowski 2004:15-28). The method as described by Adler and Ziglio (1996:8-10) is fairly simple, essentially being a questionnaire sent to several individuals in a group of pre-selected experts. The results of the opinions would be anonymous and the participants given a chance to review and refine their views.

Critcher and Gladstone (1998:446), on the other hand, concluded that the Delphi, as a method, is extremely practical due to several advantages, including low cost, efficiency, as well as being a quick method of investigation. The technique consists of the following ten steps in the process (Fowles 1978:275) to complete the method:

1. Team members to undertake and monitor Delphi on a given subject need to be established.
2. Identify the panel of experts that would participate in the Delphi.
3. Formulate the questionnaire used in the first round of the Delphi process.

4. Test the questionnaire for clarity and bias.
5. Execution of first round by sending the questionnaire to the expert panel.
6. Analysis of the results of round one.
7. Formulate and prepare second round questionnaire.
8. Execution of second round by sending the questionnaire to the expert panel.
9. Analysis of the answers in the second round responses (Steps 7 through 9 may be repeated if required.)
10. Report writing and conclusions on the findings resulted from the Delphi method.

The panel size used for this research was in line with the recommended minimum of seven members. The panel of experts identified, consisted of two sub panels; one representing the underground mine and one the open cast mine, the former with 14 members and the latter only 10 members.

From the experience base it was very clear that the selected members of this panel have been involved in the mining industry for many years, working on several medium-sized to mega projects. The members are also representative of both the direct project management as well as strategic senior management positions, qualifying them to be considered experts in their field of work

The data gathering process followed the research plan and requirements set out for the Delphi technique. The steps followed are listed below, with a more detailed discussion for some of them thereafter:

- The objective of the Delphi study was defined to be the twofold objective of determining the strategic drivers and organisational capabilities.
- The panel of experts were identified in two business units within a large mining organisation.
- The Delphi questionnaire was developed to be able to reflect the objective of the study.
- The questionnaire was tested on a fellow project manager to identify any misunderstanding or poor clarity.

- The full questionnaire was then sent out to the selected participants at the two business units via e-mail, and given two weeks to respond. The e-mail included a short description of the process of a Delphi research as well as what is expected from the panel.
- Once results of the first round were received back, they were collated into a combined answer sheet to be used in a second round. The number of respondents from the open cast- and underground mines were seven and (only) two respectively from the original selected 14 and 10 in the two organisations.
- The combined answer sheet was then re-distributed to the same panel to get a final view on the answers received in the first round with the aim to reach consensus on the answers. All the members that participated in the first round again participated in the second round.
- The second round replies from the individual panel members were then compared to confirm that consensus was reached.
- It was established that consensus was reached.
- The results were then analysed and collated into a single finding as described in the next section. As mentioned, the core capabilities and strategic drivers will be analysed separately for more clarity.

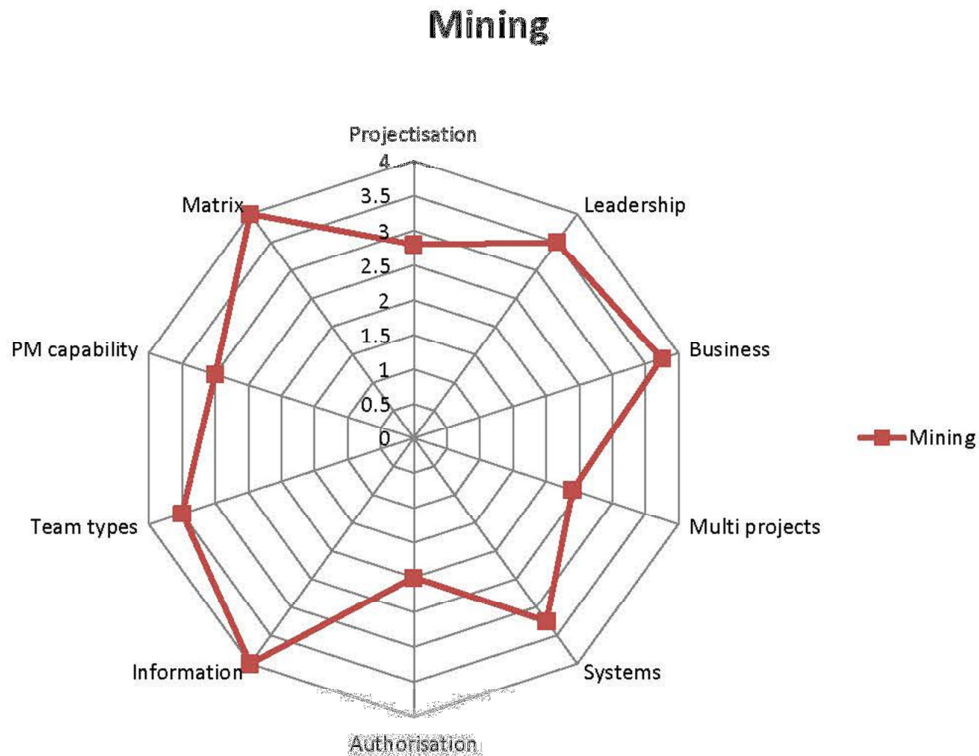
4 RESULTS

4.1 Core organisational capabilities

The results were plotted on a spider graph diagram model adopted from Cooke-Davis and Arzymanow (2003:475) for the purpose of comparing the findings. The first Spider Graph shown in Figure 1 indicates the results for the mining industry alone to provide a clear picture of the development in the ten domains.

An interesting fact to note from the data is that some of the domains have developed much faster than others and the following can be deduced from the data:

FIGURE 1: CORE ORGANISATIONAL CAPABILITIES IN THE MINING ORGANISATION



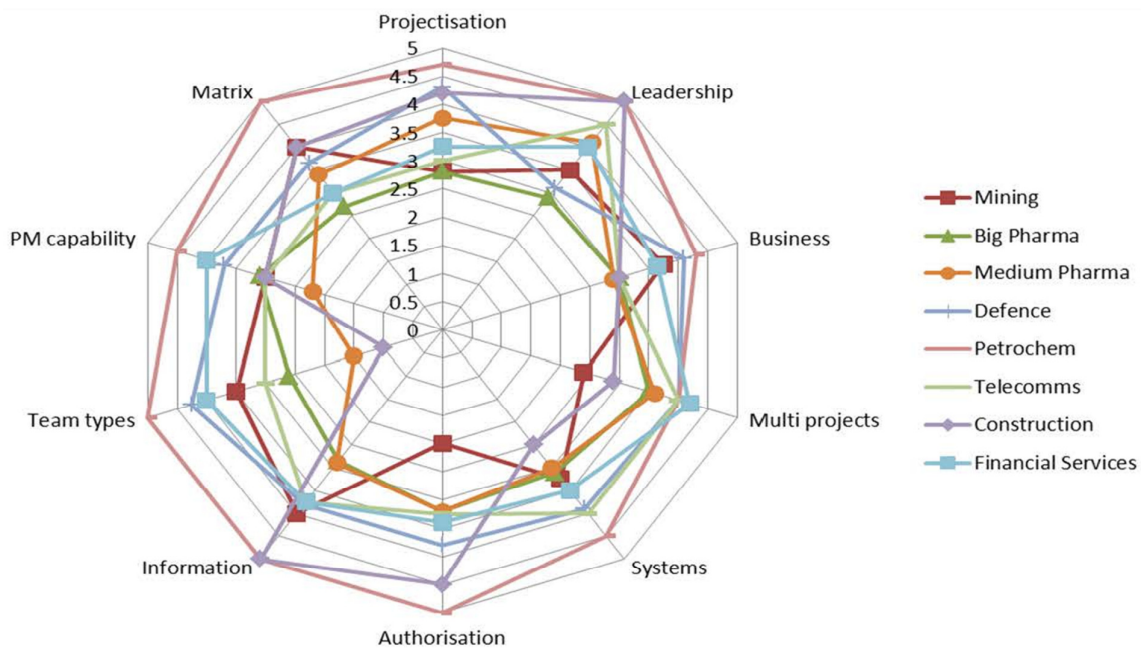
SOURCE: Adopted from Cooke-Davis & Arzymanow 2003:475

- The considered organisation made a clear decision to incorporate projects as a vehicle for performing certain work, indicated by the high score in the Matrix domain.
- The first step is normally to establish a project support office and get the systems and procedures rolled out to assist the project managers in their task, indicated by the high score on information and systems.
- Senior management seems to be committed to project management and has certainly given the project teams the mandate to execute the business goals through projects as indicated by the score of above 3.5 for leadership and business.
- The rest of the domains seem to lag behind in their development. The systems are in place, management is supporting the direction and everyone knows they need to drive the projects to be able to support the organisational goals, but the teams and the overall culture within the organisation still need to develop to be

able to positively support the new strong matrix (relatively low Projectisation score).

The combined results as compared to the results found in the research by Cooke-Davis and Arzymanow (2003:475) are shown in Figure 2. The graph is very “busy” and explains why Cooke-Davis and Arzymanow (2003:475) indicated the more- and less mature industries separately.

FIGURE 2: COMPARISON OF CORE CAPABILITIES OF MINING INDUSTRY



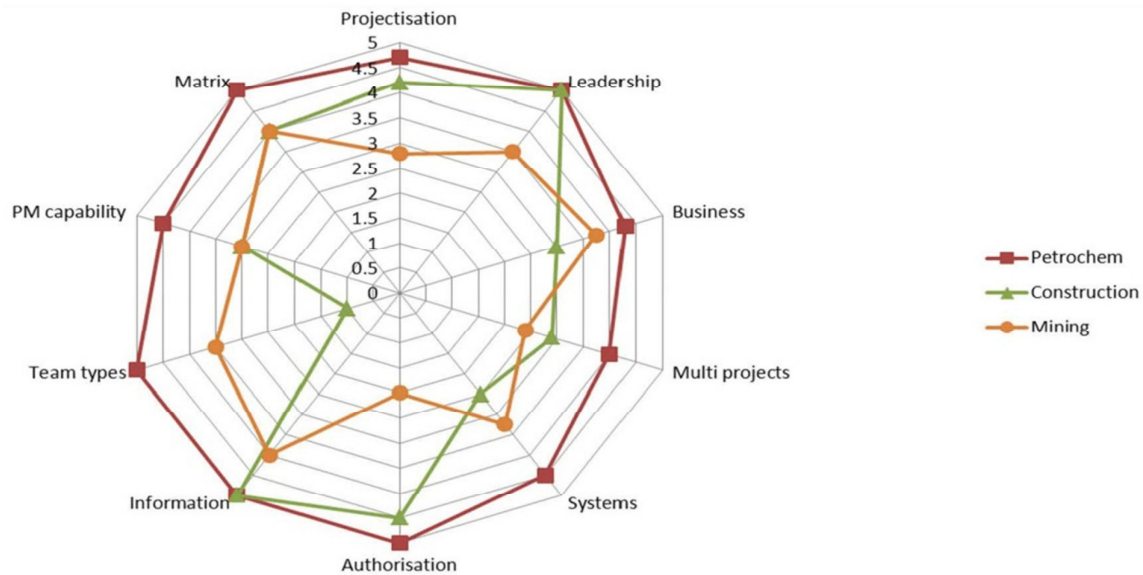
SOURCE: Adopted from Cooke-Davis & Arzymanow 2003:475.

In aid of better understanding, the mining industry will only be discussed together with the more mature industries as can be seen in Figure 3. When comparing the mining organisation with the rest of the industry sectors, one can distinguish between the industries where project management have been developing over a longer period of time. It appears that the petrochemical industry is well advanced on all the domains in comparison to the rest, followed by the defence industry.

An interesting observation to be made is that the construction and medium Pharmaceutical industries have been struggling to match their project teams to the project type or stage of the project. Once again, the senior management is fully supportive of the process and developed excellent tools in the form of information, but

the team development is lagging behind. The Mining sector (the business unit being considered in this case) seems to be well advanced in most areas but still lack in the two areas, Authorisation and Multi Projects.

FIGURE 3: CORE CAPABILITIES OF MINING COMPARED TO RESULTS FOR PETROCHEMICAL AND CONSTRUCTION



SOURCE: Adopted from Cooke-Davis & Arzymanow 2003:475.

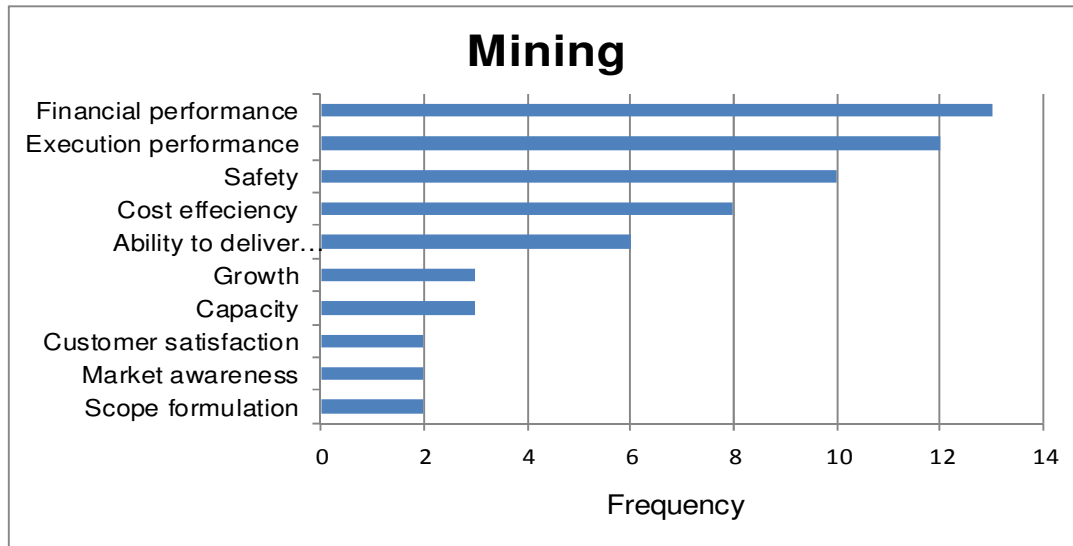
4.2 Key strategic drivers

The results from this study pertaining to the second objective is presented similar to the way that Crawford and Cooke-Davis (2010:Conference paper) presented their results, being a qualitative list showing the frequency in which a specific topic was raised and firstly shown separate as the result for the mining organisation in Figure 4.

Financial performance and execution performance were found to be the leading two strategic drivers as were the case with the study of similar industries abroad, done by Crawford and Cooke-Davis (2010:Conference paper). The propositions for the study were as follows:

- The Mining sector investigated is close to the petrochemical industry in nature, and the projects performed as part of the realisation of the strategy are, in essence, engineering and construction projects, therefore it is expected to yield results that are a combination of the two.

FIGURE 4: STRATEGIC DRIVERS IN MINING ORGANISATION



SOURCE: Crawford & Cooke-Davis 2010: Conference paper.

- Due to the nature of the Mining sector, with one of the key strategic drivers being safety, the results is expected to show a higher focus on safety in comparison to execution performance, or cost performance and, in essence, giving way to safety.
- The PMO within the Mining sector is also expected to be well established and well developed in their approach and execution processes with key competence focussing on schedule, stakeholder engagement and cost.

This was indeed the case when comparing the top 5 results from the Mining sector to those of the Petrochemical industry. Four out of the five items are present in exactly the same ranking pattern as indicated in Table 1. Execution performance did, however, rank higher than the safety driver in contrary to the proposition above.

TABLE 1: TOP SIMILARITIES BETWEEN INDUSTRIES

Petrochemical	Engineering and construction	Finance	Mining
Predictability	Execution performance	Execution performance	Financial performance
Financial performance	Financial performance	Cost efficiency	Execution performance
Execution performance	Stable and quality management	Financial performance	Safety
Safety	Meet customer expectations	Profitability	Cost efficiency
Cost efficiency	Innovation	Ability to deliver strategy	Ability to deliver strategy

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Core organisational capabilities

The results provided an answer as to the project management development level of the mining business unit. The level of project culture influence in some of the domains developed much faster than others.

The pattern displayed is interesting when analysed, showing that the business unit is well advanced in the development of its processes and support from the senior management. The shift in the mind set of management in migrating the business from a functional focused organisation to a strong matrix is also well advanced, but lacks growth in some areas. The organisation does not assign priority of allocation of resources according to the strategic importance of the projects, but is still in the growth phase of the project portfolio approach, prioritising projects and resources.

When comparing the Mining sector to the more 'mature' industry sectors as described by Cooke-Davis and Arzymanow (2003:477), the mining business unit appears under developed in the project management side in the execution of the projects, but well established in the processes.

5.2 Key strategic drivers

It was proposed that the two industry sectors of Mining and Engineering and Construction were very much related. The deduction was made based on the nature of the mining industry focusing extensively on the process of refining or extracting the desired product from raw material. It is, however, interesting that, although the safety aspect is third on the ranking for the mining industry, since one would expect it to be

higher up on the list, due to the explicit focus on safety within the sector and the topic of safety being on everyone’s radar in the mining industry.

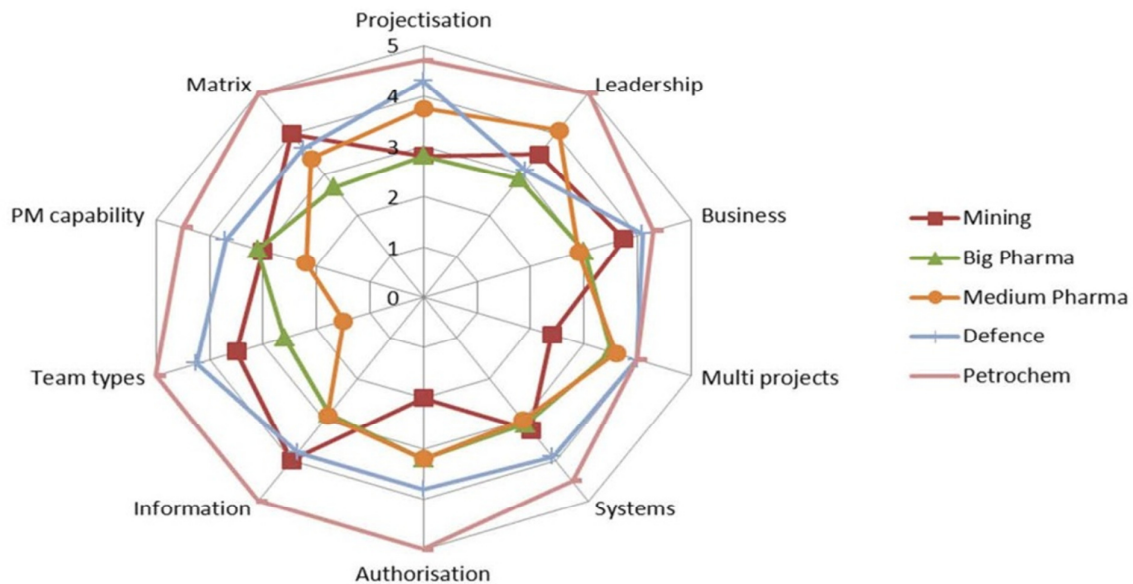
A similar comment can be made regarding safety within the Engineering and construction industry in South Africa. It should, however, be noted that the sentiment and importance of the safety aspect of the mining industry in South Africa is not necessarily shared all over the world.

As expected, the key strategic drivers of the mining business unit are very similar to that of the Petrochemical industry and the Engineering and Construction industry.

5.3 Contribution to practice

With the top three key strategic drivers being very closely matched between the Petrochemical, Engineering and Construction and the Mining sector, one would expect the organisational capabilities to follow the same pattern as the strategic drivers. As seen in Figure 5 it is, in fact, not the case with growth levels in the ten domain areas differing dramatically.

FIGURE 5: COMPANIONS OF STRATEGIC DRIVERS FOR MINING



SOURCE: Adopted from Crawford & Cooke-Davis 2003:475.

The top four strategic drivers for the specific mining organisation providing an indicative answer are:

- Financial performance.
- Execution performance.
- Safety.
- Cost efficiency.

The specific business has only been developing the PMO and culture over the past four to five years. This trend is visible in the key competencies that have developed well in the domain Information, Systems and the strong Matrix culture, but the growth and culture is still developing in the domains of strong authority and competency of the project management team. The third domain lacking in growth is a culture to empower projects through the management of the project portfolio to reflect the strategic importance of each project.

The deduction can thus be made that there are no direct relationships between the key strategic drivers in industry and the core organisational capabilities within the same industry sector. The development and progress of development of a project culture is therefore not a direct influence on the key strategic drivers in the organisation.

5.4 Generalisability

The mining industry in South Africa is well known for the gold industry, but also includes iron ore, diamonds, coal and platinum to name but a few of the other large members comprising the total industry. The specific research target group was conducted in the open cast and underground mining environment. The target group, therefore, represented two of the sub-industries.

The one organisation that formed part of the target group did not respond to expectation, and rendered the Delphi inconclusive for the underground mining portion. With this research being conclusive for only one of these sub-industries, the question of adequate representation within the larger industry sector exists.

5.5 Recommendations

It is recommended that a further study be conducted to include the broader mining industry, incorporating all the sub industries. It would also be interesting to see if there is a clear distinction between the different sub sections within the industry.

It is cautioned that this research should only be used as an initial indication of the key strategic drivers and core organisational capabilities within the South African mining industry.

Secondly, the Delphi research method used for data collection for this research lends itself perfectly to the limited number of respondents within the target group. It appeared that people more familiar with the researcher showed much more enthusiasm in responding, compared to people who saw the researcher as an outsider or possible competition. It should, therefore, be beneficial if a future research team would be made up of representatives from each of the sub-industry sectors.

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