Developing Capacity Building through Professional Development and Career Options: Insights from the Petroleum Profession

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor of Business Administration

By

Sultan Said Hamed Al-Shidhani

March 2017

Acknowledgement

This work is dedicated to all of those who seek knowledge and life-long learning, and reflect that in their knowing and conducts, and to my parents who were great inspiring and motivating examples for me.

I would like to acknowledge and thank PDO's (Petroleum Development Oman-the renowned company that I had the privilege to conduct my research in) leadership, management, and professionals for supporting or participating in this research. I would like to express my sincere thanks to its senior leadership for the support, guidance, encouragement, and provision of access to company's data and information, and facilities utilized in this research.

I would like to heartfully thank my family for their understanding and support during this research, without which I would not have been able to accomplish this great undertaking while maintaining a highly busy job.

I would like to express my sincere gratitude to my primary research supervisor, Dr. Nnamdi Madichie for the continued guidance, invaluable advices, and steers in conducting the research and reviewing the thesis. I extend similar gratitude to the second supervisor Dr. Caroline Ramsey for the invaluable guidance and support, and to Dr Allan Macpherson for providing me with invaluable comments and steers on my initial thesis write-up.

Table of Content

List of Tables

List of Figures

DBA Thesis Abstract

This research addresses the subject and practice of capacity building through professional development and career ladders in the petroleum (oil and gas) upstream or Exploration and Production (EP) sector. It focuses upon petroleum professions concerned with the evaluation, development and production of petroleum resources – notably petroleum engineers and geoscientists. The study adopts an insider action research methodology, with a particular focus on a national oil company – Petroleum Development Oman (PDO) LLC, which operates in the Sultanate of Oman. PDO epitomises a typical EP company undertaking significant professional development efforts across its sizeable pool of petroleum professionals.

Despite its wide operational remit, however, there are some key issues that have affected the firm and that warrant scholarly interrogation. Notable amongst these are challenges in developing specialists, technical professionals and managers who are competent and able to address the increasing technical, developmental, commercial, and managerial difficulties facing the oil and gas sector. Consequently, this study seeks to propose actionable remedial strategies to address these managerial skills and organizational capability gaps.

This research thesis offers valuable literature review of the concepts and practices related to capacity building, professional development, and career aspects. This has enabled bridging conceptualization gaps underpinning professional development and career management in the EP petroleum sector, particularly in PDO, and identifying elements and aspects that were considered in evaluating the studied case. Further, by examining PDO's organizational records and codes of practice, the study has established the company's intended strategies and approaches, hence allowing identifying gaps with practices as assessed by engaging PDO's executives, team leaders, and professionals.

In this research, insider action research approach was adopted with case study-mixed research methods combining qualitative and quantitative data collection using three main methods of enquiry. These methods were (1) four focus group discussions, (2) twenty one-to-one semi-structured interviews, and (3) an online questionnaire survey - with 147 respondents. These methods of enquiries enabled engaging executives, team and discipline leaders, and petroleum professionals who are either influencing or influenced by PDO's approach to capacity building through professional development and career options, hence enabling adequate case evaluation.

Four research questions (RQ) were posed with associated propositions outlining the research problem and describing the studied case for guiding the research activities and analysis. The RQs relate to PDO's approach in developing capacity through professional development, its professionals' uptake of their own professional development and career association, its dual career ladder model and organizational and individual professionals' factors influence it, and identification of more effective alternative strategies, frameworks, and practice options.

The contributions of this research are in the form of assessing the reviewed concepts, mainly capacity building, professional development, and career ladders/options, and studied practice case, and in the proposed model and improvements to the practice. This research found that organizational factors and professionals' considerations have significant and direct influences on PDO's capacity building. For instance, professionals on specialist career paths are driven more by attitudes and motives, while those on the managerial paths are driven more by the organizational support and enablers. The study also found that concept-practice gaps in PDO, such as the measure of career progression being based on job titles and positions, which is suitable for the managerial career path but less so for the specialist career paths. Advances in career theory have called for considering "roles" rather than "positions" as career units, which suit all career paths.

Additionally, the espoused dual career model in PDO is not fully in line with actual practice, in that the research showed that in reality three major career routes exist: technical management, specialists/functional and technical professionals/generalists. A number of professional and organizational/contextual factors and considerations were found to have an increasing impact on capacity building, professional and career development and management, hence requiring further investigations and the development of suitable strategies and approaches. A number of proposals to enhance capacity building and professional development in PDO were presented to members of PDO's senior leadership, who endorsed some of these actions and supported further evaluation and work on others. Notably, PDO senior leadership endorsed a proposed professional development framework and an alternative multiple career ladders model.

Key words: Capacity building, petroleum profession, professional development, career options, career ladders model

Chapter 1

INTRODUCTION

Petroleum Engineering and Geoscience professions constitute the main capabilities in the Exploration and Production (EP) sector of the petroleum (oil and gas) industry. Such capabilities define the capacity of the sector and its organizations to explore, develop and produce oil and gas. This research thesis addresses the professional development of petroleum professionals in Petroleum Development Oman (PDO) in light of its approach to building own capacity. PDO is an EP company operating in Oman. |For carrying out its hydrocarbon (oil and gas) exploration, development, and production activities, PDO is building capacity and develop capabilities that are essential enablers and requirements. With the stronger driver for nationalizing its workforce along with increased technical and developmental challenges associated with developing the remaining difficult hydrocarbon resources, the process of developing capacity building is not delivering and hence requiring review, assessment, and improvements. For instance, for over a decade of efforts to develop technical (specialists) and managerial capabilities, PDO was unable to develop required specialists in various areas of expertise. This is despite the senior leadership's support and the in-place management systems for achieving that. In addition, there are two major challenges facing the company in the near future, for which the company does not seem to have robust strategy to deal with. These are large number of Omani petroleum professionals joined the company who will not have sufficient progression opportunities with current operating model. The second is addressing the remaining hydrocarbon resources that require different ways of operating and more expertise than currently available in PDO. This research is addressing this problem through developing deeper understanding of PDO's approach in light of literature-reported concepts of capacity building, professional development, and career ladders, assessing PDO's practices, and taking and proposing actions.

At the outset of this thesis, I outline and briefly describe the industrial and organizational context, professional development in the petroleum industry, and capacity building in PDO. I also articulate the research problem and the aims and objectives of this research thesis.

1.1 Petroleum Industrial Context

Petroleum EP, also known as upstream, is a major sector in the petroleum industry employing an extensive and highly skilled workforce, particularly in engineering, geosciences, production operations, and other supporting professional disciplines. The sector is facing significant human resourcing challenges, particularly deficiencies in expertise and shortage of trained and experienced personnel (Drysdale, 2012, Orr and McVerry, 2007). I attribute these challenges to a number of professional, organizational, industrial and other external contextual factors. These factors include competition with other industries for talent, insufficient efforts at academic and research institutions to offer higher degrees in petroleum and in supporting oil and gas capabilities and professional development through internship programmes. Other considerations and factors include projected employment growth in the oil and gas extraction industries - according to the US Bureau of Labour Statistics (or BLS) - and the impact of fluctuating oil prices and demand for oil and gas on employment (Torpey, 2013). In addition, factors that are related to developing trends in professional career paths, such as weak career identity (Watson, 2006), and an increasing propensity to change careers (Weitman, 2006). Some of these factors are discussed and investigated as part of this thesis. The petroleum industry has undergone periods of low oil prices resulting in postponement or cancellation of development projects and lay-offs, which had significantly affected efforts to build and retain expertise, and to attract new generations of professionals. This situation had left the industry with an ageing workforce and reduced attractiveness of the sector to graduates (Bairi, Manohar, & Kundu, 2013; Vo, 2009). In recent periods of high oil prices, however – before the sharp decline in prices in the years 2014-2016 – there was increased demand for a qualified workforce to attend to new oil development and production activities (Alquist and Gervais, 2013; Morana, 2013). Despite the current downturn experienced by the oil industry, technical experts in various fields and qualified managers to deal with these technical and developmental challenges are also in increasing demand. Hence, the drive for petroleum companies to develop both technical expertise and managerial capabilities is significant and requires some serious research attention. This is even more pressing for 'oil-producing' countries and their national oil companies (NOC) such as PDO.

Leis, McCreery and Gay (2012) investigated the rise to prominence of NOCs and their increased ability to source financial, human and technical resources directly—despite this once being the exclusive domain of the large independent or international oil companies (IOCs),

sometimes known as multi-national oil companies (MNC). As they further outline, IOCs are facing new challenges to remain relevant to the NOCs, as well as to governments as resource holders. Leis, McCreery and Gay (2012) argued that the shift in control of the world reserves from 10% in the 1970's to 90% in the second decade of 21st century reflects the rise of NOCs. Therefore, the dominance of IOCs, with their focus on economic and share value considerations, has in the past tended to contribute to resourcing crises in the industry. For instance, layoffs and limited recruitment in times of low oil prices have affected the development of their workforce. In contrast, NOCs have national objectives, including employment and the development of local capabilities, as their main business drivers. This raises various challenges related to the ability to develop own capabilities and loss of experiences and expertise.

Despite the continued growth in the oil and gas industry, supported by increasing demand for oil and higher oil prices (Alquist and Gervais, 2013; Morana, 2013), Hopkins (2008) argued that the industry is not attracting enough young professionals and is relying on an aging workforce with an average age of over 50 years. There is, therefore, an urgent need to improve and step up recruitment of new staff and enhance the capabilities and retention of existing staff through training or other means. Drysdale (2012) focused on addressing the skills gap in the energy industry in the U.S, predicting that the demand for energy will increase by 40% by 2030, requiring significant investment in human resources. As an example of companies' realization of this skills challenge Drysdale quoted BP's 'Challenge Programme for the development of new talent'. Orr and McVerry (2007), discussing research conducted by Oliver Wyman that stressed the need for the oil and gas industry in the U.S. to hire and maintain skilled workers in order to achieve global success, outlined that knowledge will be the gauge of future value growth, driving the search for skilled talent to fill the experience gaps facing companies. They also highlighted that companies need to provide additional professional opportunities and financial rewards as a strategy to retain their skilled employees. Hopkins' (2008) investigation of the 'skills gap' or 'skills crisis' phenomenon led him to attributing it to number of factors; such as limited formal education in the petroleum disciplines. Improvements include collaboration between the industry and universities - the former investing in the latter - enhancing the attractiveness of the industry to young engineers, and by emphasizing the role of structured, modular learning packages for both university courses and continuous professional development. In developing countries, such as Oman, meanwhile, the majority of petroleum professionals are of a younger age, meaning that while the pressures of

an aging workforce are less than in the US, there is a greater skill gap in terms of experiences and expertise. In a similar argument, Gabdrakhmanova (2013) described ways to improve the quality of graduates in Oil and Gas Engineering by implementing a competence building approach, including the use of an activity approach for professional development.

1.2 PDO Organizational Context

PDO is the major exploring and producing company in the Arabian Gulf country of Oman. It started oil production in the late 1960s, and since then its resources, activities and workforce have seen gradual growth. PDO is an Omani company registered and operating in Oman in accordance to Omani laws and government policies. Its ownership has been constant since the early 1970's with the Government of Oman having the majority shareholding of 60% along with three other major IOCs (or MNCs); the Dutch/British Shell International, holding 34%, the French Total holding 4%, and the Portuguese Partex holding the remaining 2%. The company's website offers further information about the company and its activities; http://www.pdo.co.om/Pages/AboutUs.aspx.

PDO is a NOC but with strong ties with its largest private shareholder, the major MNC-Shell International. While the resourcing policies and capability development objectives for PDO is in line with those of an NOC in terms of nationalization of the workforce and building its own capacity and capabilities, it is still largely supported by its MNC partner, and is therefore affected by the resourcing and capability challenges IOCs face.

Influenced by its partnership with Western oil companies, PDO seemed to follow the Western MNC approach in respect to identifying and developing potential leaders, both as technical experts or managers. Vo (2009) explored how multinational companies (MNCs) localize human resources within their subsidiaries in the context of developing countries. Vo found that the differing approaches dictate possible career paths for local managers, in particular the approaches adopted by Japanese and American automotive MNCs operating in Vietnam. The American approach of early identification and selection of high potential staff and fast tracking, enabled managers to be moved quickly through organizational ladders. On the other hand, the Japanese MNC adopted 'wait and see' tactics for identifying and developing/progressing talent.

PDO's approach is to estimate a CEP (currently estimated potential) for its staff in their first years in the company. The CEP is an estimation of the job level the individual could reach in his or her career. Those with high CEP, i.e. potentially reaching director and managerial levels, get special attention and faster progression. Those with technical specialization interests and preferences are identified as potential experts and subject matter experts (SMEs), and their professional development is planned accordingly. As is assessed in this research, this approach affects capacity building through professional and career development in PDO.

As an energy company, PDO can be characterized as a knowledge-based (Woiceshyn and Falkenberg, 2008) or a knowledge-intensive firm (Horwitz, Heng and Quazi, 2003). Woiceshyn and Falkenberg argued that energy (petroleum) exploration and production companies are knowledge-based firms who seek to apply knowledge and technology to solve unique problems and creating value. Hence, petroleum professionals are knowledge workers, whose characteristics and professional development and career options are described below.

1.3 Professional Development and Petroleum Professionals

Professional development is defined in the Business Directory as the '*Process of improving and increasing capabilities of staff through access to education and training opportunities in the workplace, through outside organization, or through watching others perform the job.*' It is also called staff development. (http://www.businessdictionary.com/definition/professional-development.html). Guskey & Yoon (2009:499) stated that *'effective professional development requires considerable time, and that time must be well organized, carefully structured, purposefully directed, and focused on content or pedagogy'*. Career is strongly linked to professional development, since it describes the route of the professional progression.

Career ladders are described as career development and progression paths leading to either specialist/consultant or manager (Hirsh, 2006; Cesare and Thornton, 1993).

PDO's petroleum professionals are associated to one of five disciplines grouped into two main professional disciplines, geoscience (geologists and geophysicists) and petroleum engineering (reservoir engineers, production technologists (engineers) or petrophysicists). Petroleum professionals use knowledge and technology to create value and solve unique problems in areas such as defining and describing petroleum resources and reservoirs, developing recovery methods, and managing the implementation of these methods. They also have the professional

or functional expertise necessary to develop and deliver services and products, and to enhance the organizational aspects of the companies within which they work (Hirsh, 2006). Based on these characteristics, petroleum professionals are knowledge workers (Hirsh, 2006; Drucker, 1999; Van Staden and du Toit, 2011).

In describing careers in the oil and gas industry, Pike (2013) made the analogy of a three-act play; early years spent hands-on for young workers, before managing field activities and then holding senior management positions, and worker reminiscences. This analogy provides and overall description of the main professional stages for petroleum professionals. The first act represents the first common stage in the dual career ladders; the second is the divergent stage in which employees become either managers or consultants, while the third stage is either a continuation up the ladder or a career shift. Pike's article is one example among many that have been published in petroleum journals describing careers and professional development in the petroleum industry. These articles do not link strongly with other research and academic studies on the subject, and tend to rely more on their authors' accumulated experience and knowledge rather than on reviewing and evaluating reported studies and research in the literature.

1.4 Capacity Building

PDO's approach to capacity building is by driving professional development for petroleum engineers and geoscientists through a dual career path approach (technical or managerial) and by operating in a matrix organizational structure - with complementary line and functional responsibilities. This approach, however, is not adequately underpinned by robust theoretical conceptualization, or by evaluation of the effectiveness of its implementation in achieving the objectives of building organizational capacity and the development of petroleum professionals. Additionally, there are indications of various difficulties and hurdles facing full implementation and wide acceptance of these approaches among professionals. Although, supported by increased attention in the literature, the idea of dual career paths is gaining wider recognition and acceptance as a main feature in knowledge based work, there is limited published work and evaluation of dual career paths as means of capacity building in the exploration and production petroleum (oil and gas) industry. This study explores and investigates this situation, in a typical petroleum company, in order to propose improvements in both understanding and practice. Hence, this case study research aims to identify and assess

the factors, particularly organizational policies and practices, professional credentials and abilities, and a PDO adopted dual career model, that have an effect on PDO's approach to developing capacity building.

The literature (Torpey, 2013; Pike, 2013) notes that when developing competencies and building capabilities professionals and organizations follow and adopt different routes and approaches, in particular generalist and specialist routes. The petroleum professions and the associated career paths are not formally regulated (Rathman, 2013) compared to, for instance, the medical (Burket et al, 2010) and educational (Ebmeier & Hart, 1992) professions. However, competence assessment and definition of career ladders are means – albeit less formal - of regulations.

The concept of knowledge workers and dual career ladders outlined above forms the basis for this research. This enables an understanding and theoretical underpinning to be developed for petroleum professional development and capacity building through dual career ladders. This study seeks, therefore, to evaluate the effectiveness of PDO practices in developing and retaining petroleum professionals and in meeting organizational objectives by assessing the effectiveness of policies geared towards managing these dual managerial and technical career paths.

There are increasing gaps in capabilities in the petroleum industry at large and in the national oil companies (NOCs) in the main oil and gas-producing region of the Arabian Gulf. While the industry is experiencing aging workforce, the Gulf NOCs are – as part of their nationalisation drives – having young workforce. This situation poses challenges at both fronts inadequate replacement of expertise in some parts of the industry while needing to develop young professionals in the other parts. Bairi, Manohar and Kundu (2013) highlighted that major critical success factors in the oil and gas industry include knowledge acquisition from an aging oil and gas workforce. Outsourced service providers do offer a solution by tapping into experienced professionals acting as consultants or experts in the fields. These experts could be those in Pike's (2013) third act or worker reminiscences stage. Forbes (1987) examined patterns of early upward mobility for a cohort of 180 employees within an oil company over an 11-year period, and found that later positions were more predictive of career attainment than were early promotions and that the initial functional area and the number of different jobs held were related to career attainment. Forbes's study in some ways supports the career ladders concept by demonstrating higher career predictability once professionals have chosen their

career paths. As a success case of capacity building in a developing country, Panford (2014) carried out an exploratory study that serves as an inventory of petroleum skills, training and educational institutions in Ghana. This study sought to assess Ghanaians' state of preparedness to perform competently, especially in technical, professional, management, and supervisory jobs, and examined the extent to which the skills needed for the new petroleum sector exist in the country. A similar study in Oman should contribute to the on-going efforts in developing capacity through professional development. Concerning another dimension of capacity building through professional development, Cruthirds (2014) narrated how four female executives from companies in the upstream oil and gas sector are revisiting their companies' training and development programmes for technical and leadership roles.

1.5 Research Subject and Problem

To deliver its business goals and targets, PDO is realizing the importance and need for building capacity and required developing managerial and specialists' capabilities. However, given the strong drive for nationalizing its workforce while facing increased technical and developmental challenges, there are concerns over the effectiveness of building required capacity and developing professionals, particularly, as specialists. Hence, this research is addressing this subject and to contribute with improved understanding, credible evaluation, and actions to bridge the conceptualization and practice gaps. The research subject/problem is articulated as *'Assessment of PDO's approach to developing capacity building through professional development that adopts dual career ladders, particularly the underpinning conceptualization, its suitability and effectiveness, and professionals' uptake, career choices and commitments'*. Case study research enables an in-depth description and analysis of PDO's approach, as a specific real-life case, with the aim of providing actionable knowledge for the studied organization. In addition, as an example of action research the study incorporates actions in two fronts: in conducting the research and by developing actions for the organization to consider and undertake. The first is by embedding learning cycles and continuous research improvements. The second is by providing the organization with a research-based assessment of its current professional development approach, presenting a case for change, and specific implementable actions.

1.6 Research Aims and Objectives

This research aims to produce knowledge through bridging gaps between theory and practice, investigating a practice case of dual career ladders in a petroleum company, and developing actionable knowledge for PDO to consider and implement.

1.6.1 Research Gaps Petroleum Professional Development

The subject of professional and associated career development and management has not been extensively researched in the literature on the petroleum industry compared to, for instance, the medical and educational professions (Bairi, Manohar, & Kundu, 2013; Drysdale, 2012; Orr and McVerry, 2007). There are, therefore, significant conceptual and empirical gaps in current research, although there are some indications of recently increased attention to careers in the petroleum industry (Pike, 2013; Rathman, 2013; Torpey, 2013). Overall, however, current knowledge does not adequately conceptualize and assess professional development and career management practices in this industry. For example, Pike's (2013) suggested analogy of careers in the oil and gas industry to a three-act play to only offers an overall model that mostly fits the generalist career path without incorporating career changes and progressions. Other researchers have identified practice gaps and offered suggestions for the industry to consider, but these have not tended to focus on the specific needs of professionals. Rathman (2013) identified the legislation and evolving regulation that will affect the oil and gas industry in the United States, which can also be projected in other regions. On the other hand, Torpey (2013) reflected on the changes in employment in the oil and gas extraction industry and some of the professional and developmental challenges being faced. Additionally, there is an absence or inadequate development of tools and approaches for professional and career development in the oil and gas industry. Examples are career counselling and the roles of career practitioners in incorporating ethical, cultural, and practice voices (Watson, 2006), as well as a lack of links to advances in general career theory (Hoekstra, 2011). Van Staden (2014) asserts that the demand for knowledge workers is increasing, calling for changes to the traditional ways in which organizations view management hierarchy as the main career option, so as to include specialization, hence leading to the formation of dual career ladders.

1.6.2 Conceptualization of dual career ladders

PDO has adopted a dual career ladder model for its capacity building and the development of its petroleum professionals. This seems to be in line with the increasingly characteristic dual career path followed by knowledge workers: specialists or generalists (Drucker, 1999; Hirsh, 2006; Van Staden and du Toit, 2011). In PDO, however, these dual career paths are called 'technical' and 'managerial' (PDO CP-125, 2002), suggesting a slight difference in definition. For instance, PDO's managerial career path does not necessarily correspond to a knowledge worker's generalist career path. This study looks into the similarities and difference between these definitions/descriptions, and provides an empirical assessment of PDO's concept and approach. In addition, the study aims to identify and assess factors differentiating what could be described as technical (professional) careers from (technical) managerial careers, especially in relation to the existence of systemic capacity building elements (Mainiero, 1986; Potter and Brough. 2004). The study identifies and evaluates the potential effects of organizational and professional factors on PDO's dual career model, and how these can enable or impede the development of technical expertise or managerial abilities.

1.6.3 PDO's actionable knowledge

The main objective of this research is to address an organizational/managerial problem facing PDO – capacity building through professional development, particularly inability to develop and retain specialists. Addressing this problem requires producing actionable knowledge by conducting action research (AR) that combines collaborative problem-solving and knowledge cogeneration, and by driving change through the implementation of the researched solutions (Coghlan, 2007; Greenwood and Levin, 2007; Coghlan & Brannick, 2010). Collaborative problem solving focuses on the suspected deficiencies in PDO's capacity building and petroleum professional development, despite a decade long implementation of a dual career ladder model. This is achieved by engaging with PDO executives and professionals. Knowledge co-generation is achieved by linking petroleum professional development to the concept of knowledge workers' career paths and conducting an empirical study into this. The research study proposes and drives changes to PDO's capacity building processes, career model and professional development practices, as actionable knowledge. In these respects, the study encompasses:

1. A critical evaluation of PDO's professional development and capability management systems (intended roles and outcomes, and their effectiveness in achieving the set goals), and, in particular, the development of technical and managerial capabilities.
2. The investigation of professionals' perspectives on their professional development approaches, their career association, and the alignment of these with the organization's capacity building objectives, goals and strategies.
3. The identification and evaluation of the possible effects of organizational and professional factors on PDO's adopted dual career model, and the influences of these on the capacity building strategy and outcomes.
4. The development and promotion of changes to PDO's petroleum capacity building strategy, career and professional development framework, and practice options.

1.7 Main Research Steps

The research approach in this thesis followed two main orderly steps/methods of enquiry and analysis/action taking.

1. **Data Gathering:**

   - **Literature Review** (Chapter 2): Establishing theoretical and conceptualization bases for the researched subject and its dimensions. The review has also enabled identifying and evaluating relevance and importance of elements of the research problem, related topics and aspects for incorporation in this study, and has informed the researcher on how to go about investigating these aspects and elements, and the selection of appropriate research methodology.
   - **Organizational Data Review** (Chapter 4): Collecting and reviewing organizational information and data that describe concepts and practices in PDO related to the researched topic and practices, In particular, establishing links between PDO's organizational structure and systems, professional development schemes and career options, and issues pertaining to the studied topic to the research problem. Also, identifying petroleum professionals who are the potential research participants. These data and information constitute essential secondary data in the research and provide necessary inputs into the design of employed methods of enquiry e.g. interviews and survey.
   - **Engaging research participants**: Research participants were engaged through:

- *Focus group discussions* with selected research participants from PDO, as an exploratory and initial assessment of aspects and practices in PDO related to the research subject.
- *One-to-one semi-structured interviews* with executives and team and discipline leaders from PDO, as in-depth probing of the aspects and practice related to the research subject.
- *Online questionnaire survey* targeting all petroleum professionals in PDO, soliciting their understanding, perspectives, and stances on the concepts and practices in PDO related to the research subject.

2. Data Analysis and Case Evaluation:

Informed by participants' perspectives, stances, and experiences, the collected information and data are coded, presented, and compared in forms of quotes, graphs, and drawn comparisons: commonalities and differences.

- **Data Collection and Analysis and Evaluation of the Studied Case** (Chapter 5): by the literature review, organizational data, and research participants' perspectives and experiences, the studied case is described and evaluated through its main elements and aspects. These are organizational factors, professionals' personal factors, PDO's in-use dual career ladder model, and possible alternative professional development approaches and career model(s).
- **Case Synthesis, Case for Change, and Taking Actions** (Chapter 6): Building on the data analysis and evaluation of the case study, the different elements of the case are brought together and linked to synthesise the case and present case for change to the organization senior leadership for driving change and addressing the areas requiring attention and action.
- **Concluding with Reflections, Implications, and Outlooks** (Chapter 7): Concluding the research with reflecting on undertaking action learning and action research, and discussing research implications, limitations, and further research to follow up and build on this research.

1.8 Summary

This introductory chapter has outlined the background to the research and the industrial/organizational contexts in which it took place. It has also described the main aspects

of the research subject: capacity building, professional development and career options for petroleum professionals; and it has outlined the research problem and its main elements and related concepts. The research subject, the challenges facing professional development in the petroleum industry and the links to capability and career development and management, is plagued by significant knowledge gaps both at the levels of conceptualization and practice. Building on the concept of petroleum organizations as knowledge-based firms (Grant, 1996; Woiceshyn and Falkenberg, 2008), and recognizing that petroleum professionals are knowledge workers (Drucker, 1999; Hirsh, 2006; Staden and du Toit, 2011), with a differentiation between technical professionals (specialists) and technical managers (Mainiero, 1986), this study attempts to bridge some of these gaps. An action research approach addresses persistent organizational issues and assesses the suitability and effectiveness of a dual career ladder approach to addressing these capacity building and professional development challenges. The research produces actionable knowledge for the organization to consider adopting and implementing.

Chapter 2

LITERATURE REVIEW

This chapter presents a literature review carried out with the purpose of identifying issues related to capacity building through professional development and dual career paths in the petroleum sector at a broad or macro level. This literature review seeks to provide a theoretical underpinning to the central elements under investigation –i.e. the dual career ladder, with a view to further highlighting the implications for organizational development.

The two fundamental and overarching concepts in the research problem and as incorporated in PDO's business strategy and management philosophy are capacity building and careers, as reflected in PDO's policy and business documents (Chapter 4). However, these concepts are neither well described/framed nor clearly put to practice, particularly in terms of what they constitute and how to go about achieving or developing them. The literature provided an important source for better definitions, advanced conceptualization, framing, and wider and more comprehensive lists of related elements, hence providing essential inputs for properly addressing PDO's capacity building and professional development issues. The research problem/topic is framed in Figure 2.1 for guiding the literature review, with two overarching concepts (capacity building and careers) and four main themes (context, actors, approach, and factors/influences). For each number of elements and aspects are identified (Table 2.1) and assessed for applicability, relevance, and importance for PDO and for its petroleum professionals.

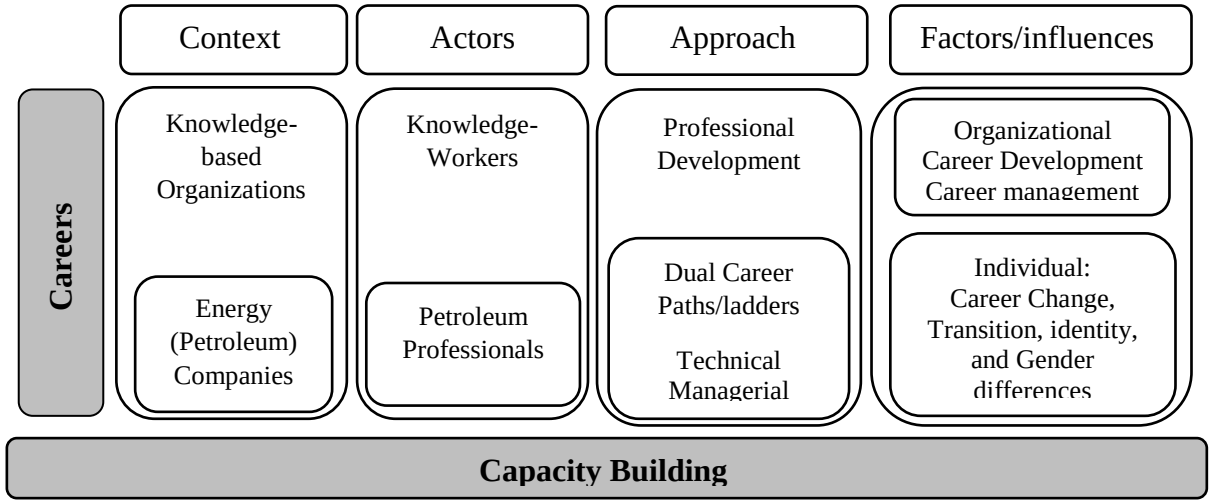


Figure 2.1 Elements of the literature review.

Source: developed for this research

Table 2.1 Concepts and subjects in the literature review

Research Element	Topic / Subject	Concept/theory	Main references
Base Concept	Developing capacity building	Institutional capacity building	Krishnaveni & Sujatha (2013)
		Capacity pyramid	Potter and Brough (2004)
		Components of capacity building	Franks (1999)
Base Theme	Career Theory	Careers as roles	Hoekstra, (2011)
		Career identity	Hoekstra, (2011)
		Protean career concept (PCC)	Gubler, Arnold, and Coombs (2014)
Context	Knowledge-based Organizations	Theories of the firm; knowledge-based view	Grant (1996)
		Energy exploration companies as knowledge-based firms	Woiceshyn & Falkenberg (2008)
Actors	Knowledge workers (including Petroleum professionals)	Single and dual track careers	Hirsh (2006)
		Main role at senior levels; specialist and management	Hirsh (2006)
		Issues and factors affecting the career development of knowledge workers	Van Staden (2014)
Approach	Professional development as Dual Career ladders	Careers as roles	Hoekstra, (2011)
		Career identity	Hoekstra, (2011)
		Protean career concept (PCC)	Gubler, Arnold, and Coombs (2014)
		Managerial and specialist career paths	Hirsh (2006) Cesare and Thornton (1993)
		Dual career ladders	July (2011)
		Attributes of Specialists and Generalists	July (2011) Cesare and Thornton (1993)
		Multiple career anchors	Wils, Wils and Tremblay (2010)
Factors & Influences	Organizational Factors	Career management policies	De Vos and Dries (2013)
		Organizational practices	Baruch and Peiperl (2000)
		Career development	Palade (2010)
	Individuals' factors	Mid-career transition and career crossroads	Peake and McDowall (2012), Weitman (2006)
		Career gender differences, female engineers	Buse, Bilimoria & Perelli (2013), Pazy (1987)
		'boundarylessness' career	Colakoglu (2011)
		Career development and the concept of career roles	Hoekstra (2011)

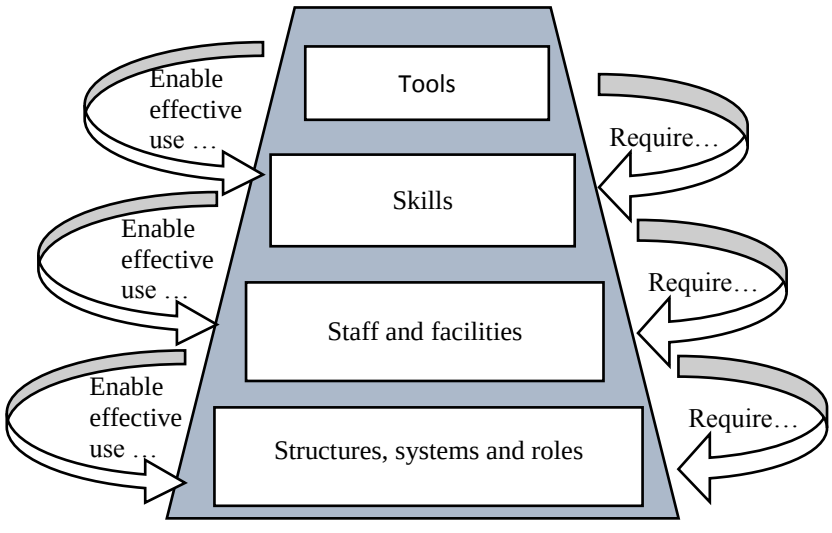
Source: developed for this research

2.1 Capacity Building

The base concept in this thesis is that of capacity building. Capacity building is not well covered in the literature; apart from "evaluation of capacity building" which has been the focus of a number of discussions (Labin, 2014; Suarez-Balcazar and Taylor-Ritzler, 2014). This study, however, is more concerned with developing an approach to building capacity and hence focuses on understanding the concept of capacity building in order then to be able to describe the factors involved in developing capacity building.

Potter and Brough (2004) stated that capacity building is the objective and component of many development programmes. However, they were concerned that narrated definitions are widely suspected of being too broad a concept to be useful. Krishnaveni and Sujatha (2013, pp. 17) defined capacity as: *'the ability of institutions, organizations, and individuals to carry out their tasks with their fullest potential'*. They identified two perspectives on institutional capacity building: a micro perspective, concerning human resources, and a macro perspective, concerning strategies to develop institutional capabilities. Based on insights developed from their comprehensive literature research and an evaluation of efforts of institutional capacity building, they proposed a six step systematic capacity building approach. These steps are: identifying existing capacity; assessing lack of capacity; consulting with stakeholders; forming a multi-stakeholder working group; developing demand-driven strategies to build capacity; and, assessing the impact of capacity building. While this study does not aim to develop an approach to capacity building, PDO's approach is assessed in this research considering these steps and concepts.

The literature offered number of capacity building-related concepts and frameworks that are useful for identifying and evaluating PDO's approach. Franks (1999) identified the components of capacity building as including increasing capacity, institutional development, and an enabling environment. These components vary in relative importance according to the situation. Potter and Brough (2004) called for a systemic capacity building approach based on a pyramid of nine separate, but interdependent, components, forming a four-tier hierarchy of capacity building needs; as reproduced in Figure 2.2.



Source: Potter and Brough (2004)

Figure 2.2 Capacity pyramid

These components correspond to the ones stated by Franks (1999) and are summarized in Table 2.2.

Table 2.2 Capacity pyramid and component

Capacity pyramid (Potter and Brough, 2004)	Components of capacity building (Franks, 1999)
Skills and tools	Increasing capacity
Structures, systems and roles	Institutional development
Staff and facilities	Enabling environment

Source: Developed for this research

Potter and Brough's (2004) model of a hierarchy of 'capacity building needs' provides an overview of the capacity building aspects, some of which can be linked to staff professional development and skills building. This research study investigates the influences of organizational (contextual) factors on the careers of petroleum professionals, and Potter and Brough's (2004) model (Figure 2.2) includes components (e.g. structures, systems, roles, and facilities) which relate to the investigated organizational factors.

Evaluation of capacity building (ECB) aims to improve programme outcomes (Labin, 2014) by employing a number of measurement tools and approaches. The literature reports continuous efforts to enhance ECB approaches and tools, reflecting the importance of ECB and the challenges it faces. Integrated ECB (IECB) is an example, for which Labin offered an update based on mapping the various concepts into a common framework, enabling the visualization of the relationships in the ECB process. Whereas, the original ECB model had five categories; (1) policies, practices, and processes (PPP), (2) mainstreaming, (3) culture, (4) leadership, and (5) resources (Labin, 2014: pp. 110). Integrated ECB enables the mutual effects of individual changes and organizational changes in a dynamic process to be identified, taking into account iterative effects and feedback loops. Labin also stressed that developing common measures of the ECB component elements is important to progress the science and practice of ECB. Suarez-Balcazar and Taylor-Ritzler (2014) argued for envisioning ECB science in a reciprocal relationship with current practice, describing this relationship as a '*science-practice model'* and arguing for the need to adhere to it by committing to conduct research that is responding directly and contributing to practice while creating synergies between practitioners and researchers of ECB. The concept of the model is '*We must strengthen the science to refine our*

practice and strengthen the practice and write about it to refine the science' (Suarez-Balcazar and Taylor-Ritzler, 2014; pp. 97). Although this thesis explores the aspects of capacity building in a specific setting, and is not a direct application of ECB, it can be considered to have elements of ECB such as policies, practices and processes (Labin, 2014). This research is in a way responding to Taylor-Ritzler's (2014) '*science-practice model'* and the call for research that contributes directly to practices. Important ECB concepts to take into this research study are (1) integrating component elements and (2) the science-practice approach and relationship. The first relates to how inadequate integration contributes to the deficiency in building capacity in PDO, while the second reflects potential gaps between conceptualization and practice.

2.2 Careers

Career ladders form the means and frameworks for professional development in PDO. However, there is inadequate conceptualization and definition of careers and their elements such as units and ladders/paths. The literature reflects differing and evolving definitions and dimensions of careers that are useful for defining and assessing PDO's career concepts and practices. Arthur (1988: 182) defined **career** as '*the succession of a person's work experiences over time*', and more recently, Hoekstra (2011:150) defined it as '*the sequence of occupational positions through the life span. The word "position" is deliberately vague: it may denote a profession, a formal job title, an organizational hierarchy level, or a reputation. A career results from many transaction processes, short-term and long-term, between personal and contextual factors*'. Hoekstra (2011), therefore, outlines a new concept of career roles as units instead of jobs describing careers, and offered a model of six universal career roles, consisting of maker, expert, presenter, guide, director and inspirator roles, which he defines as: '*Maker and Expert roles are defined in the realm of independent individual production*' (:163), '*Presenter and Guide roles are defined in the realm of interaction with others'* (:164), and '*Director and Inspirator roles are defined in the realm of collective developments of groups and organizations'* (:164). Considering units of careers as 'roles' instead 'jobs or positions' changes how careers are viewed, managed, and progressed in PDO, as is evaluated in this research.

Organizational careers have gone through changes and transition to 'Protean' or 'Boundaryless' careers (Hoekstra, 2011; citing Baruch 2006, Sullivan and Arthur, 2006, and

others). These changes are from organizations driving their employees' career development and progression to occupy jobs and positions, to professionals choosing their career options, identifying their career goals, and driving their competency building within their opted work fields. These changes are reflected in the emerging definitions of career, as reported by Hoekstra (2011); an '*unfolding sequence of person's work experiences over time*', or as '*the sequence of employment-related positions, roles, activities and experiences encountered by a person*' (Arnold, 2001 cited in Hoekstra, 2011). Hoekstra defined "career role" as a '*descriptive construct at the person level and the organization level at the same time*' (Hoekstra, 2011:160). Hoekstra also identified two aspects of career developed gradually by internal adaptive process and influenced by the person's environment: career identity and career significance. Career roles require social validation mechanisms and self-regulation, and provide a vehicle for achieving career significance and developing career identity (Hoekstra, 2011:161). Hoekstra stated descriptive personal dimensions of career roles to be career distinctive, integration, and structure motives, and environmental dimension as organizational values. It can be argued that describing careers in terms of roles provides a clearer basis for defining and framing the careers of knowledge workers, including petroleum professionals. That is, in dual career paths, the differences between specialists and generalists or technical experts and managers are clearer in terms of roles than positions. PDO's current career ladder model (described in Chapter 4) is based on positions progressed to. Adopting roles instead, will result in changing the model (Chapter 6).

Exploring another aspect in the development of the concept of career, Gubler, Arnold and Coombs (2014) conducted an integrative literature review of empirical research into the protean career concept (PCC). They described PCC as focusing predominantly on the motives of individuals in following a particular career path, along with two other related but differing concepts: protean career orientation (PCO), outlining an individual's attitude; and protean career path (PCP). The "boundaryless" career concept, meanwhile, is about forms of mobility. According to Gubler, Arnold and Coombs, 2014: S23), both the protean and boundaryless career concepts emerged in response to wider societal, economic and technological changes that have led to individuals, as opposed to traditional organizations, assuming more influence in the development and management of their careers. This led them to consider the protean concept as a useful tool for explaining some career changes and phenomena. Furthermore, it might be argued that the protean career concept explains the shift of responsibilities for career development and management from organizations to individuals and increased levels of career

change. Further, organizations do have a significant influence on the careers of their employees. This is related to adaptability, one of the four components of Gubler, Arnold, and Coombs' (2014) refined protean career concept model. The other three components are identity, being values-driven, and being self-directed. These four components are investigated in this research, in light of their presence, importance to petroleum professionals, and impact on the dual career ladders/paths approaches. Hoekstra's (2011) view of career units as roles, instead of jobs, also reflects the shift toward strengthening individuals' influences on their own careers and reducing organizational ones. Dual career ladders' models (including PDO's one) imply no interchange of career ladders/paths. This is in conflict with the protean or boundaryless careers that reflect easy and more frequent exchanges.

2.3 Context – Knowledge-based organizations

Organizations form the platform and settings where professionals are developed, and their characteristics define their roles and responsibilities needed to deliver the organizational objectives, targets and values. It is, therefore, essential to understand organizational characteristics and settings. PDO is an energy (petroleum exploring and producing) company. Woiceshyn & Falkenberg (2008) classified energy exploration companies as knowledge-based firms, where value is created by applying specialized knowledge and technology in unique combinations of resources in problem solving activities that are cyclical and iterative rather than sequential (pp. 86). Furthermore, working professionals in these companies, in particular petroleum professionals, are also characterized as knowledge workers having the professional or functional expertise necessary to develop and deliver services and products, and enhancing organizational aspects (Hirsh, 2006). In the case of PDO and petroleum companies, such expertise are on exploring for and producing highly variable petroleum resources.

Woiceshyn & Falkenberg (2008) described the approach of aligning knowledge-based resources as a 'value shop' model in contrast to a 'value chain' model adopted in firms producing and selling standardized goods and services through a sequential and routine chain of activities. To explore problem-solving approaches in knowledge-based firms, they studied exploration departments in four upstream petroleum firms, finding that all the firms employed the same resources (knowledge and its attached value, managerial and technical systems, and networks). Value in petroleum firms is created through problem solving, for instance, by addressing the uncertainties and complexities associated with deep, variable geological

settings, rocks, and hydrocarbon properties in the petroleum reservoirs. The knowledge base of a firm includes the knowledge and skills that employees bring to problem-solving tasks. These knowledge and skills vary in both depth and breadth according to the discipline (e.g. geoscientists, reservoir engineers) and specialization (e.g. theoretical modelling, technical application of models, niche expertise in reservoir descriptions and fluid characterization) of the individual professionals. Expertise and specialists' knowledge and experiences are also important components of these technical systems. Based on the above, it can be argued that petroleum professionals exhibit the characteristics of knowledge workers, including in the career paths they follow.

Given the lack of work specifically on the petroleum profession as a knowledge-based industry, however, this review relies on literature characterizing both knowledge organizations (Woiceshyn and Falkenberg, 2008; Horwitz, Heng and Quazi, 2003) and knowledge workers (Hirsh, 2006; Drucker, 1999; Van Staden and du Toit, 2011) more generally. While accepting that energy (petroleum) companies as knowledge-based, I challenge the widely-accepted concept of knowledge workers following only one of two career ladders/paths (specialists or generalists), instead – as is demonstrated by this research - multiple career ladders/paths provide better description for knowledge workers including petroleum professionals.

The organizations' context and mode of operating have major impact on their capacity building and on their professionals' development and chrematistics. For instance, PDO's matrix organizational set-up appears to be in-line with the dual career ladders model. Yet, PDO is not achieving its capacity building and development of its professionals. Hence, there is a need to have deeper understanding of organizational contexts and roles, and professionals' roles and motives. To understand the organizational context of knowledge-based firms, I reviewed Grant's (1996) work on the theory of the firm. Grant outlined the theories of the firm in a model of business enterprises that sought to explain and predict the firm's structure and behaviours. Grant argued that there is no single multipurpose theory of the firm, but rather every theory of the firm is an abstraction of an enterprise with a particular set of characteristics and behaviours. Grant argued that a resource-based perspective indicates that idiosyncratic resources and capabilities, with the prime role of management in optimizing the deployment and development of such resources and capabilities, serves to create the highest value. Although knowledge is a most strategically important resource, Grant stated that the knowledge-based view of the firm is an emerging concept that has not yet fully matured to represent a theory of the firm. Further, Grant argued that knowledge is central to other related

concepts, which have attracted significant research attention and development. These are organizational learning, managerial cognition, and the management of technology (Grant, 1996: 110). Furthermore, Grant outlined a set of premises that form the basis for considering the theory of the firm, such as its structure, performance and behaviours. Grant also built on prior research and reported advances in the literature, identifying a number of characteristics pertaining to the utilization of knowledge in the creation of value within the firm. These characteristics are transferability, capacity for aggregation, appropriability, specialization in knowledge acquisition, and the knowledge requirements of production. Whereby '*appropriability refers to the ability of the owner of a resource to receive a return equal to the value created by that resource… knowledge is a resource which is subject to uniquely complex problems of appropriability. Tacit knowledge is not directly appropriable because it cannot be directly transferred: it can be appropriated only through its application to productive activity*' (Grant, 1996: 111). The existence of the firm as an institution for producing goods and services is underpinned by having conditions under which individuals are able to integrate their specialist knowledge and expertise (Grant, 1996:112). Grant's concept of knowledge integration is somewhat different from that emphasized in the literature; instead of focusing on the acquisition and creation of organizational knowledge, Grant's argument is based on the concept that creating knowledge is an individual activity whereas firms have the primary role of integrating and applying the knowledge of their workers to the production of goods and service. On this basis, Grant stated that *'firms are conceptualized as an institution for integrating knowledge*'. Integration requires firms to coordinate the efforts of their professionals and specialists. Hence, organizational capability is a reflection of the firm's ability in *'accessing and integrating specialized knowledge of its employees*'. Such abilities can be achieved more with mechanisms of integration rather than just the sophistication of members' common knowledge and their specializations. This understanding of knowledge-based organizations suggests a need to define organizational structures better. For instance, the matrix organizational structure as in PDO - described in Chapter 4 - reflects two roles and career paths that correspond to the dual careers of knowledge workers. Grant identified two implications of this for knowledge-integrating institutions: the role of hierarchy and the location of decision-making (Grant, 1996: 117). The first is concerned with coordination and cooperation, while the second refers to the distribution of decision making in knowledge-based firms and is concerned with the links between decision rights and ownership, and with the co-location of decision-making and knowledge.

The characteristics of knowledge-based firms discussed above, and the knowledge-based view of the firm, offer a better understanding of the organizational aspects, issues and challenges facing petroleum exploring and producing companies, particularly when addressing value creation processes, management roles and responsibilities, behaviours, and performances of their professionals. Hence, this organizational definition and description provides the basis for characterizing Petroleum Development Oman (PDO) as knowledge-based organization, and its petroleum professionals as knowledge workers, as becomes further apparent in Chapter 4.

2.4 Actors: Petroleum Professionals as Knowledge Workers

Similar to developing understanding of petroleum companies – as knowledge-based organizations – characteristics, in this section I identify the characteristics of petroleum professionals based on those of knowledge workers, particularly career development and options. Hirsh (2006), when addressing the career challenges faced by 'knowledge workers', identified them as those with professional or functional expertise necessary to deliver the products or services of the organization, or to support the effective running of the organization. Van Staden (2014) in his doctoral dissertation *'The career development of knowledge workers*' stated that the term knowledge worker refers to the fact that the worker needs to be able to deal with large amounts of information, analyse and then generate knowledge out of this vast wealth of data, and then be able to use this knowledge to create the necessary products and services to provide a competitive advantage for the organization. Van Staden further stated that organizations have become more streamlined, getting rid of hierarchical layers of managers in an effort to become more agile and responsive to market demands. Thus, traditional careers that were hierarchical in nature have been abandoned. Further, the reliance on knowledge workers creates interesting problems for organizations since management is no longer the only career option available. Specialization and dual career ladders are required to ensure that the knowledge residing in the minds of knowledge workers are not lost.

Similar to PDO's dual career ladder model, Hirsh (2006) identified two career paths for knowledge workers: managerial and specialist. Specialists are the persons whose contribution to the business lies in doing detailed professional or technical work themselves. Hirsh stressed that knowledge workers are key to business performance in many sectors, as main deliverers, developers or supporters. Knowledge workers embody the organizational capability and they

constitute a highly demanded ‘corporate asset’ reflecting the increased role of technology, and the scarcity of their skills.

The importance of specialists and technical experts is underpinning PDO’s adoption of dual career ladders model – as is outlined in Chapter 4. Such importance is also reported in the literature and is assessed with this research’s participants, particularly executives and managers. Kochanski and Ledford (2001: cf., Hirsh, 2006) estimated the cost of losing technical and scientific professionals as three to six times that of losing administrative professionals. With the growing need for innovations, new developments, and complex problem solving, organizations are motivated to attract, develop and retain knowledge workers. Hirsh stresses the role of motivating knowledge workers, which is mostly achieved through acknowledging their *'stronger loyalty to their field of work or professional community than to their employing organization*' (Hirsh, 2006; 2).

In addition to the organizational structure, operating models and management systems have an even stronger influence on developing capacity building and on the effectiveness of the professional and career development. Hirsh (2006) identified four knowledge worker career management challenges facing organizations: job design and grading, career paths, career management, and motivation. These challenges are explored in this study in respect to petroleum professionals in a specific organizational setting. Additionally, Hirsh (2006) considered job families as a way of identifying the main functions in the organization, reflecting the distinct bodies of knowledge and professional grouping. The job families’ concept allows knowledge workers careers to be managed by allowing them to stay within the broad job family of a profession, while being able to move around the organization in other divisions and departments engaged with similar knowledge and skill bases, organizational tasks and capabilities. The job families' concept enables the design of specialist jobs, technical skill frameworks and career paths (Hirsh, 2006: 6), and is helpful in investigating career change among petroleum professionals (i.e. whether the career change takes place within job families, through a change of workplace and organization, or to new professions or disciplines).

Progressing in career ladders go along with professional stages that start as common for both career-ladders (managerial and specialist) and deviate afterward, reflecting the resumed differing roles and responsibilities. This means that job design and grading are important aspects and do pose challenges of aligning levels of work with career stages for knowledge

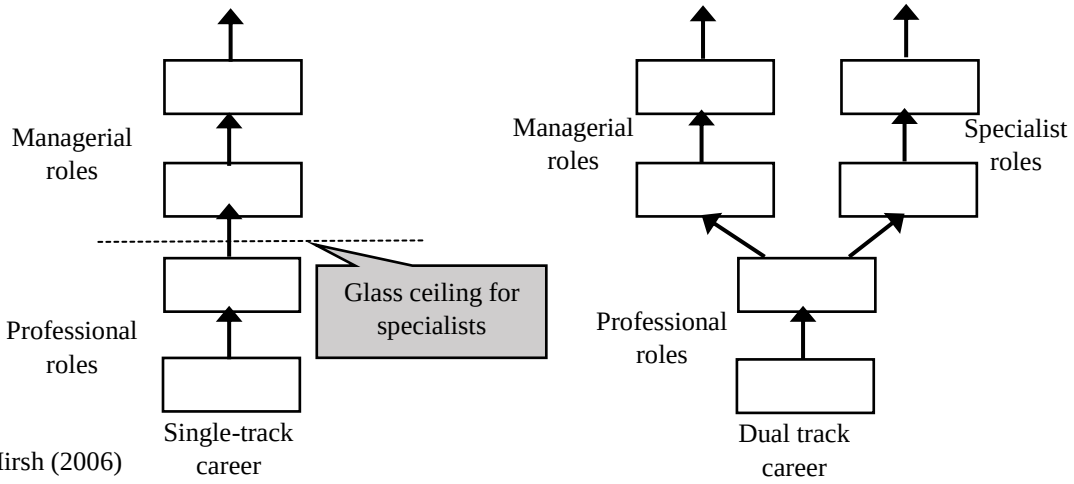
workers. For instance, job levels that are defined and measured by managerial responsibilities undermine the valuable expertise and contributions of technical professionals and specialists and limit their progression and opportunities to compete for these jobs. On the other hand, technical professionals and specialists might face business and decision-making challenges if they assume managerial roles. Knowledge workers, and in particular specialists, progress their careers in accordance to the intuitive model based on different levels in the organization reflecting degrees of autonomy, or the age-old system of craft training shifting from apprentice to journeyman to craftsman (Hirsh, 2006: 6). Daton (1977, cited in Hirsh, 2006) proposed four stages in specialists' careers based on a study of working professionals in the United States (US). These stages are apprentice, independence, mentoring, and strategic. In a further study, Daton (1989, cited in Hirsh, 2006, page 7) found significant numbers of specialists with limited or a complete lack of management responsibilities hence limiting their progression to only the second stage (independence).

Job roles describe types of job responsibilities, whether generic or particular, enabling the communication of what senior and specialist knowledge worker dose. To outline and clarify specialist careers, therefore, skill frameworks and role descriptions by levels are highly valuable and very useful (Hirsh, 2006: 7). In the studied organization, PDO, job descriptions (JD) exist for all petroleum professionals' jobs at all levels, along with job competency profiles (JCP) as the skills framework. While the first (JD) is job or position related, the second (JCP) is professional related. In optimum situations, placements on jobs or assignment of roles are guided by matching the job/role descriptions with the JCP of the candidates. In addition to the grade level - corresponding to salary group (SG) in PDO -, jobs in job families (i.e. petroleum engineers and geoscientists in PDO) are defined by role types. Hirsh (2006) identified two main role types at senior levels; specialist roles and management roles forming the commonly known 'dual career'. He argued that these two role types are not discrete or totally separate. This argument is supported by overlaps of responsibilities and exchange of roles between those on managerial lines with those on specialist lines – albeit less common - in some organizations such as PDO. Secondly, 'management' encompasses many different things, including managing people belonging to particular professional groups or the tasks of such groups. The latter can be described as 'functional management'. Based on this understanding, Hirsh makes an interesting observation that *'managers with only general managerial skills make poor decisions about technical matters*', and that *'technical or professional skills are central to credibility in functional management roles.'* (Hirsh, 2006: 8). He offered the example of the

major international BP (British Petroleum) in which there is a differentiation between leadership roles and functional management on the one hand and general management roles on the other hand, with functional leaders occupying most of the senior business roles. Based on this definition, there are three job roles; business leader, functional leader and specialist.

Moving between specialist and business leader roles is rare, but common between specialists and functional leaders. Designing jobs for senior specialists is highly challenging, in that if the role is designed around the individual, accounting for his/her specialty and expertise, it will distort the pay and job evaluation systems, and could lead to a misalignment with the firm's business objectives and performance. Petz's (1989, cited in Hirsh, 2006: 10) finding that *'scientists do not do their best work when they do their own thing in a protected environment*' supports this concern. This provokes a challenge in respect to countering the drive for autonomy by specialists with the need to collaborate to deliver business objectives and achieve tasks. In other words, specialists need to incorporate managerial considerations and not just the purely technical ones. This leads to a key challenge for knowledge-based firms of how to align specialist and managerial ones. In meeting this challenge, Daton's four professional levels are linked to management roles: apprentice as junior professional, independent fully fledged professional as junior manager, mentoring senior professional/specialist as middle manager, and strategic as senior manager. In PDO's matrix organizational structure, there are two sets of roles corresponding to professional levels in both the line and the function.

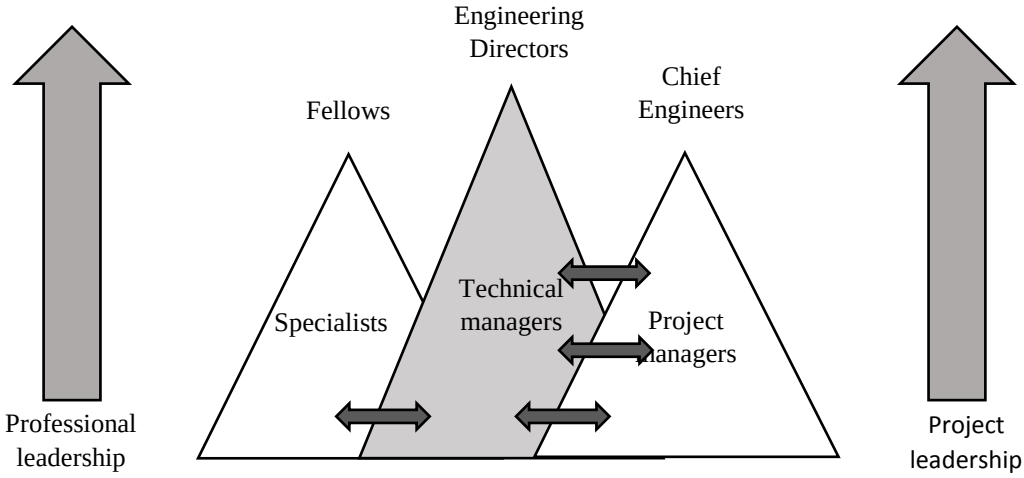
The attractiveness of the specialists' career path is lower than that of the managerial career path. Grady and Fineham's (1990, cited in Hirsh, 2006: 16) study of a Research and Development (R&D) laboratory in Australia suggests that specialist career paths are seen as inferior to those for managers, hence recommending that dual career path approaches ensure that they provide 'equal opportunities in both status and compensation'. For knowledge workers, career ladders fork at certain points in line with Daton's professional levels model, but not necessarily adopting the four levels. Adopted from Hirsh (2006: 17), Figure 2.3 depicts single and dual careers ladders. PDO has followed a similar model for dual careers in the petroleum professions (Chapter 4).



Source: Hirsh (2006)

Figure 2.3 Single and Dual track careers

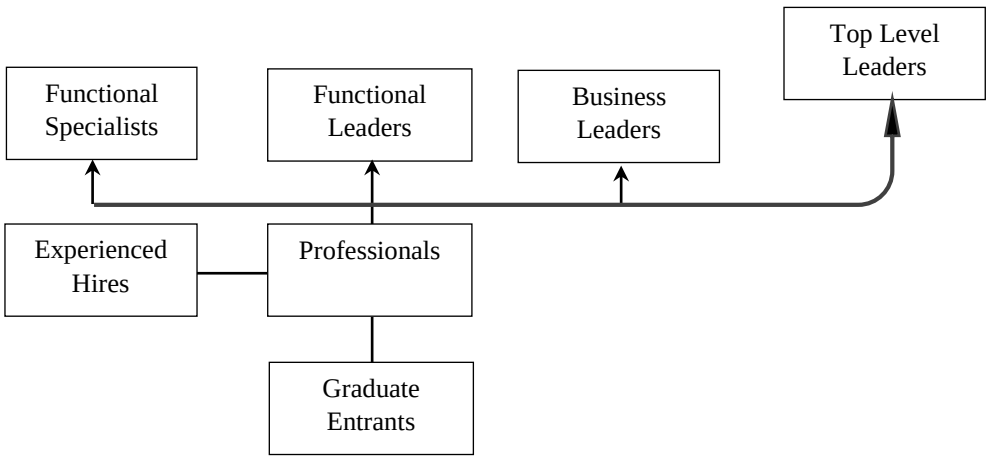
While dual career paths are valid approach, as argued Hirsh (2006), there is potential for multiple career paths, such as the one depicted in Figure 2.4.



Source: Rolls-Royce plc, 2004 (from Hirsh, 2016)

Figure 2.4 Multiple career paths for engineers

An important aspect in dual or multiple career paths is the flexibility to move from one path to another. As demonstrated in Figure 2.4, flexibility exists for specialists to move to technical managers, for project managers to technical managers, and for technical managers to either specialists and project managers. The major oil company BP has adopted this flexible model for careers (Figure 2.5)



Source: BP, 2003 (from Hirsh, 2006)

Figure 2.5 Varied leadership career paths

The varied leadership path depicted in Figure 2.5 shows four senior level options, which also exist in the studied organization (PDO). Number of questions are raised about mobility between these senior roles, however; regarding compatibility with the career divergence models (Figure 2.3 and 2.4) and the possibility of re-convergence; i.e. re-skilling and acquisition of the essential knowledge and abilities needed for each of these senior roles. Some of these questions are investigated in this research. Hirsh (2006) also discussed, albeit briefly, the important issue of the ease with which career paths can be changed outside one organization. There are number of aspects to be investigated about changing career paths when professionals join other organizations through either secondment or recruitment. The implications extend to the individual adaptability and disruption of careers on the one hand, and to organizations' retention ability and loss of its built capacity on the other hand. It is important and valuable for both professionals and organizations alike to understand career changes, the consequences of professionals moving to other organizations, and the magnitude of disturbance or enhancement caused. This research, however, will only explore limited aspects of this problem, based on the composition of participating PDO petroleum professionals and their experiences with career change.

The existence – or perceived - of career ceilings and career expectations in the light of dual career paths (Hirsh, 2006: 23) are also important dimensions to be assessed with PDO research participants. This is particularly relevant with the reduced positions and roles in the organizational pyramid structures with the moves toward flatter structures, and the high market demand for professionals, including freelance consulting, along with the emerging high

mobility and aspirations of professionals. At the heart of this issue is the ability of organizations to value their professionals, particularly specialists, by rewarding them, and by enhancing their roles and impacts. Career progression is a critical component in moving through career ladders but can be different in the various career paths. For managing career progression, Hirsh (2006) identified three basic models; post-led (or 'pull'), person-led (or 'push'), and recognition awards. In PDO, the first is mostly applicable for the managerial career path, while the second for the technical/specialist career path. The issues, challenges and opportunities associated with these progression models are investigated in this research. Progression and rewards, for instance, are governed by the organizational human resourcing systems and processes, and so career development and management.

Human Resource (HR) systems and processes have a huge effect on career management. For knowledge workers, including petroleum professionals, competency frameworks are widely used (Hirsh, 2006: 28) and provide essential guidance and references for progression into career ladders. These frameworks require continuous updating, however, in order to reflect advances in knowledge, technology and competencies. They also must be supplemented with technical skills frameworks as objective criteria for assessing professionals' functional and professional works. According to Barber et al. (2005, cited by Hirsh, 2006), Shell recruits its graduate entrants from engineering and science disciplines starting with an assessment centre. The assessment centre uses some selection criteria that balance *"technical skills and orientation on the one hand, with signs of future leadership potential on the other*" (Hirsh, 2006: 29). Since Shell is a major shareholder and technical advisor for PDO, PDO adopts many of Shell's management systems and processes including the graduate recruitment assessment centre. This is widely considered in PDO – and as pointed out by interviewees in this research- to have significantly improved the quality of the intake. However, the emphasis on leadership potential in the selection does pose a challenge to the development and retention of specialists on the one hand and to managing the career expectations of those in the managerial career path on the other hand. This aspect is further investigated in this research. Other HR aspects that have an effect on knowledge workers' career paths and progression, according to Hirsh (2006), are early career development design and support, job filling and deployment processes, succession planning and talent management, and support for career choices. As indicated earlier, the motivation of knowledge workers is a key component in their career management, particularly in the specialist/technical career path. According to Hirsh (2006), there is substantial research literature on motivating knowledge workers, particularly specialists. In this

regard, job challenges are major motivators for specialists (Arnold, 1997 cited in Hirsh, 2006). Hoppe (1993, cited in Hirsh, 2006), meanwhile, identified the top work goals of international R&D scientists as challenge, freedom, a good relationship with managers, and co-operation, while the lowest were employment security, working with prestigious organizations and good physical working conditions. This research assessed whether PDO's petroleum professionals, both on the technical/specialist and on managerial/general career paths, consider similar work goals. Newell's (2000, cited in Hirsh, 2006) model of six key requirements of knowledge workers are used for this analysis – specifically, autonomy, keeping up to date, participation in missions and goals, achievement, and professional identification. While many of these work goals differentiate knowledge workers, particularly specialists, from other workers and professionals they have implications for both individuals and organizations, particularly in terms of loyalty and alignment with organizational business objectives, policies and processes, and the challenges of managing and motivating specialists.

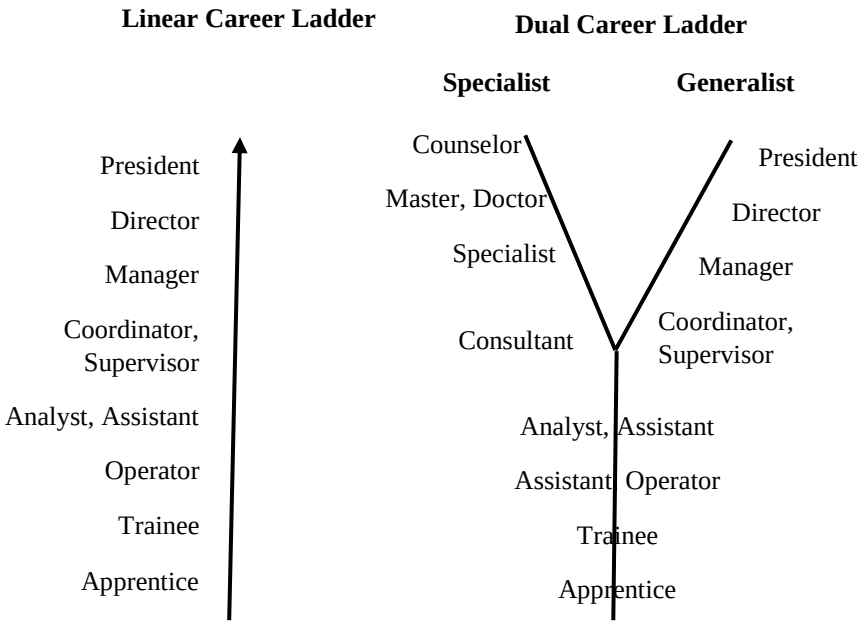
Petroleum professionals are knowledge workers, and hence develop professionally along one or more career paths; of which the generalist and specialist routes are particularly accepted and described (in PDO's classifications, technical and managerial). Additionally, there are indications that these career paths are in many instances interchangeable.

2.5 Professional Development Career Paths - Technical versus Managerial

Dual career ladders/paths

The dual career ladders describe the steps of professionals follow in their opted career paths. The concept of dual career ladders/paths existed from 1950's (Cabanes, et al (2016). Each of the two career ladders or paths are called and defined in the literature as generalist or managerial and as technical specialist or technical. In both cases, the first naming indicates wider professional's characteristics and roles than the second. In a review of the literature on dual career ladders, July (2011) explored the differences between specialists and generalists' profiles and considered both organizational and individual perspectives. The review was a summary, however, rather than an in-depth and comprehensive review. This indicates the limited number of in-depth studies in this field. July argued that the paradigm of identifying managerial leadership positions with successes and prestige breaks down in the face of famed specialists. The multiple career lines (July, 2011, citing Drucker, 1999) reflect differences

people have in their abilities, acquired competencies, preferences and experiences. Successes and demonstrated abilities in particular roles and activities do not necessarily result in abilities to perform well in other roles; managers might fail in specialist role and vice versa. For instance, linear careers pose limitations for personal growth for people with technical profiles (July, 2011 citing Noe, 2002). The dual career ladder (Figure 2.6) offers a career development plan that enables ascendant mobility and growth to managerial or consultant/specialist roles and positions (citing Cesare and Thornton, 1993 and Noe, 2002).



Source: July (2011)

Figure 2.6 Linear and Dual Career ladders

July (2011) outlined the differences between the specialist and generalist profiles from two lenses; external (e.g. market) and internal (organization). The generalist profile is seen externally also as an expert in management practices. The differences are much clearer in the internal lens, with ten attributes (Table 2.3) identified by July (2011) based on a number of perspectives found in the literature. Externally, however, it might be argued that specialists are becoming more differentiated by their areas and levels of expertise, similar to managers in their areas of experiences and sectors/industries.

Table 2.3-Attributes of Specialists and Generalists

	Specialist	Generalist
Focus	Result of the process, specific improvement, discoveries, problem solving, high specialization	Global result
Vision	Specific – deep Knows much about some areas	Systemic – general Knows a little about each aspect of a given business
Perspectives and knowledge	Micro (details) Smaller variety of themes and bigger deepness. Knowledge elite	Macro Greater variety of themes and smaller deepness.
Hierarchical growth	For each step the expectation of a bigger degree of freedom and de autonomy in the practice of one's specialty, and in the direction of one's projects	Each step brings the expectation of more power and influence. Freedom and autonomy are seen as rewards for good work and not as duties
Management	Of processes and projects	Of people, processes, and projects
Commitment (identification)	Commitment to the specialty area	Commitment to the organization
Learning	It takes years to master the technical aspects. Training for thinking in a meticulous way about the area of performance, using a precise and objective terminology	A faster speed of conceptual evolution (due to a shallower context). More frequent and more valued changes of area – for the achievement of a fully systemic management
Simultaneity and productivity	Accumulates "specialty" More productive when performing in one initiative at a time	More productive when coordinating multiple activities
Decisions making	When before tangible and complete evidences	Based on intangible and limited evidences.
Source of motivation	Learning Enrichment of the work	Advance, progress Broadening of scope

Source; July (2011)

One could also argue that managers' competencies and abilities are externally recognized with demonstrated managerial successes that are enabled by the macro-level (global) conditions and settings of organizations and industries. On the other hand, experts are mostly recognized in their fields at micro-level (field) conditions and settings. Viewing the differences through evaluation and assessment lenses, generalists (managers) are assessed mostly on their (perceived) influence on people and their business impact, while specialists are assessed on in-depth knowledge and peer and institutional recognition as authorities in their field and subject matter. This difference in the approach to evaluation and recognition is fundamental in that it is more robust, sustained, and requires more effort for experts compared to managers. That is, expertise, experiences and in-depth knowledge are more objectively measurable against set references and merits, while managerial capabilities are measurable by impacts and influences.

Professional identity is another important attribute that varies in strength and impact to professional development and career progression. Cesare and Thornton (1993) stated that specialists define and identify themselves through their professional identity rather than a corporate one, in contrast to generalists who identify themselves with the organizations they work for. Specialists place high importance on growing professionally through continuous skills development and achieving mastery in their field of specialization. Hence, a dual career ladder is an effective strategy for attracting, developing, and retaining specialists. Cesare and Thornton argued that a number of factors lead employees and job applicants to consider themselves as specialists (technical or professional) and not general managers. These factors include changing social values and increased educational levels. Further, they characterized specialists as segregated into their disciplines, while generalists have macro perspectives and are able to deal with a breadth of activities and projects. They distinguished between two cultures; the professional culture and corporate culture. The first values the continuous development associated with specialist disciplines, while the latter values commitment to the organization.

For developing and retaining professionals, it is essential for hosting organizations to recognize that professionals on different career paths have different attributes and preferences (e.g. Table 2.3). Cesare and Thornton call for the differences between generalists and specialists to be recognized. Citing previous studies (Cesare and Thornton, 1993: 32) conducted in the early 1980s with a large pool of surveyed employees from over 1200 organizations, they found that over 50% of specialists planned to leave their place of employment. With globalization, ease of mobility, and increasing demand for specialists, one would expect more specialists to be willing to leave their current employing organizations in today's conditions. Cesare and Thornton (1993) stressed, "Learning is the key" to specialists, hence they consider work as a mean to further develop their competencies, skills and professional prestige, and hence career development and expectations are central to retaining and attracting specialists. Cesare and Thornton identified five global factors from the literature that enable competency development and skill acquisition, particularly for specialists; autonomy, skill variety, task identity, task significance and feedback. In contrast, generalists do make decisions based limited evidences or intangibles, and consider autonomy and freedom in the job as rewards not as requirements (:32). This suggests a significant contrast between specialists and generalists, as argued for by Cesare and Thornton (1993). As depicted in Figure 2.6, however, these two paths diverge after professionals have built their core discipline and field knowledge and skills, and have reached

a senior level. This concept “the dual career ladders” is acknowledged by the Cesare and Thornton (1993: 37) when they describe the dual career ladder as being Y-shaped. They argued, based on the perspective of total segregation, that specialists are not trained in and do not have experience of managing people. This would seem to constitute a significant gap in career development and capacity building, but in real life there such total segregation does not exist. Specialists do deal with people and business aspects and managers do deal with technical aspects and processes. Since both specialists and managers start their careers by building core discipline and field knowledge, however, it is argued that managers only develop managerial competencies once they assume managerial roles. Although this article is over two decades old, it still reflects today’s concerns and issues related to inadequate recognition and understanding of specialists’ needs, preferences and ways of developing and working. On the other hand, those pursuing the managerial career path while benefiting from the core technical knowledge and experiences, only develop their managerial competencies once they take up the managerial post, and hence are not adequately prepared. Specific aspects are related to motivations, retention and continuous learning and development. This research investigates these issues.

Dual career ladders/paths challenge

While specialization is increasingly attracting more professionals, there are still many, including engineers, who see more prospects and higher career progression in the managerial career line. Srour et al. (2013) investigated the reasons why engineers choose an advanced degree in management related studies rather than further specialization in a technical field, and in particular Master's degrees in Engineering Management (MEM), and how this decision relates to career planning and progression towards managerial positions. They found that many engineers opt for management studies rather than technical field specialization if they decide to pursue an advanced degree. This conclusion was based on a survey of Master of Engineering Management (MEM) graduates in Lebanon. Although it may be that the desire to pursue MEM is indicative of a preference to follow managerial career paths, such a conclusion would only be valid if the surveyed engineers were representatives of all engineers not just those who opted for MEM and from other countries. This study, therefore, assesses the preference for managerial or technical/specialist career paths with all petroleum engineers/professionals in PDO invited to participate.

In addition to acknowledging professionals’ varying attributes, preferences, and considerations, organizations’ approach and systems to manage their development and careers must also

reflect such differences, and no one-size fit all. Cabanes, et al (2016) argued that the management of technical staff (e.g. engineers, researchers, and scientists) – the dual ladder is currently the main system used by most organization - is increasingly crucial for science-based organizations. They also argued that this over 50-years in-use management device – dual ladder - has been strongly criticized by researchers and practitioners, hence proposing to complete the dual ladder system with organizational structure that accounts for the role of experts and technical staff collective action. Further, Hoffmann, et al (2016) argued that despite potential benefits of dual ladder career systems in retaining and motivating R&D professionals, facilitating such positive effects is hindered by lack of knowledge of design properties of dual ladders. And by drawing on contemporary justice theory, they identified two factors that are integral for the successful application of dual ladders. These are the transparency of the dual ladder and perceived equality of the technical ladder, which were tested to have positive relationship with professionals' career satisfaction and their organizational commitment. In a similar study, Biron and Eshed (2016) focussed on the gaps between employees' actual and preferred career paths (technical or managerial), they found performance levels are lowest for those on technical paths but prefer to be on managerial paths, and the burnout levels are lowest with those with career path fit. These recent studies identified gaps and issues with the dual career ladders systems. While efforts are put to improve these long-existing staff management systems, the system of dual ladders is challenged.

Multiple career paths

The concept of dual career ladders is based on two areas of professional development and work responsibilities: management and technical expertise/specialization. However, in real life situations these two areas overlap resulting in more than two career paths. Mainiero (1986) investigated the early career factors that affect the decision to move from a technical professional job to a technical management position, by interviewing scientists and engineers from two R & D divisions in the chemical industry. They were categorized into three groups; career technical professionals by choice, technical managers, and career technical professionals by default. Mainiero found that the first two were characterized by a favourable job structure, access to mentors/sponsors, and entrepreneurial initiative, while the third group was characterized by the absence of these factors. Similar classifications apply to PDO petroleum professionals, although the first two groups have defined career ladders: technical (specialists by choice) and managerial (technical management). The third group is also present in PDO:

technical professionals (by default) who do not have a defined career ladder. This study confirms that this group exists, and explores its size and possible differences compared to the other two groups.

Further, career anchor(s) is a concept that explains possible multiple career paths. According to Schein, 1978 cited in Wils, Wils and Tremblay, 2010: 236) the psychological process that underlies career anchors or career orientations is shaped around three poles: basic values and attitudes, self-perceived motives and needs, and self-perceived work talents and abilities. Based on a study of 880 Quebecois engineers, Wils, Wils and Tremblay challenged Schein's theory of career anchors, particularly the dominance of a single career anchor or orientation that gets enforced with experience (Rodrigues, Guest and Budjanovcanin, 2013). Wils, Wils and Tremblay (2010) re-conceptualized the idea in terms of multiple dominant anchors. In another study, Roberts (1994) assessed the career paths of scientists and engineers in their transition into management. Roberts used Human Research Information System data from a large R & D firm to explore alternative perspectives for careers in which the transition is seen as an efficient human resource promotion strategy. Based on the above, this thesis makes the argument that transition and change of career paths challenge the concept of a single career anchor or orientation and supports the notion of multiple anchors and orientations that develop with time.

Professional development is a responsibility of and highly influenced by both organizations and professionals. Defining and agreeing on the roles of each is an area that is not always achieved. Guskey (2002) described levels of evaluation for improving professional development as ranging from participants' reactions and learning, organizational support and change, use of skills and new knowledge, and learning outcomes. Guskey and Yoon (2009), based on a major synthesis of the research, argued that undertaking professional development, planning and implementing responsibilities requires learning how to assess and evaluate the effectiveness of such undertakings critically. They stressed that *'effective professional development requires considerable time, and that time must be well organized, carefully structured, purposefully directed, and focused on content or pedagogy'* (Guskey and Yoon, 2009: 499). These studies support the notion that professional development is a joint effort on the part of both the organization and individuals. How much of and what efforts are the responsibility of the organization or the professionals is explored in this study, along with the level of understanding and recognition of such responsibilities in PDO.

2.6 Organizational and individual factors

Capacity building through professional development is influenced by various organizational and individual-based factors. The first of these stems from the organization's management systems, policies, work environment, structures, culture and practices, while the second reflect individual behaviours and attitudes, acts and experiences, convictions and preferences, and qualifications and credentials.

2.6.1 Organizational Factors: Career Development and Management

Various organizational based-factors influence both organizational capacity building and its professional's development. Identifying such factors and assessing their existence, relevance, or impacts require developing understanding of the organization's work culture, management systems, and adopted approaches and practices. In their survey of 194 UK companies, Baruch and Peiperl (2000) argued that there is a lack of theoretical and systematic approaches careers in organizational contexts. Since fewer individuals now straightforwardly follow the organizational career framework, however, the suitability and effectiveness of organizational career frameworks is questionable. Baruch and Peiperl identified five groups of practice, associated with particular organizational characteristics, which could be organized into a typology indicating the nature of each of the practices forming the group. The first is active planning, including four practices; performance appraisal for career planning, career counselling by HR practitioners and by direct supervisors, and succession planning. The second is active management including assessment centres, career workshops and formal mentoring. The third is formal with written personal career planning, a dual career ladder, and books and/or pamphlets on career issues. The fourth is multi-directional peer and upward appraisals. The fifth is basic in the form of job postings, formal education and pre-retirement lateral moves. This research investigated these factors by reviewing PDO's records, use of focus group discussions, interviews and a survey.

Professional development is strongly linked to career management and options based on organization-individual joined or separate responsibilities and drives. Palade (2010) considered career development as supporting the professionalization of individuals and organizational prosperity. Palade also considered career planning and development activity to form an extremely important component in career management. Career planning, its suitability, and effectiveness are explored in this research, particularly for the dual career ladder approach. In a

qualitative case study, Lips-Wiersma and Hall (2007) argued that although, in an increasingly unpredictable career environment, individuals are taking responsibility for their own career development and career concerns. Such career development is considered to remain central to organizational management practices. This phenomenon of individuals taking more responsibility for their career development might pose a major challenge to organizations, particularly during organizational change, by pursuing career options that are in in line with the organizational needs.

A significant portion of the research pool of PDO's petroleum professionals are expatriates, as it is typical for many petroleum companies in the oil-rich Arabian Gulf countries. On the one hand, most of these expatriates are experienced and experts in their fields, on the other hand they might be seen to be disadvantaged by Oman's nationalization policies. This is reflected in more opportunities for professional growth being given to local professionals (Omani nationals). In their study of the career capital development of self-initiated expatriates (SIEs), Rodriguez & Scurry (2014) found that contextual features have an effect on individuals' efforts towards career capital accumulation and lead them to experience 'career capital stagnation'. Hence, nationalization (in this case Qatarisation) has a significant influence in terms of limiting opportunities and support for SIEs. This research investigates this phenomenon, particularly in light of the dual career path, and whether these contextual and organizational factors influence expatriates to opt for technical and specialist career paths.

Although related to individuals, professionals' pool management (rotation and changing jobs, time-based employment contracts, …) are practiced and do impact organization's capacity building. De Vos and Dries (2013) assessed empirically how organizations' human capital composition (uniqueness and strategic value) affects the way in which career management policies are designed and implemented. They attached particular importance to continuity and adherence to 'traditional' models of career management that are driven by the characteristics of their business and human resources. From these study results, one would see a gap between the emerging protean and boundaryless careers whereby individuals drive and undertake the prime responsibility for their careers while organizations continue to attempt to maintain influence on their employees' careers.

2.6.2 Individual Factors: Career identity, attitudes and drivers

Professionals realising their roles and responsibilities for their careers' development and the influence of their personal abilities and attributes have on career choices are important aspects in professional development. However, professionals opting for a career path, particularly at the early professional stages, might not match their abilities and attributes. Many researchers (Cesare and Thornton, 1993; Lips-Wiersma and Hall, 2007; Srour et al, 2013) have observed that individuals are increasingly taking responsibility and shaping (often re-shaping) their career development, options, paths, identity and professional associations. The shift to individuals taking more responsibility than the traditionally dominating organizational roles, and pursuing more choices, results in the emergence of many individual-based factors. These factors have, to varying degrees, influenced capacity building in companies such as PDO that have implemented a dual career ladders approach. This section outlines literature on three aspects of career management and development: career change and transition, career identity, and career gender differences.

Career change is a feature to be considered in professional development, albeit happening at varying levels, and is a reflection of increasing career exchanges and weakening career boundaries. The drive toward protean and boundaryless careers (Gubler, Arnold, and Coombs, 2014) poses challenges relating to measuring career successes and advancement. Colakoglu (2011) developed a model in which career 'boundarylessness' affects subjective career success through its effect on three career competencies (knowing-why, knowing-how, and knowing-whom) along with career autonomy and career insecurity. The results provided empirical support for the importance of career autonomy, career insecurity, and the development of knowing-why and knowing-how competencies in the successful pursuit of a boundaryless career. One key factor in the new individually driven career development is employee participation. Bednall, Sanders and Runhaar (2014) stated that 'employees' participation in informal learning activities benefits their workplace performance, and ultimately their long-term career development. They identified several individual- and organizational-level factors that promote participation. They found that performance appraisal quality (i.e. the role of human resource management (HRM) in each activity over time), and HRM system strength positively moderated these relationships. Hoekstra (2011: 65) described career development as *'the interactive progression of positions and roles acquired'*, and argued for the need for a content model of career development since the field is currently dominated by process theories.

That is, career development is seen as an approach or series of activities, either by the individual or the organization, that includes training, jobs, responsibilities and progression. This limited view of career development, by not paying attention to the contextual aspects and individual considerations, can be argued to have significant implications for career establishment and progression. Hoekstra is arguing for the need to have a good understanding and framing of career development that is responsive and reflective of both the process and outcomes of internal (individual) career identity formation (e.g. specialist or generalist) and expanding career roles, options and changes in response to the contextual (organizational or industrial) development and changes. De Vos, Dewettinck & Buyens (2009) explored empirically the relationship between organizational career management and career self-management, and found that individuals who take more initiatives to manage their career expect more career support from their employer, and career self-management positively influences affective commitment and perceived career success. The importance, relevance and strengths of these individual factors are assessed in this research.

One of the emerging characteristics of careers that was noted in the literature is the tendency of professionals to change careers and to go through transitions due to changing socio-economic conditions, technologies or working environments. Peake and McDowall (2012) assessed mid-career transition and identified four common themes, including lack of career planning, growth from adversity, lucky breaks, and finding a fit. Career successes were shaped by a combination of chaos elements; unplanned events, chance, and non-linearity of resultant outcomes. Hence, questioning the suitability and effectiveness of career planning and sustainability. This understanding might provide a viable explanation for the difficulty in attracting and maintaining the commitment of professionals and the drive needed to develop specialists through specialist career ladders.

With increasing number of professionals opting for career change, staying course in a career path they need be motivated and incentivised to do so. An important motivation for professional and career development, particularly in the specialist/technical career paths, is professional association or identity. Savickas et al. (2009) designed a contextualized model based on the epistemology of social constructionism, recognizing that an individual's knowledge and identity is the product of social interaction. They argued for a life-long designing model for career intervention endorsing five presuppositions about people and their work lives: contextual possibilities, dynamic processes, non-linear progression, multiple perspectives and personal patterns. LaPointe (2010) argues, in contrast to traditional definitions

of career identity as an individual construct, for a discursive approach to career identity as a practice of articulating, performing and negotiating identity positions in narrating career experiences and for leaving space for individual agency and change. Dobson et al. (2014) examined empirically the relationship between career interests and work values across more than 57,000 individuals. They found good internal consistency for the career interests, and poor for work values. Therefore, professional association and identity are important indicators of robust professional development and strong motivators for developing long-lasting careers.

Staying within life-long career or career path, professionals progress/climb career ladders steps. Kosine and Lewis (2008) described the Super's (life-span, life-space) theory of career development, stating that the life stages of growth and exploration are inherent to the process of acquiring knowledge of how one's interests and abilities align with the requirements of occupations. Weitman (2006) described career crossroads as a sign of the times for engineers to opt for a career change or continuation. Weitman argued that following the first technical job, warning signs of an impending crossroads on the career path are when boredom or disinterest are noticed. When engineers decide to take a new path, the technology area and the suitability of the new path with their abilities should first be considered. There are various motivators for professionals to change career or jobs, roles and workplace. These could be contextually based or personally driven. For the former, changes in the business environment and conditions, e.g. business shrinkage caused by lower oil prices, are possible motivators. For the latter, possible motivators could be the identification of better prospects or a better fit with personal preferences in switching from managerial roles to technical roles or vice versa. The most obvious cases of PDO petroleum professionals changing careers are when they leave the company for other companies. While exit-interviews might give indications of the main motivators, and whether these are contextually or personally driven, the available data is insufficient to provide an adequate assessment as there are only few records of these interviews and are treated as confidential. This research explores this issue of what motivates career change, particularly from the perspectives of petroleum professionals.

Sampson et al. (2013) identified a broad range of variables that may influence an individual's readiness to benefit from career interventions. Variables contributing to a low readiness to make career interventions include personal characteristics and circumstances; knowledge of self, options and decision-making; and prior experience with career interventions. While these are important individual factors, this research does not address the personal assessment of professionals; i.e. it does not investigate the personal abilities and capabilities that could

influence views on the research subject nor their career ladder paths preferences. Such an assessment would require different and more complex means of data collection and assessment and is beyond the scope of this thesis.

Although, there are more men than women in the engineering and petroleum professionals, as exemplified in PDO, an increasing number of females are joining the company in recent years (Chapter 4). The gender difference is not considered to have significant influence on their personal attitudes and drivers. Buse, Bilimoria and Perelli (2013:139) stated that *'women remain dramatically underrepresented in the engineering profession and far fewer women than men persist in the field'*. Through qualitative research they attributed the persistence of women engineers to articulated high-levels of self-efficacy, their identity as engineers, motivated by the novelty and challenges of the profession, and the ability to adapt. Pazy (1987) investigated differences between women and men in their responsiveness to formal organizational career management. A questionnaire survey found that women's individual career variables were mostly similar to men's, but that their responsiveness to organizational career management was higher than men's, and that women's career effectiveness (performance, attitudes, identity and adaptability) and career planning increased when the level of perceived organizational career management was high.

Based on the above discussions, there are number individual (professionals) factors and considerations that influence or are influenced by professional and career development and progression in varying levels. The study uses these identified factors and aspects in exploring the case of PDO.

2.7 Research-enquiries of literature-based concepts and subjects

The literature review included wide range of concepts and practices related this research subject of capacity building, professional development and career options. This was necessary and valuable to establish the dimensions and elements of the research problem. Many of these concepts and elements formed basis for this research enquiries, while few were not considered or were dropped out during the research due to irrelevance or non-importance. The enquired and investigated concepts by this research are listed in Table 2.4.

Table 2.4 - Literature-based concepts selected for research enquiries

Literature-based subject / concept	This research questions / enquiries
Capacity building:	
- Regulation of professions and careers.	- Means of regulations in PDO petroleum professions, and their roles in guiding and enforcing capacity building and career management
- Required capabilities of technical experts, or managers	- Does PDO faces technical and developmental challenges, and what capabilities (expertise, managerial) are required?
- Influence of IOCs (Shell) on NOCs (PDO)	- What Shell's influences PDO's capacity building and its petroleum professional development?
Professional Development:	
- Concepts of knowledge-based firms and knowledge workers	- Do the concepts (and frameworks, models, …) of knowledge workers and knowledge-based firms form sound conceptualization basis for petroleum professional development and career paths?
- Distinctive professional development stages/phases	- Are there distinctive professional development stages/phases for PDO's petroleum professionals to go through? How many and what are these? Are they linked to the dual career ladder model stages?
- Career management challenges in PDO	- Which of the following career management challenges are present in PDO: job design and grading, career paths, career management, or motivation of its petroleum professionals?
Professionals	
- Important professionals' requirements	- As petroleum professional, which of the following is (are) your important requirements: autonomy, keeping up-to-date, participation in missions and goals, achievement, or professional identification (career association and identity)
- Dual career ladders – professional development and attainment strategy	- Do you consider dual career ladders as effective strategy and mean for attracting, developing, and retaining specialists? Which is more valuable and attractive to you; specialization or managerial responsibilities?
- Motivating work goals	- As petroleum professional, which of the following is (are) your most motivating work goals: job challenges, freedom, good relationship with managers, co-operation, employment security, prestige, or good physical working conditions?
- Professional growth / managerial roles	- Which is most important to professionals: professional growth (skills development and mastery in field of specialization) or enhancing managerial roles and positions?
- Organizational/personal responsibilities	- Is career development and management more of an organizational or personal responsibility? Is career self-management by individuals encouraged and supported by the organization?

Table 2.4 (Continue) - Literature-based concepts selected for research enquiries

Career Paths:	
- Demand for experienced/experts & specialization career options	- Do high demands for experienced and expert petroleum professionals with high mobility have stronger influence on professionals to opt for specialization rather than the attractiveness of managerial positions?
-	
-	
- Career association and career identity	- How strong are the career association and career identity among PDO petroleum professionals?
- Organizational/management hierarchy and structure-based career options	- Do PDO management hierarchy and structure provide sufficient career options, particularly dual career paths; specialization and managerial?
- Matrix organizational structure & systems influence on dual career ladders	- How organizational structures (matrix) support or hinder petroleum professional development as dual career paths? Do organizational (contextual) factors such as systems, roles and facilities impact petroleum professional development as dual career paths? How organizational management hierarchy impacts both managers/generalists and experts/specialists?
-	
- Knowledge and skills of specialists and managers	- How much of the essential knowledge and skills (e.g. use of tools and technologies, problem solving, knowledge sharing, etc.) are common and how much distinct for both specialists and managers?
- Motivating specialists and managers	- How specialists and managers are motivated?
- Managerial responsibilities and job levels definition	- Do managerial responsibilities in PDO define job levels? If so, do these disfavor specialists' progression? Are specialists' positions considered to be at senior levels?
- General management and functional management	- How decisions by managers with only general management skills on technical matters are perceived? Are there functional management (combined technical and managerial) roles in PDO? And who occupy these?
- Progression models: post-led (or 'pull'), person-led (or 'push'), or recognition award	- Which of the three progression models are most common in PDO, and is there a difference for each of the two career paths; specialist and generalist/manager?
- Protean or boundaryless career concepts and components	- Which of the four components of protean or boundaryless career concepts are more present/observed in PDO: adaptability, identity, being values-driven, being self-directed
-	
- Mid-career transition	- Do PDO's petroleum professionals go through mid-career transition?
-	
- Career cross-road	- Do petroleum professionals face career crossroad needing to decide to either continue or make a career change
- Organizational practices impacting the career paths	- Which organizational practices are present in PDO, and impacts each has on dual career ladder development: active planning, performance appraisal, career counselling, succession planning, assessment centers, career workshops, formal mentoring, or job postings?

2.8 Summary

The literature review focused on the petroleum industry as the research context, petroleum professionals as actors, professional and career development as an approach, and the factors/influences of the career model. These are all underpinned by career theory and capacity building considerations. The review has explored the concept of capacity building (Krishnaveni and Sujatha, 2013) as the objective of many development programmes requiring a systemic approach (Potter and Brough, 2004). It found capacity building to be an area that requires further definition, conceptualization and empirical assessment, with this research seeking to explore it within a given context. The review has also explored advances in the theory of the career, particularly the concept of roles as career units, instead of jobs or positions as had previously been theorized (Hoekstra, 2011). Other advances in career theory are the emergence of changes and the transition to 'Protean' or 'Boundaryless' careers (Hoekstra, 2011; citing Baruch 2006, Sullivan and Arthur, 2006, and others). This definition of career units has a direct relationship to the dual career ladders being adopted in PDO. Important concepts underpinning the career ladders/paths for petroleum professionals are the classification of energy exploration companies as knowledge-based firms (Woiceshyn & Falkenberg, 2008), and thus of its petroleum professionals as knowledge workers (Grant, 1996; Hirsh, 2006). A number of career models were reviewed, ranging from single and dual track careers and varied leadership career paths (Hirsh, 2006), and Linear and Dual Career ladders (July, 2011). These share a view of dual career paths as entailing specialists and generalists, corresponding to PDO's technical and managerial functions. I have also reviewed challenges raised about the dual career models, and in particular the specialist career path. This led to looking at the multiple career model concepts and the impact of career theory advancements in the design and characteristics of the such concepts and models. An example of such concepts is Mainiero's (1986) grouping of professionals into three categories: career technical professionals by choice, career technical managers, and career technical professionals by default that provides a better classification of career paths. In this research, I am investigated the presences of dual and multiple career paths in PDO, along with other career-related concepts such as career change and career identity (Cesare and Thornton, 1993).

It was necessary to explore and review the literature for concepts, elements, and practices related to the subject of this research to enable establishing good understanding of the study dimensions and define the elements and components to be investigated by this research. Of

which, only some were taken into the research activities (interviews and survey). Table 2.5 outlines these concepts and elements, their importance and relevance to this research, and those selected for further research.

Table 2.5- Literature-identified concepts and research elements

Concepts & research elements	Importance & relevance	In this research
Developing capacity building		
- Institutional capacity building	- Overarching concept	- Exploring and assessing PDO's systems and practices that form institutional capacity building
- Capacity pyramid	- Relevant framework	- Identifying capacity building components
- Components of capacity building	- Relevant elements	- Exploring and evaluating presence and effectiveness of these components in PDO.
Career Theory		
- Careers as roles	- Important new concept	- Assess its acceptance in PDO and for constituting new careers model
- Career identity	- Important and relevant	- Assess its strength and impact onto professional and career development
- Protean career concept (PCC)	- Important new concept	- Assess signs of its presence in PDO and as explanation for career change.
Knowledge-based Organizations		
- Energy exploration companies	- Important founding concept	- Assess acceptance, applicability, and influence on PDO's approach to professional development and career models.
Professional development		
- Knowledge workers	- Highly relevant	- Reference for PDO's dual career ladder model
- Single and dual track careers	- Important and highly relevant	- Exploring and evaluating characteristics and aims of the various careers options, and propose enhanced career models and frameworks
- Attributes and career options of Specialists and Generalists Issues and factors affecting the career development	- Important and highly relevant	- Utilising characteristics of knowledge workers – from the literature – to describe and assess petroleum professionals (limited in literature) characteristics and career options
- Multiple career anchors and model	- Important alternative career model concept	- Exploring and evaluating acceptance and applicability in PDO and as an alternative in practice to the dual career ladder model.
Organizational Factors		
- Career management policies, organizational practices, and career development	- Relevant and important & organization-based	- Assess organizational factors - as identified from the literature- in PDO by reviewing company records and systems, and through interviews and survey
Individuals' factors		
- Mid-career transition & career crossroads	- Relevant, increasingly importance	- Explore understanding and practices in PDO
- Career gender differences, women engineers	- Relevant	- Explore (through the survey) whether male and female professionals have different views and uptake of career choices and development.
- 'Boundaryless' career	- Important new concept	- Explore understanding and applicability in PDO
- Career development and the concept of career roles	- Relevance and essential	- Evaluate understanding and applicability in PDO.

Chapter 3

METHODOLOGY

The purpose of this chapter is to outline the research methodology used in the investigation of capacity building in PDO through professional development using dual career paths. This research investigates conceptualization and practices in a specific organization-PDO by addressing number of research questions about PDO and its professionals' characteristics and practices. The research aims to contribute to the respective field of knowledge and to problem-solve an organizational/managerial issue through participation. Hence, the selection of research methodology is determined by the aims of the research as outlined by the research questions and associated propositions, the dimensions of the researched topic, organization, and subjects (professionals).

3.1 Research Questions and Propositions

This research is evaluating suitability and implementation of an organizational managerial concept in a specific context-petroleum company. Building on the conceptualization and theoretical assessment made by the literature review, the research is addressing the adoption of capacity building through career development in PDO as an example of organizational application. Hence, the research enquiries and assessment are focussed on PDO case, and aims to produce actionable knowledge combining collaborative problem-solving and knowledge cogeneration, and taking action achievable by action research (AR). Research questions (RQ) address the research objectives (RO), guide the research by breaking the research problem into researchable elements, and guide enquiries to explore and evaluate relevance and importance of these elements.

Addressing the RQs and associated propositions require defining and designing suitable research methods, i.e. methods of enquiry, research participants, enquired data and information, and means of analysis. Propositions enable RQs and ROs to be addressed by articulating a potential (desired) state, focusing the data collection, and guiding the research along the conceptual framework (Yin, 2014; Stake, 1995; and Baxter and Jack, 2008). Four sets of research questions (RQ) and associated propositions (P) are articulated:

RQ1. How does PDO go about developing capacity building in its Petroleum and Geoscience professions? What professional development and capacity management systems are in use in PDO for developing petroleum technical and managerial capabilities?

P1.1 PDO's petroleum professionals, executives, and staff managers recognize and are content with its approach to developing capacity building in the petroleum and geosciences professions.

P1.2 PDO has established and implementable professional development and capacity management systems for developing petroleum technical and managerial capabilities.

RQ2. How do petroleum professionals in PDO view and undertake their own professional development and career association in relation to PDO's capacity building objectives, goals and strategies?

P2.1. Petroleum professionals in PDO have clear views on their professional development and career association.

P2.2. Petroleum professionals in PDO link their professional development and career association to PDO's capacity building objectives, goals and strategies.

RQ3. Is the dual career (technical-managerial) model in PDO and its objectives understood and supported by PDO's petroleum professionals? What organizational and individual professional related factors influence the dual career model? How do these factors correlate and influence PDO's capacity building strategies and outcomes?

P3.1. PDO's dual career (technical-managerial) model's objectives are clear and known to petroleum professionals and are being achieved.

P3.2. Organizational and individual (professional) aspects and factors affect the implementation of the dual-career model and its outcomes.

P3.3 Organizational and individual factors, and the dual-career model, influence PDO's capacity building strategies and outcomes

RQ4. What strategies, frameworks, and practice options could be more suitable and effective in developing capacity building in a dual-career paths situation as in PDO?

P4.1 Clearer strategies linked to encompassing frameworks and measurable practice options are essential for developing capacity building in PDO's dual-career paths situation.

Derived from the above four research questions (RQs), and with a view to fulfilling the research objectives, the main research aspects include the impacts and/or inter-relationships across three areas influencing petroleum capacity and capability building of PDO professionals. These areas and research topics are;

- **Organizational aspects/factors:** PDO's approach to developing capacity building In respect to petroleum technical (specialists) and managerial (generalists) capabilities
- **Personal professional factors:** PDO's petroleum professionals' perspectives and experiences with professional and career development
- **PDO's dual career ladder model:** PDO dual career (technical-managerial) model, and its interrelated influences with organizational and professional factors.
- **Alternative frameworks and career options:** emerging perspectives, strategies, frameworks, and practice options that are deemed appropriate for developing capacity building in the studied situation and context.

For each of these research topics, I identified participants, defined sought data and information, and selected means of engaging participants.

3.2 Research Methods Selection Considerations

This research evaluates PDO's approach to developing capacity building through professional development and career options, both from the conceptualization and understanding, and from the implementation and practice aspects. It is a descriptive and evaluation study aiming to develop a comprehensive view of an organizational approach and practice case. The research methodology is selected and designed to address the research problem as outlined by the research questions. The following considerations were considered in selecting and designing the research methods.

The philosophical positions underpinning this research are a relativist ontological position (Easterby-Smith, Thorpe and Jackson, 2012) and a constructionist epistemological commitment (Savickas et al., 2009). These philosophical positions are most suitable to exploring and understanding issues related to social systems and building a complex and holistic view of natural settings (Creswell, 2013).

3.2.1 Action Research

The main research approach adopted for this management research is an action research (AR) that combines three aspects: research, action and participation in the aim of cogenerating new knowledge and solving problems (Brannick and Coghlan, 2007). Inside Action Research (IAR) takes these aspects to higher levels of complexity, particularly in terms of the potential impact of the researcher's influences and inside information on the produced knowledge (Evered and Louis, 1981). It conducts research from the inside and utilizes deeper understandings of the researched subject, albeit with higher potential for bias. The three aspects of AR in this research are:

Research: reviewing and analysing the literature and organizational records for establishing the concepts, frameworks, and practices related to the researched case and elements. In addition, research is undertaken by engaging actors in the studied case (professionals and company-PDO leadership) for assessing their understanding, experiences, and stances on the research problem and elements.

Action: is by undertaking activities and acts by the researcher in response to the research needs and by adjusting the research process and activities. Moreover, research participants act in response to enquiries or as reflecting on their own understanding and experiences and considering taking personal changes. Additionally, organizational leadership and management act in response to the research outcomes, recommendations, and proposals for addressing the researched organizational/managerial problem.

Participation: engaging research participants, who are also influenced by or influencing the research problem and studied case, in a participatory problem-solving manner. Participation is in the way of assessing concepts in use and practices, and in offering new perspectives and solutions.

In this research, participants included petroleum professionals in various roles and levels: technical management, functional management, specialists and working engineers and geoscientists. Participants are to reflect on the researched subject (petroleum professional development and career options) from two fronts: their understanding of relevant concepts and their own practices, on the one hand, and their understanding of organizational practices on the other. Such reflections and developed understandings and insights could provoke personal

change (Brydon-Miller et al., 2003) and lead to new actions such as the driving of organizational change following reflection on their experiences during the research process.

Conducting AR require good preparation, understanding of its diverse approaches, the framing of the problem to be action-researched, and identifying the organizational context and the research participants. Several issues/aspects that could potentially hinder the research or affect its outcomes, but mitigated for n this research as outlined below.

1. *The suitability of the research problem for the conduct of action research* (Greenwood and Levin, 2007). The research problem had a clear research area with knowledge and practice gaps, in a specific context setting, clearly identified target participants whose contributions are an essential input into the study and with potential actions undertaken by the researcher and participants.
2. *Representative participants having the interest and motivation to participate and contribute*. Participants are PDO petroleum professionals and executives who have clear relevance to the research problem and the research context organization.
3. *Framing the research problem into its different dimensions such as organizational aspects, individual factors, and the career models in-use*. Such framing was guided by literature-based field knowledge and reported practices, along with documented PDO systems and processes. These were reflected in the issues that formed the basis for interviews and the questionnaire survey, and were then refined and modified in response to the findings and reflections from the focus group discussions and initial interviews. Such reflexivity is an important element in action research.
4. *Defining and developing engagement methods that enabled and encouraged identified participants to share and discuss their experiences and perspectives*. Experiences and perspectives were initially sensed within the focus group discussions. These were followed by one-to-one semi-structured interviews, and concluded with an online survey sent to selected participants from PDO's large professional pool with minimum exposure time in the organization.
5. *Introducing continual change that is evolving from AR, particularly through the research process and activities*. This required building flexibility in the research process while ensuring adherence to research quality and maintaining its credibility. Four sequential activities were adopted to reflect on and enhance the research topic's relevancy. These were; establishing a knowledge base using the literature and PDO's own records, focus group discussions for initial engagement with participants, in-depth one-to-one semi-

structured interviews, and a finally refined online questionnaire addressed to a large population of petroleum professionals.

Undertaking inside action research (IAR) entails accessing and using inside information; explicit and tacit knowledge of organizational dynamics and systems (Coghlan & Brannick, 2010), and researcher connectedness to information holders and controllers based on organizational policies, norms, and protocols that govern such access or the use of information.

Action Research Protocol

Action research (AR) '*focuses on important social or organizational issues as they are being implemented by those who are experiencing these issues directly'* (Anderson, Gold, Steward, and Thorpe, 2015:93). One of the forms of AR is the 'Meta Learning Cycle' that applies three forms of reflection: content, process and premise, and by going through research cycles consisting of constructing, planning action, taking action, and evaluating action (Coghlan & Brannick, 2010: 12). The actions in this research come at three levels: researcher, research participants and the organization, each of whom go through the action research cycles at varying paces and approaches. As integral parts of the AR, actions are taken during the research and others as outcomes, and are at three levels:

1. **Organizational:** in addition to the organizational (PDO) support for this study, actions to be taken by PDO based on this research are determined by influencing PDO's senior leadership and managers through their participation in the research, by enhancing their awareness of the capacity building and professional development, reflecting and assessing current approaches and practices, and by reconsidering changes. The research outcomes and proposed actions to address systems' deficiencies and practice gaps are presented to PDO's senior leadership with a case for change, and reporting supported changes and commitments.
2. **Research Participants:** actions by research participants are mostly in the form of participating in the research, enhancing their understanding of the researched subjects, and considering actions triggered by their participation. The two are sensed by requesting survey respondents to indicate whether they experienced such enhanced understanding or felt the need to take action.
3. **The Researcher:** as researcher, my actions are determined by going through the research cycles and applying the meta learning cycle (Coghlan & Brannick, 2010: 12) particularly

reflecting on the content, process and premise. The content is reflected on by making changes to the research problem elements – in response to the literature review and engaging research participants. This entailed, for example, adjusting the process of engaging participants, consulting the literature and PDO documents, and evaluating and revising methods of inquiry. The premise of the research is reflected on by challenging some of the common concepts and perspectives on research subjects.

3.2.2 Mixed research methods

To address organizational-based managerial problem, mixed research method is adopted in this research that combines qualitative and quantitative data collection and analysis (Jick, 1979, Johnson and Onwuegbuzie, 2004). Four sources of data and information, including secondary or organisational records and documents and outputs of the three means of engaging research participants, were tapped on.

Secondary data Preparation

Secondary data are integral parts of this research, and serve as references or guides for the other data and information generated in the research process. The sources of such data are from PDO, where the research took place. According to Easterby-Smith, Thorpe and Jackson (2012:229), use of secondary data, such as databases and achieves, is valuable in achieving credible data analysis. Access to the secondary data was obtained and regulated via signed confidentiality agreements with PDO.

Confidentiality and anonymity were applied to all personnel data, whether obtained as secondary or primary data (interviews and surveys) and as defined in the study protocol and plan, which were submitted to the University of Liverpool for the purposes of obtaining ethical approval. Other PDO organizational data and records were used in the research and are referred to when describing relevant management systems, policies and codes of practices.

Qualitative Research

Qualitative research establishes meanings and explores social or human issues to build up a more holistic and complex picture, accounting for the views and perspectives of participants in natural settings (Creswell, 2013). According to Trochim and Donnelly (2008:142), a qualitative research is an approach of choice in circumstances with one or more of four

characteristics: for generating new theories or hypotheses, achieving a deep understanding of issues, developing detailed stories to describe a phenomenon, or mixed methods research. They further identified qualitative data as being highly varied in nature, with three major categories: in-depth interviews, direct observation, and written documents. The first category includes focus group discussions and interviews. For qualitative research, Trochim and Donnelly identified (Table 3.1) quality measures to include generated results to be credible or believable from participants' perspectives, as well as being generalizable or transferable to other settings or contexts, and adequate description of changing contexts so that others can confirm or corroborate the results. All these measures are incorporated in the two qualitative research data collection methods adopted in this research; focus group discussions and interviews.

Table 3.1: Criteria for judging research quality

Traditional Criteria for Judging Quantitative Research	**Alternative Criteria for Judging Qualitative Research**
Internal validity	Credibility
External validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

Source: Trochim and Donnelly (2008:149)

Quantitative research

Quantitative research and inquiry methods enable defining cause-effect and other relationships and patterns of behaviours, as a means of further developing wider description, and analysis of the specific case by drawing understanding and perspectives from a large pool of participants through survey questionnaire. The quality measures (Table 3.1) such as validity provide a confidence measure in respect to the commonality and variability of such positions and perspectives among the participating professionals, and the representativeness of professionals by the respondents. In this research, quantitative data are collected from research participants' responses to questionnaire survey and used to provide measures of level of agreements or disagreements of the various aspects and practices as expressed by large number of participating professionals.

3.2.3 Case Study

A case study is a research method in bounded settings, events, or enactments, which provide educational benefits through learning. It is about the in-depth description and analysis of a specific case (Creswell, 2013). Case study is one of the five main approaches to inquiry as qualitative research method (Creswell, 2013). The other four are narrative research, phenomenology, grounded theory, and ethnography. For this research, the adopted case study is the one that is part of a larger mixed methods research (Yin, 2014: 66). The case study approach was deemed most suitable for generating an empirical study of a practice case evaluated from different angles: the field's body of knowledge, industrial context, organizational systems and practices, and organizational members' positions and perspectives.

Case studies rely on multiple sources of data including documents, interviews, observations, and artefacts. Challenges in conducting case studies relate to clarity of objectives, sufficient description of the case, and the educational elements. The literature is full of case studies, including a number on the retention of professionals in petroleum organizations (Bashir et al., 2011) and on the localization of human resources (Vo, 2009).

Using a variety of data sources, Baxter and Jack (2008) outlined that case studies facilitate the exploration of a phenomenon within its context and support the deconstruction and subsequent reconstruction of that phenomenon, allowing researchers to explore organizations or individuals through complex relationships, interventions, communities or programmes (Yin, 2014).

According to Baxter and Jack (2008), there are two key widely known and adopted approaches in case studies. The first was proposed by Robert Stake (1995) and the second by Report Yin (2014). Stake (1995) identified three types of case studies; intrinsic, instrumental and collective. Yin (2014) characterized case studies as explanatory, exploratory or descriptive (Table 3.2).

Table 3.2 Types and definition of case studies

Case Study Type	**Definition**
Explanatory	Yin (2014): for answering a question seeking to explain presumed causal links in real-life interventions that is too complex for survey or experimental approaches and strategies.
Exploratory	Yin (2014): for exploring situations in which intervention, being evaluated, has no clear outcomes.
Descriptive	Yin (2014): to describe an intervention or phenomenon, and the real-life context in which it occurred.
Multiple–case studies	Yin (2014): enabling exploring differences between cases, with the aim of replicating findings across the cases.
Intrinsic	Stake (1995): having a genuine interest to better understand the case itself (unique situation), not some abstract construct or generic phenomenon.
Instrumental	Stake (1995): providing an insight into an issue or helping to refine a theory. The case is of secondary interest, and is often looked at in depth, its contexts scrutinized, its ordinary activities detailed, and helping pursuing external interest.
Collective	Stake (1995): similar to multiple case studies as articulated by Yin (2014)

Source: adopted from Baxter and Jack (2008)

Further, Yin (2014) stresses that case studies are considered to answer 'how' and 'why' questions, but are not able to manipulate the behaviours of those involved, or to address contextual conditions that are relevant to the phenomenon or where the boundaries between the phenomenon and context are not clear.

Another consideration in selecting the case study approach is determining the case or the unit of analysis (Baxter and Jack, 2008); whether it is individuals, organizations, programmes or processes. This allows the research to be better focused and the development of appropriate research questions. Yin (2014: 29) stated that there are five important aspects in the design of a case study: its questions, its propositions (if any), its unit(s) of analysis, the logic linking the data to the propositions; and the criteria for interpreting the findings. The research questions, propositions, and criteria for interpreting the findings are discussed in the chapter. Yin (2014) stated that there are four tests commonly used for establishing the quality of empirical social research designs, including case study (see Table 3.3).

Table 3.3: Tests of research designs quality

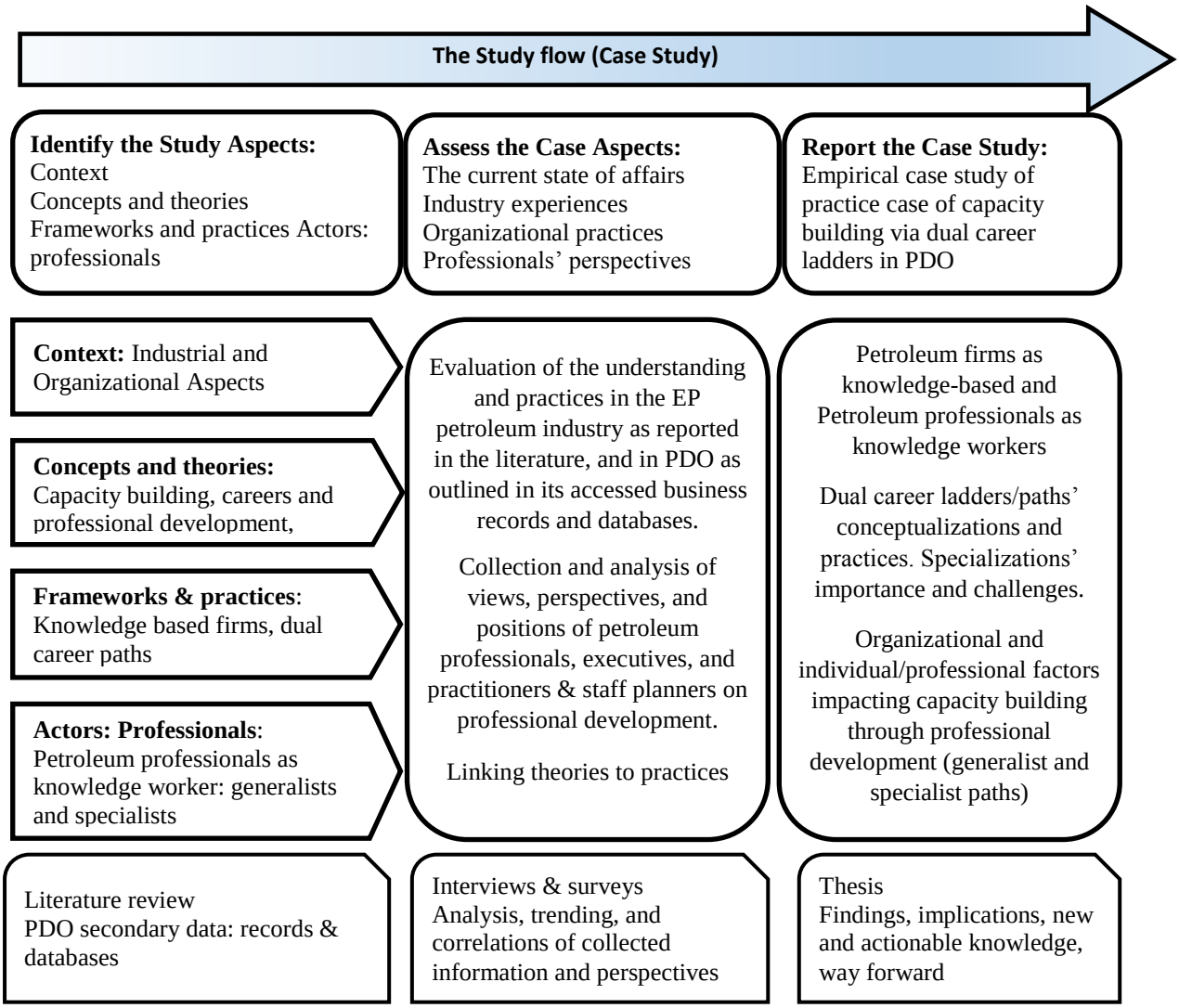
Tests	Description	Case Study Tactic	Phase of research
Construct validity	Identifying correct operational measures for the concepts being studied	• use multiple sources of evidence • establish chain evidence • have key informants review draft case report	• data collection • data collection • composition
Internal validity	Seeking to establish a causal relationship whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships. (for explanatory or causal studies only and not for descriptive or exploratory studies)	• do pattern matching • do explanation building • address rival explanation • use logic model	• data analysis • data analysis • data analysis • data analysis
External validity	Defining the domain to which a study's findings can be generalized	• use theory in single-case studies • use replication logic in multiple-case studies	• Research design • Research design
Reliability	Demonstrating the operations of a study –such as the data collection procedures- that can be repeated with same results	• use case study protocol • develop case study database	• data collection • data collection

Source: Based on Yin (2014: 45-6).

For this research, construct validity is obtained by use of multiple resources (literature, company records/documents and databases, interviews, and survey). As this study is neither explanatory nor causal, internal validity is not applicable. This study is a single case study and uses a theory (generalist/specialist dual career paths for knowledge workers) to obtain external validity.

Research Workflow

Based on the case study method, the research follows the workflow outlined in Figure 3.1. It comprises three main stages; identification, assessment and analysis and reporting. The first identification stage is covered in chapters 1, 2, and 4: the introduction and context setting, the literature review, and PDO based secondary data. The assessment stage is covered in chapter 5: data analysis and discussions.



Source: developed for this research

Figure 3.1 Research workflow

Data to Propositions and Interpretation Criteria

Of the five important aspects in the design of a case study according to Yin (2014:19), the first section has already articulated the research questions and corresponding propositions. The third aspect is the unit of analysis, which is the studied organization (PDO). The remaining two aspects are the logic linking the data to the propositions and the criteria for interpreting the findings.

As this research is a descriptive case study aiming to describe an intervention or phenomenon, and the real-life context in which it occurred (Yin, 2014), the research focuses on describing and assessing the studied practice case. This is by employing various methods of inquiry and analysis. The collected and generated data and information are in two forms, qualitative and quantitative. These data and information are grouped / classified, and compared to enable a good understanding and assessment of an intervention - professional development and career

options – in PDO's real-life context. The qualitative data (PDO documents and records, focus group discussions and interviews) are large and highly variable. Similarly, the quantitative data (PDO databases and records, and responses to the questionnaire) are large in volume and varying.

The criteria for interpreting findings from these collected and generated data are in two ways. The first is based on the relevance and availability of the data and information on the different elements, factors and aspects as stipulated in the propositions. For example, the career ladders / paths' models are as described in PDO documents and systems, in the literature, or by PDO research participants (professionals, executives, line and functional leaders). If the data and information are available, the interpretation criterion is by comparing definition/understanding, conceptualization and importance stipulated in each of the resources. When the data and information are not available from any one of the three sources (PDO, literature, and participants), however, a plausible explanation of the reasons for the differences is put forward. The second criterion for interpreting findings is related to identifiable changes, advancements, and further development in both conceptualization and practice fronts. By understanding such changes and advances at both the theoretical and practical levels, it is possible to analyse the concepts in use and establish good practices on the basis of their suitability and effectiveness.

3.2.4 Collected Data and Information

The sources of collected data and information are (1) PDO's organizational records and internal documents, (2) focus group discussions and interviews with executives, petroleum line team leaders, and petroleum functional and discipline leaders, and (3) responses to the online questionnaire survey distributed to working petroleum professionals, team leaders and discipline leaders.

The reviewed literature and PDO's organizational records and systems formed the basis for identifying the concepts, research problem elements, and studied case related practices, as outlined in Tables 3.4a-c. The relevance and applicability of the investigated aspects were tested in focus group discussions, resulting in some changes being made to some of the aspects in either the interviews or the questionnaire. These aspects are considered under three main headings; capacity building, professionals' development with corresponding career options in organizational context, professionals' individual factors, and PDO's dual career ladder model.

The fourth research aspect; alternative frameworks and career options is to be identified and developed from the research engagement and analysis.

Table 3.4a Capacity Building concepts, elements, and practices

Capacity Building
• Regulations and regulatory analysts guiding/enforcing petroleum professions/careers. (Rathman, 2013) • PDO's approaches to petroleum capacity building/professional development in relation to being a National Oil Company (NOC) and influenced by an International Oil Companies (IOC). (Vo, 2009) • PDO's institutional capacity building (e.g. differentiation between micro (concerning HR) and macro (concerning strategies). (Krishnaveni & Sujatha, 2013).

Source: developed for this research

Table 3.4b Professional development concepts, elements, and practices

Professional Development
• Knowledge-based firms and knowledge workers' characteristics; providing sound conceptualization basis for petroleum professional development. (Hirsh, 2006; Woiceshyn and Falkenberg, 2008; Van Staden, 2014) • PDO's approach to developing its professionals; early identification of talent or adopting a 'wait and see' approach. (Vo, 2009) • Professional development stages/phases for petroleum professionals. (Pike, 2013) • Career management challenges in PDO; job design and grading, multiple career paths, career management system, and motivating petroleum professionals. (Hirsh, 2006)

Source: developed for this research

Table 3.4c (1) Career Options/Ladder concepts, elements, and practices

Career Paths/Options
• The influence of increasing demands for experienced petroleum experts opting for specialization. (Torpey, 2013). • Career association and identity among PDO's petroleum professionals. (Watson, 2006) • Dual career paths and career association (Cesare and Thornton, 1993) • PDO's management hierarchy, structure and provision of career options. (Van Staden, 2014) • Matrix organizational structures and petroleum professionals' dual career paths. (Potter and Brough, 2004) • Motivating specialists and generalists (on managerial path) (Hirsh, 2006) • Influence of managerial responsibilities and/or technical expertise/specialization at senior level jobs in PDO • Distinction between business leaders, functional leaders, and specialists in PDO. (Hirsh, 2006)

Source: developed for this research

Table 3.4c (2) Career Options/Ladders investigated concepts, elements, and practices

Career Paths/Options

- Movement between business leader, functional leader and specialist roles in PDO. Hirsh (2006)
- Career ceilings for specialists and for generalists in PDO. (Hirsh, 2006)
- Progression models in PDO: post-led 'pull', person-led 'push', or recognition award. (Hirsh, 2006)
- Emphasis in graduates' entry assessment in PDO; leadership/managerial or technical and specialization capabilities
- Factors affecting the pursuit of career paths; early career development design and support, job assigning processes, succession planning, talent management and support for career choices. (Hirsh, 2006)
- The influence of PDO's Omanization (nationalization) policies on Omanis opting more for the managerial career ladder
- Protean or boundaryless career components: adaptability, identity, being values-driven, being self-directed. (Gubler, Arnold & Coombs, 2014)
- Mid-career transition. (Peake and McDowall, 2012)
- The effect of organizational practices on dual career ladder development; e.g. active career planning, performance appraisal, career counselling, succession planning and active management, formal mentoring and formal practices. (Baruch and Peiperl, 2000)
- Factors influencing professionals in changing their careers; changing socio-economic conditions, technologies, and working environments. (Peake and McDowall, 2012)
- Career crossroads; needing to decide whether to either continue on the career path or make a career change. (Weitman, 2006)
- Petroleum professionals' important requirements; autonomy, keeping up to date, participation in missions and goals, achievements and professional identification. Newell (2000, cited in Hirsh, 2006)
- Strategies and means of providing dual (or multiple) career ladders/options for attracting, developing and retaining specialists. (Cesare and Thornton, 1993)
- Petroleum professional motivating work goals: E.g. Job challenges, freedom, good relationship with managers, co-operation, employment security, working with prestigious companies, or good physical working conditions. Hirsh (2006)
- Career development and management; organizational or personal responsibility. (Palade, 2010)
- PDO's encouragement of individuals to take responsibility for their own career development and career concerns. (Lips-Wiersma and Hall, 2007)
- Organizational support to career self-management by individuals. (De Vos, Dewettinck & Buyens, 2009)
- Workplace context and social interactions influence on career development and professional identity. (Savickas et al, 2009)
- Important factors/enablers in professional growth; skills development and mastery in field of specialization, or enhancing managerial roles and positions

Source: developed for this research

The outlined concepts, elements and practices in Tables 3.4a-c, were translated into inquiries and questions posed in the focus group discussions, the interviews and in the questionnaire survey.

3.2.5 Other research considerations

The study seeks to improve my – as the researcher - abilities as a scholar-practitioner and management researcher, and to enhance my knowledge and meta-cognition of a subject that is at the heart of my organizational responsibilities and leadership roles. As an organizational member and manager in PDO, I have accumulated knowledge and experience from previous involvement in coaching programmes and schemes. I was also involved in the set-up of a dual career ladder that was intended to provide balanced capability development between the increasingly needed technical expertise and specialists on the one hand and the more attractive - and seemingly more rewarding - managerial careers on the other hand. Reflecting on these past experiences, there were limited conceptualization, theoretical foundations, and credible research efforts to underpin the various schemes. Number of learning points are derived from this experience, particularly the lack of a theoretical grounding in career theory and the inadequate engagement of professionals in defining the problem dimensions and in developing solutions. This thesis, therefore, provides a more robust theoretical and credible empirical evaluation of the research problem and subject. Various specific considerations are considered.

1. The limited literature on petroleum career development posed a constraint on the conceptualization and on empirical studies that might provide important references and valuable experience. Petroleum (oil and gas) exploration and production companies are characterized as knowledge-based firms (Grant 1996; Woiceshyn and Falkenberg, 2008) and their petroleum professionals as knowledge workers (Drucker, 1999; Hirsh, 2006; van Staden and du Toit, 2011) with dual career paths as specialist and managerial. Such a linkage provided an important anchor to bridge the conceptualization gaps in the petroleum professions.
2. An important source of information is secondary data and information in the form of PDO's policies, management systems, personnel data/records and accounts of practices governing and affecting professional career development and competency/skill capacity building. There were two main challenges in this regard; access to the data and information on the one hand, and the usefulness and adequacy of this information to draw reasonable and representable definitions and pictures of the career and capacity building systems and

practices, on the other hand. In respect to the access challenge, company approval was granted in accordance to signed confidentiality agreements between PDO and the University of Liverpool and between PDO and the researcher. The usefulness and adequacy of the information provided by PDO is assessed as part of the research process with appropriate conclusions being drawn.

3. Qualitative data obtained through focus group discussions and interviews with executives and petroleum professionals in PDO was another important source of data. A potential constraint here was in securing the acceptance of participants to be interviewed, and their willingness to offer valuable and relevant responses. In addition to obtaining clear organizational senior leadership support, the number of participants targeted for interviews constitute about a third of managers and functional leads/skill pool managers currently in place. Similarly, the targeted participants for each of the focus group discussions were from the different disciplines and levels.
4. One the main data collection for the research was from responses to an online questionnaire survey that targeted PDO's petroleum professionals with a minimum time of one year in PDO for mature recruits and two years for graduate recruits; the rationale for which is outlined above. With such inclusion criteria, over 500 professionals were invited to respond to the questionnaire. The associated potential constraints in this activity were threefold; design of the survey, administering the survey, and responses to the survey. The first one is a main research activity for which the researcher developed the required competency/skill during the research process. For the second, organizational support was obtained to carry out Information Technology (IT) based questionnaire surveys using the organization's systems and facilities.
5. The researcher's experience in the oil and gas EP, his engagement in various competency development schemes, and current managerial roles and responsibilities enabled him to reflect on the dimensions of the research problem within the organizational setting and context. This posed the risk of introducing personal biases and preferences that could affect independent and credible evaluation, however. Awareness of this risk is important and is discussed explicitly during the research so as to alleviate any related concerns in respect to the analysis.
6. Ethical aspects need to be taken account of when conducting research with people as participants and subjects. In this regard ethical approval was obtained from the university detailing the approaches that were to be followed when conducting the research to address

any concerns that could arise from engaging with participants. No significant hindrances were identified.

3.3 Engaging Research Participants

To enable answering the research questions and assessing the associated propositions that evaluate and outline PDO approach and practices, I reviewed PDO records and management systems and engaged research participants from PDO in two means of qualitative and one of quantitative inquiries. According to Easterby-Smith, Thorpe and Jackson (2012), focus group discussions and interviews are the two main methods for qualitative data collection through language. The means of engaging participants - actors in the studied case - were in three forms or methods of inquiry that are conducted in the following order of (1) focus group discussions, (2) one-to-one interviews, and (3) online questionnaire survey. The sequence of conducting these engagements and inquiries was to enable

- Refining, redefining, or improving descriptions of the various research elements and aspects. This process started with literature review, followed by focus group discussions, and concluded with the interviews. Example from focus group discussions that was taken into the interviews is linking PDO's term of subject-matter-expert (SME) to specialist.
- Identifying relevance and importance of research elements and aspects, hence continuing or dropping from research pursuit. Example: at focus group discussions, the concept of predicting career attainment was assessed to be less relevant, hence not dropped.
- Identifying new concepts, aspects or practices. For example, the presence of multiple careers emerged from the focus group discussions and was explored and assessed at the interviews and by the questionnaire

Focus group discussions and interviews addressed the same researched elements and issues, with two main differences. First is the presentation whereby for focus group discussions the topics and inquiries were presented for group debate and discussions, while in the interviews were for soliciting individual interviewee's own perspectives and assessments. In the questionnaire survey, the researched elements were presented in more accounts, statements, or questions that were aiming for direct responses in forms of levels of agreement or disagreement, or selecting from pre-specified answers. These three means of engagements provide, in addition to PDO's organizational records and documents, the four sources of data

and information used in this research. These resources are used for addressing the research aspects, research questions, and elements as outlined in Table 3.5.

Table 3.5 Researched Aspects, research questions, and elements to be investigated

Main Aspects	Research Questions	Investigated Elements	Organizational Records	Focus Group Discussions & Interviews	Survey
Organizational Context/factors	Is there a clearly defined and agreed-on approach for developing capacity building in PDO's Petroleum and Geoscience professions?	**Capacity Building** - Needs - Approaches - Systems	√	√	-
	Are there professional development and capacity management systems for developing petroleum technical and managerial capabilities?	**Organizational roles and influence on Petroleum Professional Development** - Concepts: knowledge work/dual careers - Context & Management Systems - Career Opportunities & Challenges - Talent Development & Omanisation	√	√	√
Professionals' (Personal) Factors	How do petroleum professionals in PDO view and undertake their own professional development and career association in relation to PDO's capacity building objectives, goals and strategies?	**Petroleum Professionals' views and roles** - Career identity & association - Clarity and importance of career options - Career motivations (generalists, specialists) - Career change and transition - Professional development responsibilities - Professional growth	-	√	√
The Dual Career Ladder Model	Are the dual career (technical-managerial) model in PDO and its objectives understood and supported by PDO's petroleum professionals?	**Career options** - Career paths in PDO - Career drivers (demand, value, support…) - Petroleum career options in PDO - Early identification of talent & career options	√	√	√
	What organizational and individual professional related factors influence the dual career model?	**Influencing career options** - Organizational factors (systems, practices,) - Individual factors (drivers, values, …)	-	√	√
	How these factors correlate and influence PDO's capacity building strategies and outcomes?	**Professionals' and organizational alignment** - Agreements in goals and approaches - Gaps in drivers and practices	-	√	√
Alternative frameworks and career options	What strategies, frameworks, and practice options could be more suitable and effective in developing capacity building in a dual-career paths situation as in PDO?	**New strategies and frameworks, and practices** - Capacity building: concepts and approaches - Professional development: framework & options - Career model and options - Adapting to changing career options & professionals commitments and choices - Bridging the concept-practice gaps.	-	√	√

Source: developed for this research

Participants in the research

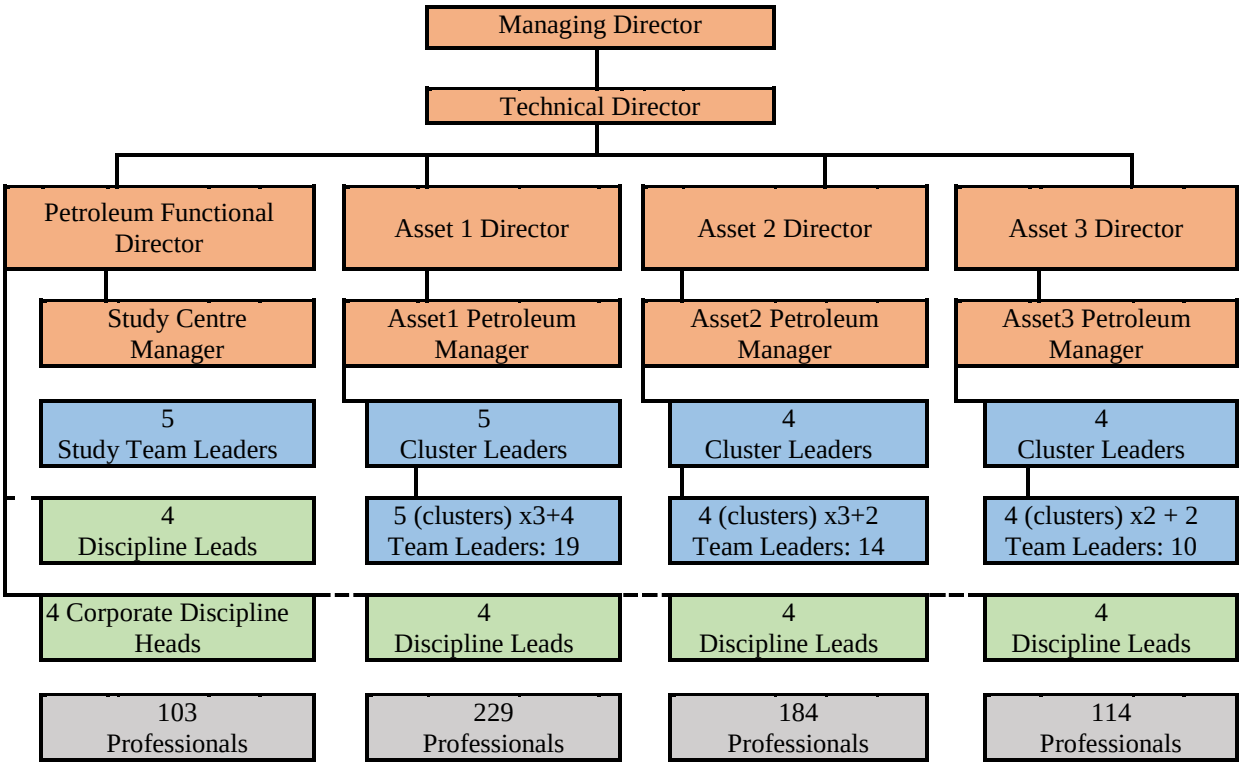
Participants in the research were members of PDO who can either influence, or who are influenced by, the studied case. Participants took part in one or more of three means of engagement: focus group discussions, one-to-one interviews, or responding to online questionnaire. Invited participants were

1. **Executives:** holding executive and business leadership roles
2. **Team leaders:** holding technical and line management delivery roles
3. **Discipline Leads:** holding discipline/functional management and technical assurance roles
4. **Professionals:** working petroleum engineers and geoscientists

The latter three all belong to the petroleum profession – i.e. have worked as petroleum professionals and have sufficient knowledge and experience in the petroleum disciplines (engineering and geosciences). Most of the executives have also worked and acquired significant knowledge and experience in the petroleum profession.

Participants in the research are selected for each of the engagements and methods of inquiries based on their roles and affiliation to provide representation of disciplines, roles, and workforce demography (female/male, Omani/Expatriates, and job/experience levels). Figure 3.2 shows PDO's organizational structure describing the reporting structure and the positions from which the research participants were invited. This organizational structure depicts only those positions directly relevant to the petroleum functional work sector and that have an influence on petroleum professional development and management responsibilities.

The term cluster describes a group of oil or gas fields located in defined geographical regions, whereby the cluster leader is heading a petroleum department responsible for the development and production from these fields. Within each cluster there are two to four work process or project teams headed by team leaders.



Source: Developed for this research

Figure 3.2 PDO organizational structure; Leadership and Petroleum Units (as of 1 May 2015)

Research participants' inclusion criteria

Invitations to participate in the research were extended only to those who had joined PDO's workforce as new graduates before 1st May 2013 - i.e. two years or more in PDO at the time of engagements that started in April 2015- or as experienced and mature recruits before 1st May 2014 – one year in PDO. This inclusion criterion was set to ensure participants with reasonable knowledge and exposure to PDO's systems and practices. The two-year experience requirements for graduate recruits is a reflection of the initial induction and training programme they go through, thus allowing time for minimum work and knowing organizational systems. In each of the three means of inquiry and engagement, participants were engaged based on their roles, influences, and experiences.

- **Focus group discussions:** Team Leaders, Discipline Leads (and skill pool managers), and Professionals (from each of the petroleum disciplines: reservoir engineering, geology, seismology, petrophysics, and production technology).
- **Interviews:** Executives, Team Leaders, and Discipline Leads
- **Questionnaire Survey:** Team Leaders, Discipline Leads, and Professionals

Number of participants invited to participate in each method of inquiry/engagement were determined by the objectives and representativeness, and manageability considerations. Twenty-four direct engagements (four focus group discussions and twenty interviews) were considered sufficient to provide insights and qualitative assessment of the studied case. However, the manageability and flexibility (e.g. time to respond) allowed the online questionnaire survey to target all professionals, including team leaders and discipline leads. Table 3.6, below, lists the number of invited and attended participants for each of the three methods of inquiries.

Table 3.6 – Number of research participants for each method of inquiry

Method of inquiry	**Focus Group Discussions**		**Interviews**		**Questionnaire**	
Objectives of inquiry	Initial engagements to assess relevance and importance of research elements identified from the literature to PDO		Soliciting perspectives, experiences, and assessments of dimensions and PDO practices of the researched subject		Soliciting professionals' own perspectives, experiences, uptake, and assessments of the studied case.	
Invited Participants (% of population)						
Executives (10)	-	-	7 (70%)	7	-	-
Team Leaders (62)	4 (6%)	2 (3%)	8 (13%)	8	52 (84%)	22 (35%)
Discipline Leads (20), Skill Pool Managers-SPM (4), and Subject Matter Experts-SME (16)	8 (20%)	7(18%)	5 (13%)	5	40 (100%)	14 (35%)
Professionals (474)	16 (3%)	7 (1%)	-	-	474 (100%)	111 (23%)
	Invited	Participated	Invited	Participated	Invited	Participated

Source: developed for this research

Participants were identified and invited from PDO's petroleum function/community pool and were invited through e-mail messages containing an introduction to the research, the meeting venue, and format. Participants were informed that they possessed the full discretion and right not to participate, to withdraw, or to refrain from responding to any discussion points, without any consequences. Access to PDO's personnel database custodian was authorized by the signed researcher-PDO confidentiality agreement to generate lists of targeted participants. The confidentiality and anonymity of participants were ensured as far as possible: apart of occupiers of some senior positions who can be inferred to by participating.

3.4 Focus group discussions

Focus group (FG) discussion is a form of engaging number of research participants at the same time and venue, in which participants explore a wider understanding, multiple perspectives, and establish alignments or differences on the researched issues and problems. The overall aims were to explore dimensions or aspects - not identified or adequately described in the research proposal and initial framework - of the research problem/practice case.

Four FG discussions were conducted in April 2015 at PDO offices. The groups consisted of skill pool managers and discipline leaders who all have staff development responsibilities, team leaders (technical managers) of departments hosting petroleum professionals, and number of petroleum professionals. Participants were knowledgeable and experienced with the subject and related practices. To avoid bias and to enable all participants to express their views and perspectives freely, professionals were invited to different group discussions from those attended by their line managers or discipline leads. In addition, participants in the focus group discussions were requested to support confidentiality by not disclosing the discussions and participants' identifications (anonymity), and not to use the discussions against or for any participant in any way. The format of the discussions was an open forum with the use of audio recording to capture discussions that were later transferred into writing. For each FG, seven participants were invited, of which actual participation was four, four, three and five in each of the four focus group discussions respectively, constituting an overall participation of 57%.

The researcher started the discussions by introducing the research, outlining participants' rights and required consent to participate, and the objectives of the discussions. The points for discussion were based on the elements described in Tables 3.4a-c and Figure 3.5, and as listed in Appendix I, in addition to offering definitions and descriptions of some of discussed aspects. The discussions debated the various presented concepts and aspects in order to establish their relevance to and presence in PDO's practice context, their value and importance to PDO, to its petroleum professionals, and to the industry.

The dynamics of the discussions improved as the researcher's own competency developed, and with the opportunity to reflect on the outcomes of prior discussions. The more participants and the greater the mix, the richer were the discussions and expressed perspectives. The main outcomes of the focus group discussions were establishing which of the professional

development and career option concepts were relevant, where the points of consensus or variance lay, and where gaps in practice existed.

Focus group discussions addressed themes from the main research questions.

1) PDO's approach to developing capacity building via professional development and capacity management systems that develop petroleum technical and managerial capabilities.

2) PDO's petroleum professionals' views, pursuits, and assessment of their own professional development and career association, in relation to PDO's capacity building objectives, goals and strategies.

3) PDO's developed and adopted dual career (technical-managerial) model's set objectives and achievements. Moreover, its related organizational and individual professional factors.

4) Strategies, frameworks and practice options that are seen by leaders and professionals to be more suitable and effective in developing capacity building in a dual-career path situation such as in PDO.
5) Additional themes emerge from the discussions.

The outcomes of the discussions are categorized, analysed, and reflected on in the light of the research questions, and were then taken to the one-to-one interviews for further discussions and assessments, and as inputs to the exploratory and descriptive case study. I categorized (grouped) the data collected from the focus group discussions into the main research themes and topics. The focus group discussions extracts are reported in Appendix I. The themes and topics under which the quotes are grouped are capacity building, professional development, organizational practices and systems, and career development. Of these four areas, the first three outline the organizational aspects, while the last outlines petroleum professionals' roles and practices.

3.5 Interviews

The interviews were semi-structured and aimed to solicit perspectives, accounts of experiences, reflections and assessments of the research subject and practices in PDO; e.g. professional development policies, codes of practice, implementation and experiences, interviewee

perspectives and views on these systems, actual practices, outcomes, changes and outlook. The interviews were also to explore patterns, trends, group and individual thinking; alignment and variability.

The interviews were conducted, during the months of April and May 2015, following the focus group discussions. This is to build on their outcomes, particularly on putting more emphasis on important aspects, further propping key issues, or to not pursue identified least important or relevant issues.

In conducting the interviews, I adopted the guidelines provided by Jacob and Furgerson (2012). These included using a script for the beginning and end of the interview, open ended questions, starting with the basics and easy to answer questions before moving to controversial or more difficult issues, writing big and expansive questions enabling participants to offer wider, and more valuable and interesting information, and using prompts or probes.

The interviewees represented decision makers, professional development practitioners and guides, thus, providing wider and more representative perspectives and experiences enabling to draw good assessment of studied case and the researched elements.

Twenty one-to-one interviews were conducted with the objective of understanding the observed organizational practices and the various factors affecting PDO's petroleum professionals' career ladders and professional development. I interviewed seven executives, eight team leaders, and five discipline leads. The interviews took place at the interviewees' offices or their selected venues and took between fifty and sixty minutes each, and were audio recorded to ensure that the interviewees' responses were captured accurately. The interviews did not follow order of seniority nor roles, however the later interviews reflected on the findings from the earlier ones.

The interviews were semi-structured, meaning that questions were posed around predefined topics and aspects of the research as listed in Tables 3.4a-c and Figure 3.5, and detailed in Appendix II. The researcher offered definitions and descriptions based on the literature or relevant PDO documentations and records in respect to some of these elements. The interview questions were probing the understanding of the interviewees regarding organizational practices and provided important insights as well as challenges in terms of data coding and analysis. To deal with these challenges, the insights revealed were categorized as either direct

inputs into the research case study or matters for further research outside of the scope of this enquiry.

I categorized (grouped) the data collected from the interviews into the main research themes and topics, and by participants' categories (executives, team leader, and discipline leads). The interviews extracts are reported in Appendix II. Selected quote are included for referencing in in the analysis and discussions of the research findings and outcomes in the next chapter. The themes and topics under which the quotes are grouped: capacity building, professional development, organizational practices and systems, and career development. Of these four areas, the first three outline the organizational aspects, while the last outlines petroleum professionals' roles and practices.

3.6 Questionnaire Survey

In most survey-based research studies, questionnaire is the main data collection tool. In this research, it builds on and supports the collected qualitative data and information through the first two methods of inquiry: focus group discussions and one-to-one interviews. An online questionnaire survey was designed to explore and assess professionals' understanding, perspectives/positions, and experiences of the identified elements and aspects of the research topic as in Tables 3.4a-c and Figure 3.5. Responses to the questionnaire were used to refine, evaluate, or contrast with findings from the literature, PDO's organizational records or from the focus group discussions and interviews (Gibbs et al. 2007; Hoonakker and Carayon, 2009; Oyeyemi, Adewara and Adeyemi, 2010).

It was programmed and administered as an online survey by PDO IT department using the internet-based SelectSurveyNet software. It was hosted in PDO's secure server that is accessible only to invited PDO members. Selected research participants for taking the survey were invited by e-mail messages sent individually to their PDO e-mail addresses with the link to the questionnaire Appendix III) that allow each to take the survey, save their responses, return to it until completing and submitting. Consent to participate to take the survey was part of the questionnaire. Respondents had the option not to respond to any of the questions/statements. To ensure anonymity and confidentiality, the survey did not include any information that could indicate the identities of the respondents.

The survey had an expiry date after which it access was ceased. The duration for the survey was initially set for two months, then extend for additional month to allow more participants to

take it or complete it. Reminders were sent to all participants every three weeks. This was to allow those were absent or did not receive the invitation due to their inboxes not accepting due to being full to take the survey. The software also allows the administrator to obtain reports of how many respondents have started or completed the survey, and the submitted responses. The reports do not show the identity of the respondents. And only the administrator had the full access to the survey results and reports, who in turn provided the researcher with regular updates on how many took the survey,

The questionnaire comprised 86 questions organized in number of sections, the majority of which comprised questions using a 5-point Likert scale (Trochim and Donnelly, 2008:136) suitable for respondents rating their agreement or disagreement with each of statements in the questionnaire. These questions and statements were on the research subject and elements, and on professionals' own perspectives, experiences, and observations of practices in PDO. To enable clearer responses, these statements were made simple, addressing one issue/element at a time removing ambiguities and possible multiple answers, and were directly related to respondents' understanding and experiences, including their observations of organizational practices. As an iterative action research and based on the learning from the focus group discussions and interviews, some of the investigated concepts were found to be either unfamiliar or were not understood. For these, definitions or descriptions were included prior to some of the questions/statements.

Additionally, as an indicator of action learning and action research, the survey included a request for the respondents to reflect on the impact of taking the survey on their understanding of professional development and career options and on how this might encourage them to take action and drive change. The questionnaire also requested the respondents to indicate their age, discipline (e.g. reservoir engineering, geology), gender, staff category (Omani, Expatriate), years of experience, and job level (e.g. engineer, discipline lead, team leader, subject matter expert). This was used for grouping and trending responses. None of these data allow identifying respondents since there were more than 20 individuals in any of the grouping or categories.

The initial response was low, requiring a number of reminders to be sent out and an extension to the time allowed for the survey. Factors contributing to the low response could be the timing of posting the survey, during the summer vacations, in addition to the length of the survey.

The overall response (using fully completed surveys) is 26%, with professionals had lowest response rate 23% and the team leaders had highest response rate of 42% (Table 3.7).

Table 3.7 –Invited and responded participants in the Questionnaire

Participants	Invited	Participated	% Participated
Team Leaders	52	22	42%
Discipline Leads / Skill Pool Managers (SPM) /Subject Matter Experts (SME)	40	14	35%
Professionals	474	111	23%
All Participants	566	147	26%

Source: developed for this research

Respondents' demographics indicated that respondents who completed the survey are a reasonable representation of PDO's petroleum professionals, based on gender, age, educational levels, job / professional levels, working years in POD, disciplines, and staff categories.

- **Genders:** 25 females and 121 males completed the survey, with females constituting 17% (the invited female population is 19% of all invited).
- **Age:** the majority of respondents are at a middle career stage of 30-39 years (47%), while the lowest response is from those in initial career stages, who constitute sizable portion (~40%) of PDO petroleum professionals.
- **Educational levels** of respondents are mostly Master's degree (44%), Bachelor's degree (42%), and Doctorate's degree (12%).
- **The job levels** (measured by salary groups) of respondents showed that high to middle professional levels constitute the largest group, while the lowest professional levels are least represented.
- **Years working in PDO** ranged from over 20 years (12%) to less than 2 years (10%), with the majority 2-10 years (59%).
- **Disciplines of respondents** represent the actual distribution of petroleum professionals in these disciplines; with production geologists, production technologists, and reservoir engineers are largest while petrophysicist and production seismologists are lowest reflecting the actual petroleum professionals' population distribution.
- **Staff categories of respondents** represent the actual distribution of working petroleum professionals in PDO, Omani (62%), seconded expatriates (20%), and direct hire expatriates (18%).

The survey responses are categorized under main headings describing researched aspects and elements of the studied case, mostly on careers, professional development, organizational and professionals' factors impacting capacity building and career development. The responses are presented graphically for trending and referencing in the analysis and synthesis of the case study. In addition, reflections on survey impact on respondents are presented, and comparisons between responses to all the questions are made in radar charts (Appendix III).

3.7 Summary and Research Plan

A mixed method (qualitative and quantitative) case study was selected as the research methodology, based on a relativist ontological position and a constructionist epistemological commitment. These philosophical positions are most suitable to exploring and understanding issues related to social systems and building a complex and holistic view of natural settings. The qualitative research enables meanings to be established and social or human issues to be explored, building up a more holistic and complex picture, and accounting for the views and perspectives of participants in natural settings. Quantitative research, on the other hand, was utilised to engage larger group research participants through responding an online questionnaire, hence complementing the qualitative-based face to face engagements. The design of the methods of inquiry reflects cumulative knowledge and able to be enhanced during the research process, starting with secondary data collection, focus group discussions, interviews, and completed by an online questionnaire survey. Participants in each phase/method are representatives of the studied group of professionals and those with the roles of directing and managing the professional development of the studied petroleum professionals. The design and conduct of the three research methods of inquiry; focus group discussions, interviews, and questionnaire were discussed.

Chapter 4

ORGANIZATIONAL DATA ANALYSIS

This case study research addresses a practice case in a specific context and assesses it in light of the concepts developed in the literature. This chapter investigates the studied case – capacity building and professional development in PDO – by reviewing PDO's organizational management systems, business records, established policies and practices, and its population of petroleum professionals. These constitute what is commonly described as secondary data. The sources of the organizational data and information are business records, reference documents and personnel databases. Access to these data and permission to use them are based on signed agreements between PDO and the researcher, and between the University of Liverpool and PDO.

4.1 PDO's Business Management Documents

PDO is a well-established company having operated for over 50 years. It is governed by a Board of Directors and has a clearly defined organizational structure and governance model. It has well documented and shared corporate principles, policies, standards, and code of practices forming part of its business records, some of which are used in this study to describe the company's position in respect to the studied subject.

For this research, I consulted a number of important internally-published documents - that are accessible to employees with confidentiality protocols governing their use and sharing their contents. These documents are relevant and provide important input to describing and assessing the research elements, studied subject and practice case. These documents are categorised as Code of Practices (CP), Specification (SP), or Guidelines (GU).

- PDO CP-107 (2014) is PDO's Corporate Management Framework (CMF) and it is the highest-level control document defining the company's approach to management, as a framework for conducting PDO's business, and for integrating PDO's structure, roles, processes, policies and assets.
- Statement of General Business Principles: http://www.pdo.co.om/Pages/Legal.aspx.

- PDO CP-125 (2002) is PDO's Petroleum Engineering (PE) Management code of practice. It sets out rules and guidelines in managing PE roles and responsibilities, the means of carrying out mandates and duties, and in particular developing and managing PE capabilities, including the development of petroleum professionals and resourcing approaches.
- PDO CP-174 (2003) (Omanisation) code of practice defines the activities and responsibilities fully to achieve PDO's Omanisation (employing Omani nationals) policy
- PDO CP-180 (2003) Recruitment code of practice stipulates recruitment criteria, with those related to petroleum professionals as mature recruits and as graduate recruits quoted here.
- PDO SP-2061 (2014) (Technical Authority System) stipulates that PDO's Discipline Controls and Assurance Framework (DCAF) provides one standard approach towards Quality Assurance (QA) and Quality Control (QC) and defines technical authority (TA) roles.

These documents outline PDO's policies, organizational structure and management systems, capacity building, staff professional development, and human resource processes such as progression and training. These documents provide essential resources for in describing and analysing the studied case, particularly the organizational aspects and factors impacting petroleum capacity building, petroleum professional development, and career options.

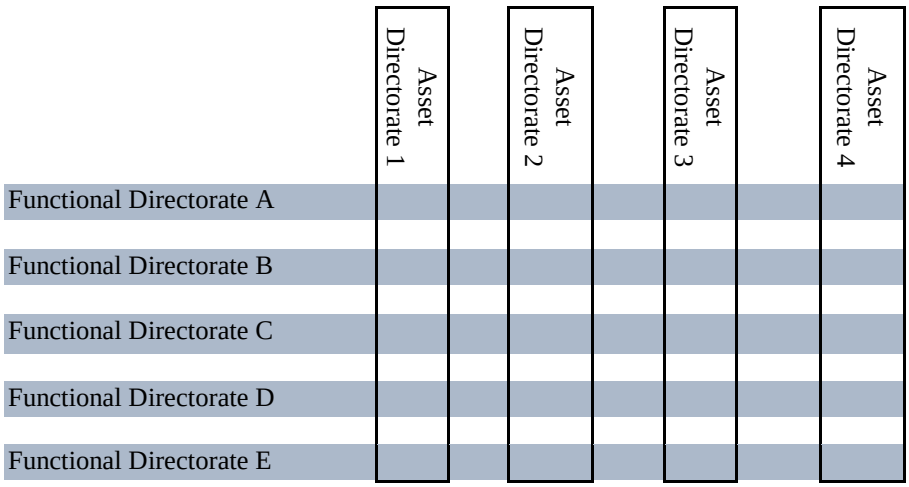
4.2 Organizational structure and systems

PDO operates with a matrix organizational set-up combining the benefits of functional structure and project (Assets in PDO's terms) organization (Galbraith, 1971), and is guided by established management systems and processes deemed necessary for the delivery of its business objectives and its complex operations and activities.

4.2.1 Matrix Organization and Dual Career Model

As stipulated in its CMF document "*PDO to conduct its business through a matrix organisation consisting of both Line and Functional Directorates"* (PDO CP-107). At the

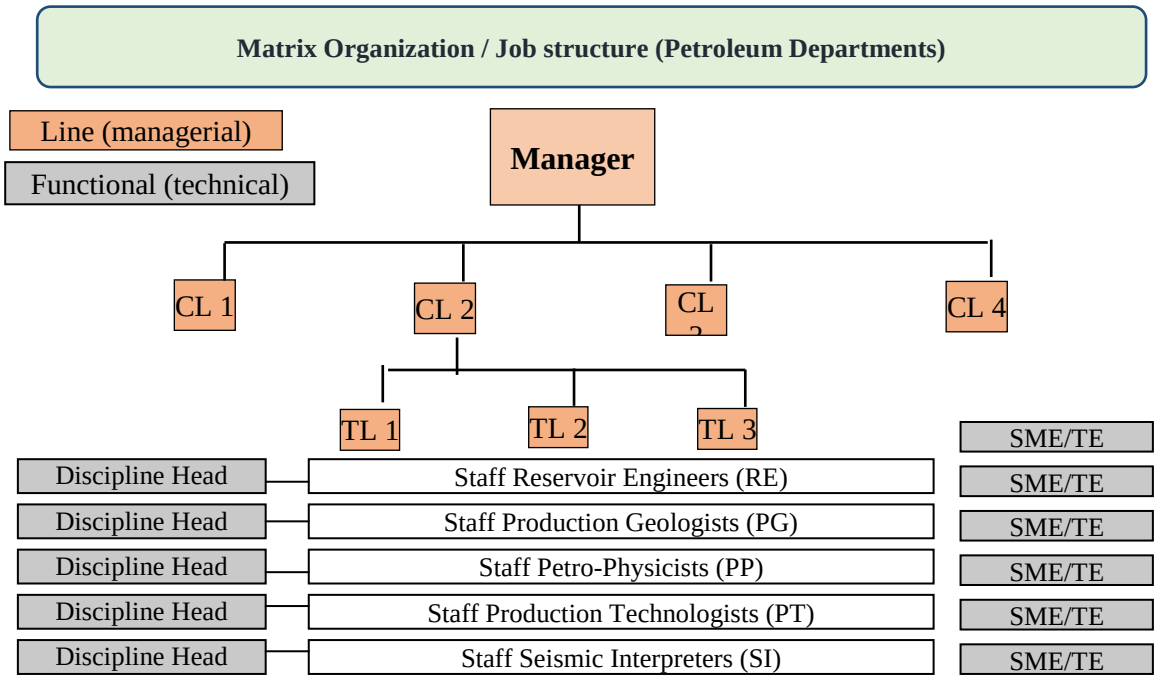
highest level, the organization is structured into Asset (Line) Directorates and Functional Directorates (Figure 4.1).



Source: developed for this research

Figure 4.1 PDO Matrix Organization (Highest Level)

The matrix structure is further extended to lower levels in the organization. Figure 4.2 depicts a typical structure for petroleum engineering departments (within the Asset Directorates).



CL: Cluster Leader TL: Team Leader SME: Subject Matter Expert TE: Technical Expert

Source: Developed for this research

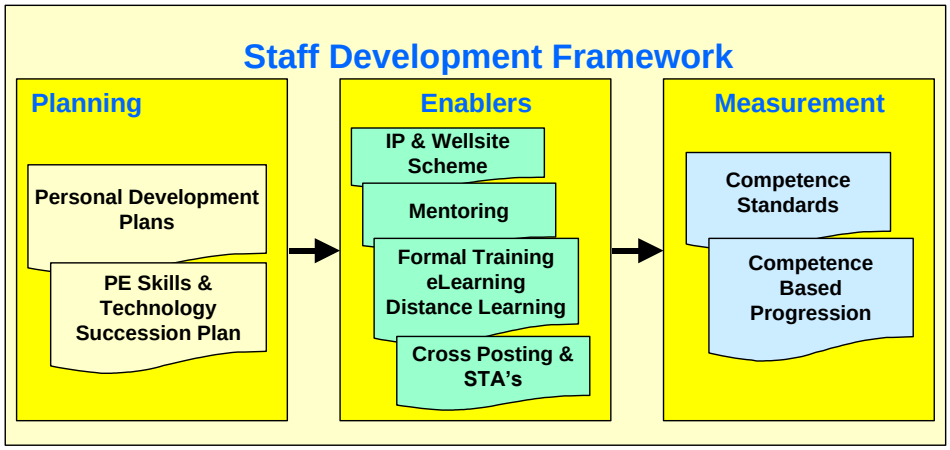
Figure 4.2 Typical Petroleum Engineering Departments: Matrix Organization.

This organizational set-up is in line with and does support the dual career ladders/paths model. Those on the managerial career paths take up the line/asset management (manager, CL, and

TL) roles. Those on the technical/specialist career paths take up the functional (discipline heads, SME, TE) roles. At the highest organizational levels, there are Asset Directorates and Functional Directorates, including the Petroleum Engineering Functional Directorate, which hosts corporate functional discipline heads (CFDH) for each of the disciplines, and skill pool managers, who are responsible for planning and human resource management of petroleum professionals in PDO.

4.2.2 Professional and career systems

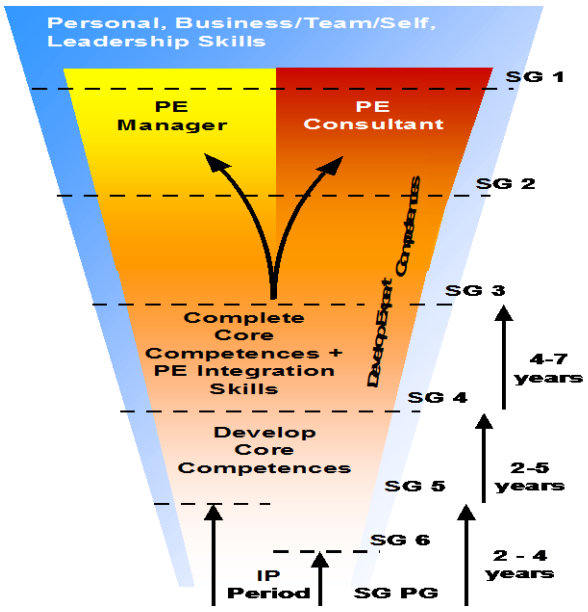
As stipulated in PDO's policies and code of practices, the employees are considered to be the most valuable assets and resources in PDO. Hence, staff development and career progression receive significant attention in the organizational scene. This is reflected in various policies, management systems, and codes of practice aiming to develop capacity building and management capabilities. The staff development framework (Figure 4.3) outlines PDO's approach to developing and managing its petroleum engineering (professionals) manpower. The framework defines the three aspects/elements for delivering staff development objectives and goals. These are planning, enablers and measurements; for each, different approaches and activities are needed in order to deliver the staff development goals.



Source: PDO CP-125 (2002)

Figure 4.3 PDO PE Manpower and Staff Development Framework

Further, the code of practice, PDO CP-125 (2002), defines the staff development framework as incorporating a dual career ladder model (Figure 4.4) for petroleum engineers and petroleum geoscientists (petroleum professionals).



Source: PDO CP-125 (2002)

Figure 4.4 PDO PE Dual Career ladders model

Based on the above, PDO's organizational structure, and management systems and processes seem to provide the required infrastructure and enablers for capacity building through professional development and dual career model. On the other hand, the research problem indicates practice and implementation gaps and deficiencies in achieving capacity building and developing professionals, particularly specialists. This raises questions about the suitability and effectiveness of PDO's approach and processes.

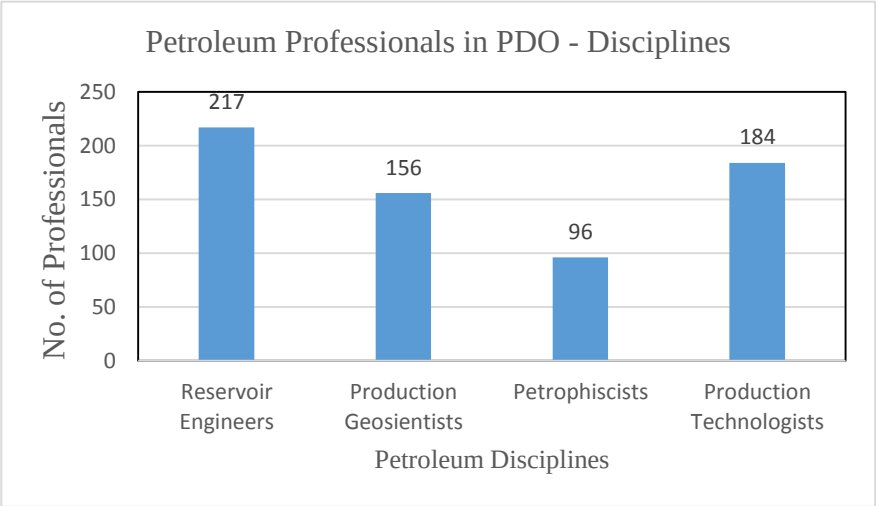
4.3 PDO's Petroleum Engineering Workforce

PDO has some 8800 employees, more than 750 of which are petroleum professionals (engineers and geoscientists), and another 200 are support staff, mostly technical assistants and data management assistants. Although, petroleum professionals comprise only 10% of the company's workforce, they are considered to represent the company's core capabilities. The other technical disciplines (production operations and maintenance, well engineering, exploration, facility engineers) also have sizeable workforces, although the majority are technicians, executors and operators. Petroleum professionals do work closely with the other technical professionals and to lesser extent with others from corporate disciplines such as finance and human resources. The demography and characteristics of petroleum professionals,

and their distribution impact directly PDO's capacity building and development of it petroleum professionals. In the following sections, I will discuss each of these aspects and their impacts.

4.3.1 Petroleum Disciplines

The petroleum professionals, known in PDO as petroleum engineers, are split into four disciplines: reservoir engineering (RE), production geosciences (PG) (geology and seismology), petrophysics (PP), and production technologists (PT). These professionals mostly work within multi-disciplinary teams that are parts of petroleum engineering departments in six units (Assets, Exploration, Functional Directorates and the Study Centre). Figure 4.5 shows the number of professionals in each discipline.



Source: PDO's petroleum engineering personnel database; March 2015

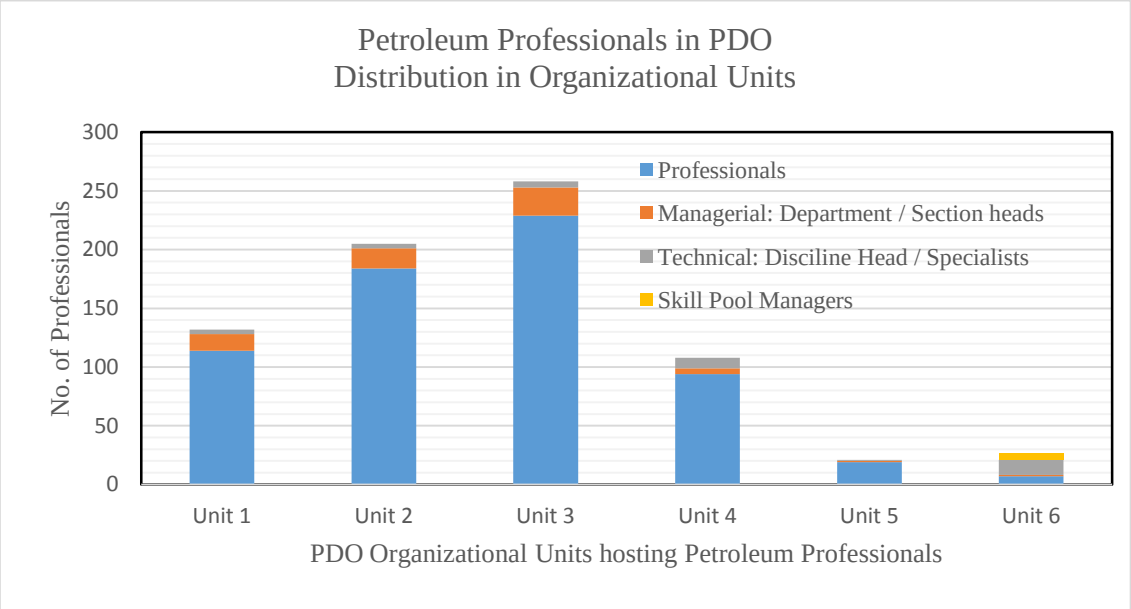
Figure 4.5 PDO Petroleum professionals per discipline

The two disciplines with largest numbers do also have more specialists (discipline-based) and more professionals who progress to managerial positions than the other two. While this situation reflects the population size of each discipline, it poses a challenge of discipline imbalance in technical (team leaders) managers' roles. Hence, impacting capacity building.

4.3.2 PDO Departments and Jobs for Petroleum Professionals

The development of petroleum (oil and gas) resources goes through stages; exploration, appraisal, initial development, re-development and abandonment. At each stage, the roles of petroleum professionals vary with different disciplines, numbers and competencies required.

Petroleum professionals are assigned to various departments of the different directorates in PDO, and later get re-assigned to other departments or roles and positions. The movements of individuals between these departments are governed by PDO's resourcing model reflecting levels and types of work-scope each department is responsible for and as mean for professional staff development. The various petroleum departments with variability in work scope and type offer valuable development opportunities for PDO's petroleum professionals and wide range of competencies and experiences. In addition, the job rotations allow professionals and the organization to identify their abilities and preferences, hence enabling identifying and developing suitable career paths. Figure 4.6 shows the distribution of professionals into the various PDO units and the main job categories. The figure shows the dominant staff category is (technical) professionals, then managerial positions, and lesser technical experts and skill pool.



Source: PDO's petroleum engineering personnel database; March 2015

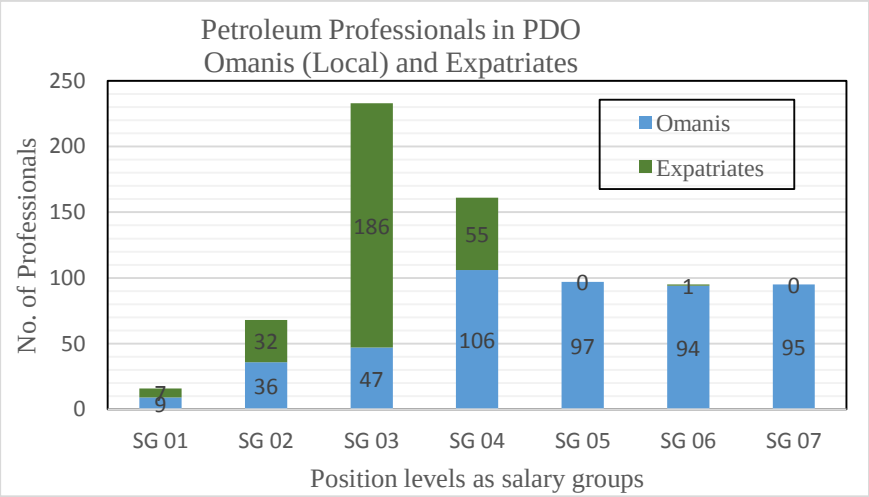
Figure 4.6 PDO Petroleum Professionals Organizational Distribution

Further, the dominant work scope of the units influence the level and number professionals allocated to each. The first three units (1, 2, and 3) are in development/production asset directorates, having only petroleum disciplines. Units 4 and 5 have responsibilities to deliver specialized work (e.g. exploration and development studies) and hence involve petroleum disciplines and other disciplines such as concept engineering and exploration. Unit 6 is the petroleum functional directorate. While such variability provide rotational and development opportunities for petroleum professionals, it pose a challenge of attracting petroleum

professionals to some of the jobs deemed not offer good career advancement and driving change.

4.3.3 PDO's Petroleum Professionals Characteristics

PDO's petroleum professionals are divided into two staff categories; Omanis (local) and expatriates. The former category is developed by PDO with lasting employment contracts, while the latter are recruited with time-based renewable contracts or seconded (cross-posted) from Shell International. PDO progresses its professionals through levels (identified as salary groups) corresponding to job levels (called job groups) starting from 7 (lowest) to 1 (highest). The entry levels for Omanis are SG 7, 6, or 5 for those with a Bachelor degree, Masters' degree, or PhD degree respectively (PDO CP-125, 2002; PDO CP-174, 2003; PDO CP-180, 2003). Expatriates are recruited as experienced professionals with a minimum job level corresponding to SG 4. This is shown in Figure 4.7, whereby expatriates are at levels SG 4 to SG 1. The company has a strong drive to nationalize (Omanize) its workforce, including petroleum professionals. This is clearly reflected in the steady intake of Omani graduates as demonstrated (Figure 4.7) by the numbers of Omanis in SG 7 to SG 5. This kind of staff composition and demography, however, poses significant challenges to achieving capacity building and professional development. The challenge lies in how to sustain capacity building that is, by definition, a long-term effort while experienced expatriates are being replaced by less experienced Omanis, especially technical specialists and experts.



Source: PDO's petroleum engineering personnel database; March 2015

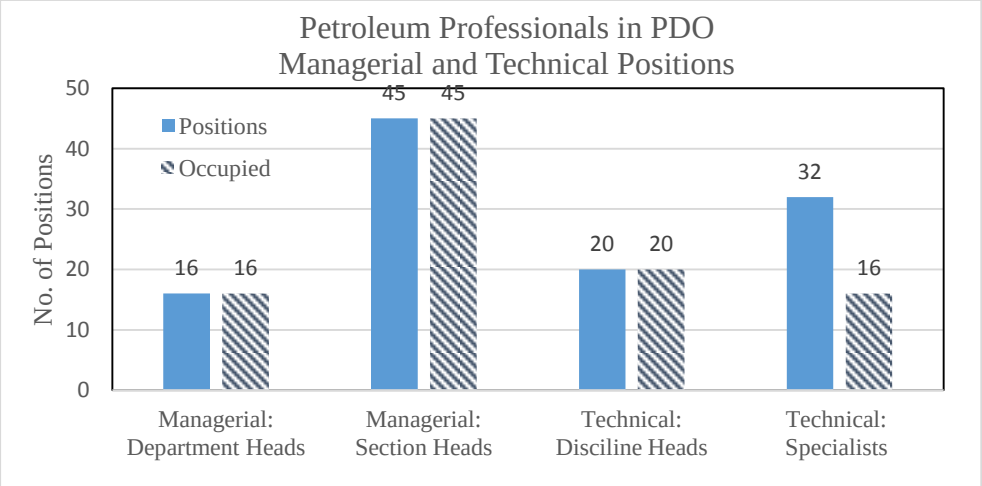
Figure 4.7 PDO Petroleum Professionals' Position-Levels Distribution

4.3.4 Petroleum Professionals Roles and Positions in PDO

Based on PDO's matrix organizational structure and as reflected in PDO's petroleum engineering personnel database, there are two levels of managerial positions and two types of discipline/specialists positions. Technical authorities are assigned to professionals to sanction, endorse, or approve works and activities based on their expertise and assigned roles.

Managerial and Technical/Specialist

Of the two main organizational roles and responsibilities petroleum professionals are assigned, Figure 4.8 shows that all managerial and technical/discipline/specialist positions are filled (i.e. the positions are occupied). The ratio of managerial positions to professionals is around 10% for the three asset units and 5% for the specialized units (as depicted in Figure 4.6). The petroleum managerial positions are at two levels, with the top-level constituting only a fifth of the positions, equating to 2% of the total population of petroleum professionals in the company, with the second level being about 8%. This situation therefore constitutes a significant bottleneck for professional progression for the large pool of professionals who would prefer the generalist managerial career paths.



Source: PDO's petroleum engineering personnel database; March 2015.

Figure 4.8 PDO Petroleum Managerial and Technical/Specialist Positions

Petroleum technical lead roles are of two types: discipline heads or specialists. Specialists and discipline leads (technical) are at the job levels of SG 1 and 2, similar to department heads and team leaders (managerial). Most Omanis in SG 1 and 2 are in managerial positions, while most expatriates at these levels occupy the discipline and specialist positions. The technical specialist roles are mostly centred on subject-related expertise, including subject matter expert

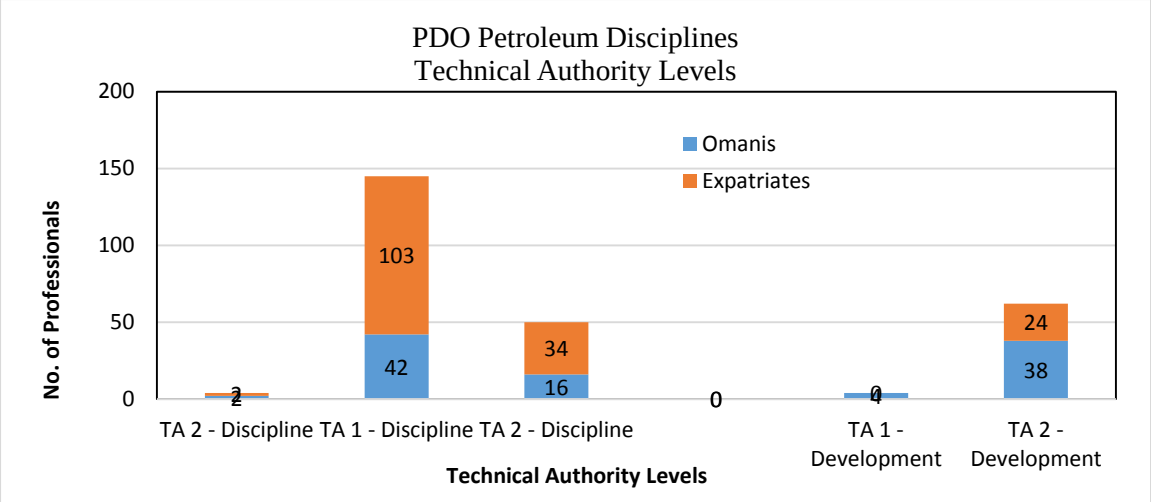
(SME) roles. There are currently 32 technical specialist positions/roles but these are only half-filled. The ratio of the technical positions to the population of petroleum professional is 2-4% for the asset units, and 5-10% for the specialized units. The specialists' roles are professional-based not organization-based, allowing more than one SME in every subject and therefore opening more progression opportunities to petroleum professionals than are available in the managerial positions. The low ratio of technical positions and the low occupation of defined positions (Figure 4.8) further highlight the lack of professionals undertaking technical roles, which can be attributed to these roles being less attractive than the managerial ones. The low occupation of technical and specialist positions reflects a common concern within PDO – to be assessed with PDO research participants - of there being a gap in building capacity and developing technical specialists.

The apparent attractiveness of managerial and line authority positions as opposed to the technical expertise positions may be attributed to the clarity of progression in the latter (hierarchal-based) and the authority associated with managerial positions. Another reason could be the need to demonstrate in-depth technical competencies to progress to specialist positions compared to the generalist technical management positions.

Technical Authorities

Based on PDO's DCAF (Discipline Control Assurance Framework, outlined in PDO SP-2061, 2014), petroleum-related Technical Authority (TA) types are either technical / discipline based or developmental / managerial based (Figure 4.9). Professionals are assigned these TA levels based on their areas and levels of expertise for technical/discipline TAs or position and roles for the developmental/managerial TAs. While the list of TAs at the different levels is published, the bearers of TA, especially at levels 2 and 3, do not necessarily have clearly acknowledged (named) position titles reflecting their expertise and specialization.

Figure 4.9 shows that there are more professionals with discipline TA2 and TA3 than those with developmental TA2. In addition, more Omanis have developmental TAs, while more expatriates have discipline/specialist TAs. This reflects the stronger presence of Omanis in managerial positions than in technical/discipline TAs roles. This can be attributed to the greater experience and professional maturity of expatriates and the drive within PDO to nationalize (Omanize) managerial and leadership positions.



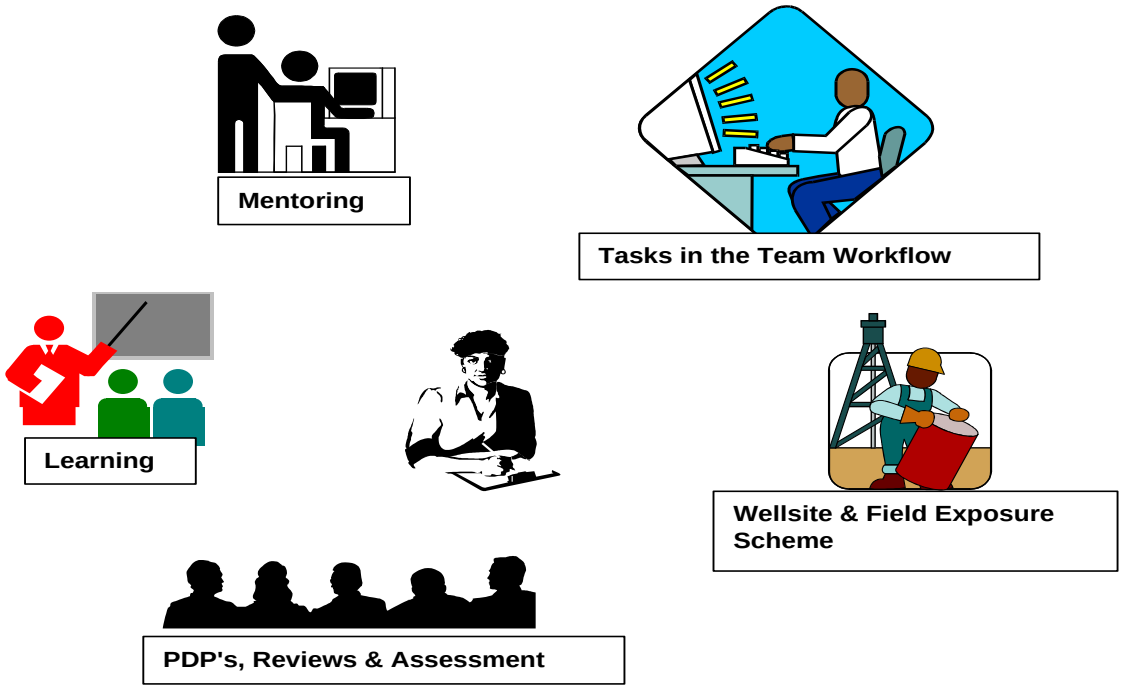
Source: PDO's DCAF (PDO SP-2061, 2014) -Technical Authority System - March 2015

Figure 4.9 PDO Petroleum Professionals Technical Authority (TA) Distribution

This lack of Omani technical experts is a major concern and challenge for organizational capacity building and the sustainability of required capabilities. It is an important aim for this research to understand this situation, what led to it, and the organizational effectiveness in developing capacity building.

4.3.5 PE Professional Development Schemes and Experiences

PDO has, over the years, implemented various schemes to develop and manage the careers of its petroleum professionals to build the capacity required to deliver its business objectives. These schemes have evolved over time to account for changes in operating conditions and workforce levels and composition. PDO also has a petroleum engineering staff development strategy that has a number of elements (Figure 4.10). The application and impact of these elements varies according to a number of organizational and individual factors, however. This study explores these factors and their influences on capacity building and professional development. For instance, mentoring, sometimes called coaching, is provided to graduate professionals during their first years in PDO to guide their development and build their technical and business skills and competencies.



Source: PDO's Petroleum Engineering IP Guideline (PDO GU-405, 2002)

Figure 4.10 PDO starting petroleum professionals Staff Development Strategy

Every professional has a Personal Development Plan (PDP), outlining his or her career options, professional development activities (training, tasks, jobs …) and potential to develop as a consultant or a manager (Table 4.1).

Table 4.1 PDO's Petroleum Engineering Manager and Consultant Profiles

PE Manager Profile	PE Consultant Profile
(Technical) professional with broad experience	(Technical) professional with lengthy experience in a Petroleum Engineering discipline
Shows evidence of capacity and drive to achieve through consistent good performance and business impact	Shows evidence of capacity and drive to achieve through consistent good performance and business impact
Demonstrates a broad and deep understanding of PDO & EP business - PE Cross-Discipline and outside PE e.g. RtL	Demonstrates a broad and deep understanding of PE and PDO business - PE Discipline and PE Cross-Discipline e.g. V2V
Shows evidence of broad skills and knowledge in PE disciplines and integrated areas. Provides independent advice to other assets	Shows evidence of competence mastery in one or more areas where others refer to him/her as an industry expert or specialist.
Co-ordinates/advises others on PDO business planning cycle (Field Development Plans, Programme Build etc.).	Advises others on standards/ procedures/ guidelines
	Promotes new technologies, methods and ways of working
Advises others on the business and commercial aspects of projects	Advises others on the business, commercial and technical aspects of projects
Understands the market and develops business & commercial strategies	Understands the market and develops business, commercial and technical strategies
Can assess, generate and implement opportunity proposals.	Can assess, generate and implement opportunity proposals.
Competent to lead a multi-disciplinary (inside & outside of PE) team	Competent to lead a multi-disciplinary (inside PE) team
Shows evidence of high leadership skills in the Business/Team/Self + HSE + IM areas.	
Unleashes talent by passing on competences to the other team members. Capable to guide, coach, mentor and inspire team members.	Unleashes talent by passing on competences to the other team members. Capable to guide, coach, mentor and inspire team members.

Source: PDO's Petroleum Engineering IP Guideline (PDO GU-405, 2002)

The main difference between the manager and consultant profiles is that the focus of the former is on business management while that of the latter is on technical aspects and expertise. In practice, there are no clear lines of demarcation between the two lines of responsibilities and competencies, however, and in fact there are significant overlaps. That is, managers inevitably have significant dealings with technical issues and technical professionals, and hence need to be well versed and knowledgeable in the technical aspects of the business. On the other hand, experts and specialists need to understand and incorporate business considerations, limitations, and drivers. As is discussed later, the current definitions and descriptions of these two careers or lines of responsibilities being managers and technical are inadequate. These definitions, particularly the managerial one, contribute to the gaps in capacity building and the challenges

facing professional development. The manager profiles put more focus on business aspects and little on the technical competencies and abilities, hence driving professionals away from building their technical competencies and skills that are – in real life situations – essential capabilities for (technical) managers.

4.4 Summary

In this chapter, I discussed PDO's organizational information and data that are relevant to the research problem and studied case. By reviewing PDO's organizational management systems, business records, established policies and practices, I established what underpins PDO's strategy, approach, and practices of capacity building, professional development, and career options. I have also reviewed PDO systems and its business management principles that are guiding capacity building through professional and career development. I have also reviewed the composition and characteristics of PDO's petroleum professionals, who are the subjects of and participants in this research.

While an increasing attention to capacity building and professional/career development and is evident in PDO's policies and management systems, number of gaps do exist in both the conceptualization and practice fronts. The capacity building challenge persists, particularly in developing specialists and achieving the desired balance between the developed capabilities of the two defined career ladders: technical and managerial. For instance, most Omanis pursue the so-called managerial ladder, while only a few take the so-called technical ladder. Among the various reasons causing this imbalance, is a definition and conceptualization problem. On the other hand, not all PDO's petroleum professionals fit either of the two defined career paths neatly. Instead, they fit one of three career paths -similar to those described in Mainiero's (1986) groups – specialists, technical managers, or technical professionals. The presence of three classes (groups) is assessed in the research activities to follow.

Chapter 5

COLLECTED DATA ANALYSIS AND CASE EVALUATION

The purpose of this chapter is to analyse and reflect on the collected data and information, and to evaluate the studied practice case. This is achieved by addressing the research questions outlined in four main topics and research areas: organizational aspects and practices, professionals' perspectives and positions, PDO's adopted dual career ladder model, and alternative professional development approaches and career model(s). The collected data and information from the literature, PDO's records and databases, and by engaging research participants through three methods of enquiry - focus group discussions, interviews, and questionnaire survey- are referenced and linked to describe and analyse the studied practice case and its underpinning conceptualization and adopted approaches.

The case evaluation starts by analysing enquired data and information in two ways. The first is by identifying commonalities and difference expressed by the research participants about the investigated concepts and practices. This provided an overall view and sense of common understanding and perspectives or otherwise. The second is establishing the relevance and importance of the factors as identified by the literature review and organizational records. Then, this is followed by addressing the research questions and to assess the propositions made for this case study research.

5.1 Commonalities and Difference

Commonalities and differences in the research participants' understanding of concepts and their views regarding PDO's practices were extracted in order to better delineate the studied case. Although interviewees' responses were in most instances expressed differently – in the quotes listed in Appendix II. Similarly, commonalities and difference were drawn from the survey outcomes by comparing the responses of grouped respondents based on gender, age, current positions, job levels, staff categories, working time in PDO, and based on low or high variances in agreement/disagreement levels as established from the radar charts in Appendix III.

Commonalities:

Majority of research participants expressed in the interviews or through responding to the survey common understanding and views on some of the researched aspects and elements of research problem. Identifying these commonalities was valuable for knowing what is commonly upheld hence is assumed to be an established reference in the organization. These references are used in the analysis of the researched aspects and elements, and in addressing the research questions. The main areas of commonalities are:

- PDO is a knowledge-based organization, petroleum professionals are knowledge workers.
- All petroleum professionals require to have basic technical knowledge and skills
- Need for more specialists, and there are challenges in to developing them.
- PDO gain value in collaborating with IOCs (international oil company)
- Common progression models adopted in PDO are post-led and person-led
- Moderate to strong career identity with association to petroleum profession.
- There are common and varying motivators for generalists and for specialists.
- Career change does happen
- Professional growth/development are more personally driven but organizationally enabled.
- Petroleum talents in PDO are mostly those with potential to become leaders and managers.
- PDO matrix organizational setup support dual career ladders (managerial and technical)
- PDO's management hierarchy and systems do not support development of specialists.
- Specialists face more career ceilings - limiting upward progression - than managers.

More accounts of commonalities of understanding and perspectives that were drawn from the interviews and from response to the survey are listed in Tables 5.1 and 5.2 respectively.

Table 5.1 Commonalities in participants' responses (interviews)

Most salient commonalities drawn from the interviews

- Accreditation is a form of regulation that is valuable for professional development, particularly for specialists.
- Technical knowledge and skills are core for all petroleum professionals pursuing any of the career paths.
- Specialists are needed more, but are more difficult to find or to develop.
- Specialization has less appeal.
- By collaborating with an IOC (international oil company), PDO is benefiting/enhancing the professional development of its petroleum professionals.
- PDO adopts, and follows, to varying degrees, both the 'Early identification of potential' and 'wait-and-see' approaches in developing and growing its professionals.
- In PDO, the first two of the three professional development stages; working stage, leading / managing stage, and advisory stage are present.
- In PDO, the first two of the three progression models; post-led or 'pull', person-led or 'push', and recognition award are adopted and practiced.
- Petroleum professionals do have career identity and association, although this is not always clearly expressed.
- There are basic technical/discipline-based knowledge and skills that must be acquired and developed by all professionals; specialists and generalists (managers)
- There are common and varying motivators for all petroleum professionals; as generalists and as specialists.
- Career change does happen, and it is more salient with new generations of petroleum professionals.
- Professional growth is more personally driven and organizationally enabled and supported.
- Professional development is a collective personal and organizational responsibility, but becomes more of an individual responsibility, particularly at later stages.

Table 5.2 Commonalities in participants' responses (survey- respondents)

Most salient commonalities drawn from the survey responses

- PDO is a knowledge-based organization and petroleum professionals are knowledge workers.
- Petroleum professionals who are seen to have the potential to become leaders and managers are considered as talents in PDO.
- PDO matrix organizational setup provides platform development of career options along the dual career ladders (generalist/managerial and specialist/technical).
- PDO's management hierarchy and systems not seen as supporting the development of petroleum professionals in the specialist and technical career path.
- Training, coaching/mentoring, general management competency, progression/job rotation are used more as means of career management systems in PDO, while performance management, competence assessment, and motivational means are used less.
- Perceived high demands for specialists and technical professionals.
- Professionals expressed having strong career association and identity as petroleum professionals.
- Having challenging jobs, having autonomy and operating freedom, having good relationships with executives and managers, working conditions are highly motivating and an important contributor to petroleum professional development.
- Position prestige is considered to be less of a motivator and contributor to professional development.
- Specialists and subject matter experts (SME) are considered to be at senior levels in PDO.
- The possibility of those on the managerial line moving to the technical/specialist line is not considered to be strong.
- Specialists face career ceilings limiting upward progression, while managers face fewer ceilings.
- Career management is seen to be both organizational and personal, with the former being the stronger.
- Middle level professionals expressed less PDO encouragement to take up personal responsibility for professional development and career management than seniors.
- Petroleum professionals expressed strong drive to undertake personal responsibility of career and professional development.

Differences:

Research participants, also, expressed in the interviews or through responding to the survey differing understanding and views on some of the researched aspects and elements of research problem. Identifying these differences enabled identifying aspects which with there are issues or contributing to the managerial problem being researched. The main areas of differences are:

- Appeal of developing as specialist, value of early identification of specialists, and increasing demands for specialists
- Drive and efforts/commitments in developing specialists by the organization and by professionals themselves.
- PDO's management hierarchy/systems support to professional/career development.
- PDO undertaking responsibility of developing professionals.
- Need of all professionals to have strong technical competencies.
- Specialists and functional/technical leads moving to the managerial line.
- Support/talent management to those on managerial career vs. on specialist career paths.
- PDO's career management and valuing specialization vs. managerial roles.

Differences in understanding and perspectives drawn from the interviews and from responses to the survey are listed in Tables 5.3 and 5.4 respectively.

Table 5.3 Differences in participants' responses (Interviews)

Most salient differences drawn from the interviews:

- Appeal of developing as specialist
- PDO's collaboration with IOC and developing PDO's self-sufficiency in expertise
- The value of early identification of specialists
- Increasing demands for specialists
- PDO's organizational drive and efforts in developing specialists
- Professionals' individual drive and commitment to develop as specialists
- PDO's management hierarchy and matrix structure's support for all career options
- Levels and weights of technical and managerial competencies in defining job descriptions and responsibilities
- Value, need, and adoption of third progression model; 'recognition award', in PDO
- How Omanization (nationalization of workforce) policies and practices influence Omanis opting for a career path.

Table 5.4 Differences in participants' responses (survey- respondents)

Most salient differences (varying stances/agreements) drawn from the survey responses.

- Only juniors consider that PDO supports and guides their professional development to become potential specialists.
- Seniors, SMEs, and seconded expatriates consider PDO's matrix organizational structure to offer career options as specialists and as managers, to support petroleum professional development and their career options.
- Seniors consider PDO's management hierarchy and systems to support the development of petroleum professionals in the managerial career path.
- Juniors and seniors (not mid-level professionals) consider that PDO undertakes the responsibility of developing professionals.
- Based on perceived high demands for specialists, professionals (except for some juniors and those in managerial positions) consider developing a specialization.
- Juniors and mid-level professionals (11-20 years of experience) considered career association and identity as petroleum professionals in PDO to be not so strong.
- Some direct-hire expatriates and those on mid-job levels (SG 3) considered PDO not to be offering motivating job challenges.
- Professionals in various groupings differ in respect to the perceived importance of the various motivators PDO is offering.
- There are varying views among those in managerial positions and roles on the need to have strong technical competencies.
- The possibility of specialists and functional/technical leads moving to the managerial line is considered to be strong by seniors and discipline leads.
- PDO's support for chosen career options by petroleum professionals is viewed/assessed differently, with the least support evident among mid-level professionals and direct-hire expatriates.
- Most seniors and SMEs consider that PDO provides more support and talent management to those on managerial career paths than those on specialist career paths.
- The survey outcomes indicate varying views regarding professionals undergoing mid-career change in PDO and mixed personal experiences with mid-career transition..
- More juniors than seniors indicated stronger PDO career management of its petroleum professionals.
- Mid-level professionals expressed least satisfaction with PDO's career management and confidence that specialization is more valuable than managerial roles.

5.2 Organizational Factors

The first Research Question (RQ) is about how PDO goes about developing capacity building. It is addressed by assessing PDO's organizational factors, particularly PDO's approach and how its organizational settings affect the development of capacity building in respect to the capabilities of petroleum technical (specialists) and managerial (generalists). The first RQ is about (a) developing capacity building and (b) developing technical and managerial capabilities in PDO.

5.2.1 Developing capacity building in PDO's Petroleum professions

In assessing PDO's approach to developing capacity building, a number of aspects were identified from the literature and were assessed in this research. These are regulations, certification, and required capabilities.

Regulation and certification

There are no formal regulations or certification for petroleum professions, neither in Oman nor in PDO. The research participants, however, expressed differing views on the need for regulation through certification or accreditation in the industry and in PDO. Accreditation is a form of regulation without having a legal dimension, and is valuable for petroleum professional development, particularly specialists (SME-subject matter experts). These views and stances were expressed by number of interviewees:

> *"If you are generalist, it (*certification*) is not necessary. For SME* (subject matter expert) *it is not necessary but has value: recognition, personal development (external and internal to the person), and it is a win-win for organization and individual".* (Executive)
>
> *"Regulation is needed for professional development, serves capacity building, and feeling pride. Personally, I think we require it, now our business is segmented that will be served by accreditation in addition to professionals having pride. We cannot get away without having technical (specialists)." (*Executive)
>
> *"I see value in regulation and accreditation. Competence assessment is for internal use, accreditation is important for external recognition"* (Team leader).

It is recommended to consider formal and standardized accreditation as mean of alignment in the industry and in PDO for assigning technical and expert authorities. Such regulated accreditation also provides a valuable measure of built capacity. Though there are clear benefits from establishing formal regulations, major concerns do exist particularly with respect to putting systems in place, resources, and effective management.

Required capabilities in PDO

PDO capabilities are largely seen as specialists and managerial cadres, and as described by the dual career ladder model and organizational systems (PDO CP-125). However, the majority of its petroleum professionals' workforce forms a third group of 'technical professionals'. Technical professionals form the core petroleum professional group, from which technical managers and specialist develop.

Participants agreed that there are mainstream professionals who are neither specialists nor managers, forming a third career path, hence challenging the dual career ladders/paths model of technical and managerial, or specialist and generalist. These three career paths correspond to Mainiero's (1986) three groups: career technical professionals by choice, technical managers, and career technical professionals by default. By characterizing and placing themselves into three groups: 40% as technical professionals, 35% as specialists, and 25% as managers, the research participants confirmed the presence of three career paths in PDO (Figure 5.1).

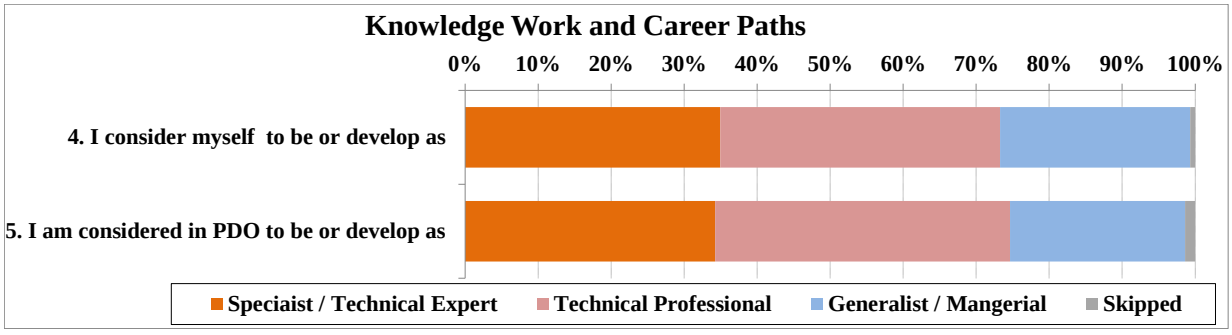


Figure 5.1 Questionnaire Responses-Professionals' Careers

However, there exists a gap between strong realization of the need for specialists and inability to attract and develop them, as expressed at the focus group discussions and interviews:

> "*Need more specialists, there are enough managers. PDO has two big issues; strong technical* (professionals) *go to managerial, strong technical experts leave PDO. Need strategy to sustain/retain experts.*" (Focus Group)

"In PDO, there is more technical management; specialists can be managers not the other way. In early career, develop technical professionals" (Executive)

"All Petroleum professionals are technical professionals, only a few needed as specialists (who have strong affinity to the subject), needing one specialist at a time)". (Executive)

"PDO is struggling to attract professionals to pursue the technical ladder, although, there is a high demand for technical/specialists". (Discipline lead)

In addition, managerial career paths - to the contrary to what is considered to be common view - is less attractive compared to the other career paths. This could be a reflection of the limited positions in the managerial career paths compared to the other two. On the other hand, there are shortages of specialists, who are especially needed, albeit not in large numbers, for addressing the remaining difficult-to-access oil resources. Business and technical leaders able to drive disruptive change are also needed. Developing as technical specialists is not appealing to many professionals and it is a highly challenging undertaking. While the technical ladder does provide the means to develop specialists, there is inadequate assessment of the required capabilities in PDO both in type (technical expertise, SMEs, technical managers, technical professionals) and in numbers.

Research Question 1 (1): Developing Capacity Building

Table 5.5a relates the discussions on the organizational factors affecting the development of capacity building in PDO to the first research question-part 1.

Table 5.5a Investigated aspects of research question 1 (1)

Research Question 1 (1): How does PDO go about developing capacity building in its Petroleum and Geoscience professions?			
Aspects	**PDO Practice Case**	**Notable PDO specifics**	**Literature**
Needs	Clearly expressed needs for specialists, technical managers, and technical professionals	Realization for increasing demands for experts and specialists.	
	Demand for experienced and expert petroleum professionals is high, and is realized by professionals	Moderately attractive for professionals to develop expertise and specialization	Torpey (2013)
Regulation / accreditation	Competence assessment is a well-established methodology for guiding career development and progressions,	Value for a form of organizationally-based accreditation (measure of capacity).	Rathman (2013)
Approach	PDO's petroleum engineering management code of practice (PDO CP-125, 2002)	Defining organizational and personal roles and responsibilities	Vo, (2009)
Institutional capacity building (system)	Organizational structure and operating/governance model are in place, as defined in PDO's Corporate Management Framework (PDO CP-17, 2003)	Management systems and processes affect professional development and career management of petroleum professionals.	Krishnaveni & Sujatha (2013)
	Dual career model is established in PDO for petroleum professions' capacity and capability building (PDO CP-125, 2002)	Jobs /roles are based on model, with limitation of the assumption that all professionals will fit one of the two.	

In summary, the study identified that there is no well-developed system that clearly integrates an articulated strategy and approach for developing capacity building in PDO. Number of processes, guidelines and practices exist, however, that do constitute elements of such a combined system, strategy and approach. The study, in particular, explored the need for building capacity in respect to the development of professionals using internal-based regulation via well-established competence assessment schemes, career/professional development management systems, and aspects of institutional capacity building.

5.2.2 Developing petroleum technical and managerial capabilities

This research has explored number of issues in assessing PDO's approach to developing needed technical and managerial capabilities. These are knowledge work and career paths, organizational structure and job design, career and career Management, progression models, influence of IOCs on NOCs (PDO), demand for experienced/experts and specialization, professional development stages, and Omanization (nationalization of workforce) policies.

Knowledge Work and Career Paths

The survey questionnaire respondents indicated a clear and strong acceptance of the concept of knowledge work, knowledge workers, and dual career paths (Figure 5.2).

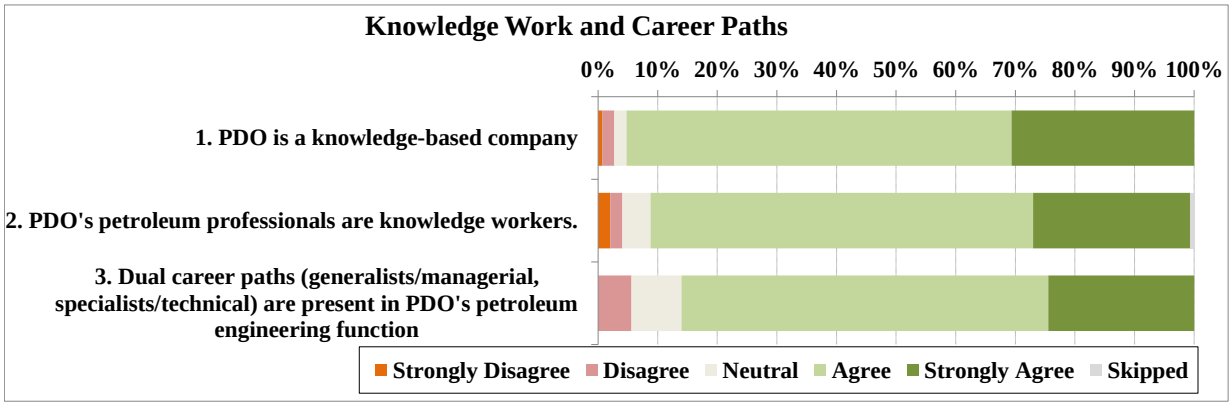


Figure 5.2 Questionnaire Responses – Knowledge Work and Career Paths

Considering energy/petroleum companies as knowledge-based companies was supported and reflected on by number of interviewees':

> *"I see that. I am reading the global competence index, a key part of our business, for innovation you need to have the knowledge and technology. (*Executive*)*
>
> *"I see the knowledge base company* (concept) *fits* (PDO). *The way I see petroleum engineering; we design things based on acquired knowledge to solve problems and realize opportunities/value."* (Executive)

However, respondents to the survey considered themselves to be in or to opt for one of three career paths instead of the two associated with knowledge workers: technical professionals, specialists, or generalists/managers (as in Figure 5.1). This might be considered as a deviation from the two-career paths followed by knowledge workers. The two career ladders' model is being challenged, and multiple-career ladders' model has more acceptance.

Organizational structure and job design

PDO's matrix-organization structure and its suitability and support to the dual career (managerial and functional/specialist) ladders were assessed (Figure 5.3). While there is overall suitability and support by the matrix organization to the dual career ladders, the management hierarchy and systems cause an imbalance in terms of support in favour of the managerial line. PDO's matrix-organization structure (Figure 4.2 in Section 4.2) is considered -to some extent- as supporting dual career (managerial and functional/specialist) development. This is through job design and progressive job levels in the line managerial route and in the functional line and specialist route. On the other hand, there are concerns raised over inadequate organizational managerial-hierarchy support for developing specialists and experts, as expressed in the interview quote.

> *"Currently the focus is more on those on the managerial path. The job prospectivity is more on the specialists' routes. Yes, we need to develop specialists, make it more attractive, for generalists/managerial progression is easier, specialists require accreditation. Potential technical experts do not stay course, change."* (Focus Group)

> *"Management hierarchy is supporting the managerial line, not sure for technical ladder".* (Team leader)

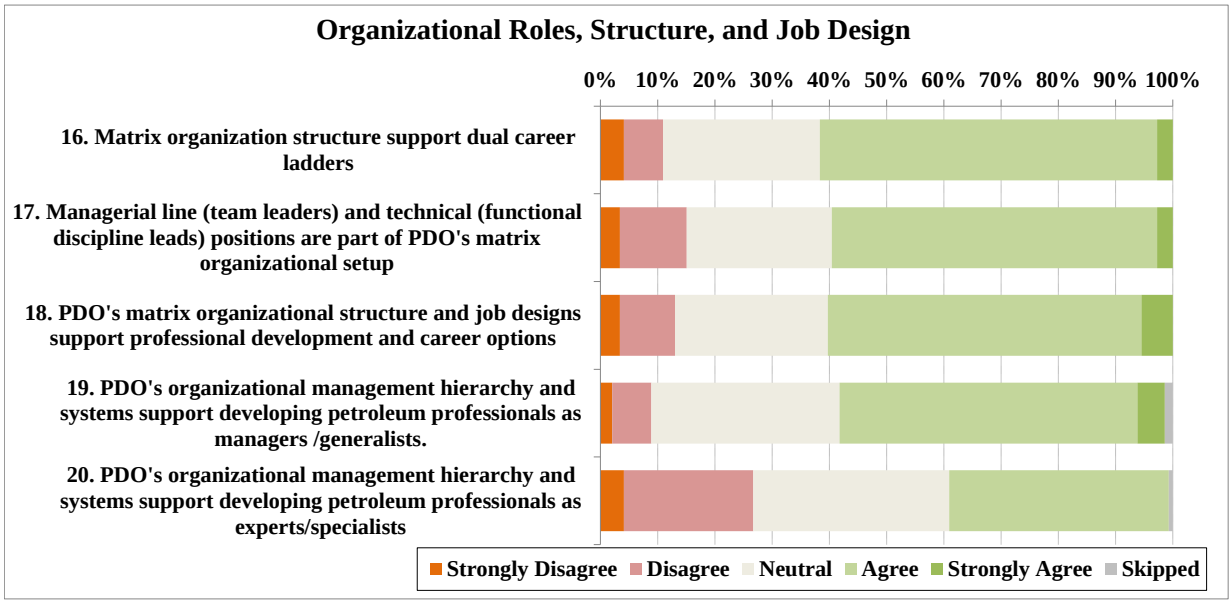


Figure 5.3 Questionnaire Responses – Organizational Roles and Structure

There is a common view that the managerial responsibilities have stronger definition/presence in higher organization levels, and this is seen to disfavour specialists. Technical competency is seen as essential to all professionals; managerial and specialist alike.

Career and Career Management

PDO's organizational roles and responsibilities towards its professionals' career development and management, and the means and approaches employed were assessed (Figures 5.4 and 5.5).

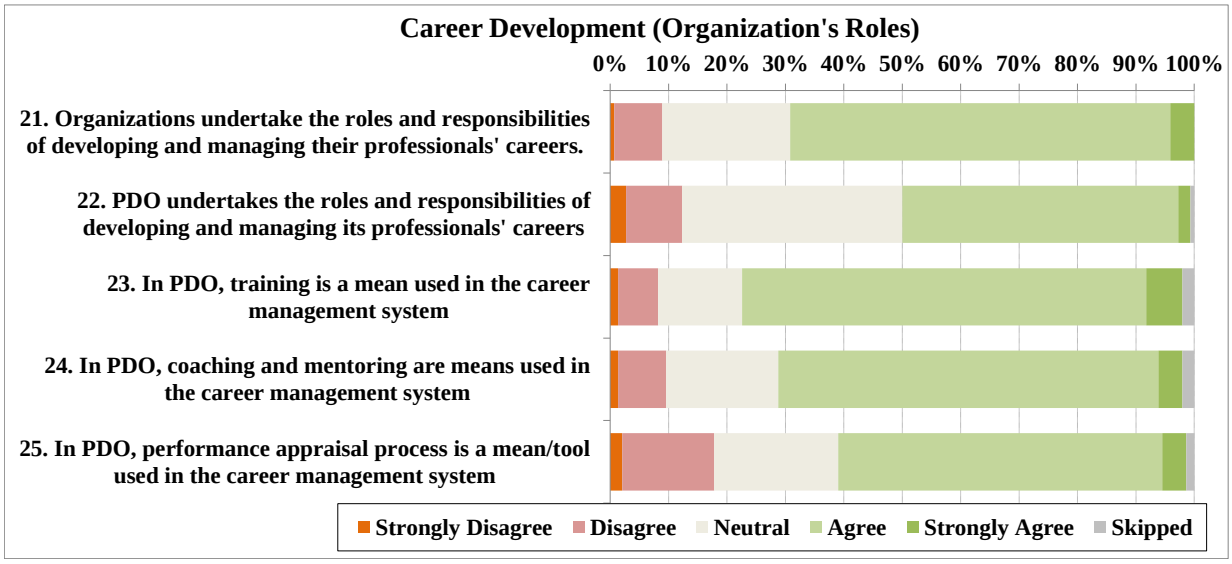


Figure 5.4 Questionnaire Responses – Career Development

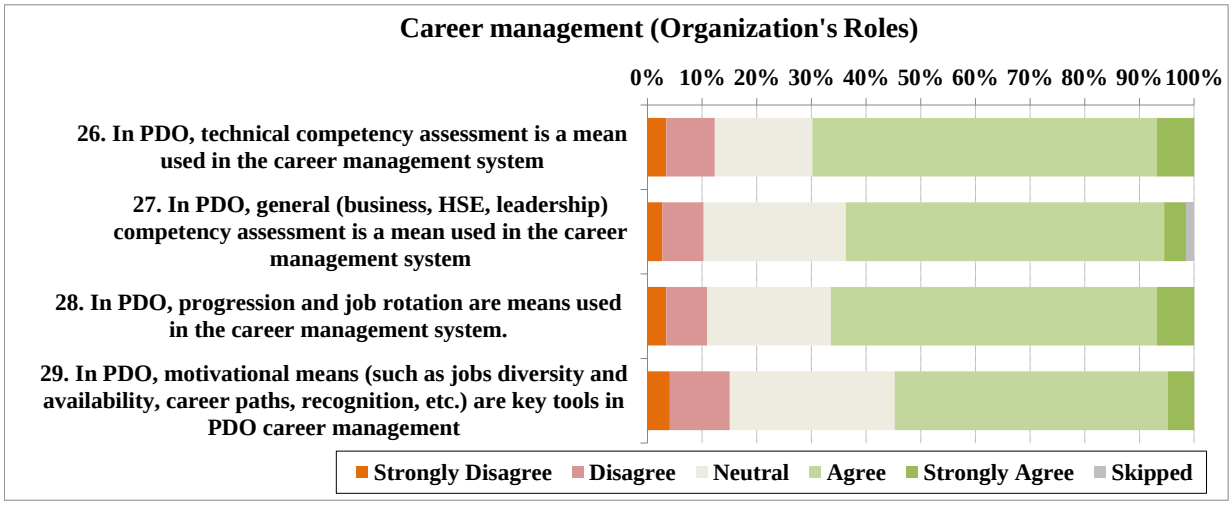


Figure 5.5 Questionnaire Responses – Career Management

There was reasonable agreement regarding PDO's responsibilities and the various means of career development (e.g. training, mentoring, etc.), but the feedback regarding how much PDO

itself did to support professionals' careers was more mixed. Research participants considered and expected the organization to undertake – through career management systems – the responsibility for developing and managing its professionals' careers. There are various means and tools for this, of which research participants indicated that the most salient are training, coaching and mentoring, performance appraisal, technical competency assessment, general competency assessment, progression and job rotation, and through motivational means (job diversity, recognition, career paths …). The one with the most effect is training and the one with the least effect is motivation.

There is less satisfaction, however, with the company's roles and responsibilities - compared to the individual means and tools. This is a weakness in the overall career management system and in professionals' understanding and appreciation of such a system. There are some strong elements in PDO's petroleum career system: structure, career ladders, development platforms but a number of career management challenges nonetheless exist, such as developing specialists and technical leadership, the static nature of the workforce with limited opportunities for broadening and changing careers, and balancing business and professional development needs and priorities. Other challenges are related to managing people's expectations, weak career paths/ladders, and limited support for technical and SME development and career ladders. Overall, there were widely shared concerns regarding the effectiveness of PDO's career management system, particularly in respect to career ladders and developing technical experts.

Progression models

Of the three progression models of person-led (push), post-led (pull), and recognition award (Hirsh, 2006), PDO implements the first two person-led (demonstrated competency) and post-led (job availability). Post-led is mostly for managers while person-led is for specialists. However, there are differing views on the third progression model and the most-common first two models, as expressed in the focus group discussions and interviews:

> *"Progression is different for the two on career paths. Managerial path growth through positions, for specialists' growth through the ladder, though not visible"* (Focus Group)

> *"Of the three progression models in PDO (*post-led, person-led, or recognition award*), the first two are most common, the third only few examples".* (Executive)

"Post-led most common, person-led for SME but limited, no recognition". (Team leader)

Participants indicated that there is merit in a third progression model known as the recognition award progression model for retaining technical professionals who continue to grow professionally neither purely as managers nor as specialists.

Influence of IOCs on NOCs (PDO)

There is a positive influence of IOCs (International Oil Companies) on PDO's (NOC-national Oil Company) petroleum professional development in the form of the provision of wider exposure, training, and expert/specialist development for PDO's professionals. Interviewed executive outlined such influence. The influence was expressed by an interviewed executive:

"IOCs support, at start, NOCs building expertise. PDO developed its own culture-Western identifying talent. Over time NOCs develop themselves and are becoming as IOCs. It is very healthy, especially for small NOCs, improves learning curve rapidly. (Executive)

NOC-IOC collaboration offers mutual benefits and support in terms of professional and expert development. A concern was raised, however, that reliance on the support of IOCs reduces the urgency in developing Omani specialists and expertise.

Demand for experienced/experts & specialization

The majority of petroleum professionals are technical professionals and only a few are considered as specialists. Managerial positions are more attractive to petroleum professionals than technical positions. Indications of needs for change were expressed by research participants in a number of areas: from specialists to managerial routes, practices in developing and retaining specialization in PDO, and widening gaps between professionals' desires to develop as experts and the efforts required to achieve that. There are also gaps seen between the need for specialists on one hand and values/drivers to develop as specialists on the other hand. Also gaps were indicated between the needs for specialists on one hand and developing Omani specialists on the other hand. Figure 5.6 shows the research participants responses to the questionnaire on the career options.

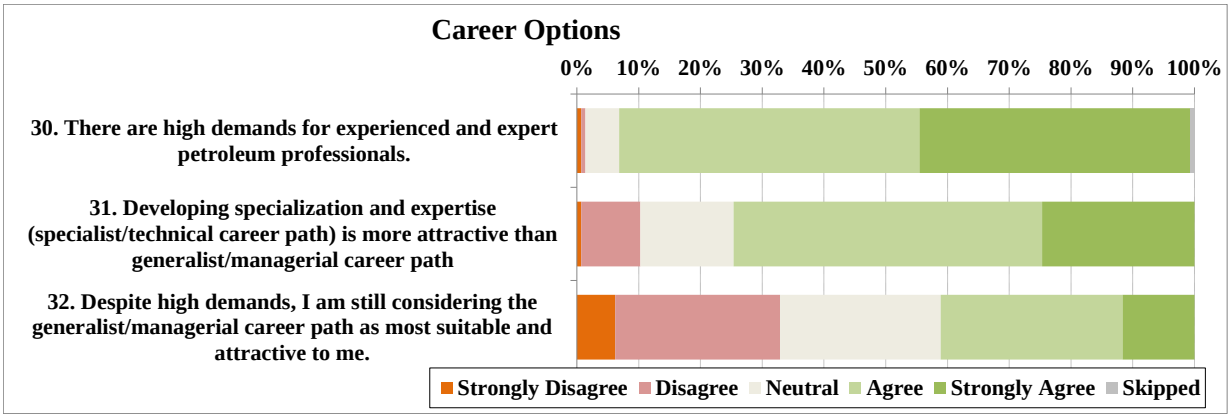


Figure 5.6 Questionnaire Responses – Careers Options

Additionally, the high demand for specialists increases the challenge of retaining specialists and technical professionals. Interviewed research participants expressed assessments of the demand for specialists, developing specialists, and petroleum professional identity.

> *"Yes, we need to develop specialists, make it more attractive, managerial progression is easier, specialists require accreditation. Potential technical experts do not stay course"* (Focus Group)

> "*There is high demand for specialists and experts, and new comers express desire to develop as experts. However, there are no clear programs; the system is not supporting; and they* (professionals) *loss interest as there are no clear opportunities to pursue; limited SME positions, career development for specialists not clear".* (Team leader)

> *"PDO is struggling to attract professionals to pursue the technical ladder, although, there is a high demand for technical/specialists".* (Discipline lead)

Professional development stages

The three distinct professional development stages described by Pike (2013) are present in PDO according to interviewed executives and team leaders. However, the most common are the first two: working and leading/managing. The third stage – advisory - is rare in PDO.

> *"The advisory stage does not exist in PDO, Shell has it as consultant. Instead, there are four stages in PDO: entry (developing), independent, cross-functional/specialists, leadership functional/line".* (Executive)

"I can see the three stages; but termed differently or defined differently. Development stage - rigorous ways of developing them -, working independently, leading team/coaching, Advisory not in PDO". (Executive)

"Advisory is more on the specialists; e.g. PTE (Principal Technical Expert in Shell)". (Team leader)

Other research participants see merits in having the third – advisory - stage, particularly for mentoring and capability building.

"The third stage not visible, definitely, there is a value in having the third stage". (Discipline lead)

Omanization (nationalization of workforce) policies

There is no company policy driving Omanis toward managerial roles. Nonetheless, the attractiveness of managerial roles/positions along with the challenges entailed in becoming a specialist are considered to be the main factors influencing Omanis to opt for managerial roles rather than specialist ones, as described by an interviewed research participant.

"Driving to take risks with Omanis on managerial as there are many controls, technical has to have merit, cannot take a risk with assigning TA (Technical Authority) *to those who are not able".* (Executive)

In addition, there are concerns over the greater support given to those on the managerial ladder compared to those on the technical/specialists ladder.

Research Question 1 (2): Developing technical and managerial capabilities

Table 5.5b relates the abovementioned and discussed factors to the first research question-Part 2. In summary, in PDO there are various aspects and practices that - albeit not well integrated – constitute elements and dimensions of a professional development and capacity management system. These are organizational roles and influence, the knowledge work/dual careers concept, context and management systems, career opportunities and challenges, and talent development and nationalization (Omanisation).

Table 5.5b Investigated aspects of research question 1 (2)

Research Question 1 (2): What professional development and capacity management systems are in use in PDO for developing petroleum technical and managerial capabilities?			
Aspects	**PDO Practice Case**	**Notable PDO specifics**	**Literature**
Knowledge work / dual careers	PDO fits the characteristics of a knowledge-based organization. Petroleum professionals fit the knowledge worker characteristics; with dual career paths (Figure 2.5)	PDO dual career ladders (PDO CP-125, 2002) technical corresponds to specialist, and managerial to generalist.	(Hirsh, 2006; Woiceshyn and Falkenberg, 2008; Van Staden, 2014)
Organizational Context	Matrix organizational structure, with management hierarchal positions and roles; including staff management processes, roles, and responsibilities	Platform for dual careers (functional and managerial lines) Career development support through training, mentoring, and succession planning	Potter and Brough (2004) Van Staden, (2014)
Career Development and Management	Well defined roles and responsibilities, processes, guidelines/procedures governing and guiding capability building, and human resource management.	Clarity of functional and line management roles and responsibilities; performance appraisal, technical and general competency assessment, progression and job allocation	Baruch and Peiperl (2000)
	Progression models in PDO; person-led (demonstrated competency), post-led (job availability), and least-applied recognition award (retention).	Person-led: in initial professional stages and for specialists Post-led: managing/leading roles Recognition-award: retaining technical professionals	Hirsh (2006)
	Career development and management is joined organizational and personal responsibility	Changing with professional progression, initial stages more organizational and later more personal	
	PDO's business partnership with an (IOC) supported career development of petroleum professionals.	Learning from the IOC approach and its well-developed/tested systems, exposures, training, and expert / specialist development	
	Challenge: specialists' career development and progression	Dual career ladders model and approach is not delivering	Hirsh (2006)
Talent & nationalization (Omanisation)	PDO adopts early identification of talents for guiding their professional development and career progression. It also adopts the 'wait-and-see' approach in responding to developing talents and career changes.	The two approaches of 'early identification' and 'wait-and-see' provide PDO with flexibility and responsiveness, particularly in building capability, managing career changes, and addressing retention challenges.	Vo (2009)

5.3 Petroleum Professionals' Personal Factors

Professionals' personal factors are those outlining PDO's petroleum professionals' perspectives, roles and experiences of their professional and career development, and are addressed by the second research question.

Career Identity and Association

Interviewees expressed differing views on the strength of their professional identity and association as petroleum professionals.

> *"Professional identity should be from the start".* (Focus Group)

> *"I have strong identity. I used to be proud to be petroleum engineer"* (Executive)

> *"The petroleum community are proud of their identity, it is dynamic; people are more familiar with PDO rather than the petroleum professionals"* (Team leader)

Survey respondents considered petroleum professionals to have a clear career identity and association to PDO's petroleum profession (Figure 5.7).

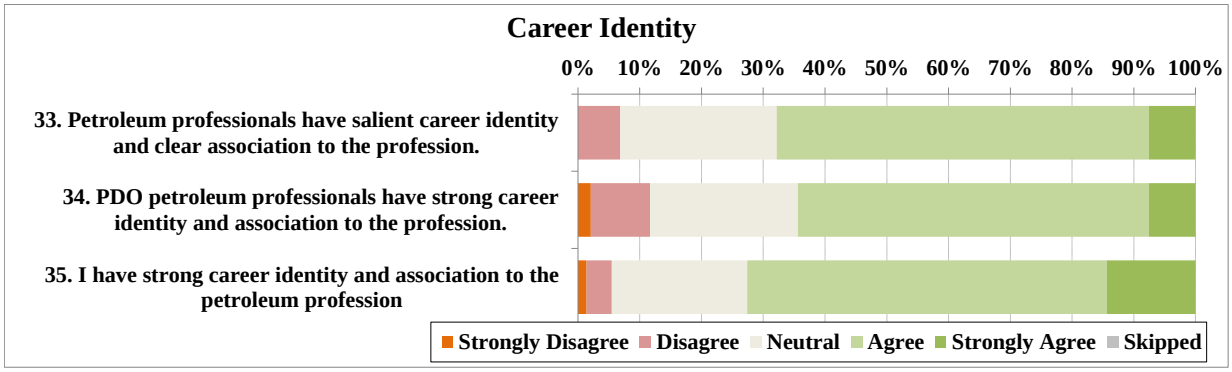


Figure 5.7 Questionnaire Responses – Careers Identity

Association to the discipline is considered by some to be stronger than to the petroleum profession, however. Accreditation is considered to aid the development of a strong petroleum professional identity. Reflected in the desire to change professions, young professionals are seen to have less loyalty and association to the profession compared to the older professionals. Specialists have stronger professional identity than managers do.

Career Development and Motivation

Specialists and generalists are motivated differently. Specialists are motivated by exposure and recognition, while generalist/managers by their positions and roles.

> *"I agree specialists are motivated differently than generalists".* (Executive)

> *"Motivations for specialists; upfront accelerated development and recognition, provided with the space and knowledge building and expert development means and opportunities; e.g. service companies develop SMEs".* (Team leader)

In principle, there are more development / professional growth opportunities for specialists. On the other hand, there is a clearer managerial path than there is a specialist path. There is a potential conflict in the motivational means utilized by leaders (the majority are managers) with those demanded by specialists, such as autonomy and operating space, as expressed by interviewed research participants.

> *"The structure, development, and opportunities for managerial careers are clear, but not for specialists. Specialists need clear value and recognition, and progression"* (Team leader)

> *"Dominated at higher levels by managerial responsibilities; disfavouring specialists, for sure. Specialists' positions considered to be at senior levels, but not in practice".* (Executive)

However and as observed by interviewed research participant, there are also some motivational approaches that work for both generalists and specialists.

> *"Motivational packages are similar; generalists' wider exposures; specialists in depth. Accreditation and status and some room are essential".* (Executive)

Survey respondents expressed their assessment of various job and working environment-based motivators for their professional development and careers (Figures 5.8a, 5.8b, and 8.5c). These included challenging jobs, autonomy and operating freedom, keeping up-to-date with advances in the industry, having good relationships with executives and leaders, good working conditions, and position prestige. The last of these are more valued by those with a managerial career preference, however. Similarly, these motivators are seen to contribute to professionals' career and professional development. Fewer respondents agreed that PDO is adequately

offering such motivators and it is therefore argued that most of the responding professionals have an affinity with technical professional and specialist routes.

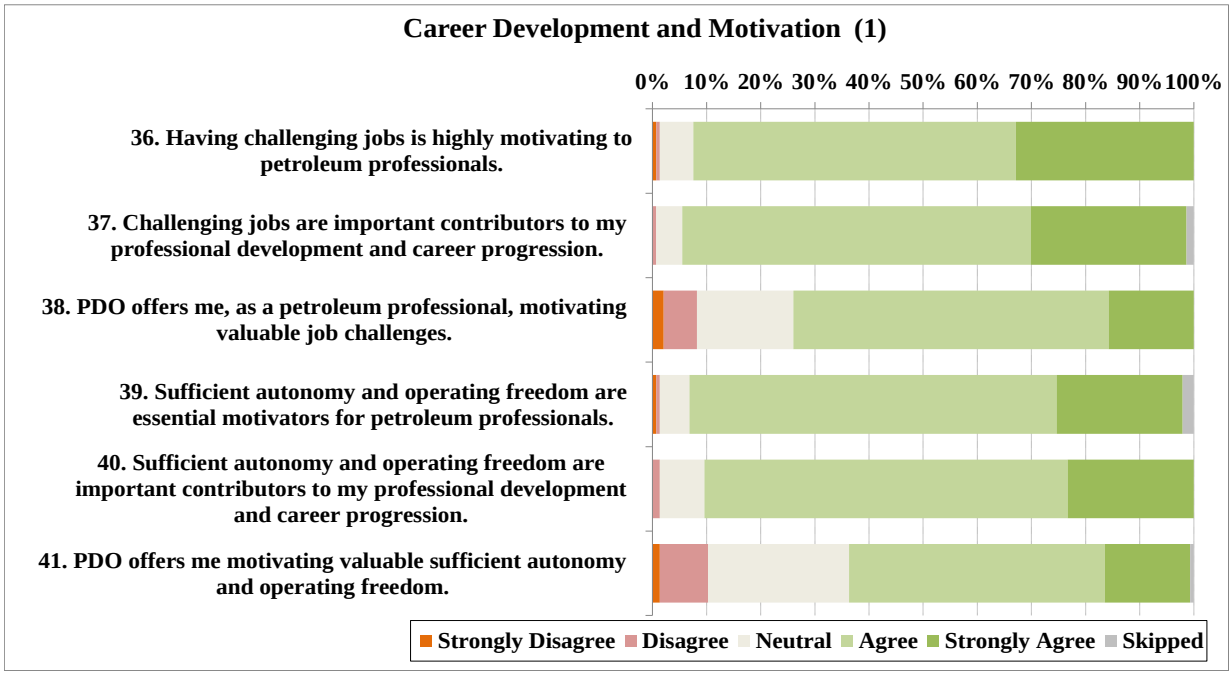


Figure 5.8a Questionnaire Responses – Career Development and Motivation (1)

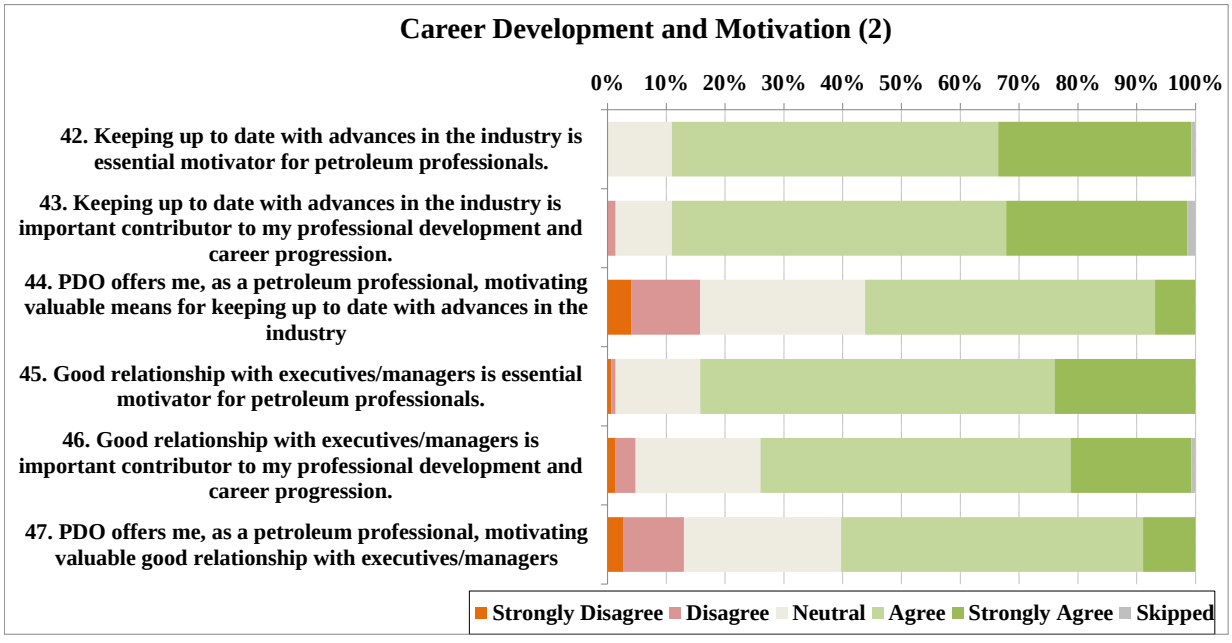


Figure 5.8b Questionnaire Responses – Career Development and Motivation (2)

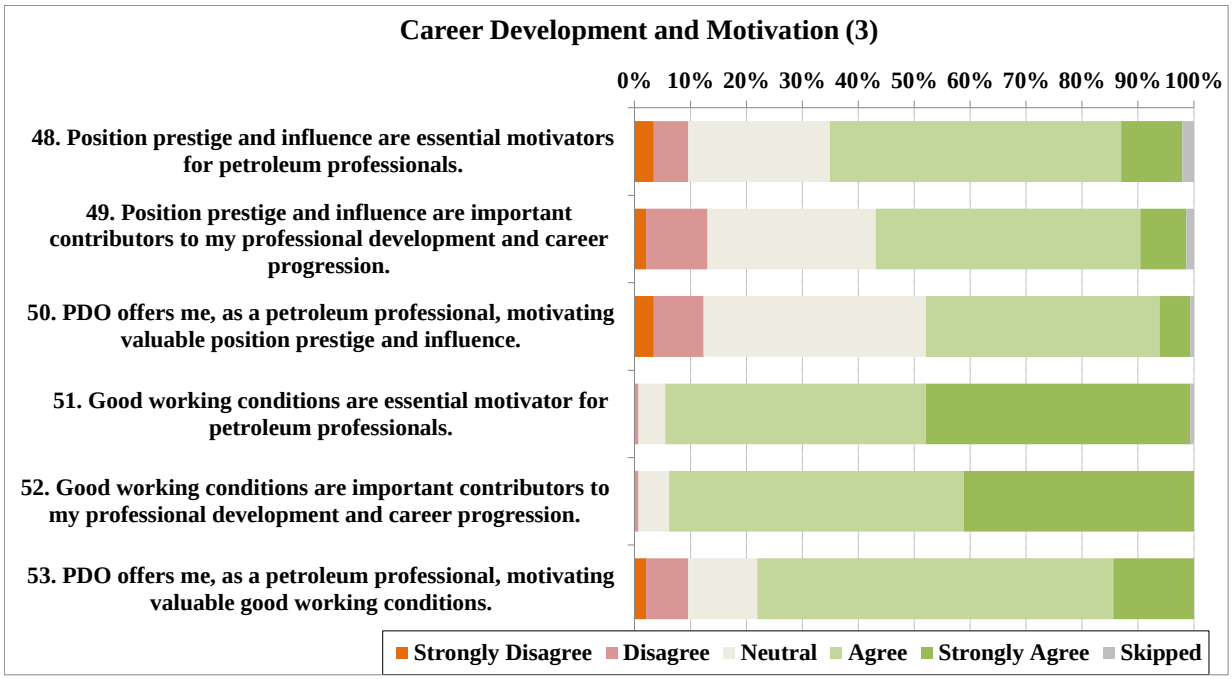


Figure 5.8c Questionnaire Responses – Career Development and Motivation (3)

Career change

Petroleum professionals experience mid-career change mostly in the way of changing organization, moving to managerial or specialist roles, but rarely by changing profession (Figure 5.9).

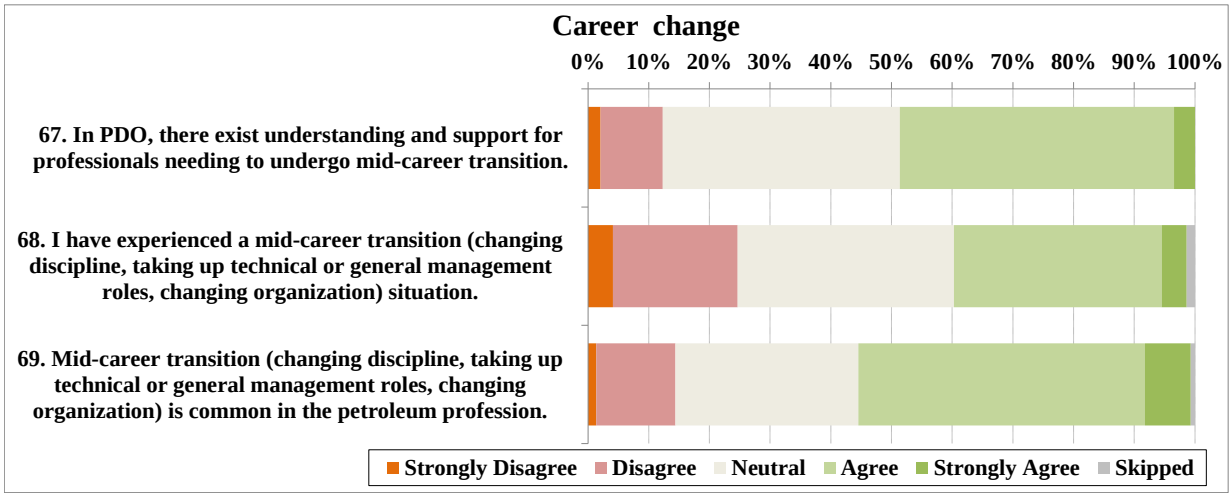


Figure 5.9 Questionnaire Responses – Career change

Professionals undertake career change that varies in significance and in time/stage of career paths, as outlined by an interviewee below.

> *"I see a lot of that* (career change) *happening in the first five years, but less afterwards. I do not think we can handle mass change. Good news it happens early".* (Executive)

Professional growth, a competitive market, or maturing preferences are the main motives for career change. Career change occurs more frequently with the new generation. The organization is not adequately prepared for the increasing trend of career changes.

Research Question 2: Professionals' development and careers

The characteristics, perspectives and practices of PDO's petroleum professionals were drawn together from their responses to the focus group discussions, interviews, and the questionnaire (Table 5.6).

Table 5.6 Investigated aspects of research question 2

Research Question 2: How do petroleum professionals in PDO view and undertake their own professional development and career association in relation to PDO's capacity building objectives, goals and strategies?			
Aspects	**PDO Practice Case**	**Notable PDO specifics**	**Literature**
Career identity & association	Petroleum professionals have a clear career identity and professional association.	Stronger association to the discipline (e.g. reservoir engineering, petrophysics)	Watson (2006) Cesare and Thornton (1993)
Career motivations (generalists, specialists)	Motivators and contributors to petroleum professional and career development; job and working environment aspects; e.g. challenging jobs, autonomy, and working conditions.	Specialists and generalists are motivated differently with only some common motivational means.	Hirsh (2006) Peake and McDowall (2012)
Career change and transition	Petroleum professionals undergo limited mid-career change; e.g. moving to managerial or specialist roles, and changing organization, but rarely by changing profession.	Only some professionals have experienced mid-career transition and limited career change (e.g. changing discipline, career path, or organization) that is supported in PDO,	Weitman (2006)
Professional development responsibilities	Responsibilities for career development and management are shared; earlier in one's career with more onus on the organization and later more on the professionals.	Professionals might not realize their own roles and responsibilities in respect to career and professional development.	Palade (2010) Lips-Wiersma and Hall (2007)
Professional growth	Specialists are considered to be at senior levels, however they do face career ceilings	Specialists receive less career support and are less developed as talents.	Hirsh (2006)

5.4 PDO's dual career ladder model and career options

The understanding and implementation of PDO's dual career ladders (technical-managerial) model in relation to the organizational and professional factors was investigated through the third research question, which consists of three parts (Tables 5.7a, 5.7b, and 5.7c).

5.4.1 The dual career (technical-managerial) model in PDO.

Career options/paths in PDO, career drivers (demand, value, support…), and early identification of talent and career options were the investigated elements for assessing PDO's adopted dual career ladders model.

Talent identification and development

Early identification of talents (through PDO-based Currently Estimated Potential-CEP) has been a highly salient practice in PDO for guiding and supporting professionals' career development. There is a slow shift, however, towards adopting a 'wait and see' approach. There exist varying stances on the appropriateness, need, and implementation of PDO's approach to talent identification and development, as indicated by individuals' CEPs (the level the individual is seen to be able to reach in his/her career). The senior leaders have more confidence in the approach, while those on lower levels do not have such confidence, as outlined in the below quotes from the interviews.

> *"The system* (PDO's CEP*) is very robust with a number of people involved in the assessment; however there is an element of wait and see."*(Executive)
>
> *"We see a general shift to the wait and see, people are much nervous about early identification. We have people to stay, if identified early and got it wrong you make damage".* (Executive)
>
> *"Wait and see is better as it allows people chance to develop naturally. CEP is not guiding the professional development; it hinders specialist/technical career development".* (Team leader)
>
> *"The* (CEP) *system is more tilted towards leadership/managerial, influencing professionals' development and desires to opt for the leadership/managerial".* (Discipline lead*)*

Responding professionals to the questionnaire considered –as shown in Figures 5.10a and 5.10b- the company practice to provide better support in developing managerial/leadership talents than that which is provided to specialists and expert talents.

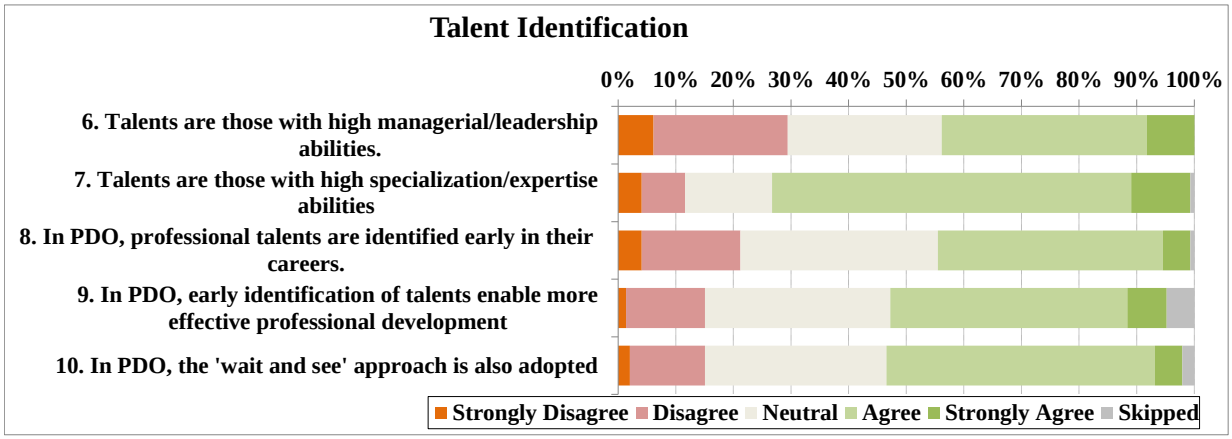


Figure 5.10a Questionnaire Responses – Talent identification

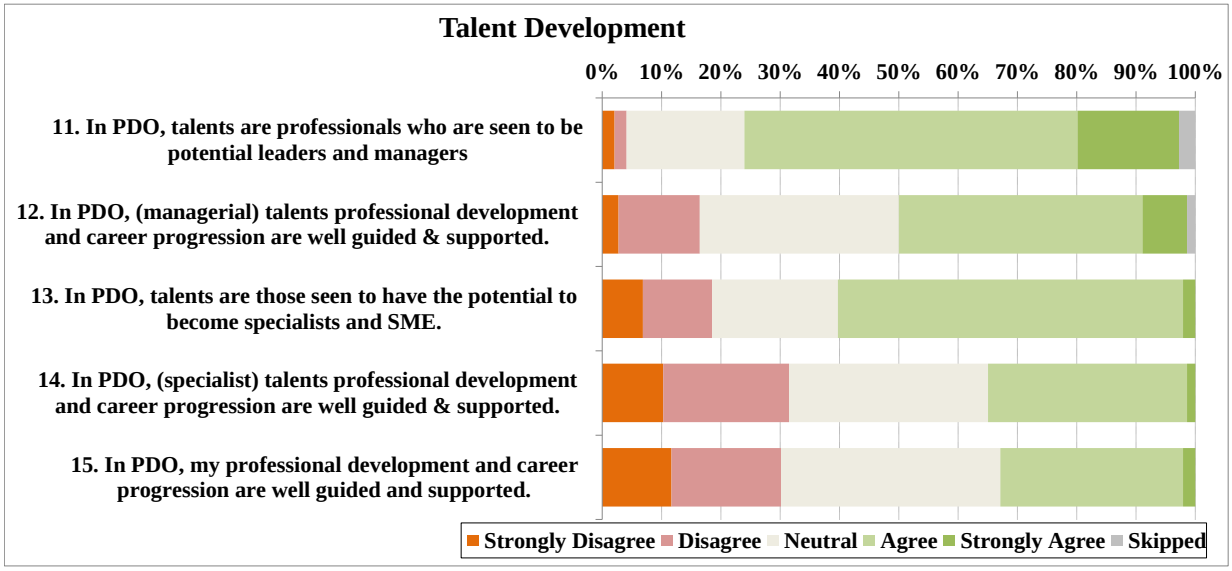


Figure 5.10b Questionnaire responses – Talent development

There are gaps between the company considerations and approaches to talent identification and career development on the one hand, and petroleum professionals understanding and their assessment of the practices on the other hand.

Career options: generalists or specialists

All petroleum professionals by default and based on professional development process (acquired competencies and skills) are generalists, with only few become specialists.

> *"By definition, anyone can be generalist and not everyone can be specialists".* (Executive)

Once committed to specialist or managerial ladders, skills and competencies differ. Petroleum professionals develop strong technical competencies as a basis for assuming (technical) managerial roles or specialists. While there seems to be recognition of specialists as being at senior levels, specialists do face career ceilings, based on the response to Question 58 (Figure 5.11a).

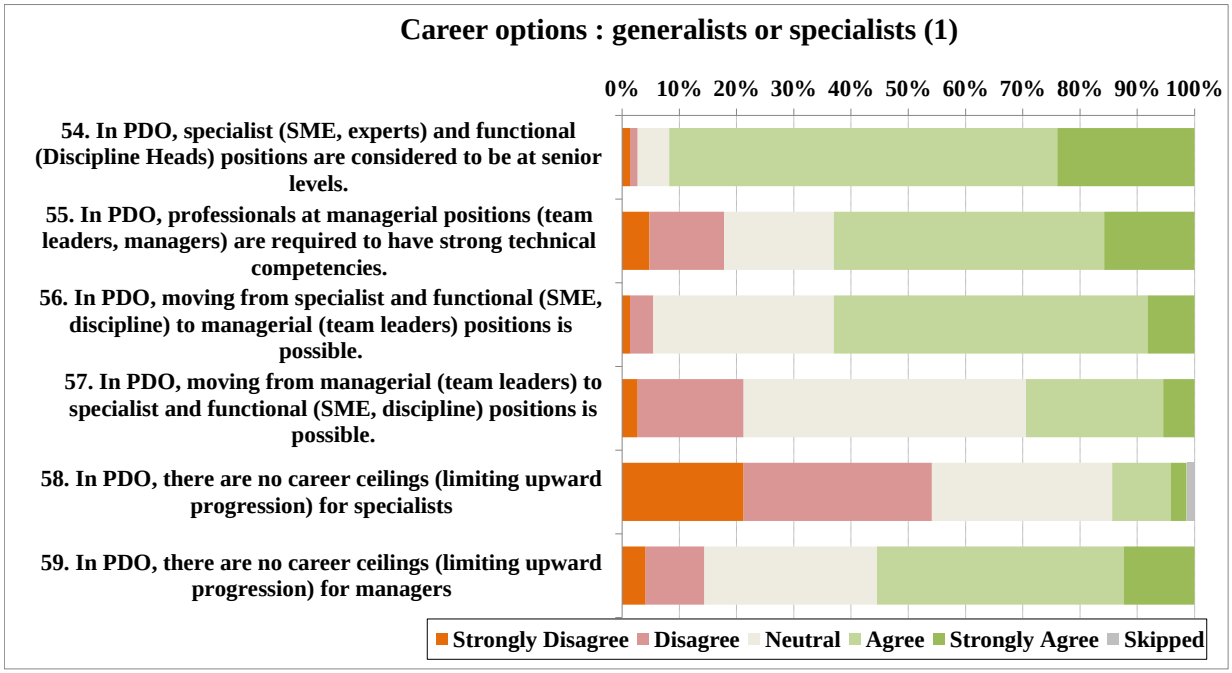


Figure 5.11a Questionnaire responses – Career Options: generalists or specialists (1)

Similarly, survey respondents indicated less career path support for specialists compared to that for managers (Question 60, 61, 62 – Figure 5.11b).

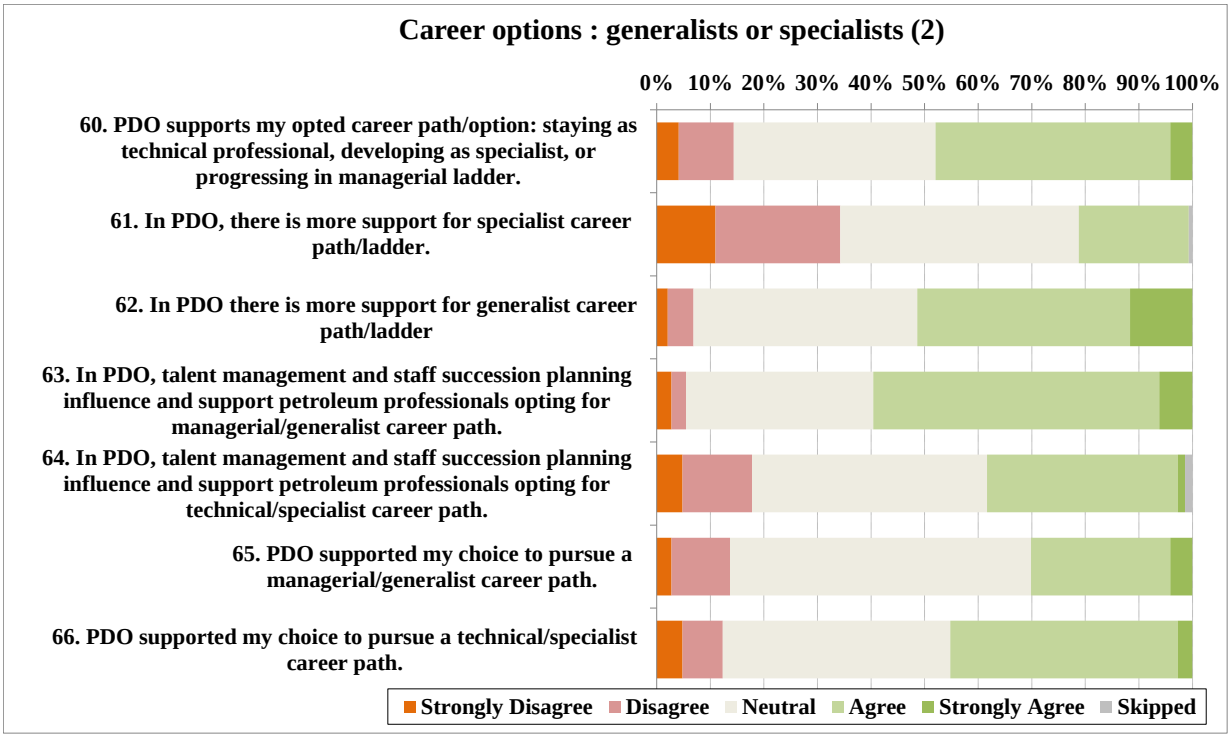


Figure 5.11b Questionnaire responses – Career Options: generalists or specialists (2)

Research participants, however, considered that was more possibility for specialists and discipline leads to move to managerial roles than for managers to move to specialist roles.

> *"Dominated at higher levels by managerial responsibilities; disfavouring specialists, for sure. Specialists' positions considered to be at senior levels, but not in practice".* (Executive)

In addition, there was less satisfaction with the extent of PDO's support for professionals' opted career paths, indicating that more professionals want to develop as managers or specialists but are not getting the support for their choices (questions 65 and 66; Figure 5.11b).

Research Question 3 (1): PDO's Dual Career Ladder Model

PDO's dual career ladder model guiding petroleum professionals' development was assessed. Its aspects and implementation in PDO were identified and evaluated by engaging research participants who responded to enquiries posed at the focus group discussions, interviews, and the questionnaire (Table 5.7a).

Table 5.7a Investigated aspects of research question 3 (1)

Research Question 3 (1): Is the dual career (technical-managerial) model in PDO and its objectives understood and supported by PDO's petroleum professionals?			
Aspects	**PDO Practice Case**	**Notable PDO specifics**	**Literature**
Career paths in PDO	PDO has adopted a dual career ladder (known as the managerial and technical) model for its petroleum professionals (PDO CP-125, 2002)	In practice, there is an additional third career path which is the continuation of the core route; technical professionals	Cesare and Thornton (1993)
Career drivers (demand, value, support…)	There is a widespread and strong realization in PDO of the needs of professionals in all career paths; specialists, technical professionals, and technical managers, but with varying levels and numbers.	PDO professionals (survey) considered themselves as technical professionals (~40%), specialists/technical experts (~35%), and generalists / managers (~25%).	Torpey (2013)
Petroleum career options in PDO	All professionals have the option to pursue either of the two career options; technical or managerial, provided they possess the required specific abilities for each. The organization is seen to support and develop those on the managerial career path more than those on those on the technical (specialist) one	Specialization is not highly appealing to petroleum professionals. The (core) technical professional career path is missing from the dual career model, and is not adequately recognized, and rewarded (profession).	Cesare and Thornton (1993)
Talent & career's option early identification	Early identification of talent (mostly those with leadership abilities) has been the practice in PDO, enabling enhanced professional development. However, there is a noticeable change to 'wait-and-see' and increasing development support for those with 'specialization acumen'	Early identification of talents had mixed results in terms of developing business and technical leaders, and has been a cause of demotivation and distraction from specialization. Gaps are in early identification of specialization talents and responding to career changes.	Hirsh (2006)

5.4.2 Influences on PDO's dual career model

The influence was investigated by assessing organizational factors (systems, practices) and professional factors (drivers, values …) on the career options. Of the various influences and practices, two are reflected on further: the general concerns regarding specialists' development and the increasing trend for professionals to experience career change and transition, with the organization's apparent lack of preparedness for this.

Professional development responsibilities

Responsibilities for career development and management are shared by the organization and by the individual professionals. Two-thirds of the survey respondents considered career development and management as an organizational responsibility, while the majority considered it also as a personal responsibility (Figure 5.12).

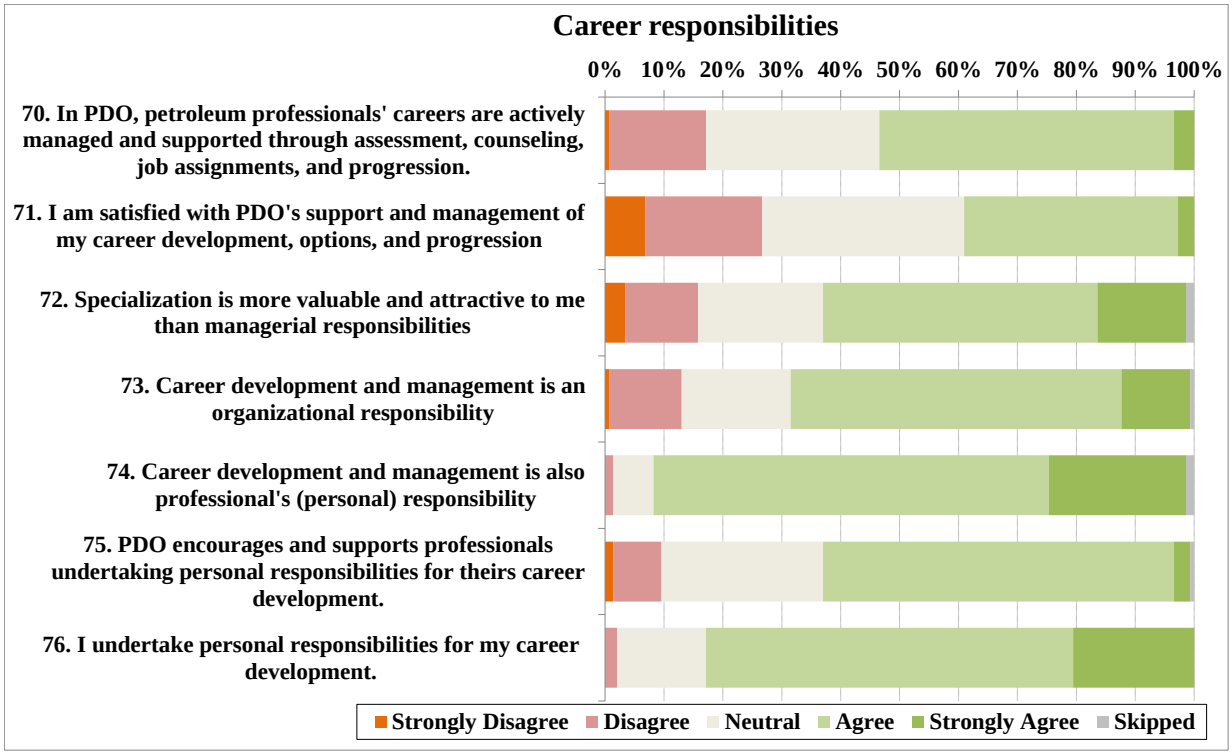


Figure 5.12 Questionnaire responses – Career responsibility

At early career stages the responsibilities lie mostly with the organization, but shift more to the professionals in later stages.

> *"Career development and management lies early more on the organization, later more on the individuals; selecting, opting, driving".* (Executive)

However, there could be a gap in professionals realizing their roles and responsibilities and there are potential conflicts with the organizational needs when the responsibilities begin to shift to the individual.

"Potential area of conflict: organizational needs vs. individual interests. Organizational responsibilities in setting it up, but individuals drive it. There could be conflict between organizational needs and individual desire". (Discipline lead)

Professional growth and managerial roles

Professional growth is achieved in both the managerial and specialist career paths. The first is by deepening and focussing, while the second is by broadening and exposure to non-technical work.

> *"Professional growth for technical is through deepening, and for managerial is through the opposite; broadening, wider exposure, and venturing out of the technical route" (Executive)*

The managerial route is saturated and hence has limited opportunities, but specialists' positions are more numerous, hence offering more opportunities.

Research Question 3 (2): Factors influencing PDO's Dual Career Ladder Model

PDO's dual career ladder model is influenced and its implementation is impacted by organizational and individual factors. These factors and their influences and impacts were explored and evaluated by engaging research participants who responded enquiries posed at the focus group discussions, interviews, and the questionnaire as outlined in Table 5.7b.

Table 5.7b Investigated aspects of research question 3 (2)

Research Question 3 (2): What organizational and individual professional related factors influence the dual career model?		
Aspects	**PDO Practice Case**	**Notable PDO specifics**
Organizational factors (systems, practices,)	Organizational structure (Matrix: functional and line) Progression models and career ceiling Talent identification and development Job design and responsibilities	Clarity of roles and responsivities (functional and line) Progression models support career ladders, perceived career ceiling for specialists. Specialist talents not identified/developed. Perceived more power with managerial jobs, specialists/functional have the technical authority and expert endorsements.
Individual factors (drivers, values, …)	Career identity and professional association Motivators and contributors to petroleum professional Career change Responsibilities for career development	Career identity and pride is stronger with specialists. Specialists are motivated differently (e.g. job challenge, autonomy,) than managers Career change is less with specialists, and it is increasing with younger professionals. Taking personal responsibilities for career development is increasing with progression.

5.4.3 Influences on PDO's capacity building strategies and outcomes

The organizational and individual factors outlined and assessed above are brought together and related to PDO's capacity building strategies and outcomes in ways of influences and impacts.

Research Question 3 (3): Factors influencing PDO's capacity building

Alignment between and agreements in goals and approaches, and possible gaps between intents (drivers) and practices between PDO (the organization) and its petroleum professionals were explored as aspects of the third research question-part three, as outlined in Table 5.7c.

Table 5.7c Investigated aspects of research question 3 (3)

Research Question 3 (3): How do these factors correlate and influence PDO's capacity building strategies and outcomes?	
Aspects	**PDO Practice Case**
Agreements in goals and approaches	Operating model: the matrix organizational model is aligned with functional (technical) and line (managerial) roles and responsibilities. Dual career ladder model and progression models provide career paths for professionals with specialists or managerial affinity Job design and responsibilities are based on the roles defined in the operating model Job rotation opportunities cater – albeit in a limited way – for some career change.
Gaps in drivers and practices	Talent identification and development is based on leadership abilities, driving managerial career paths. Career identity and professional association can be over-shadowed by organizational affiliation and the visibility of managerial/leadership roles. Motivators and contributors for petroleum professionals are stronger for progressing through the managerial career path. Organizational and professional (individual) responsibilities for career development are sometimes overlapping but not in full alignment.

5.5 Alternative Professional Development Approaches and Career Model(s)

As an action research, this study sought to identify areas for change in both the conceptualization and in the approaches to professional development and career options. This aim was achieved by reflecting on the research participants' perspectives of current understanding and practices in so far as they alluded to necessary changes. Alternative frameworks and career models/options were explored by testing participants' understanding

and observations of organizational practice in reference to current knowledge (literature) and organizational systems and practices; as outlined in Research Question 4.

Research Question 4: Alternative strategies, frameworks, and practice options

Although there was wide acknowledgement of current frameworks and career model/options among PDO's petroleum professionals, the discussions (focus group and interviews) revealed some new perspectives, emerging strategies, and calls for changes in the currently adopted frameworks and practice options. These are summarized in Table 5.8.

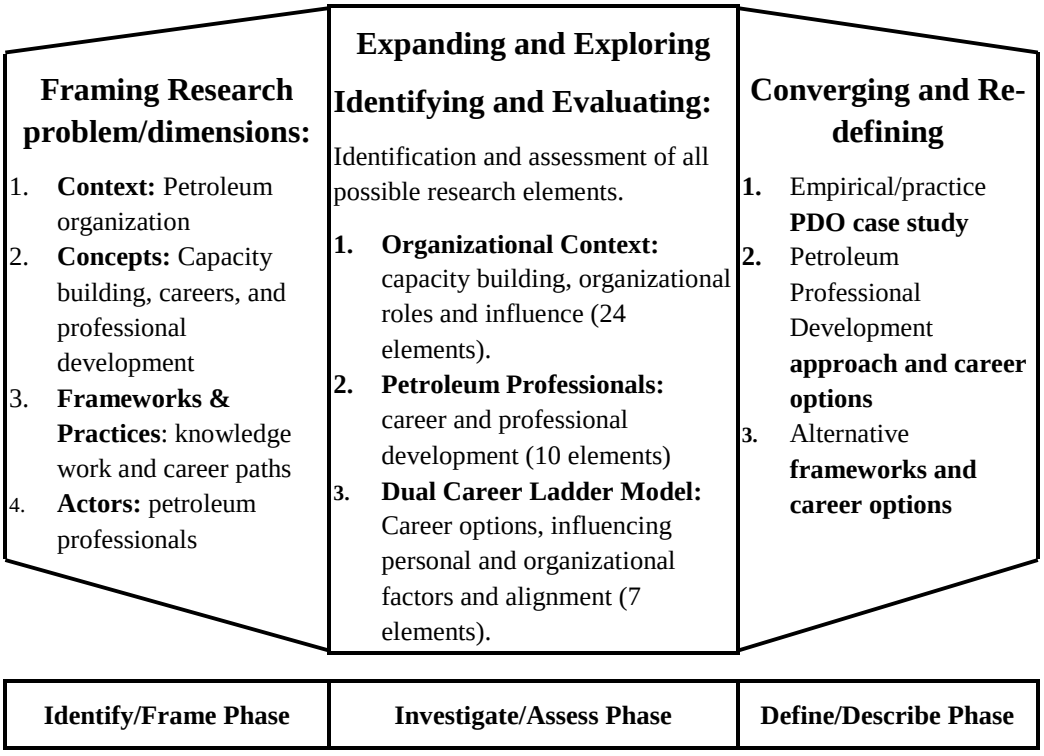
Table 5.8 Investigated aspects of research question 4

Research Question 4: What strategies, frameworks, and practice options could be more suitable and effective in developing capacity building in a dual-career path situation such as in PDO?	
Aspects	**Proposed changes to the PDO case (frameworks and approaches)**
Capacity building	Develop a more comprehensive capacity building system (objectives, strategies, model, means, roles and responsivities,) that is built on the characteristics and needs of knowledge work, and taking into account the continually changing working environment and professionals' characteristics and attitudes.
Professional development	Building an integrated professional development and management system that supports the capacity building system. This process should reflect on the observed changes and new developments in career theory, professional development and management approaches, as well as the characteristics of the new generations of professionals (e.g. career identity and professional association, career change, use of knowledge and technology, …)
Career model and options	A new/modified career model is proposed with the following elements: - Multiple (instead of dual) career paths (generalists/technical professionals as core/main, specialists, technical managers) - Multiple (instead of one) points of deviations and return (from/to the three paths). - Career ladders steps/units are roles instead of positions
Changing professionals' career options	Be responsive to professionals increasingly undertaking career changes reflecting; - Rapid changes in work environments and continued technological advancements - Open and competitive market for petroleum professionals (limited supply, changing demand for qualified and experienced professionals). - A non-standardized and non-regulated oil and gas industry-based - only organizational-based -professional development and career management approaches.
Bridging the concept-practice gaps	Clearly linking the career concepts (e.g. career theory: roles as units, boundaryless careers and career change, knowledge workers, progression models,) to practice models, processes and management systems.

5.6 Research Induced Actions

Action research (AR) utilizes collaborative efforts between the researcher and research participants to solve problems and co-generate new knowledge (Coghlan & Brannick, 2010) by combining research, action and participation (Greenwood and Levin, 2007: 6-7). In this research, actions come in three levels: the researcher, research participants and the studied organization.

- **Actions by the researcher in the research process:** the research process has evolved and was continually improving through a three-phase process of diverging and converging (Figure 5.13). The process included framing the research problem, assessing its dimensions and elements and describing the researched case study. The changes were in the form of expanding the research problem description to include many elements drawn from the literature review (first two phases), followed up either by excluding some irrelevant elements or by combining/modifying others. Exclusions and modifications were made by reflecting on the outcomes focus group discussions and interviews. Additionally, the research enhanced researcher's competencies, understanding of the research subject and comprehension of broader interrelated people and organizational management aspects.



Source: developed for this research

Figure 5.13 Changes (induced actions) in research problem framing

- **Actions by the research participants:** participants in the focus group discussions and in the interviews indicated the newness of some of the discussed aspects of the research subject. The researcher provided participants (interviewees and respondents) with background information, definitions, and descriptions of some of the concepts as drawn from the literature or PDO's records. Indicators of actions by participants were their willingness to take action, e.g. related to career choices and approaches to professional development, as they reflected on the impact of taking the survey (Figure 5.14).

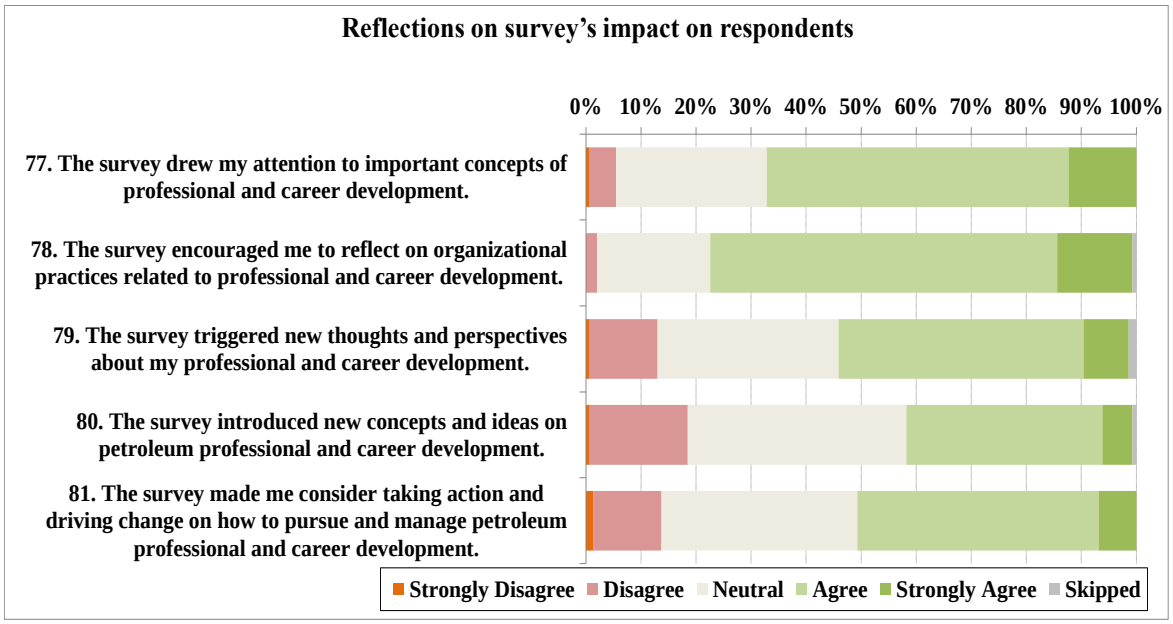


Figure 5.14 Questionnaire responses – Survey's impact on respondents.

As a measure of the action learning achieved, 67% of respondents indicated that the survey enhanced the importance of professional and career development to them, and 77% said that it encouraged them to reflect on related organizational practices. Some, however, indicated that the survey triggered questions (53%), introduced new concepts and ideas (41%), and made them consider taking action and driving change (51%) about their professional and career development. Overall, the survey had some effects on respondents' knowledge or actions.

- **Actions by the organization:** actions taken by the organization (PDO) started with support for this research; indicating acceptance of the research topic and the value it could bring. PDO's support for the research was in various forms, including access to and provision of organizational data and information, the participation of its executives, managers and

professionals' in the research, and permission to use its facilities. The research outcomes were discussed with relevant PDO executives and decision makers, and a case for change was presented (Chapter 6).

5.7 Summary

This chapter has analysed the collected data and information from through the three means of inquiry: focus group discussions, interviews, and questionnaire survey. The outcomes of these research activities were linked the literature and organizational data, enabling addressing the research questions. This research study has covered a wide range of issues and many related elements. This has meant the acquisition of a vast amount of data and information (Appendices I, II, and III) to provide an overall view of the studied case and related general trends. This was conducted without attempting to delve into in-depth analysis of the various aspects, since this would entail significant research work beyond the scope of this thesis research. Nevertheless, the case could be described adequately, with valuable contributions made to it in terms of definition, dimensions, link to the knowledge field, and concept-practice gaps. The case study was evaluated first by establishing common and differing perspectives and stances of research participants, followed by addressing the main research areas as outlined by the research questions. These were under the main headings of organizational factors, petroleum professionals' personal factors, PDO's dual career model and career options, and an alternative professional development approaches and career model(s). In addressing the research questions, I have evaluated their various elements based on the responses of the research participants from PDO. These elements included developing capacity building in PDO, developing petroleum technical and managerial capabilities, career options and related aspects, PDO's dual technical-managerial career ladder model in PDO, and in-use or potential alternative career models in PDO. Some of these elements found to be salient in PDO practices, while others are being considered. Finally, participants' reflections on the survey's impact on them were discussed based on their responses to the survey.

Chapter 6

CASE SYNTHESIS AND RESEARCH ACTIONS

This chapter synthesizes the research outcomes in respect to the studied case and in relation to the main concepts of capacity building and professional development on the one hand, and to PDO's organizational aspects and practices on the other. The discussions follow the three main areas reflected in the research questions: organizational factors, professional (personal) factors, and the career model guiding professional development. The fourth discussed area is an alternative framework and career model that describes the practice and current approaches.

The research outcomes are presented in the form of a qualitative assessment of the propositions describing the studied case. Actions are also proposed for the organizational leadership to consider, whether for immediate implementation or further evaluation.

6.1 Capacity Building and Professional Development in PDO

Professional development is a vehicle for capacity building in PDO to guide the development of the capabilities needed by petroleum professionals to achieve the company's objectives and goals. Based on the company records and documents that were reviewed in Chapter 4, and the responses of participants in this research, it is possible to make the general observation that PDO has systems and processes in place that provide its petroleum professionals with various means to develop their careers. This research has also revealed gaps and areas for improvement in the underpinning conceptualization, approach and practices, however, as well as in their outcomes. In addition, given the inadequate literature in terms of published benchmarks or references, it is very difficult to assess the adequacy and effectiveness of PDO's capacity building approach. Capacity building and professional development are now reviewed from two angles: organizational and professional considerations.

6.1.1 Organizational considerations

Organizational context and settings provide the platform, enablers and constraints for professionals to develop their capabilities and progress through their careers. This research clearly shows that PDO's organizational aspects are key in defining and guiding the career development and management of petroleum professionals. Increasing calls were noted in this

research, particularly from executives and senior managers in the company, for more responsibility to lie with professionals. Nonetheless, the organization holds the key enablers for professional development and choices. Hence, there are gaps between the concept and intent. Accordingly, the two propositions set out below outline the organizational considerations in respect to capacity building and professional development in PDO. These are qualitatively assessed on the basis of the collected data.

- *P1.1 PDO's petroleum professionals, executives, and staff managers recognize and are content with its approach to developing capacity building in the petroleum and geosciences professions.* A fair level of knowledge and understanding of PDO's approach to developing capacity building exists, as is reflected in the willingness and ability to describe various aspects ranging from systems (competence assessment, progressions, ...), content (career options, job design and levels, …), and inputs (training, needs for specialists, …), and outputs (specialists, managers, …). It was not evident from the data collected from the various sources used in this research, however, that there is a clear, effective, robust and integrated approach nor that there are systems underpinning practices. For instance, PDO's documentation calls for building capacity through professional development, and in particular developing Omani specialists and (technical) managers, yet, there are very few Omani specialists or SMEs (Subject Matter Experts). There is no clear description of the required capacity to be built and no measures in place to build that capacity.
- *P1.2 PDO's professional development and capacity management systems for developing petroleum technical and managerial capabilities is well established and implemented.* These systems are established through the corporate management framework and codes of practice, job designs along the matrix organization (technical/specialists, managerial), and consistently practiced competence management and progression processes. Varying views were expressed by participants in this research, however, regarding the appropriateness and effectiveness of such systems in terms of developing the required capabilities, in particular specialists and technical experts.

The evaluation of the two propositions regarding organizational considerations contributed to the presentation of a case for change and potential organizational actions to PDO senior leadership.

6.1.2 Professionals' considerations

Petroleum professionals' considerations (preferences, abilities, perspectives, aspirations, motivations, etc.) are essential ingredients and drivers in their professional development. Understanding these considerations is essential to achieve the capability building necessary for the organization to achieve its objectives, and for professionals to achieve their personal goals. Two propositions about professionals' perspectives and stances are qualitatively assessed, based on the collected data and information, below.

- *P2.1. Petroleum professionals in PDO have clear views on their professional development and career association.* Professionals participating in the research expressed a good understanding of the imperatives of their professional development and their roles and responsibilities. They differed, however, in their perspectives on the level of organizational responsibilities and actual support provided. When asked, petroleum professionals stated clear career association.

- *P2.2. Petroleum professionals in PDO link their professional development and career association to PDO's capacity building objectives, goals and strategies.* The links were not clearly made, although they can be implied. A clear example was the acknowledgement of the importance of specialization and technical expertise to PDO that drives some to pursue it as a career path. On the other hand, petroleum professionals see more progression prospects in the managerial career path. However, not all professionals are motivated by career progression in the traditional sense; specialists are less concerned about progression ceilings.

Similarly, the evaluation of these two propositions in respect to organizational considerations contributed to the case for change and organizational actions.

6.2 Career options in PDO

Career options in PDO define the organizational capacity building needs, professional development opportunities, and sense of achievement for petroleum professionals. PDO adopted a dual (technical and managerial) career ladder model for its petroleum professionals, although in practice there is also a third career path followed by those who do not follow either

of the dual career paths. Based on advances in general careers theory, and findings from this research, a new career model is proposed.

6.2.1 Dual Career Ladders

A dual career ladders model has been adopted by PDO for many years (PDO CP-125, 2002). This research has raised concerns about its appeal to professionals, its outcomes, and its suitability. These are reflected in the following qualitative assessment of three research propositions in respect to the dual career ladders model in PDO.

- *P3.1. PDO's dual career (technical-managerial) model's objectives are clear and known to petroleum professionals and are being achieved.* The objectives are known and are expressed by participating professionals, who also expressed a high level of agreement with the knowledge workers career paths; generalist or specialist. There is a large pool of professionals, however, (more than third) who consider themselves as not following either of PDO's defined career paths. Professionals in this third path are identified here as technical professionals. The current descriptions of the dual career ladders warrant revisions. To this end it is proposed to change the managerial path to technical management, technical to specialists, and to add technical professionals. The latter two correspond to those describe knowledge workers careers: specialists and generalists.
- *P3.2. Organizational and individual (professionals) aspects and factors affect the implementation and outcomes of the dual-career model.* The number of organizational (e.g. matrix structure, job design and roles, progression,) and professional (motivation, career identity, career change,) factors were related by participants to the implementation and outcomes of the PDO adopted dual career ladders model. Some of these factors support the model while others do not.
- *P3.3 Organizational and individual factors, and the dual-career model do influence PDO's capacity building strategies and outcomes*. The dual-career ladder model is to enable capacity building in PDO by developing specialists and managers that the company needs. The model and associated organizational and professional factors have clear influences on PDO's capacity building strategies and outcomes. The influences are in two folds: achieved successes and remaining challenges. The successes are reflected in the development and progression of the Omani (nationals) professionals who constitute the majority of team leaders/managers and the technical professionals. The challenges are the inability to

develop and progress Omanis through the specialist career path. That is, PDO still relies heavily on expatriate specialists, who once they leave PDO will create a major capacity gap in specialization.

In response to the evaluation of the three propositions on PDO's dual career ladders model, I proposed a modification of PDO's model as an alternative multiple career ladder model.

6.2.2 Multiple Career Ladders

In practice, petroleum professionals in PDO follow one of three career paths and ladders: technical professionals, specialists/technical experts, and technical managers. All have similar entry and initial stages in terms of career foundations and developing technical competencies. Technical professionals continue in the same (default) path by increasing their knowledge base, and expanding their experiences and exposures to wider range of tasks. The specialists deviate to focus on niche areas of expertise and specialization by developing more in-depth knowledge and expertise of selected subjects. The technical managers deviate to take up technical managerial positions and roles. Progression and growth in each of the three career paths follows steps and levels (ladders), with the third career path having clearer levels in the form of hierarchal positions and responsibilities.

6.3 Concept-Practice Gaps

This study has identified gaps between the concepts and frameworks underpinning PDO's approach of building capacity through professional and career development and management and observed practices. These gaps are in integrating relevant concepts, in the advancements of the concepts, and in concepts-in-use versus practices.

Integrating relevant concepts: this gap relates to the last research proposition.

- *P4.1 Clearer strategies linked to encompassing frameworks and measureable practice options are essential for developing capacity building in PDO's dual-career paths situation.* Various elements of strategies exist and are in-practice (e.g. PDO scorecards, annual and five-year plans). These strategies are not adequately articulated, integrated, updated, or enforced, however.

Advancements of the concepts: as with most concepts and frameworks, the concepts underpinning professional and career development and management continue to be advanced,

reflecting accumulated experiences and research work. For instance, there are two advances in career-related concepts that are not incorporated in PDO's approach. The first advance is that the unit for measuring careers is nowadays more often the role instead of the job positions (Hoekstra, 2011). The second is the boundaryless or protean career concept of career mobility and career changes (Gubler, Arnold, and & Coombs, 2014; Colakoglu, 2011). The current PDO practice uses jobs and positions as a measure of career progression, hence the managerial career paths with its well-defined job levels is the most attractive and clearly defined ladder. On the other hand, the dual career ladders model assumes that once a professional has followed any of the two career paths he/she must continue without any career change. In this research, it became clear that professionals do go through career change. Hence, professionals' career progressions should be assessed and made by the roles they take up, not the positions they occupy. In addition, there should be less rigid lines between career paths and the ability for professionals to move from one path to another.

Concepts-in-use versus practices: frameworks are developed to guide practices. These practices might not be fully in line with the concepts underpinning them, however, hence creating gaps. These could result from inadequacy or a lack of clarity regarding the concepts or associated frameworks, stemming from the organizational context, or the unsuitable nature of the old concepts. The concept of developing capacity building is reasonably defined in PDO's policies and code of practices and is expressed by its leaders and professionals. The practice lags behind, however, since there are no clearly integrated strategies for managing and responding to changes. Similarly, the concept of professional and career development is well embedded in the company's systems and plans, but lacks an integrated approach and a clear line-of-sight to the company's objectives. A practice that is clearly lagging behind is the implementation of the dual career ladders aiming to develop specialists and experts along with a managerial cadre. Today, few specialists and SMEs (subject matter experts) are developed in PDO despite this concept having been adopted for many years. This failure could be attributed to both the inadequacy and suitability of the concepts or a serious theory-practice gap. This research proposes a number of actions to address these gaps. These including modification to the career ladders model, updates of the Petroleum Engineering Management Code of Practice to incorporate advances in careers theory and the findings from this research, and offering professionals induction awareness on the concepts of professional development, career options, and their own responsibilities for their personal professional development.

6.4 Case for Change

As an outcome of this action research, a case for change was developed and presented to PDO's senior leadership. The case for change addresses the gaps in PDO's capacity building approach and performance, and sets out the improvements needed in professional and career development of petroleum professionals as vehicles for achieving capacity building.

- **Capacity building objectives and aims** are implicitly described in various PDO documents and code of practices but without solid plans and clearly measurable targets. Particularly in respect to petroleum professions, the implicit aims are to develop specialists, subject matter experts, and technical leaders and managers needed to deliver the business, including expertise in Enhanced Oil Recovery (EOR).

- **Current capacity building processes** include the development of petroleum professionals, starting from the graduate-entry development programme, talent identification and development, building core competency, and choice of either the managerial career ladder or technical career ladder. There is a lack of alignment between the organizational aims (capacity building) and professionals' career development drivers (career progression). The organization considers the allocation of roles and assignment to jobs to professionals, while professionals themselves are interested in building competencies and capabilities that allow them to progress and to compete for higher positions.

- **There is no clear line of sight connecting professional development to organizational capacity building.** The dual career ladder model offers possible career routes to higher positions as managers or consultants/SME, but there is a common view among professionals that there are career ceilings for those pursuing the technical ladder, hence most opt for the managerial career route. This situation results in a deficiency in technical/expert capacity building and more managerial capacity than is needed by the organization. In addition, a large pool of professionals remains, who develop neither as specialists nor managers. This group from a core capacity that is not recognized in the dual career ladders model.

- **There are increasing trends of changes in career development** that affect capacity building and that are currently not reflected in existing systems and processes. These changes include the move to 'boundaryless careers', career changes, and career units as roles rather than jobs and positions. This research has revealed the presence of these

changes, albeit to varying degrees. This challenges the dual (diverting) career routes adopted in PDO and the current job design and structure in PDO.

- **The professional development roles and responsibilities** are shared by the organization and by the professionals. However, there are clear needs to clarify these roles and responsibilities, particularly the changing of these with professionals' progression and maturity. This highlights the need for enhanced awareness among professionals of development systems, processes, and their own responsibilities.

6.5 Organizational Actions

To address the above-mentioned gaps and issues, a capacity building professional development framework was developed that modifies the career model and identifies a number of organizational actions. I took the research-generated outcomes and proposals along with a case for change calling for organizational actions to members of PDO's Senior Leadership

6.5.1 Engaging PDO Senior Leadership

To assess PDO's readiness and willingness to consider the research outcomes and prompt proposed organizational actions addressing the studied PDO case, I engaged four senior executives in PDO with the authority and influence on capacity building and petroleum professionals' development and career options. Through the engagement, I attempted to assess the senior leadership acceptance of the research outcomes, and hence readiness to support implementing the research recommendations. I presented a case for change and requested support and endorsement of proposed actions. Three of the executives were interviewed at the data collection stage. Hence, they were familiar with the research objectives and researched areas. Below are the summaries of the discussions and reflections from these engagements.

1. The first executive/member of PDO's senior leadership is
   - A strong supporter for developing professionals and strengthening PDO's capacity building at both levels of leadership/managerial and technical/expertise.
   - Pointed out, during the first interview, various areas of strengths and challenges facing PDO's capacity building and its professionals' development and retention.

   The follow-up engagement revealed the following stances on raised issues and on proposed changes:

- Agreed with the proposed 'Capacity Building-Professional Development Framework' (Figure 6.1 below) and proposed adding curves cutting across the professional paths defining the job levels.
- Agreed with and supported the multiple career ladder model (Figure 6.2 below), and proposed to narrow the segments of the managerial and specialists to each be less than 20% in reflection of the current situation in PDO and its organizational structure. Hence, endorsing change from dual career ladders model to multiple career ladders model.
- Very keen to develop and retain specialists who are greatly needed for the delivering PDO business and for addressing the increasing technical challenging facing the company particularly development and deployment of new methods of oil extraction and technologies.
- Expressed concerns on the ability to develop and retain sufficient number of specialists, and attributed this firstly to inadequate clarity of specialist/subject matter expert (SME) scope of work, roles, measure of competency, and secondly to the weak resilience of the potential SMEs to stay course and deepen their subject knowledge and skills.
- Wanted to align the currently different approaches to professional development adopted by the various functions, e.g. Well Engineering, Surface Engineering, and Petroleum Engineering and Geosciences. And steered to consider the proposed framework and multiple career ladders model to be common basis for all professions in PDO.
- Was concerned over the adequacy of progression in PDO in all career paths and ability of the organization to promote all its employees; particularly for the majority of professionals who are neither specialists nor managers but remain in (general) technical professionals' career path. The concern is how to align with the company's organizational structure that determines the job levels and associated salary (groups) grades.

2. The second executive/member of PDO's senior leadership is

- Long serving member of PDO who witnessed the development and evolution of the company's business, processes/management systems, and capabilities
- Influenced greatly how the company is currently operating and where it stands in terms of capabilities and resources.
- Initiated number of the processes, code of practices, and guidelines governing the development of PDO's petroleum professionals and capacity building (e.g. CP-125, 2002).

The follow-up engagement revealed the following stances on raised issues and on proposed changes:

- Is receptive to making changes to PDO's approach, though still sees that professionals should have more significant duties for driving the desired change, and the organization to be more effective in guiding and supporting them.
- Believes that the dual career ladder for petroleum professionals in PDO is still valid, and its limited success is attributed to ineffective implementation.
- Could see that multiple career ladders model could offer an improvement and more career options in PDO.
- Is a strong advocate for career planning that should start from recruitment and entry to PDO by offering joining professionals a career proposition that form part of the employment contract. The proposition outline the selected career path (e.g. specialist), for which the company ensures providing long life career development and progression and the professional makes commitments to develop and stay in the offered career. However, this approach is challenged by the early commitment to a career that is yet to be aligned to professionals' abilities and preferences, and by the increasing trends of career change particularly with new generation of professionals.
- Expressed concerns about appropriate understanding, uptake, and resilience of professionals opting to be SMEs.
- Agreed with the identified need and benefits to offer training for professionals about the process of professional and career development and the joint and individual responsibilities of the company and the professionals.

3. The third executive/member of PDO's senior leadership is

- Well-seasoned petroleum professional who climbed the professional ladder from the first steps.
- Is a strong supporter and advocator for capacity building through robust technical and leadership development of professionals.

The follow-up engagement revealed the following stances on raised issues and on proposed changes:

- Expressed clearly taling personal responsibility for developing petroleum professionals, therefore willing to support and endorse improvements on both fronts: processes and systems, and effective implementation.
- Believed that good progress has been achieved in developing specialists in PDO, though the challenge remains to be retaining them.
- Agreed that petroleum professionals do compete for limited managerial or SME positions, therefore leaving the majority as main stream technical professionals. Hence, supported the multiple career ladders model as a more suitable alternative to the current PDO dual career ladder model.
- Is concerned about PDO's ability to retain petroleum professionals, due to reduced progression opportunities resulting from high nationalization (Omanization) levels of middle and high positions as defined in the current organizational structure.

4. The forth executive/member of PDO's senior leadership is

- Combining understanding of the needs by technical departments to operate with human resourcing processes and considerations.
- Initiated reviews of HR processes and systems to enable effective resourcing and capacity building.

The engagement revealed the following stances on raised issues and on proposed changes:

- Currently developing pan-PDO resourcing strategies, focussing on developing leaders and specialists.
- Recognizes that there are number of difficult areas to be addressed, particularly aligning employees' aspirations and demands for progression with the lesser higher level positions based on an organizational pyramid structure.
- Sees a challenge in creating balance between personal responsibilities of professionals with organizational responsibilities. The organization can only have a standard approach, while the individuals differ greatly in their preferences and aspirations, abilities and limitations, and in motivations.
- Expressed interest in the use of roles as career units instead of positions and jobs, however implementing this concept in PDO will require significant work and might lead to restructuring-a much greater undertaking.
- Strongly supports developing and delivering training on professional development and career management. This comes in line with a recently started work on Learning and

Professional Development Strategy being developed around the concept of 10-20-70 rule: formal training-coaching/mentoring-on job development.

- Considered this thesis research work to contain number of valuable concepts and ideas that supports and enhance the learning and professional development strategy.

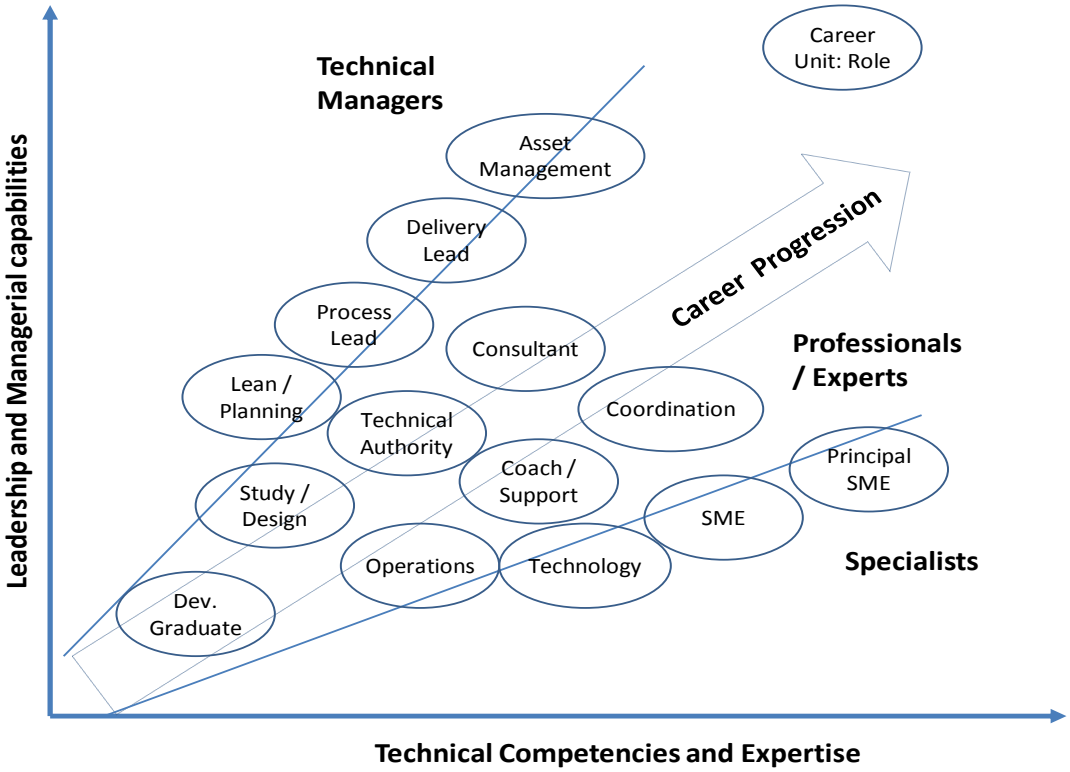
Overall, there is good support expressed by these senior leaders in PDO for the presented research outcomes and the actions proposed. However, there are concerns that some of the changes will require undertaking significant organizational structural and cultural changes. Hence, there is clear need to build support across the organization by engaging with wider professional base and pursuing gradual implementation. This research developed actions to address identified gaps in PDO's systems and practices or to bring improvements.

6.5.2 Organizational Actions

In my engagements with members of PDO senior leadership, I presented organizational actions proposed by this thesis research.

1. Endorse the Capacity Building-Professional Development Framework

Based on the research outcomes, a framework was developed linking the two main areas of capacity building -leadership/managerial capabilities and technical competencies/expertise- to professional development and career progression using roles as career units (Figure 6.1).



Source: Developed for this research

Figure 6.1 Capacity Building-Professional Development Framework

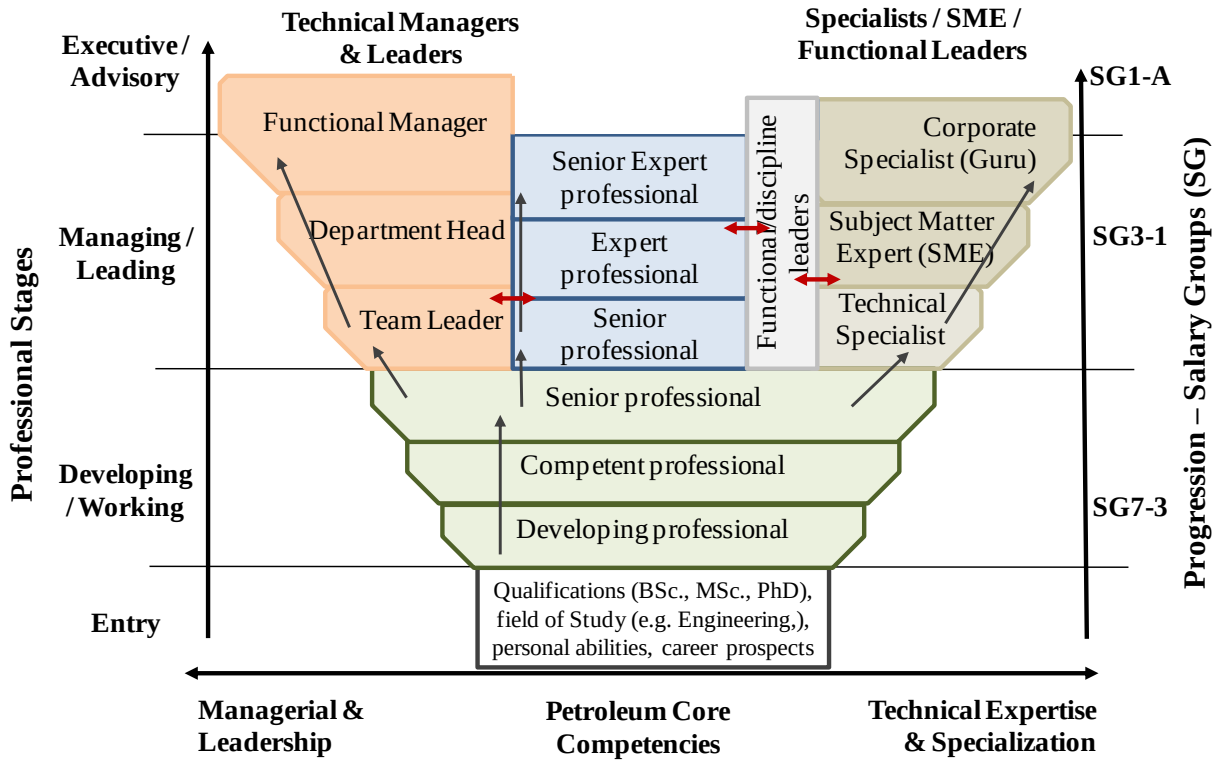
The framework was presented to the four executives, who all endorsed it; hence it will now be incorporated in the relevant code of practice (PDO CP-125). Executives accepted the concept of roles constituting career units. However, implementing it requires a mapping of actual roles assumed by petroleum professionals against current job levels and career routes. Also requested that this framework to be shared with other professions (functions) in PDO once it has been updated with actual roles.

2. Endorse the (modified) career model

Based on advances in the general theory, the findings from this case study research in respect to the various reported career models in the literature, and the capacity building-professional development framework developed in this research (Figure 6.1), a modified career model is proposed (Figure 6.2) to PDO. This model incorporates the following concepts and practices:

1. Current reality in PDO: professionals are in three or more groups/career routes, in line with what participating petroleum professionals identified as career routes and similar to those proposed by Mainiero (1986).

2. There are more varying roles for professionals to assume than formal positions in PDO, hence roles do provide better measures as career units compared to positions/jobs (Hoekkstra, 2011).
3. Increasingly, professionals go through career changes along with weaker career boundaries leading to boundaryless careers (Hoekstra, 2011; citing Baruch 2006, Sullivan and Arthur, 2006, and others).



Source: Developed for this research

Figure 6.2 Proposed Multiple Career Ladders/Paths Model

This career model was discussed with the four executives. Two requested refinements to reflect the organizational settings and operating models; e.g. the progression models, organizational structure, and the ratios of technical management roles (10-20%), specialists' roles (10-20%), and the mainstream technical professionals' roles (50-60%). One executive referred to a PDO earlier proposal of career model (PDO's internal note) to offer career propositions for recruits along the line of career paths. This research-proposed multiple career ladders model provides reference for adopting such proposal. The petroleum functional dirctor endorsed it and approved it to replace the current dual career ladder, and to be incorporated in the Code of Practice (CP-125, 2002).

3. Revise PDO's Petroleum Engineering Management Code of Practice (PDO CP-125)

The revision is to enhance the definition of capacity building in PDO, employed processes, and to establish a clear line-of-sight connecting capacity building to professional development strategies and approaches. In addition, the revision aimed to incorporate updates to the career model into learning and development ladders, the career management process, and the respective roles and responsibilities of PDO and the petroleum professionals.

All executives supported updating the Code of Practice (CP-125, 2002) as proposed. The owner of the CP-125 and Petroleum Engineering (PE) processes- endorsed the proposed revisions and has committed to provide the required resources and expertise to work with the researcher to make the revision.

4. Contribute to PDO's learning and professional development strategy.

A PDO team from the Learning and Development Centre and from the People and Change Directorate is currently developing the strategy. The overarching principal of the professional development strategy is a combination of formal training (10%), mentoring (20%), and on-the-job development (70%). Career units, career paths, career change, and accreditation and regulations are some of the concepts being considered for incorporation into such a strategy. The champion of the strategy – acknowledged that the outcomes of this research are highly valuable and relevant for the learning and professional development strategy, and therefore requested that the researcher work with her team to realize the full utilization of the research findings. This process has already begun.

5. Develop induction/training on capacity building and professional development

Develop induction training on professional development and capacity building in PDO as a means to improve the professional development process and strengthen the link to PDO's capacity building objectives. This is to improve professionals' readiness to take responsibility for their own professional and career development as opposed to totally relying on the organization.

All four executives supported the initiative, suggesting that it started with the petroleum professionals before being extended to other professionals in the company.

6. Enhance talent management to focus on both leadership and expertise development.

PDO talent development focuses more on leadership through broadening exposure and increasing managerial responsibilities. The proposal is to value both leadership and expertise development equally and to extend career management of talent to include experts' roles along with managerial roles.

Two executive supported the concept of incorporating leadership development along with technical expertise in developing and managing talents, and confirmed that a focus on both abilities was already being practised.

6.6 Summary

Following the data analysis in respect to the research questions in the previous chapter, this chapter has synthesised the studied practice case of PDO by assessing the propositions describing the case. Assessment of most propositions indicated gaps and areas for enhancements. To achieve the desired states as described by the propositions, a case was made for change containing number of elements. These were translated to specific proposals that were presented to PDO's senior leadership for obtaining support for the research outcomes and proposed actions. Notably, a professional development framework and multiple career ladders model are developed and proposed for PDO to consider and adopt replacing current dual career ladders model. The actions also include conceptualization enhancement, and number of specific organizational activities.

Chapter 7

REFLECTIONS, IMPLICATIONS AND CONCLUSIONS

This concluding chapter reflects on the lessons learned from undertaking action research as a case study and the contributions made by this research thesis to the field of knowledge in general and the studied practice case in particular. It also discusses the implications and limitations of this research, and identifies remaining research gaps and opportunities for further research. The chapter closes by summarising the research conclusions.

7.1 Reflections on Action Learning and Action Research

The thesis adopted an action-learning approach (Revans, 1988, cited in Coghlan and Brannick, 2010). As the research progressed, opportunities arose to reflect on the process of enquiry and as well as on the enquired information and data. Adapting to emerging issues and responses was challenging but informative.

The literature review revealed the dimensions and issues pertaining to the researched subject, and identified many related aspects, but that have not been adequately considered in PDO's conceptualization of and approach to capacity building and professional development. These aspects were investigated with the research participants. It was therefore necessary to define these concepts for the research participants as a precursor to the discussion points and questions. This process had two action learning aspects. The first was for the research participants who were offered the chance to reflect on and refine or change their views. The second was for the researcher to remove or change some of the initially identified enquiries based on their subsequent relevance to the studied case.

Following the literature review, three data collection methods were employed in sequence: focus group discussions, one-to-one semi-structured interviews and an online questionnaire survey. This resulted in the refinement of the elements to be investigated based on their relevance to the studied case as established in the first inquiry method; the focus group discussions. The focus group discussions revealed significant gaps in the understanding of number of professional development and career options' concepts among PDO's petroleum professionals, in addition to widespread unease with the organizational approach and practices, particularly in regards to developing and supporting specialists. As an action learning outcome,

these findings enabled the interviews and the survey to focus on the most important issues, as well as providing workable descriptions of some of the key concepts such as knowledge workers and career identity.

The interviews revealed some shared and some differing views among executives, team leaders (technical managers), and discipline leads and specialists regarding the investigated aspects. In addition, the interviews provided an important challenge to the main concept of dual career paths as generalists or specialists, and the assumed contrast between the two. As an action learning outcome, it became clear that there are three career options in PDO's petroleum profession, similar to those proposed groups by Mainiero (1986): career technical professionals by choice, technical managers, and career technical professionals by default. In this study, these were referred to as specialists/experts, technical managers and technical professionals, respectively.

Building on the findings from the focus group discussions and interviews, the enhanced understanding of the elements to be investigated were incorporated into the questionnaire survey design. For example, the presence of three professional groupings/career paths was investigated, instead of only the two in the dual career ladders model. The questionnaire also explored the survey respondents' understanding of elements such as career change and progression, and their perceptions of organizational practices.

While conducting this research, various actions were taken or alluded to by the research participants, including executives, leaders and professionals. These actions were derived from reflection on the research and served as triggers for change at the personal or organizational levels. For example, there was a wide acceptance of the concept, new to many, that knowledge work underpins petroleum professional development and career options. For instance, some executives responded to some of the questions by indicating a need for change. Actions by participants were indicated by their response to questions placed at the end of the survey on the possible impact of the survey on their understanding and willingness to take action.

The research findings and proposals for actions were presented to and discussed with relevant members of PDO's senior executive leadership, with the aim of persuading them to support number of actions, as outlined in Section 6.4. The proposed actions were supported with the steer of engaging with other relevant organizational members and departments to develop implementation plans, make required changes to the related policies and code of practices, or

assess the feasibility and effects of the proposed changes. As anticipated, initiating organizational change is complex and requires wider support and thorough reviews. Those participating executives, who appreciated the value of the action research, acknowledged the research results and proposals. The action research process was also valuable for the researcher's own professional and leadership development. Action research is very demanding, however, since it relies significantly on participation and taking actions that are mostly beyond one's influence.

7.2 Implications, Limitations, and Further Research

This study has a variety of implications and limitations, as well as revealing areas that require further investigation.

7.2.1 Research Implications

Action research combines collaborative participatory problem-solving and knowledge cogeneration (Coghlan & Brannick, 2010), hence driving change. There are, therefore, research implications to these aspects.

On the participatory problem-solving front, the research has highlighted and analysed the problem of difficulties in developing much-needed specialists. This is in addition to the need to enhance participants' knowledge of professional development and capacity building concepts, and identification of gaps in PDO's current practices. Interviewees and survey respondents indicated that their participation increased their awareness of professional development aspects and was a trigger for them to consider taking actions.

In respect to knowledge cogeneration, the research is an empirical case study of petroleum professional development in an organizational context that had not been studied previously. It also made a clear link with knowledge work and the petroleum profession, whereby petroleum professionals are knowledge workers who follow either specialist or generalist career paths. Taking the studied case, the research challenges the adequacy of the dual career ladder model to represent all professionals. Instead, it proposes an enhanced career model with two distinct differences to the dual career model: multiple career paths instead of two, and particularly core (generalist or technical professionals), specialists (technical experts), and managerial (technical managers or team leaders). Each of these paths must have clearer stages that guide progression

and growth. In addition, there are number of aspects that were addressed in this research, whose relevance was established but that require further investigation and linkage to practice; such as career change and the characteristics of multi-generation professionals.

Driving immediate change was limited in this study to enhancing participants' awareness and provoking action taking. For lasting change, the research outcomes were discussed with the company's senior leadership in order to initiate updates of relevant codes of practice, improve the management of professional development and career progression, and train professionals to drive their own professional development.

7.2.2 Research Limitations

The research study had number of limitations, notably in its scope, representation, methodology, and by being conducted by insider researcher.

Research Scope: The scope was wide covering three main but related subjects; developing capacity building, professional development and career paths. The research attempted to establish links between these three in a petroleum company context as a case study, without going into in-depth investigation of each, except for career paths. This is because the latter has more developed concepts and studied practices, albeit not in the petroleum profession, than the first two, and has a clearer description and approach in PDO as the study context. The research started with the objective of establishing clearer correlations between organizational factors and context, individual professionals' factors, and developing capacity building, particularly through the dual career ladder model adopted in PDO. Although some correlations could be made, more extensive and detailed research studies – beyond the scope of this thesis – are required to establish robust correlations. The contribution of this research is in the form of establishing some important understanding of the links between capacity building, professional development, and career options that provide valuable platforms for further research.

Representation: The research is an insider action research and a case study of a specific organizational context of PDO as a National Oil Company (NOC) in Oman, from which research participants were selected. This participation has two main representational limitations: representation of the petroleum professionals across organizations and countries, and representation of PDO's working professionals. The case study research methodology limited its participants to PDO professionals. Since PDO's professionals are a mix of

expatriates of many nationalities and Omanis, however, the study could be considered as providing some representation of petroleum professionals. While PDO's executives and senior professionals - engaged with in a course of 20 interviews – were well represented, it is only 27% (147 out of 547) of invited professionals responded to the survey. The mix of the various professional groupings; female/male, Expatriate/Omanis, and at professional levels, also had similar representation levels (20-30%). Hence, it can be assumed with confidence, that a reasonable representation was achieved for the type of investigation and research methodology.

Research methodology: The research methodology was an action research mixed method as a case study. This entailed collecting a vast amount of qualitative and quantitative data to describe the practice case in its many aspects. This posed a challenge in terms of coding and analysing the information collected during course of four focus group discussions, twenty interviews, and responses to the 86 questions in the online questionnaire survey. As a case study, more qualitative data analysis was made compared to quantitative data analysis and trending. Hence, there is comparison that is more descriptive and less based on quantitative correlations. This study had two main methodology-related limitations, therefore: the difficulty of fully using the vast amount of collected data, and the difficulty of conducting a full statistical analysis. The data collected, however, can provide a valuable input for future research into this subject matter.

The insider researcher: as an insider action researcher, my organizational roles, experiences, and connectedness to information holders and controllers have impacted the way this research was conducted in two ways. The first was by enabling defining the research problem and its aspects and dimensions, engage research participants, and proposing and driving research-based actions. These would have been more challenging for an external researcher. The second was in ways of biases and limitations:

- Personal biases and preferences posed a challenge of having independent and credible evaluation. Being aware of potential biases allowed mitigating by designing the research to rely mostly on gathered data and information in making assessments and drawing conclusions.

- Being manager in PDO, researcher role and authority influencing participation in the research and/or their abilities to freely express their views and evaluation of PDO's approaches. This limitation was mitigated - to some extent - by providing participants

with information about research and their rights, confidentiality, anonymity, and their consent to participate or withdraw at any time without any rewards or consequences.

- The quality of gathered information by interviewing peers, superiors, or subordinates is potentially impacted. That is by influence of organizational group think and common perceptions on one hand, and the relationships dynamics and considerations the other hand. This was mitigated to some extent by focusing on concepts and organizational practices in the focus group discussions and interviews and not on individual stances and practices. The individual's stances were assessed in the questionnaire, in which anonymity was assured.

- My experiences and knowledge were useful in exploring and identifying aspects for consideration and for propping interviewees. In the analysis, being explicit about the sources of information and data being analysed, and if necessary to incorporate my own views and experiences, I explicitly acknowledge along with discussing potential associated biases.

- Researcher's subjectivity in the analysis is main limitation in an insider action research. With my – researcher - long work/management experience in PDO and involvement in professional development, I have developed firm views and positions on the researched subject. This has been one of the sources o strength – subject knowledge – and limitations – subjectivity. To mitigate, I relied heavily on the literature and PDO's records in identifying and defining the research problem dimensions and elements, and research participants views and assessments in analysing the studied case.

Conducted an inside action research addressing a managerial problem in a social context is bound to have limitations related to engagement, subjectivity, and thoroughness. These limitations can only be partly mitigated by awareness, alertness, and undertaking research activities that reduces researcher's influences. Main limitations in this research were identified and mitigated.

7.2.3 Further Research

This empirical research is one of few in the subject of petroleum professional development and career options, hence there are still many unanswered questions, and aspects to be investigated

further, both at the theoretical and practical levels. The following are areas that require further research and investigations.

The links between the capacity building framework and professional development and career options is one area for further research. Potter and Brough (2004) offered a capacity pyramid (see Section 2.1, Figure 2.2) that links number of elements. This framework can be enhanced by defining needs, strategies, approaches and the career development and progression of professionals.

Petroleum professional development strategies and approaches in a changing business environment and rapid technological advancements is another area for further research. There are some, albeit not in-depth, studies of the effect of the cyclical nature of the oil industry as driven by significant fluctuating oil prices, and the aging workforce in the industry. There is a need to better understand the effects of these issue on the long-term need for petroleum professional development and adaptability to change, however; since their influence on developing and retaining petroleum professionals can be significant.

In this research, and in accordance to the recent advances in career theory (Hoekstra, 2011), it is proposed to consider roles as the career units – and as reflected in the proposed capacity building-professional development framework (Figure 6.1) and in the proposed career model (Figure 6.2). This is a shift from the traditional approach in PDO of defining career units as positions or jobs. While roles might be clearer in some of the career paths, e.g. functional leaders and specialists, there are less clear for other career paths such as technical managers and business leaders. Developing the alignment and clarity of the roles' concept in all career options is essential not just for those following these career paths but also addressing an important deficiency in the current approach whereby managerial and leadership career paths are seen as more attractive than the specialist and functional ones.

The attitudes of professionals are increasingly changing - as reflected in career change (Weitman, 2006) and as noted in this research. This significantly affects the development of well-seasoned experts and specialists who would have life-long careers in one subject or niche area of expertise. The changing characteristics of multi-generations can offer an interesting entry to further research on the changing uptake of new generations of professional and career development, particularly in longer-paced petroleum professions.

Finally, a vast amount of data was collected in this research that has not been fully utilized. It does provide opportunities for further more in-depth evaluation of commonalities and differences in the attitudes, characteristics and experiences of professionals according to their gender, backgrounds, experience levels, etc. Such an evaluation will provide important insights into the drivers, enablers and constraints affecting career development and management in PDO.

7.3 Conclusions

This thesis has explored a practice case of petroleum professional's career development, as a means of developing capacity building in PDO. The research approach was that of inside action research aiming at knowledge cogeneration, taking action through participatory problem-solving and driving change. The action research approach enabled reflection on and implementation of changes during the research process. These changes come into two ways. The first was revising the research approach and re-focusing the investigation on emerging important aspects; e.g. the presence of multiple career paths instead of assumed dual paths. The second was encouraging research participants to reflect and consider taking action. The latter was indicated in the response to the survey and in the interviews. The research methodology was a mixed method case study combining qualitative and quantitative data collection methods. The sources of the collected data and information were PDO records, the literature, focus group discussions, interviews, and an online questionnaire survey. Based on the literature, the research subject was found not to be well researched and this posed a challenge in terms of establishing an adequate theoretical framework.

The research was a case study reflecting conceptualization and practice in POD in respect to capacity building and professional development, organizational factors and considerations, professionals' factors and considerations. It has addressed various issues: particularly these defined objectives for the study.

- It identified a lack of conceptualization and theoretical underpinning in PDO for petroleum professional development and career options, and identified knowledge work - organizations as knowledge-based firms and professionals as knowledge workers - as the appropriate concept going forward.
- It conducted a rare empirical assessment of petroleum professional development and career choices in a practice case in PDO.

- It developed an in-depth description and analysis of PDO's approach and the outcomes of its linked capacity building, professional development, and career options. This enabled PDO executives and professionals to develop a better understanding of the issues and to consider potential actions.
- It investigated professionals' perspectives on their professional development approaches, their career association, and alignment with the organization's capacity building objectives, goals and strategies.
- It identified and explored the possible effects of organizational and professional factors on PDO's dual career model.
- It developed and proposed a modified career and professional development framework and practice options.

Overall, PDO has in place approaches to develop its petroleum professionals in order to deliver on its business objectives and deal with technical and business challenges. The current management systems and code of practices, however, are not adequately integrated or highly effective in delivering on its capacity building needs. There seemed to be deficiencies in the conceptualization when compared to advances in career theory and changing professional attitudes and characteristics. This led to gaps between the concepts and practice, and also between the aims and the outcomes of capacity building and professional development. A number of organizational and professional factors that have a direct influence on professional development and career options were identified and evaluated. The dual career ladder, although supported by the knowledge workers' dual career model, was found to inadequately reflect the reality of at least three career paths. A modified multiple career model is proposed in this research, taking into account observed petroleum career options, personal and organizational influencing factors, and considering career units to be roles instead of the traditionally considered positions and jobs. The research had a number of limitations, and areas for further research have been proposed.

Appendices

Appendix I – Focus Group Discussions

In the focus group discussions, the following aspects of the research problem were discussed. Discussions were facilitated by the researcher by introducing the topic and inviting participants to express their understanding and share experiences about the relevance and importance of these in PDO.

1. Regulation for capacity building and career management in the petroleum industry
2. PDO required capabilities; more petroleum professionals, technical experts, or managers
3. Influence of IOCs (Shell) on PDO's approach to petroleum professional development.
4. Conceptualizations for professional development in PDO: knowledge work
5. Talent identification and guiding career options (managerial or technical)
6. Professional development stages/phases
7. Demand for experienced/experts & specialization career options
8. Career association and career identity
9. Matrix organizational structure & systems influence on dual career ladders
10. Motivating specialists and managers
11. Progression models and progression in dual career ladders
12. Mid-career transition and career change
13. Organizational/personal responsibilities

The outcomes of these discussions are presented below;

Focus Group Discussions Outcomes

		Investigated concepts & practices	Focus Group Discussions' Outcomes	
			Relevance to research and to PDO	**Ideas / aspects for research investigation**
Organizational Context	Capacity Building	Regulation/certification of professional competency and for assigning levels of authority and accountability	Limited to assigning technical authority.	No common industrial approach, Other disciplines with HSE aspects; e.g. Well Engineering
		PDO's most required capabilities; expertise, generalists, or managerial.	Needs were not clear, common sense of need of more specialists.	Lose of technical experts to managerial roles or other organization. Strategy to retain experts.
		Influence of IOC on PDO's (NOC) approach to petroleum professional development.	Mostly positive, with some adverse impacts,	Most SMEs in PDO are linked to Shell, slower Omani SME development. PDO Omanis
		Institutional capacity building through presences, systems, and practices	Elements exist in PDO, not clearly seen to be fully functioning.	Gaps; career counseling and career management
Organizational Context	Professional Development	PDO as knowledge-based company & petroleum professionals as knowledge workers	New concept that was unanimously agreed on.	Progression ceiling for experts and specialists as opposed to managers
		Early identification of talents verses the wait-and-see approaches	controversial stances on this issue among professionals	Lower CEP could de-motivated or develop complacency, with higher potentials are favored.
		Distinctive professional development stages: working, leading/managing, advisory	First two exist, third not. The third are those regulating.	Professional stages/phases mean of professional progression verses the career ladders. There could be more; entry, working independent,
Organizational Context	Organizational systems and practices	PDO's management hierarchy and structure	In PDO, there is more technical management; specialists can be manager not the other way.	Needing to strengthen technical authorities versus the traditional line managerial roles. Influence professional development of petroleum professionals
		Matrix organizational structures	In theory should have balance;	In practice the business aspects are more influential.
		Managerial responsibilities defining job levels	Not very relevant	Strong technical content also define job levels.
		General management and functional management	Overlapping concepts in PDO's petroleum function.	Functional and asset management
		Job/role type distinction: business leaders, functional leader, and specialist	Key concept	Define the career options and PDO's petroleum professional jobs and roles
		Progression models; post-led, person-led, and recognition reward	Highly relevant although the classification was not clearly described in PDO.	The more technical professionals require increasing recognition-based progression
		Entry assessment	Too early. More emphasis on leadership abilities	Technical achievement assessment identify potential specialists.
		Omanization (placing Omanis) policies influence on dual career paths	Encourage indirectly developing professionals on managerial line	Not supportive to developing specialists.

Focus Group Discussions Outcomes

		Investigated concepts & practices	Focus Group Discussions' Outcomes	
			Relevance to research and to PDO	**Ideas / aspects for research investigation**
Dual Career Ladder Model	Career options	Predicting career attainment	Not relevant	Not to investigate.
		Career management challenges in PDO (e.g. job deign and grading, …)	Very relevant, though adequate investigation require major fforts.	Gaps: motivation of technical professional to progress through the career ladder
		Demand for experts and specialists	Considered by to higher than for managers	Not impacting professionals opting for specialists career paths
		Career association and career identity	Relevant though not apparent.	Professional identity should be from the start. Specialists require accreditation.
		Mid-career transition and career cross-roads	Limited but signs of being in the rise. Change can be drastic to other professions, other organizations, or to managerial roles	Potential technical experts do not stay course. Technical professional skills are very transferable and needed in many organizations
Professionals	Development and growth	Motivating specialists and generalists/managers	Relevant	Different, to be explored
		Motivating work goals	different for specialists than for generalists	Technical career path less visible (inadequate recognition of subject matter experts (SME)
		Professional growth; (1) skills development and mastery; (2) managerial roles	Both are relevant and valuable. Different for the two on career paths.	Managerial path growth through positions, for specialists growth through the ladder, though not visible.
		Organizational/personal responsibilities	Both were considered relevant and valuable, taking various forms.	Organizational control vs. individualism, role of supervisor, size of the organization, effect of career ladder.

Appendix II – Interviews

Semi-structured interviews conducted by the researcher. Interviews were requested by the researcher via an e-mail invitation:

Dear …..

I would like to request a one-to-one interview with you on the subject of petroleum professional development and career options in PDO. This interview is part of a doctoral thesis research study that I am currently undertaking with the University of Liverpool in the United Kingdom.

The discussed points and perspectives in the interview will be coded for analysis without disclosing the identity of the interviewee. The participation is voluntarily.

Please find attached participant information sheet, providing brief background of the research along with participant consent form for your review and consideration.

Regards,

Sultan Al Shidhani

The following questions were posed to the interviewees, starting with 'in your opinion and based on your understanding and experiences'

- Do the petroleum technical and developmental challenges facing PDO (and the petroleum industry) require more technical experts (consultants), or managers?
- As a National Oil Company (NOC), does PDO's link to International Oil Companies (IOCs; Shell in particular) influence its approach to petroleum professional development and capacity building? And what are these influences?
- Do the concepts of knowledge workers and knowledge-based firms form sound conceptualization basis for petroleum professional development?
- Are there distinctive professional development stages/phases petroleum professionals go through? And are they linked to the dual career ladder model stages?

- Do high demands for experienced and expert petroleum professionals with high mobility have stronger influence on professionals to opt for specialization rather than the attractiveness of managerial positions?
- How strong is the career association and career identity of PDO petroleum professionals?
- How organizational structures (matrix) support or hinder petroleum professional development as dual career paths?
- How organizational management hierarchy impacts both managers/generalists and experts/specialists?
- How specialists and managers are motivated?
- Do managerial responsibilities in PDO define job levels? If so, do these disfavor specialists' progression? Are specialists' positions considered to be at senior levels?
- How frequent and easy/flexible moving between business leader, functional leader, and specialist positions in PDO?
- Is there career ceiling for specialists and for generalists in PDO?
- Which of the three progression models - post-led (or 'pull'), person-led (or 'push'), or recognition award- is most common in PDO?
- Do PDO Omanization (nationalization) policies lead to Omanis opting more for managerial career ladder, leaving expatriates taking specialists roles and following technical/specialist career ladder
- How common petroleum professionals have mid-career transition or take career change?
- Is career development and professional identity influenced by workplace context and social interactions?
- Is career development and management more of an organizational or personal responsibility?
- Are individuals encouraged to take responsibility for their own career development and career concerns in PDO?

Quotes from interviews

Organizational Context- Capacity Building

1. Regulation/certification of professional competency and for assigning levels of authority and accountability	
Executives: - Accreditation, in PDO not required, though it has value for specialists as a recognition - Not required in Oman, accreditation started in PDO for assigning technical authority (TA) - Guide career ladders, particularly technical (SME, Specialists), practice is week. - PDO's business is segmented; served by accreditation - Internally most progression linked to some assessment - Not needed for most petroleum professionals. - The industry survived without it. - Good thing to have; need strengthening - Required for professional development, and strengthen the professional pride - Needed and valuable to some degrees - For assigning technical authority (TA) level. - Develop and mandate proper assessments. - Need to combine certification & practice	**Team Leaders:** - Does not exist in PDO / no clear system - Technical authority and career ladders: competency assessment - Regulated professional development, e.g. SME - Competence assessment (internal), accreditation (external) - Majority are technical professionals **Discipline Leads** Competence Assessment for progression is a soft accreditation. - Regulation/accreditation is to support technical development, a practice gap - Regulation in the form of accreditation and assigning technical authority - In PDO, regulation/accreditation is through competence assessment - Value for PDO & Industry to have standardized references/assessments - Useful (competence assessment) - Used for process aspects but not for development - Must for HSE
2. PDO's most required capabilities; expertise, generalists, or managerial	
Executives: - Needing specialists, technical leaders, and more knowledgeable and specialists. - Industry is pushing the boundaries (needing specialists) - PDO in growth needing more technical professionals, technical leaders, and specialists - Technical management, specialists, and technical professionals (largest group) - All needed: specialists, managers, and professionals - Specialists are needed more to address PDO's top agenda as a technical excellence. - Specialists worth several leaders - Leaders should be able to talk technical, more involved in technical work - Generalists are available, specialists are less and are more difficult to find. - Technical leaders to manage technical professionals and specialists - Needing leaders who drive disruptive change, and to recognize specialists - Executives must be strong technically - Some specialists can be resourced and not necessarily developed in PDO. - Developing as specialist does not have sufficient appeal.	**Team Leaders:** - Moving toward more difficult oil/gas to develop: needing more technical professionals and specialists. - More specialists (more difficult oil) - Needing more 'core' specialists - Dual hatting (specialists / managers) not working - Needs were realized (specialists, managers) - Need more specialists, and technical professionals who provide good feed to management - Difficult to develop specialists than managers - Dual career ladders can be improved to drive technical leaders & specialist development - Local culture privileges managers (prestige) - Majority are technical professionals **Discipline Leads** - Primary are the technical professionals, smaller number of specialists. - Need combination - Technical professionals and technical leaders do and steer the work. - Technical professionals are the core - Needing mixture; mostly technical professionals. - PDO is well positioned to develop technical professionals and specialists. - Complexity is increasing; needing more technical leaders.

Quotes from interviews

3. Influence of IOC on PDO's (NOC) approach to petroleum professional development.

Executives:
- Enhances professional development; gurus (IOC)) & wide range of activities (PDO)
- Support PDO building expertise
- Provide exposures and systems development
- Offers diversifications and variety
- Omanization reduces such influence
- Positive influence on career development
- Over the time PDO develop its expertise: faster learning curve
- Strengthen professional development
- Gives PDO access to wider resources
- No hindrance to professional development
- Leveraging for developing Omani specialists

Team Leaders:
- Learning from IOC, expertise development, and offering wider exposure to PDO professionals
- Mutual benefits: IOC systems and expertise and PDO's work variety
- Support professional development
- Offers wealth of experiences and knowledge
- IOC experiences, training, and systems support PDO's professional development.
- IOC influence reduces with Omanization
- PDO needs to develop self-sufficiency in expertise
- PDO is looked at as a place for grooming specialists
- Leverage IOC's higher capabilities
- Utilize professionals' exchange (cross-posting)
- Omanis to be pressed harder to develop expertise

Discipline Leads
- IOC contributes to the strength of PDO (NOC)
- Provide wider exposures to PDO's professionals
- Helps in professionals development; exposures, and addressing mutual challenges
- Potential polarization and conflict of approach and priorities.
- More Omanization; more of a challenge and less mix
- With time, influence is lessening
- Enable growth of technical professionals,
- Improve knowledge and expertise transfer

4. Institutional capacity building through presences, systems, and practices

Executives:
- Strategic assessment of the portfolio, followed by work broader development
- Not segmented, use Hay across for identifying job level
- Good system in place, but it is falling short in keeping talent and grooming them
- The system is there and is good,
- Provide ability for people to develop (balance and learning).
- Short-sighted, not very long approach
- Large drain, in vibrant economy people want to venture out
- Not fully operational

Team Leaders:
- There is system, dual career ladder
- Not sure if there is a strategy for capacity building
- At the middle; not well-oiled machine
- Not comprehensive; segmented
- PDO has it, has grown stronger recently: senior leadership management very integrated in identifying the needs and developing people.
- For niche expertise the system is weak
- Petroleum profession is segmented, difficulties in developing specialists
- Not fully functional, retention is a struggle
- System is in place starting from training and mentoring, progression, structured
- Needing to enforce discipline in implementing

Discipline Leads
- Variation across functions
- Not robust enough in PDO
- There is strategy but not sure what to do with the technical professionals
- Lack of effective personal development plan (PDP), skilled planners
- Discussions are focused on short term
- Enable growth of technical professionals,

Quotes from interviews

Organizational Context - Professional Development

5. PDO as knowledge-based company & petroleum professionals as knowledge workers

Executives:
- For innovation, we need knowledge and technology
- LEAN is a process of simplification, a mind set
- By the definition, PDO is a knowledge-based
- No contradiction; LEAN allow freeing creativity time
- Mix of both world; repetitive and unique
- New concept; work is utilizing thinking and knowledge
- PDO fits the knowledge work
- LEAN is a series of tools useable by knowledge worker
- Petroleum professionals design things based on acquired knowledge to solve problems and realize opportunities/value.
- Bit of repetitive work, reducing with time
- With lean, moving toward standardizing and less thinking and wider space
- Bring up abilities through knowledge
- Knowledge workers to be more practical and relevant

Team Leaders:
- Fit the petroleum profession
- Yes, exactly
- PDO is a knowledge-based company
- Interesting and relevant concept
- Yes absolutely
- Challenge is knowledge harmony
- Knowledge creation, development, unique expertise

Discipline Leads
- knowledge workers do make modifications (uniqueness)
- Agree, it is a new concept
- Petroleum professionals acquire and apply a lot of knowledge
- Knowledge based work has the soft development aspects
- Challenging for young professionals
- Lean thinking to simplify, and free professional time
- Continuous learning

6. Early identification of talents verses the wait-and-see approaches

Executives:
- Earl potential identification system (current estimated potential-CEP) very robust, with an element of wait and see
- General shift toward the wait and see.
- PDO is a mix of both
- PDO applies combination of CEP and wait-and-see
- CEP is not hindering professional development
- Organizational practice focuses on: potentials leaders
- Wait and see is practiced in PDO
- Need for re-engineering, wait-and-see could lead to struggle to compete.
- Wrong early CEP could cause damage
- Early CEP supports generalists not specialists
- PDO is not doing enough to identify specialists
- Most of high CEPs venture out from the technical ladder
- Identifying (CEP) and developing talents sometimes could be gotten wrong but not detrimental
- Bring up abilities through knowledge
- Need those who drive innovation, disruptive change & new technology

Team Leaders:
- Wait and see is better, since people do change and demonstrate abilities as they progress.
- Developing as SME comes late in the career
- In PDO, hybrid of the two
- Early identification (having the label) result in self-fulfilling
- Early identification hinders specialist/technical career development
- Moving good technical professionals into leadership positions result in the company losing significantly
- For technical ladder, wait and see is better
- Early CEP identifies leaders not specialists

Discipline Leads
- CEP is more applicable for IOC (large pool); difficult to know and observe every one
- CEP is tilted more toward leadership/managerial
- CEP influences professionals' development and their desires to opt for leadership/managerial.
- CEP's three elements; capacity, achievement, relationship; specialists (first two), managers (all)
- Practice has cases of wait and see
- Early identification can be very distractive if not probably applied
- People get concerns about perceptions rather than performance
- For specialists, early identification does not matter
- Early identification has positive influence; learning, development, career steer
- Improve rigor in re-assessing and responding to professional development

Quotes from interviews

7. Distinctive professional development stages: working, leading/managing, advisoryPDO as knowledge-based company & petroleum professionals as knowledge workers

Executives:
- Merit in third advisory stage.
- The three stages exist in PDO
- These stages do exist in PDO; development, work independently, leading team / coaching
- Not structured; first two exist, merit in the 3rd
- First 2 stages exist, the 3rd stage as coaching
- Four stages; building competency, working independent, cross-functional or detailed work: specialists (guru) or leading (senior).
- Third stage is important; especially in mentoring and coaching
- In big group , leader become advisor
- Advisory stage does not exist in PDO
- Advisory stage is getting increasingly important
- The 3rd stage is needed but not at high level; need few mostly supporting mentoring
- Third stage: celebrating technical competences / excellence;
- Combining advisory/executive: success to do both

Team Leaders:
- First two stages do exist in PDO; technical work and management, the third (advisory) does not
- First two stages exist, 3rd stage not in PDO
- First two are seen, saw one case of the third.
- First two stages do exist, the third does not exist except for extending retiring professionals.
- See a value in the third stage, especially for specialists and technical experts
- There is a value in managers move to advisory roles

Discipline Leads
- First two are evident, advisors not a lot
- The third stage is not in PDO
- First and second levels, the focus is on managerial
- All, 3rd stage are SME or managerial line. SME do advising.
- The space of advisory very limited.
- There is a value in having the third stage
- Third stage is highly valuable particularly for training, reviews, most after retirement.

Organizational Context – Organizational systems and practices

8. Career management challenges in PDO

Executives:
- Some of the building blocks are not mapped out
- Career management system is clear but needs more transparency
- PDO created challenges by advertising itself as land of opportunities
- Specialists demand autonomy and space, while still required to deliver the business
- There is a structure in place and career paths
- In general PDO was able to develop good leaders as business managers
- The biggest challenge PDO has is the static nature of its workforce
- Needing to have balance between short-term and long-term business delivery
- Career management system needs to improve

Team Leaders:
- Career management is not so clear
- PDO has good progression and reward systems
- By pulling people early impact their career management
- Career management system is not very strong.
- People are placed sometimes in certain jobs that do not match professional capabilities
- Support is limited for technical and SME ladders
- Large number of professionals don't see their career paths
- Mentoring is not working well
- Career paths in practice are not visible
- Petroleum professionals' responsibilities and job levels higher than other disciplines

Discipline Leads
- Young professionals/generations have high expectations demanding faster growth and progression
- PDO does not have clear career management system
- Career paths are ambiguous although there were efforts to make it visible
- People consider technical path to have sealing more than a managerial ladder
- PDO got a lot of opportunities.

Quotes from interviews

Organizational Context – Organizational systems and practices

9. Demand for experienced/experts & specialization career options

Executives:
- Professionals used to see value in developing expertise
- Need to develop PDO's own particular specialization
- Specialization needs provide great opportunities
- Linking development to growth for specialists
- Practice is out of synch with PDO preach about technical careers
- The vast majority of people aspire to managerial positions, due to company set up and perceived ceilings of technical ladder progression
- Lessened attraction to develop as specialists; the new generation and insufficient mentoring / guidance.
- Petroleum professionals are mostly technical professionals; only few needed as specialists
- Omani SMEs developed and moved faster
- There is more opportunities for developing technical expertise

Team Leaders:
- Professionals have strong desire of wanting to be specialists, but not putting the required efforts.
"- Professionals see a need, but they do not see value.
- Professionals express desire to develop as experts
- The system is working against expert development.
- Professionals do not see clear demand that would drive them to select specialists.
- Omanization concerns on developing expertise
- Not reflected in professionals' attitudes
- Company is not serious about developing specialists
- Professionals loss interest; see no clear opportunities to pursue
- Gap: discipline roles/experts are all expatriates.
- Gap: between specialist needs and development of Omanis

Discipline Leads
- Higher demand for specialists
- More needs for strong technical competence.
- There is a high demand for technical/specialists.
- Professionals think of managerial roles, the market demands those with strong technical competency.
- Remaining jobs/roles to fill are difficult ones.
- People look for managerial jobs
- Many technical professionals are frustrated by limited managerial roles and responsibilities
- A challenge to find competent working professionals who can be trusted to do the work
- Omanization to drive developing specialization
- Retention of best of professionals

10. PDO's management hierarchy and structure and career options

Executives:
- The harder job is the functional, though we value the asset more than the function
- Hierarchy is clearer for managerial and less for specialists.
- Highest functional job (PE manager)
- Biased toward management
- Function should have stronger power / more intellectual
- Easier to swap from technical to managerial due to the exposures
- Influence of technical professionals/specialists is increasing, it is much stronger now
- technical professionals are the engine of the company and people would like to have the name and differentiation
- For early and mid-career development have the vertical functional support,

'**Team Leaders:**
- Management hierarchy is supporting managerial ladder, not the technical ladder.
- The functional roles are not strong
- In practice, managerial hierarchy has more influence
- With Discipline Control Assurance Framework (DCAF) and Decision Review Board (DRB) it (functional role/influence) is improving
- The leadership line is well structured and explained, for SME/specialists lacking behind
- The only structure I see is mostly for managerial.
- Not balanced; the managerial line is very strong, the functional / technical line is weaker.

Discipline Leads
- Worked in both type of organizations, matrix is better provided you have good leaders
- Strange hybrids, working in fields but reporting to processes
- Power sits more with managers, driving career options to some extent
- With the good intention DCAF should provide balance

Quotes from interviews

11. Matrix organizational structure & systems influence on dual career ladders	
Executives: - Business processes forming basis for practices and for ensuring compliance. - In practice, matrix organization is more supporting the managerial line - Challenging, valuing asset managers more - It gives more power to managerial line - It is more business delivery than professional development **Team Leaders:** - Matrix org helps the dual career ladders (managerial and technical). - Equally weighted - Provides structure for developing the dual career ladders	- Functional role is not strong or missing, - Power sit with line, less with the discipline, matrix not effectively balancing authority for technical line - Business model is supporting both career ladders - In practice it is not fully utilized - Technical not very visible **Discipline Leads** - Matrix best for the business. - Split into process-based, accountability of process - PDO is much focused delivery organization (short term), discipline focus on mid and long term. - The matrix org. is not very effective. Technical not very visible. - Supports professional development/career
12. Managerial responsibilities and job levels definition	
Executives: - For generalists and for specialists are more skills strengths and exposure - Specialists are considered to be at senior levels, though there is gap in practice - I agree disfavoring specialists - Dominated at higher levels by managerial responsibilities - Mix of leadership and technical. I agree disfavoring specialists **Team Leaders:** - Should be and is the practice; both (technical competency and managerial responsibilities). - More on the managerial but is starting for specialists	- Mainly managerial, yes disfavor specialists - The technical skills are not the highest considerations, but rather leadership and managerial - There is huge technical overprint - Technical competence is stronger, job description,; delivering business targets **Discipline Leads** - More managerial competency, leading to progressing people with higher managerial position - Managerial well described, specialists can do better. - Higher jobs are managerial - More managerial roles contents. - More toward managerial.

Quotes from interviews

13. Progression models (1-post-led or 'pull', 2-person-led or 'push', 3-recognition award)

Executives:
- All progression models exist in PDO; but mostly post-led.
- The first two are most common, few examples of third, requiring step outs
- Post-led is most common, there are merits for the other two
- Equally post- and person-led, recognition to lesser extent except at higher positions.
- To motivate the organization, might review progression models of petroleum professionals.
- Promote professionals who develop specialists not necessary to fill positions
- Losing people due to not seeing growth through progression.

Team Leaders:
- Recognition not present, person-led limited, mostly post-led
- The three exist, person-led up to Salary Group 3 (SG3), post-led beyond SG3, limited progression by recognition is observed.
- All progression models, post-led most
- Post-led for managers, person-led at lower levels
- The first two are stronger, the third is not very common
- First two, more on first, third not very visible
- Managers have clearer path (motivating)
- The recognition is more for the managerial, first (post-led) on the technical professionals
- Most are the first two; the majority are post-led, recognition not visible
- Needing to incentivize professionals to continue in doing what there are good-at with progression
- Mix between post and person-led

Discipline Leads
- Most progressions driven by competency assessment; person-led
- Post-led for managerial and person-led for specialist
- First two, third could be better
- Progression is strongly associated with competency; early stage mostly personal-led, after mostly post-led.
- Two issues; need to have the competency and job availability
- Serious problem of not being able to retain professionals; how to incentivize technical professionals to continue

14. Omanization (nationalization of workforce) policies influence on dual career paths

Executives:
- Taking risks with Omanis on managerial roles; whereby there are many controls.
- It is not a policy; managerial positions are seen as high profile jobs
- Large incentive to progress Omanis more toward managerial – more visible, rewarding
- Managerial roles/positions has more pool to select from
- Technical roles does not have enough appeal
- Due to the set-up; focusing on the managerial positions (not a policy)

Team Leaders:
- More toward Omanizing managerial, less technical roles
- More Omanis opt for leadership/managerial roles
- Omanis are weaker on the specialist's route.
- Nothing to do with Omanization; managerial career paths are more attractive.

Team Leaders:
- Equal loyalty to the company and to the profession
- There is a strong identity; e.g. in conferences
- The petroleum community are proud of their identity
- Discipline (e.g. geology, petrophysics) association is stronger than that of petroleum professional
- Week identity and association; e.g. not attending to professional activities
- There is no accreditation guiding career development and association.
- Strong identity. always being proud to PE

Discipline Leads
- Strong discipline identification
- Currently most to PDO and lesser to the profession
- It is changing with younger generation, less pride with the company.
- Technical have stronger association

Quotes from interviews

Petroleum Professionals – Career development

15. Career association and career identity

Executives:
- Known by the discipline, it is less of point of pride but internal expression to external
- Branding not very strong. Globally relate as petroleum engineers (PE)/professionals.
- Identity is week, petroleum professionals are not leveraging professional organizations.
- Professionals identify themselves as leaders or pioneers.
- Strong identity. I used to be proud to be PE.
- Strong identity and feel proud. Not well appreciated by other professionals.
- The majority have strong identity, stay with the profession.
- Identity development impacted by status in society

Team Leaders:
- Equal loyalty to the company and to the profession

- There is a strong identity; e.g. in conferences
- The petroleum community are proud of their identity
- Discipline (e.g. geology, petrophysics) association is stronger than that of petroleum professional
- Week identity and association; e.g. not attending to professional activities
- There is no accreditation guiding career development and association.
- Strong identity. always being proud to PE

Discipline Leads
- Strong discipline identification
- Currently most to PDO and lesser to the profession
- It is changing with younger generation, less pride with the company.
- Technical have stronger association

16. Knowledge and skills of specialists and generalists (managers)

Executives:
- All petroleum professionals can be generalists.
- Not all petroleum professionals can be specialists
- By definition, anyone can be generalist but not everyone can be specialists.
- Both have same base to certain level
- As advancing become more selective; technical or managers
- Managers are given leadership training.
- Specialists are given assignments to places to develop as specialists
- Some people not seeing what are they capable of and what fit them more

Team Leaders:
- Differ when going to the two ladders

- Technical skills form basis for all, and important entry to managerial
- Different for experts, managers, and Technical professionals
- Technical specialists (SME) have better access to developing themselves
- Professional development is not well structured.
- Each require Different development and skills

Discipline Leads
- Technical professionals/specialists need Different competencies than managers.
- specialists focus on the in-depth, while managers focus on general/overview
- all leaders in PDO are Technical leaders
- Needing Different after deviating into Technical or managerial ladders
- Common Technical skills for Technical management

Quotes from interviews

17. Motivating specialists and generalists (e.g. managers)

Executives:

- Motivational packages differ; generalists' wider exposures; specialists in depth
- Motivators are accreditation, status, and space
- Specialists are motived differently than generalists.
- There are more opportunities in the technical line hence highly motivating.
- There are different needs for specialists and for managers: specialists to be recognized
- For specialists; striking balance is key; space within certain set of goals

Team Leaders:

- It is not totally different, all about job challenges and dimensions.
- Requires appreciation and recognition for the uniqueness of the expertise
- The structure, development, opportunities for managerial is clear, but not for specialists.
- Motivations for specialists; upfront accelerated development and recognition,
- Managers have clearer path (motivating),
- Specialists have less motivating means
- Autonomy is important for technical and specialist along with keeping up to date
- What motivate managers progression (next position), specialists (space, autonomy)
- Specialists are motived by space and means for knowledge building and expert development

Discipline Leads

- Job security is a major motivator
- Technical professionals motivated by respect and recognition.
- Managers are motivated by more roles and positions,
- Motivation is different for specialists
- specialists are self-motivated
- Specialists are motivated by exposure and recognition,

18. Mid-career transition

Executives:

- Lot happening in the first five year, but less afterward
- Develop to technical experts or business leaders
- Happening now and driven by individuals
- Trend of change; motives growth; wanting to change, or taking managerial position.
- Some professionals do not realize their initial sought careers; hence needing mid-career review
- The notion of loyalty to one job is diminishing.
- Young professionals (new generation) tend to venture out early in their careers.

Team Leaders:

- Common, people do change heart
- From professional to managerial, not vice versa
- Not on changing profession, but organizations
- Most professionals exit the organization due not seeing light at the end of the tunnel
- Personally have experienced needing to choose career path
- Changes are led by availing opportunities
- More and more having courage to say I had enough.
- Changing organization but not profession
- Managerial positions are filled up, while the other technical not visible.
- Increasing with the new generation
- Broader experience is more competitive and attractive.
- Increasing with the new generation
- Broader experience is more competitive and attractive.

Discipline Leads

- By changing organization or taking up technical management
- Happening as indicated by the rate of resignation and moving to leadership
- The fact that people are leaving is a sign of career change
- People leave the company, but not the professions.
- Moving to other organizations is increasing, though not adequately recognized by the organization

Quotes from interviews

19. Professional growth/managerial roles

Executives:

- Growth is a about personal development
- Driven by the individual and should be aligned with generalists and specialists career routes.
- Technical management is positions are limited
- Technical/specialist routes are deeper and knowledgeable; areas for professional growth
- Growth for managerial routes through broadening roles
- Technical professional growth through deepening; while managerial through broadening, wide exposure, and venturing out of the technical route

Team Leaders:

- Professional growth includes enhancing managerial roles
- The value for both, but more on the managerial (team leaders, managers, …)
- Professional growth through managerial is limited/saturated, while it is open through the technical

Discipline Leads

- Equal, if not more on the technical line, particular in PDO
- Motivator, people see more professional growth along managerial, not seeing example.

20.Organizational and personal responsibilities

Executives:

- Early more on the organization, later more on the individuals
- Shared; organization needs to ensure systems in place while the individuals to pursue
- Initial phase: organization, later phase: individual
- Not enough of personal pull and drive
- Rotation is important for professionals' career development.
- Personal Development Plan (PDP) is a must

Team Leaders:

- Organization has more control
- More to the organization reflecting the needs and resources
- Responsibilities by both sides

- Some choose their own career and take drastic ot sure if people realize mutual responsibilities; individuals steps
- N definitely to take responsibilities.
- It should be with the individual, and with the company support

Discipline Leads

- Both, earlier professionals require guidance and support; afterward more on the individual
- Mostly on the individual, the organization is to support
- Organizational responsibilities are in setting it up, but individual to drive it
- Role of the function (organization) is supporting professionals to develop
- There could be conflict between organizational needs and individual desire

Appendix III – Questionnaire Survey

Research participants (PDO petroleum professionals) were invited via an e-mail (see below) to take the survey.

From: ……
Sent: Thursday, June 5, 2015 3:03 PM
Subject: professional development and career options survey

Dear colleague,

You are invited to participate in a research study about professional development and career options for petroleum professionals (geoscientists and petroleum engineers) in PDO.

Your participation is optional, confidential, and anonymous (identities of respondents are not identified).

You will find more information about the study and your participation in the questionnaire introduction. To start the questionnaire please click on the following link.

http://sww14.pdo.shell.om/SelectSurveyNET/TakeSurvey.aspx?PageNumber=1&SurveyID=m40Hn68&Preview=true

We do highly appreciate your participation and responding to the online questionnaire.

Regards,

……

The online questionnaire starts with …

Dear Petroleum Professionals

You are invited to participate in a research study of the University of Liverpool, UK.

Study title: Developing Capacity building in dual career ladder situations: Insights from petroleum technical and managerial professionals.

Researcher: Sultan Al-Shidhani, School of Management, University of Liverpool, UK

……

The first questions of the survey are shown below. All questions are shown in the survey results presented in figures in Chapter 5.

Questionnaire Survey

Knowledge Work and Career Paths

In responding to the survey, please focus on **your understanding** and observed **organizational practices** and indicate the extent of your agreement or disagreement in each of the following statements.

Energy/petroleum companies are described as knowledge-based or knowledge-intense firms, in which value is created by solving unique problems through the application of knowledge and technology

1. Knowledge and technology are applied in exploring, developing, and producing petroleum (oil and gas) resources in PDO; hence PDO can be described as a knowledge-based company

Strongly Disagree Disagree Neutral Agree Strongly Agree

Engineers and scientists, working in knowledge-based firms, are described as knowledge workers with professional or functional expertise necessary to deliver the products or services of the organization, or to support the effective running of the organization.

2. PDO's petroleum professionals (engineers and geoscientists) employ their professional and functional expertise (knowledge and technology) in delivering PDO's value (developing and producing oil and gas resources) and in supporting the effective management of its activities; hence they are knowledge workers.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Knowledge workers follow one of two career paths; generalist or specialists.

3. The two career paths (generalists; often referred to as managerial, and specialists; often referred to as technical) are present in PDO for its petroleum professionals (engineers and geoscientists).

Strongly Disagree Disagree Neutral Agree Strongly Agree

4. In relation to the two career paths described above, I consider myself to be or develop as:

Specialist/Technical Expert Technical Professional Generalist/Manager

5. In relation to the two career paths described above, I am considered in PDO to be or develop as:

Specialist/Technical Expert Technical Professional Generalist/Manager

Talent identification and development

In responding to the survey, please focus on your **understanding** and observed **organizational practices** and indicate the extent of your agreement or disagreement in each of the following statements.

There are two approaches to developing and progressing talents; 'early identification/selection' and 'wait and see.

6. Petroleum professional talents are those with high managerial/leadership abilities and preference.

Strongly Disagree Disagree Neutral Agree Strongly Agree

7. Petroleum professional talents are those with high specialization/expertise abilities and preferences.

Strongly Disagree Disagree Neutral Agree Strongly Agree

8. In PDO, petroleum professional talents are identified early in their careers.

Strongly Disagree Disagree Neutral Agree Strongly Agree

9. In PDO, the early identification of petroleum professional talents enable more effective professional development and progression of the talents.

Strongly Disagree Disagree Neutral Agree Strongly Agree

10. In PDO, the 'wait and see' approach is also adopted; enabling identifying, developing, and progressing talents who demonstrate their abilities in their later career stages.

Strongly Disagree Disagree Neutral Agree Strongly Agree

11. In PDO, those petroleum professionals who are seen to have the potential to become leaders and managers are considered as talents.

Strongly Disagree Disagree Neutral Agree Strongly Agree

12. In PDO, professional development and career progression of petroleum professional (leadership/managerial) talents are well guided and supported.

Strongly Disagree Disagree Neutral Agree Strongly Agree

13. In PDO, those petroleum professionals who are seen to have the potential to become specialists and subject matter experts (SME) are considered as talents.

Strongly Disagree Disagree Neutral Agree Strongly Agree

14. In PDO, professional development and career progression of petroleum professional talents (specialists / technical experts) are well guided and supported.

Strongly Disagree Disagree Neutral Agree Strongly Agree

15. In PDO, my professional development and career progression are well guided and supported.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Questionnaire Responses

Definitions and Abbreviations (0):

Response	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Skipped
Abbreviations	SD	D	N	A	SA	Sk

A+AD%: Level of disagreement (strongly disagree and disagree)

A+AD%: Level of agreement (strongly agree and agree)

S/TE : Specialist / Technical Expert	**S/TE% :** Specialist / Technical Expert of the total
TP : Technical Professional	**TP% :** Technical Professional of the total
G/M : Generalist/Manager	**G/M% :** Generalist/Manager of the total

Demographics (questions 81-86) used for grouping respondents and trending responses (radar graphs):

Gender:	Female	Male

Age	Less than 30 years	30 – 39 years	40 – 49 years	Over 49 years
Abbreviations	A<30y	A30-39y	A40-49y	A>49y

Job Levels (1: highest, 7 lowest)	Salary Groups 7 or 6	Salary Group 5	Salary Group 4	Salary Group 3	Salary Groups 2 or 1
Abbreviations	SG 7-6	SG 5	SG 4	SG 3	SG 2-1

Current Position	Professional / Engineer	Cluster / Team leader	Discipline Lead	Subject Matter Expert
Abbreviations	P/E	C/TL	DL	SME

Staff Categories	Expatriate (Direct Hire)	Expatriate (Seconded;	Omani
Abbreviations	EDH	ES	OM

Working in PDO	less than 2 years	2 to 5 years	6 to 10 years	11 to 20 years	Over 20 years
Abbreviations	W<2y	W2-5y	W6-10y	W11-20y	W>20y

Demographics

No.	Gender	Female	Male
82	Respondents	25	121
	Distribution	17%	83%

No.	Age (years)	Over 49	40 - 49	30 - 39	Less than 30
83	Respondents	26	38	68	14
	Distribution	18%	26%	47%	10%

No.	Education level	PhD	MSc.	BSc.	Diploma	Skipped
84	Respondents	18	64	62	1	1
	Distribution	12%	44%	42%	1%	1%

No.	Job level (salary group)	SG 2-1	SG 3	SG 4	SG 5	SG 7-6
85	Respondents	28	55	41	15	7
	Distribution	19%	38%	28%	10%	5%

No.	Years working in PDO	Over 20	Nov-20	6 - 10y	02-May	Less than 2
86	Respondents	17	29	40	46	14
	Distribution	12%	20%	27%	32%	10%

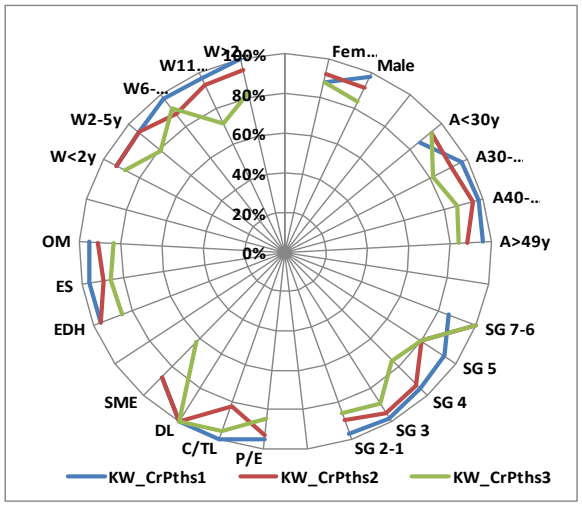
No.	Discipline	PG	PS	PP	PT	RE	Skipped
87	Respondents	37	7	20	38	41	3
	Distribution	25%	5%	14%	26%	28%	2%

No.	Current position	C/TL	DL	SME	P/E	Skipped
88	Respondents	22	6	8	103	7
	Distribution	15%	4%	5%	71%	5%

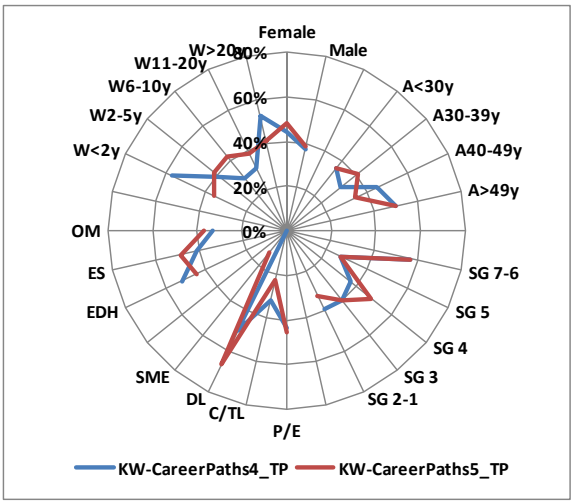
No.	Staff category	OM	ES	EDH
89	Respondents	90	29	27
	Distribution	62%	20%	18%

Comparisons of survey outcomes (2.1)

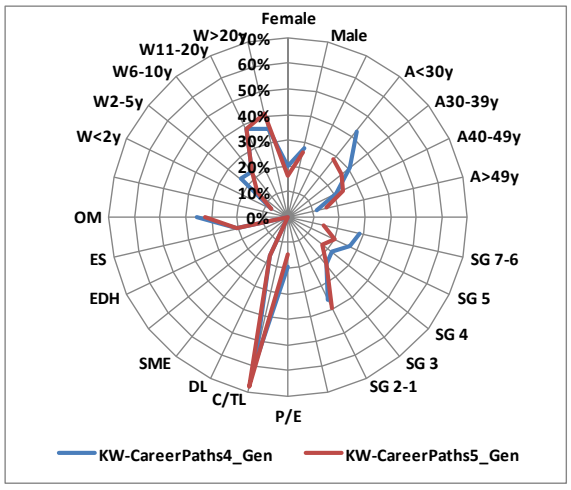
Knowledge Work and Career Paths (1-3)



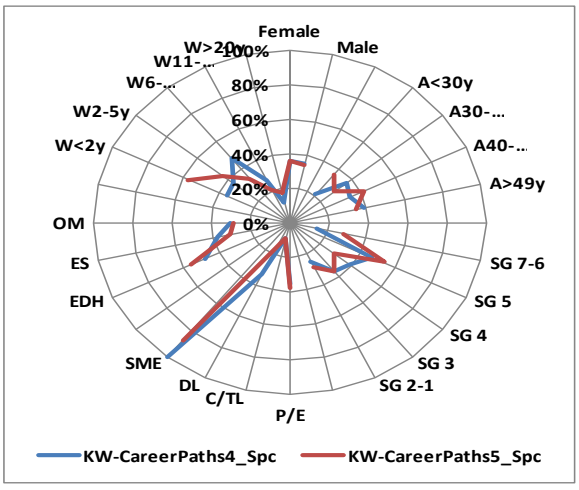
Technical Professionals (4-5)



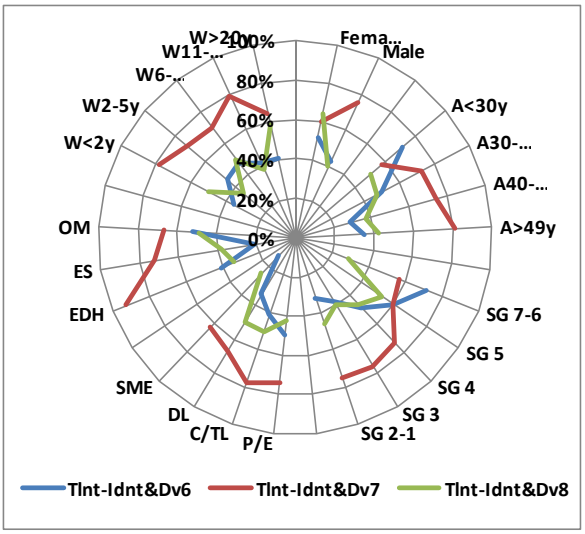
Generalists/Managerial (4-5)



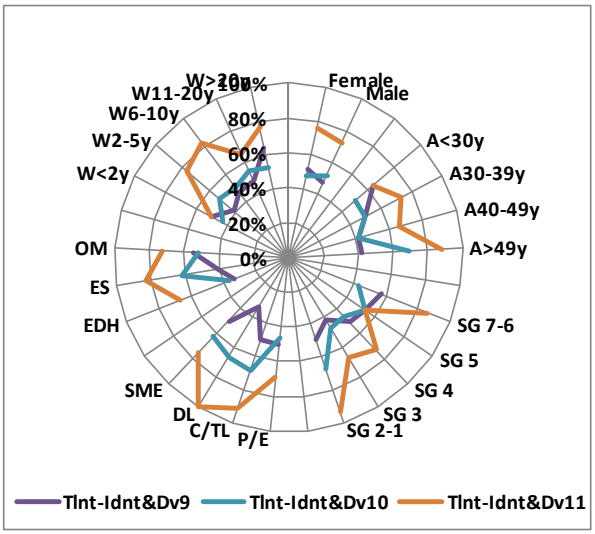
Specialists/technical Experts (4-5)



Talent identification & development (6-8)

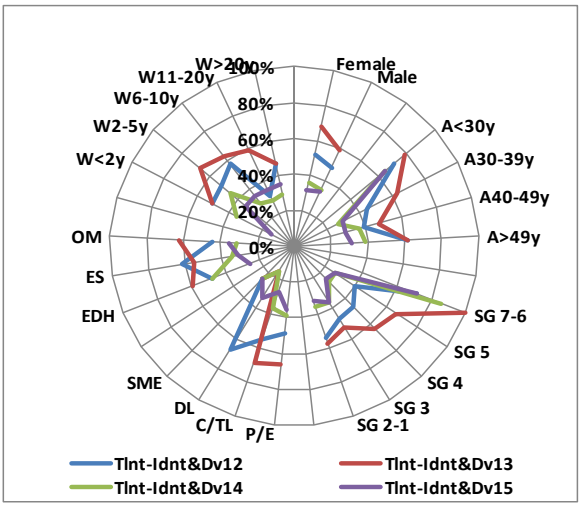


Talent identification & development(9-11)

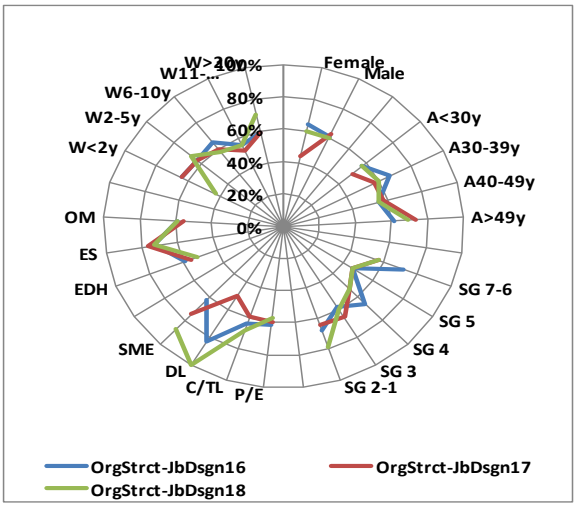


Comparisons of survey outcomes (2.2)

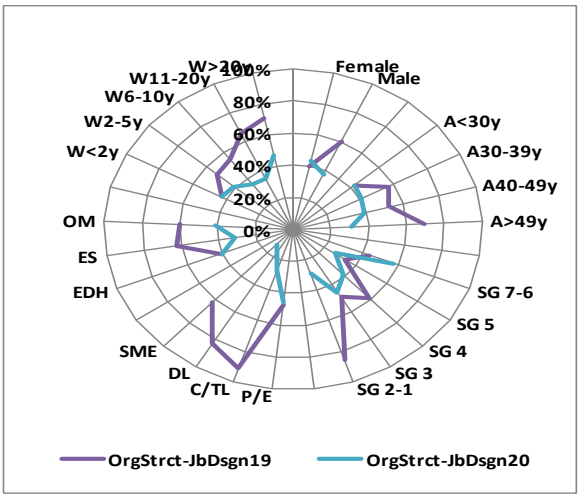
Talent identification & development(12-15)



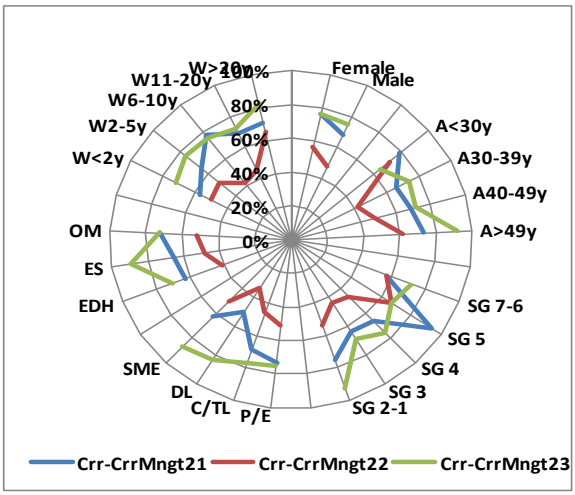
Organizational Structure& job design(16-18)



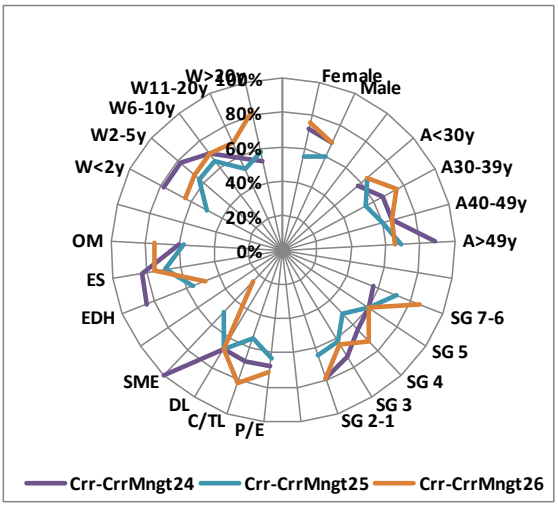
Organizational Structure& job design(19-20)



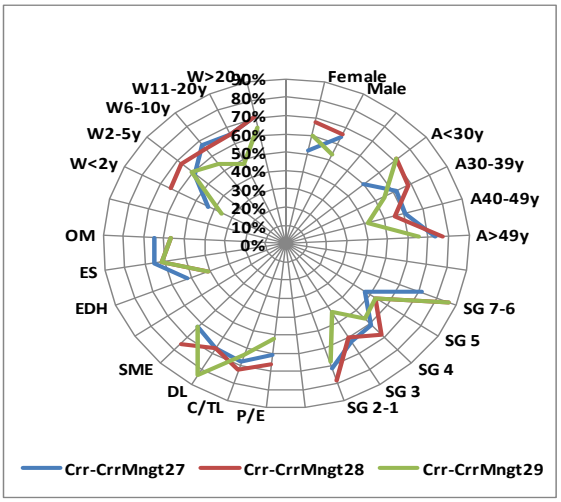
Career and Career Management (21-23)



Career and Career Management (24-26)

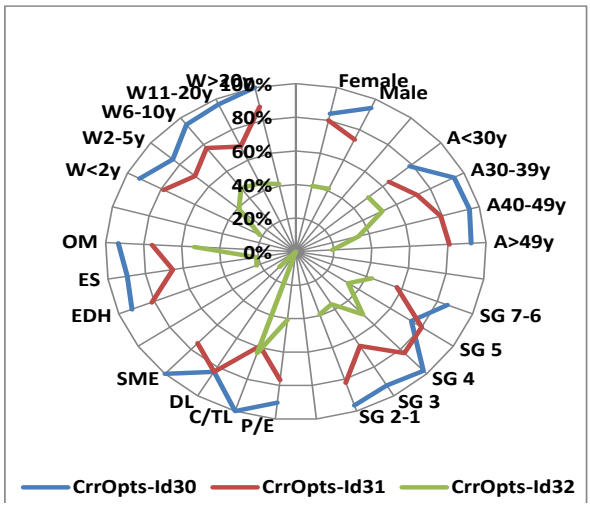


Career and Career Management (27-29)

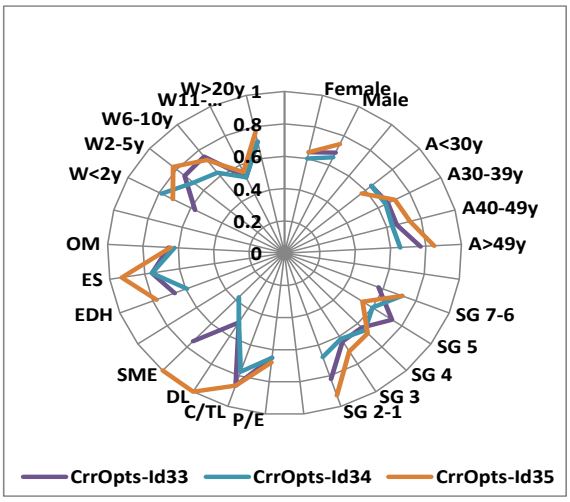


Comparisons of survey outcomes (2.3)

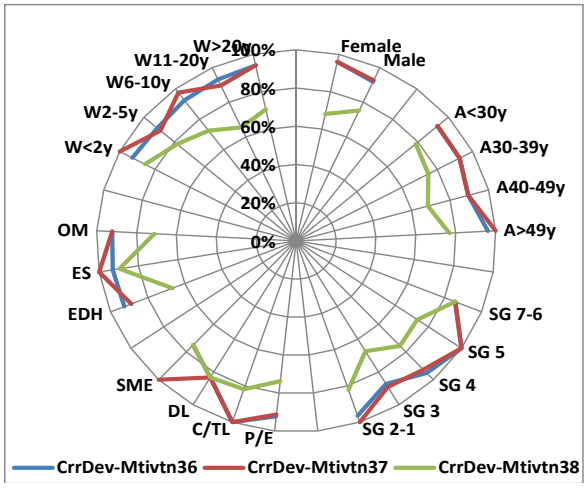
Career Options and Identity (30-32)



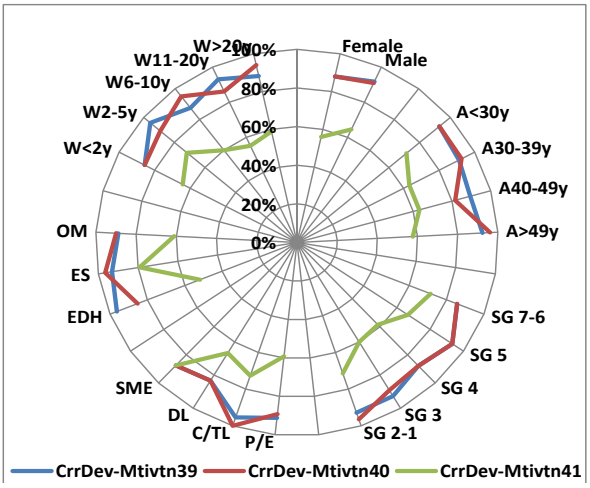
Career Options and Identity (33-35)



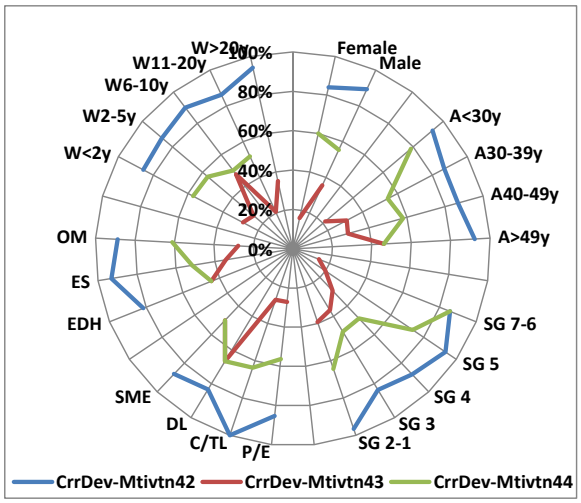
Career Development and Motivation (36-38)



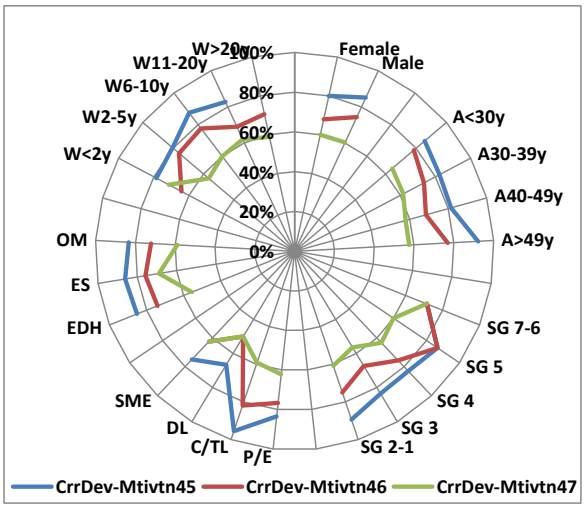
Career Development and Motivation (39-41)



Career Development and Motivation (42-44)

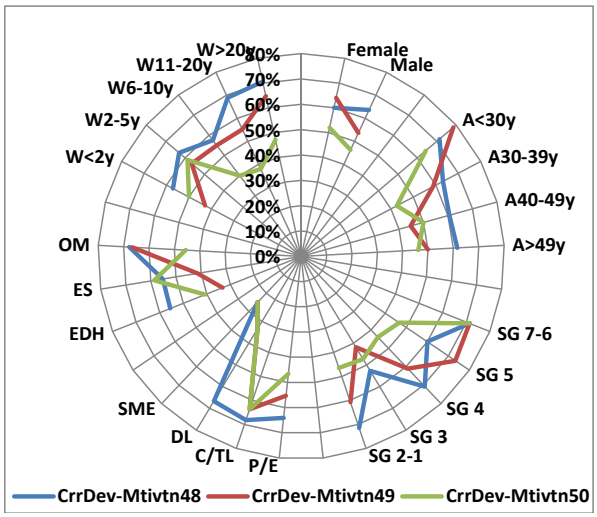


Career Development and Motivation (45-47)

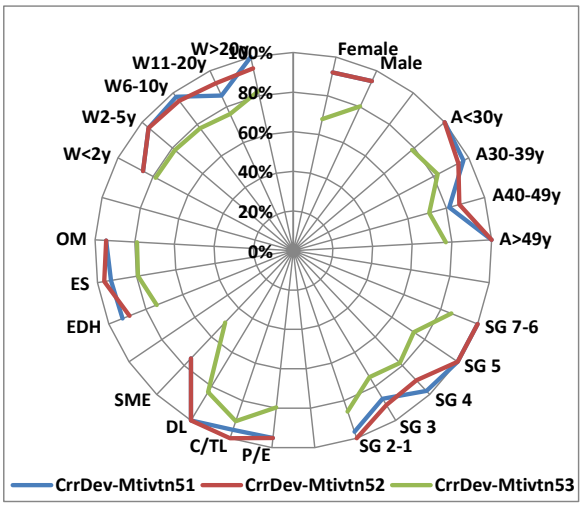


Comparisons of survey outcomes (2.4)

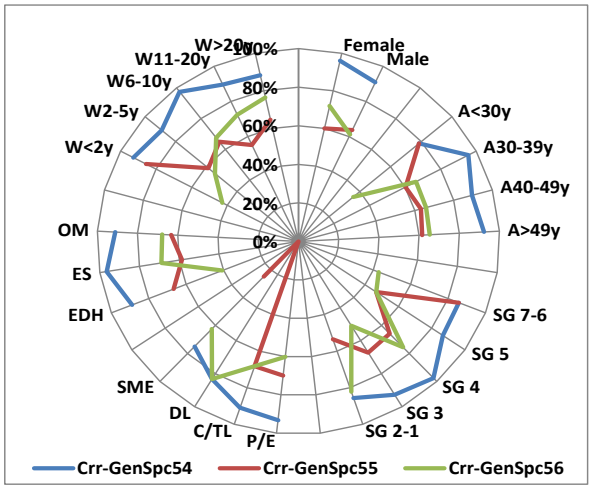
Career Development and Motivation (48-50)



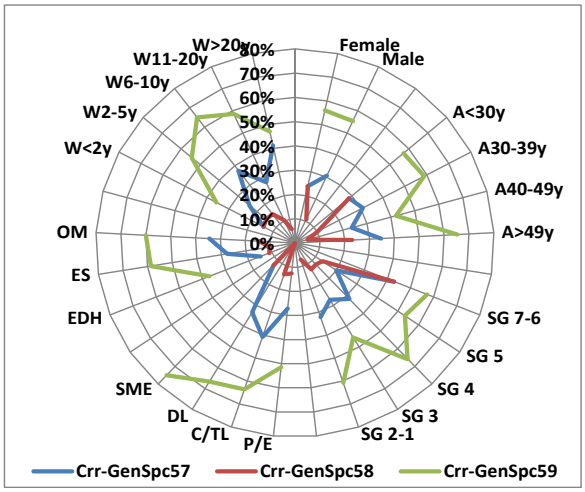
Career Development and Motivation (51-53)



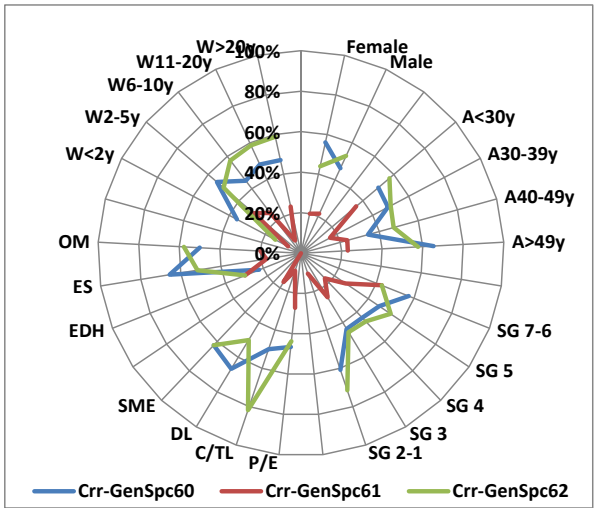
Career options: generalists/specialists (54-56)



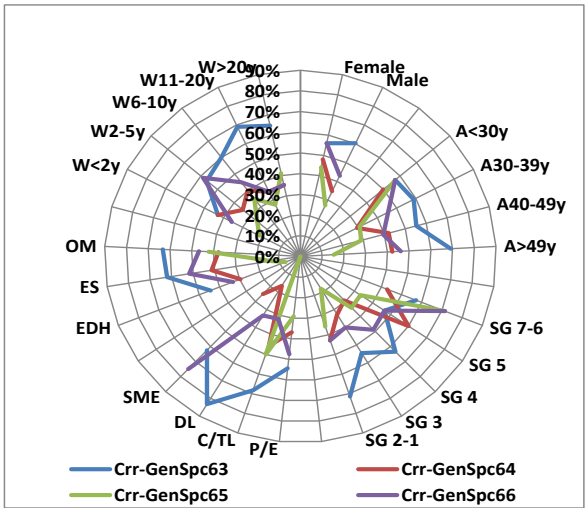
Career options: generalists/specialists (57-59)



Career options: generalists/specialists (60-62)

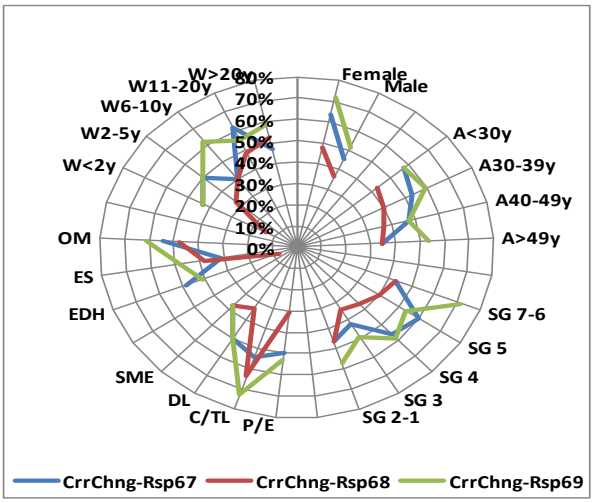


Career options: generalists/specialists (63-66)

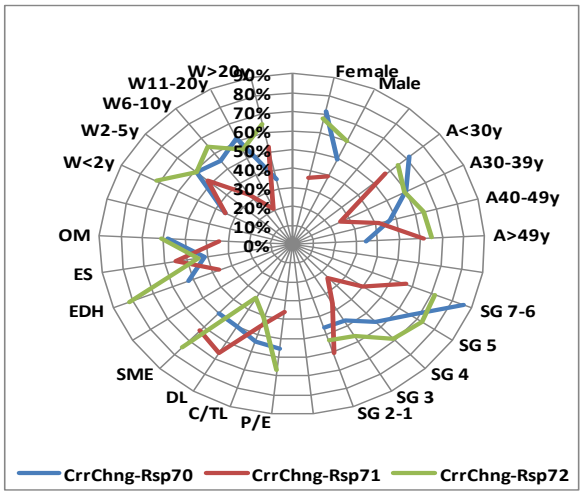


Comparisons of survey outcomes (2.5)

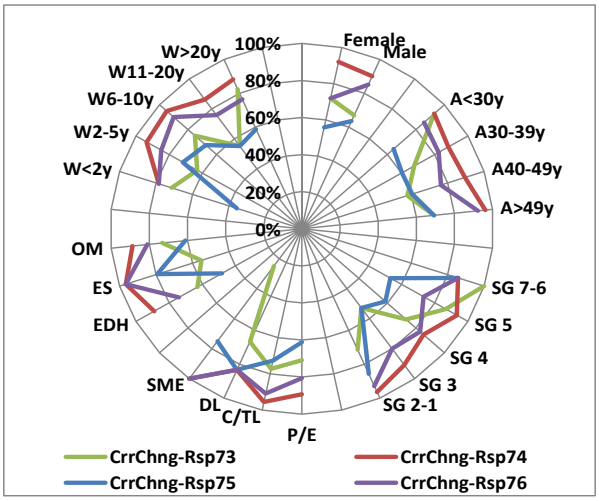
Career change and responsibilities (67-69)



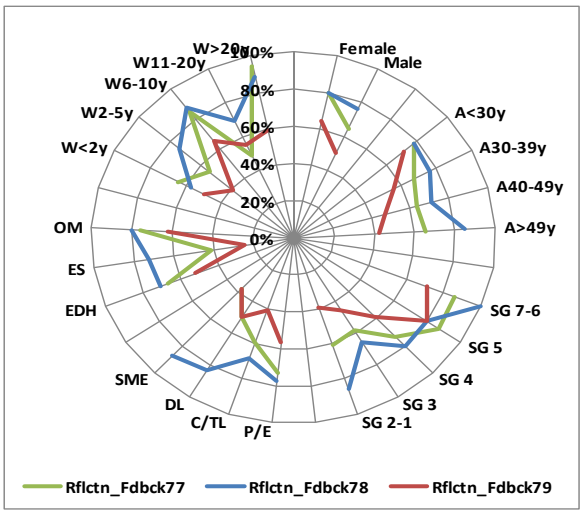
Career change and responsibilities (70-72)



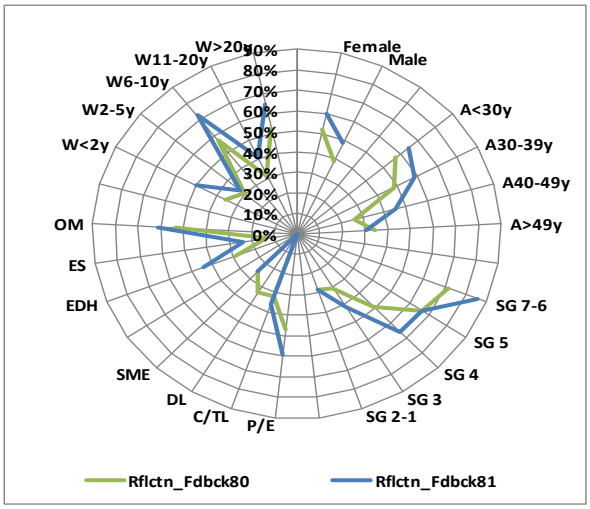
Career change and responsibilities (73-76)



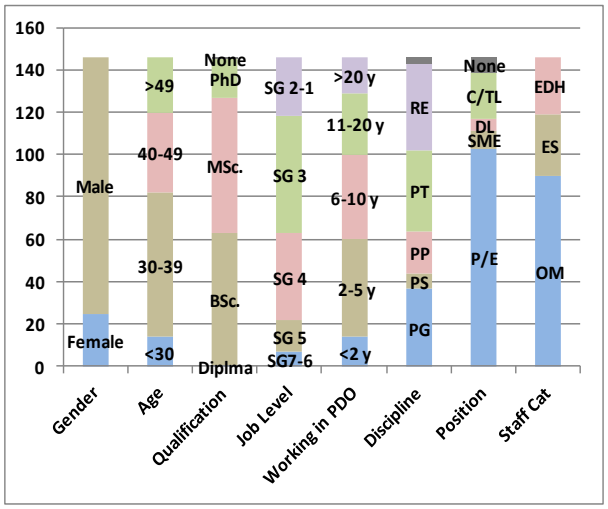
Reflections on survey's impact (77-79)



Reflections on survey's impact (80-81)



Demographics (82-86)



References

Alquist, R, & Gervais, O. (2013), 'The Role of Financial Speculation in Driving the Price of Crude Oil', Energy Journal, 34 (3), pp. 35-5 .

Anderson, L., Gold, J., Stewart, J., & Thorpe, R. (2015). Professional Doctorates in Business and Management. London: Sage

Arthur, Michael B. (1988), 'Career Development and Participation at Work: Time for Mating?' Human Resource Management, 27 (2), pp. 181-199.

Bairi, J, Manohar, B, & Kundu, G. (2013), 'Knowledge acquisition by outsourced service providers from aging workforce of oil and gas industry A study', VINE: The Journal Of Information & Knowledge Management Systems, 43 (1), pp. 39-56.

Baruch, Y., & Peiperl, M. (2000), 'Career Management Practices: an empirical survey and implications', Human Resource Management, 39 (4), pp. 347.

Bashir, U., Salman Bashir, M., Kumar, S, & Rohra, C. (2011), 'Cost Impact of Clean Wage System: A Case Study of Pakistan Petroleum Limited', Australian Journal Of Basic & Applied Sciences, 5 (7), pp. 181-187.

Baxter, P. and Jack, S. (2008), 'Qualitative case study methodology: Study design and implementation for novice researchers', The qualitative report, 13 (4), pp. 544-559.

Bednall, T.C., Sanders, K. and Runhaar, P. (2014), 'Stimulating informal learning activities through perceptions of performance appraisal quality and human resource management system strength: A two-wave study', Academy of Management Learning & Education, 13 (1), pp.45-61.

Biron, M. and Eshed, R., 2016. Gaps Between Actual and Preferred Career Paths Among Professional Employees Implications for Performance and Burnout. Journal of Career Development, p.0894845316645664.

Björkman, H. and Sundgren, M. (2005), 'Political entrepreneurship in action research: learning from two cases', Journal of Organizational Change Management, 18 (5), pp.399-415.

Brannick, T. & Coghlan, D. (2007) 'In defense of being "native": The case for insider academic research', Organizational Research Methods, 10 (1), pp. 59-74

Brydon-Miller, M., Greenwood, D. and Maguire, P. (2003), 'Why action research?', Action research, 1 (1), pp.9-28.

Burket, T, Felmlee, M, Greider, P, Hippensteel, D, Rohrer, E, & Shay, M. (2010), 'Clinical Ladder Program Evolution: Journey From Novice to Expert to Enhancing Outcomes', Journal of Continuing Education in Nursing, 41 (8), pp. 369-374.

Buse, K., Bilimoria, D. and Perelli, S. (2013), 'Why they stay: women persisting in US engineering careers', Career Development International, 18 (2), pp. 139-154.

Cabanes, B., Galy, P., Le Masson, P. and Weil, B., 2016, July. Technical staff management for radical innovation in science-based organizations: a new framework based on design theory. In R&D Management Conference.

Cassell, C. and Johnson, P. (2006), 'Action research: Explaining the diversity', Human relations, 59 (6), pp.783-814.

Cesare, S.J. & Thornton, C. (1993), 'Human resource management and the specialist/generalist issue', Journal of Managerial Psychology, 8 (3), pp. 31-40.

Coghlan, D. & Brannick, T. (2010), 'Doing action research in your own organization', 3rd ed. London: Sage.

Coghlan, D. (2008) 'Authenticity as first person practice: an exploration based on Bernard Lonergan', Action Research, 6 (3), September, pp.351- 366.

Coghlan, D. (2011) Action research: Exploring Perspectives on a Philosophy of Practical Knowing, The Academy of Management Research Annals, 5 (1), pp.53-87

Colakoglu, S.N., 2011, The impact of career boundarylessness on subjective career success: The role of career competencies, career autonomy, and career insecurity, Journal of vocational behavior, 79 (1), pp. 47-59.

Creswell, J.W. & Clark, V.L.P. (2007), Designing and conducting mixed methods research, Sage Publications, California

Creswell, J. (2013), Qualitative inquiry and research design: choosing among five approaches, 2nd ed. London: Sage.

De Vos, A. and Dries, N. (2013), Applying a talent management lens to career management: The role of human capital composition and continuity, The International Journal of Human Resource Management, 24 (9), pp.1816-1831.

De Vos, A., Dewettinck, K. and Buyens, D. (2009), The professional career on the right track: A study on the interaction between career self-management and organizational career management in explaining employee outcomes, European Journal of Work and Organizational Psychology, 18 (1), pp.55-80.

Dhiman, G, & Mohanty, R. (2010), 'HRM Practices, Attitudinal Outcomes and Turnover Intent: An Empirical Study in Indian Oil and Gas Exploration and Production Sector', South Asian Journal Of Management, 17 (4), pp. 74-104.

Dobson, L.K., Gardner, M.K., Metz, A.J. and Gore, P.A. (2014), The Relationship Between Interests and Values in Career Decision Making The Need for an Alternative Method of Measuring Values, Journal of Career Assessment, 22 (1), pp.113-122.

Drucker, P. (1999), Knowledge-Worker Productivity: The Biggest, Challenge, California Management Review, 41 (2), pp. 79-94.

Drysdale, S. (2012), Addressing the Skills Gap, Offshore, 72 (12), pp. 13-15.

Duberley J. and Johnson P. (2000), Understanding Management Research, London: Sage.

Easterby-Smith, M., Thorpe, R. & Jackson, P. (2012), Management research, 4th ed. London: Sage.

Ebmeier, H, and Hart, A (1992), 'The Effects of a Career-Ladder Program on School Organizational Process', Educational Evaluation & Policy Analysis, Vol. 14 (3), pp. 261-281

Evered, R. & Louis, M.R. (1981) 'Alternative perspectives in the organizational sciences: "Inquiry from the inside" and "inquiry from the outside"' Academy of Management Review, 6 (3), pp.385-395

Flyvbjerg, B. (2006) 'Five misunderstandings about case-study research', Qualitative inquiry, 12 (2), pp.219-245.

Forbes, J.B. (1987), "Early intraorganizational mobility: Patterns and influences", Academy of Management Journal, vol. 30 (1), pp. 110-125.

Franks, T. (1999), Capacity building and institutional development: reflections on water, Public Administration and Development, 19 (1), pp. 51-61.

Gabdrakhmanova, K.F. (2013), The problem in its function as the means of formation of professional competences with the students of technical higher education institutions, Oil and Gas Business: electronic scientific journal, (6), pp.458-46.

Galbraith, J.R., 1971. Matrix organization designs How to combine functional and project forms. Business horizons, 14(1), pp.29-40.

Gibbs, L, Kealy, M, Willis, K, Green, J, Welch, N, & Daly, J (2007), 'What have sampling and data collection got to do with good qualitative research?', Australian And New Zealand Journal Of Public Health, 31 (6), pp. 540-544.

Goulding, C. (2005), 'Grounded Theory, Ethnography and Phenomenology: A Comparative Analysis of Three Qualitative Strategies for Marketing Research', European Journal of Marketing, 39 (3/4), pp. 294-308.

Grant, R.M. (1996), Toward a Knowledge-Based Theory of the firm, Strategic Management Journal, vol. 17(S2), pp. 109-122.

Greenwood, D.J. and Levin, M. (2007), Introduction to action research: Social research for social change, SAGE publications.

Gubler, M., Arnold, J. and Coombs, C. (2014), 'Reassessing the protean career concept: Empirical findings, conceptual components, and measurement', Journal of Organizational Behavior, 35 (S1), pp.S23-S40.

Guskey, T.R. and Yoon, K.S. (2009), 'What works in professional development', Phi delta kappan, 90 (7), pp.495-500.

Guskey, T.R. (2002), 'Does It Make a Difference? Evaluating Professional Development', Educational Leadership, 59 (6), pp. 45-51.

Hirsh, W. (2006), 'Career development for knowledge workers: facing the challenge', Institute for Employment Studies.

Hoekstra, Hans A., (2011), 'A career roles model of career development', Journal of Vocational Behavior, 78, 2, pp. 159-173.

Hoffmann, P., Hoegl, M., Muethel, M. and Weiss, M., 2016. A contemporary justice perspective on dual ladders for R&D professionals. Journal of Product Innovation Management.

Holt R. and Thorpe R. (2008), 'The Sage Dictionary of Qualitative Management Research', London: Sage

Hoonakker, P. & Carayon, P. (2009), 'Questionnaire survey nonresponse: a comparison of postal mail and Internet surveys', International Journal of Human-Computer Interaction, 25 (5), pp.348-373.

Hopkins, P. (2008), 'The Skills Crisis in the Pipeline Sector of the Oil & Gas Business', Journal of Pipeline Engineering, 7 (3), pp. 1-55.

Horwitz, F. M., Heng, C. T. and Quazi, H. A. (2003), 'Finders, keepers? Attracting, motivating and retaining knowledge workers', Human Resource Management Journal, 13, pp. 23–44.

Jacob, S.A. & Furgerson, S.P. (2012), 'Writing interview protocols and conducting interviews: Tips for students new to the field of qualitative research', The Qualitative Report, 17 (42), pp. 1-10.

Jick, T. D. (1979), 'Mixing Qualitative and Quantitative Methods: Triangulation in Action', Administrative Science Quarterly, 24, pp. 602-611.

Johnson, R. & Onwuegbuzie, A. (2004), 'Mixed methods – a research paradigm whose time has come', Educational Research, 33, pp.14-26.

July, M.C.D.L. (2011), 'The concept of dual career ladder and talent retention–Recognizing the differences between specialists and generalists contributes to attract and retain talents', BSP Journal.http://www.revistabsp.com.br/edicao-julho-2011/en/2011/07/27/carreira-em-%E2%80%9Cy%E2%80%9D-e-retencao-de-talentos-reconhecer-as-diferencas-entre-especialistas-e-generalistas-contribui-para-atracao-e-retencao-de-talentos/

Kosine, N. and Lewis, M., (2008), 'Growth and exploration: Career development theory and programs of study', Career and Technical Education Research, 33 (3), pp. 227-243.

Krishnaveni, R. and Sujatha, R. (2013), 'Institutional Capacity Building: A Systematic Approach', X, pp. 17.

Labin, S.N. (2014), ‘Developing Common Measures in Evaluation Capacity Building An Iterative Science and Practice Process’, American journal of evaluation, 35 (1), pp.107-115.

LaPointe, K., (2010), ‘Narrating career, positioning identity: Career identity as a narrative practice’, Journal of vocational behavior, 77 (1), pp.1-9.

Lips-Wiersma, M. and Hall, D.T. (2007), ‘Organizational career development is not dead: A case study on managing the new career during organizational change’, Journal of Organizational Behavior, 28 (6), pp.771-792.

Mainiero, L.A. (1986), ‘Early career factors that differentiate technical management careers from technical professional careers’, Journal of Management, 12 (4), pp. 561-575.

Miller, P.J. & Cameron, R. (2011), ‘Mixed method research designs: a case study of their adoption in a Doctor of Business Administration program’, International Journal of Multiple Research Approaches, 5 (3), pp. 387-402 .

Morana, C. (2013), 'The Oil Price-Macroeconomy Relationship since the Mid-1980s: A Global Perspective', Energy Journal, 34 (3), pp. 153-189 .

Morgan, G. (1980), ‘Paradigms, metaphors, and puzzle solving in organization theory’, Administrative Science Quarterly, 25 (4), pp.605-622

O'Reilly, K., Paper, D., and Marx, S. (2012), 'Demystifying grounded theory for business research', Organizational Research Methods, 15 (2), pp. 247-262

Orr, B., and McVerry, B. (2007) 'Talent Management Challenge in the Oil and Gas Industry', Natural Gas & Electricity, 24 (5), pp. 18-23.

Oyeyemi, G., Adewara, A. A. and Adeyemi, R. A. (2010) ‘Complex survey data analysis: a comparison of SAS, SPSS and STATA’, Asian Journal of Mathematics & Statistics, 3 (1), pp.33-39.

Palade, A. (2010), ‘Significant aspects regarding career management: means for a better career planning and development’, Petroleum-Gas University of Ploiesti Bulletin, 62 (2), pp.124-134.

Panford, K. (2014), ‘An Exploratory Survey of Petroleum Skills and Training in Ghana’, Africa Today, 60 (3), pp. 56-80.

Pazy, A. (1987), ‘Sex differences in responsiveness to organizational career management’, Human Resource Management, 26 (2), pp. 243-256.

PDO CP-107 (2014), ‘Corporate Management Framework Code of Practice’, Internal document, Petroleum Development Oman.

PDO CP-125, (2002), ‘Petroleum Engineering Management Code of Practice’, Internal document, Petroleum Development Oman.

PDO CP-174 (2003), ‘Omanisation Code of Practice’, Internal document, Petroleum Development Oman.

PDO CP-180 (2003), ‘Recruitment Code of Practice’, Internal document, Petroleum Development Oman.

PDO GU-405 (2002), ‘PE Graduate Entry Arrival Process Guidelines’, Internal document, Petroleum Development Oman.

PDO SP-2061 (2014), ‘Technical Authority System Specifications’, Internal document, Petroleum Development Oman.

Peake, S. and McDowall, A. (2012), ‘Chaotic careers: a narrative analysis of career transition themes and outcomes using chaos theory as a guiding metaphor’, British Journal of Guidance & Counselling, 40 (4), pp.395-410

Pike, WJ (2013), 'An oilfield career: A play in three acts', World Oil, 234 (2), pp. 19.

Potter, C. & Brough, R. (2004), ‘Systemic capacity building: a hierarchy of needs, Health Policy and Planning’, 19 (5), pp. 336-345.

Pryor, R.G. & Bright, J.E. (2014), ‘The Chaos Theory of Careers (CTC): Ten years on and only just begun’, Australian Journal of Career Development, 23 (1), pp. 4-12.

Raelin, J.A. (2009), ‘Seeking conceptual clarity in the action modalities’, Action Learning: Research and Practice, 6 (1), pp.17-24.

Rathman, V. (2013), ‘Regulatory Experts Career Opportunities Galore’, Offshore, 73 (9), pp. 8-9

Roberts, K. (1994). ‘The transition into management by scientists and engineers: a misallocation or efficient use of human resources?’, Human Resource Management, 33 (4), pp.561-579.

Rodrigues, R., Guest, D. and Budjanovcanin, A. (2013), ‘From anchors to orientations: Towards a contemporary theory of career preferences’, Journal of Vocational Behavior, 83 (2), pp.142-152.

Rodriguez, J.K. and Scurry, T. (2014), ‘Career capital development of self-initiated expatriates in Qatar: cosmopolitan globetrotters, experts and outsiders’, The International Journal of Human Resource Management, 25 (7), pp. 1046-1067.

Roth, J., Shani, A.B. (Rami) and Leary, M. (2007) ‘Insider action research: facing the challenge of new capability development within a biopharma company’, Action Research, 5 (1), pp.41-60 .

Sampson, J.P., McClain, M., Musch, E. & Reardon, R.C. (2013), ‘Variables affecting readiness to benefit from career interventions’, The Career Development Quarterly, 61 (2), pp. 98-109.

Savickas, M.L., Nota, L., Rossier, J., Dauwalder, J., Duarte, M.E., Guichard, J., Soresi, S., Van Esbroeck, R. & Van Vianen, A.E. (2009), ‘Life designing: A paradigm for career construction in the 21st century’, Journal of Vocational Behavior, 75 (3), pp. 239-250 .

Seo, M.-G. (2003), ‘Overcoming emotional barriers, political obstacles and control imperatives in the action science approach to individual and organizational learning’, Academy of Management Learning and Education, 2 (1), pp.7-21.

Shah, S. and Corley, K. (2006), ‘Building better theory by bridging the quantitative-qualitative divide’, Journal of Management Studies, 43 (8), pp.1821-1835 .

Srour, I., Abdul-Malak, M.A., Itani, M., Bakshan, A. and Sidani, Y. (2013), ‘Career planning and progression for Engineering Management graduates: An exploratory study’, Engineering Management Journal, 25 (3), pp.85-100.

Stake, R.E. (1995), ‘The art of case study research’, Sage.

Suarez-Balcazar, Y., and Taylor-Ritzler, T. (2014), 'Moving from Science to Practice in Evaluation Capacity Building', American Journal Of Evaluation, 35 (1), pp. 95-99.

Torpey, E. (2013), 'Resources Work: Careers in Mining, Oil, and Gas', Occupational Outlook Quarterly, 57 (1), pp. 22-33.

Trochim, W. & Donnelly, J. (2008), ‘The research Methods knowledge base’, Third Edition, Atomic Dog.

Van Staden, R., & Du Toit, A. (2011), ‘Career development of South African knowledge workers’, South African Journal of Economic and Management Sciences, 14 (1), 80-91.

Van Staden, R.J. (2014), ‘Career development of knowledge workers’ (Doctoral dissertation .(

Vo, A. (2009), 'Career development for host country nationals: a case of American and Japanese multinationals companies in Vietnam', Journal Of Human Resource Management, 20 (6), pp. 1402-1420 .

Weitman, I. (2006), ‘Career crossroads are a sign of the times for engineers’, Potentials, IEEE, 25 (3), pp. 12-13.

Wils, L., Wils, T. and Tremblay, M. (2010), ‘Toward a career anchor structure: An empirical investigation of engineers’, Relations industrielles/Industrial Relations, pp.236-256.

Woiceshyn, J. & Falkenberg, L. (2008), ‘Value creation in knowledge-based firms: aligning problems and resources’, The Academy of Management Perspectives, 22 (2), pp. 85-99 .

Yin, R. K. (2014), ‘Case study research: Design and methods’, Sage publications.