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The Case Study Approach: Some Theoretical, Methodological and Applied Considerations

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ABSTRACT

In support of the aims of the Defence Army Learning Organisation (DALO) research programme, examining learning in the Australian Army, this report presents an outline of the case study approach. In doing so, this report provides an overview of: (i) case study research and its theoretical underpinnings; (ii) methodological considerations including the purpose of case studies and rationale for their use in social research; (iii) the types of case studies and issues concerning sampling, data collection and analysis; and (iv) different approaches to reporting case study research. In addition, this report provides examples of some of the ways in which the case study approach has been employed by researchers to examine the significance of learning in Defence, wider military, and organisational contexts.

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Executive Summary

A research program has been developed by the DALO research team to explore, measure, and monitor learning organisation principles that facilitate a supportive learning environment within Army. The initial phase of the research program involved measuring Army Learning Organisation Principles (ALOP) by using the Army Learning Organisation Questionnaire (ALQ) leading to the creation of an Army learning profile. The next phase of the research program involves further investigation of those factors which contribute to the ALO profile, and includes a case study approach. The purpose of this paper is to contribute to the current research program by:

- i. Describing the case study approach and how it is used as a research method. The case study is a form of empirical inquiry that enables the in-depth examination of a particular phenomenon, issue or object in real life situations. Generally, case studies are the preferred method when it comes to answering questions of 'how' and 'why', when there is a little control over events. In this respect, the case study approach will permit the in-depth examination of the results generated by the ALQ.
- ii. Demonstrating a theoretical and practical understanding of the case study approach by providing a review of literature which summarises studies that have adopted the case study approach to study learning related issues, organisational learning and change interventions. A gap in the current literature has been identified. For example, there is a paucity of research which has used a case study methodology to examine organisational phenomena and/or learning related issues in the defence context. The proposed research program will address this gap, contributing to the generation of new knowledge in the area.
- iii. Canvassing methodological considerations relating to research question, case type and selection, data collection and analysis. Insights gained through this investigation will strengthen the proposed case study research design by drawing linkages between ontology (nature or essence of particular social phenomena), epistemology (the theory of knowledge generation) and methodology (analysis of methods particular to approach to facilitate inquiry).

By emphasising the importance of the case study approach in the light of current research program, this paper offers a theoretical framework for the next phase of the DALO research program. The case study approach will provide more contextualised insights into the Army learning profile. In turn, Army will gain a deeper appreciation for those factors which inform individual, team, and organisational learning.

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List of Acronyms

ADF	Army Defence Force
ALE	Army Learning Environment
ALOP	Army Learning Organisation Principles
ALOQ	Army Learning Organisation Questionnaire
ATC	Army Training Continuum
CA	Chief of Army
DALO	DSTO Army Learning Organisation
DSTO	Defence Science and Technology Organisation

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1. Introduction

The purpose of the paper is to provide an overview of case study literature so as to gain a better appreciation for the role and utility of case studies as a research approach. This paper will discuss when and where it is appropriate to use case studies as a research methodology; outline where case studies have been employed in a Defence context; and describe how this research approach has been employed to study complex phenomena within their specific contexts.

The paper starts with some background information in relation to the Australian Army's proposal to consolidate itself as a learning organisation as part of the Adaptive Army initiative. In this respect, learning is a crucial component to the adaptation process, allowing Army to more readily respond to challenges posed by an ever-changing external environment. In relation to this, a brief review of the long term research program developed by the Defence Army Learning Organisation (DALO) team designed to profile Army's learning capability at individual, team and organisational levels has also been provided. The paper continues with a consideration of the various definitions attributed to case studies, and in doing so describes the types and purpose of case studies, and their relevance to case study design or methodology.

From an applied stance, this paper reviews the literature of studies which have adopted the case study approach. Some of these studies include considerations of case studies that have been conducted in our immediate organisational context (Defence Science and Technology Organisation - DSTO reports), as well as a wider military context. Particular attention has also been given to those case studies which focus on learning related issues, including organisational learning and change interventions in various organisations. The review of literature also addresses methodological considerations, for example decisions relating to sample selection, data collection and analysis.

The paper also offers advice on presenting or reporting case studies and considers some of the challenges related to the complexity of this approach. A rationale for different types of case studies and case selection is provided and is considered in relation to the aforementioned research programme. Finally, this report concludes with a summary highlighting the importance of the case study approach in the light of current research programme.

2. Background

The Australian Army is a multifaceted and dynamic organisation which operates in complex domains. It is an organisation which recognises the need to remain capable, responsive and relevant in order to meet its operational requirements and strategic goals. It has been stated that Army "seeks to foster an adaptive culture by consolidating itself as a learning organisation" (Australian Army 2007). The Chief of Army (CA) implemented an initiative aimed at the development of the 'Adaptive Army' where individuals will

continuously review and adapt Army objectives, structures and processes to attain Army outcomes (Australian Army 2008). Consequently, in 2009, the Army Learning Environment (ALE) concept became a feature of the Army Training Continuum (ATC) as well as Army's continuous learning process (Stothard, Talbot, Drobnjak & McDowall 2011).

In recognition that Army needs to create an environment where continuous learning will occur at all levels of the organisation (individual, team and organisational), CA has requested that Defence Science and Technology Organisation (DSTO) provide science and technology support to develop methods and approaches to monitor and improve Army's learning capability. In conjunction with Army stakeholders, a long term research program has been developed by the DALO Research Team in order to examine, measure, and monitor learning organisation principles that facilitate a supportive learning environment within Army (Stothard et al. 2011).

By improving learning practices, Army will be able to respond to changing government, military, and organisational requirements in a more efficient manner. Basically, learning at all three levels of organisation is necessary for Army to meet its operational and strategic goals. The initial phase of the research program involves the measurement of Army Learning Organisation Principles (ALOP) by using the Army Learning Organisation Questionnaire (ALoQ). The ALoQ assesses Army personnel's perceptions on the extent to which the Australian Army displays learning organisation principles at individual, team and organisational levels. The ALoQ incorporates both quantitative and qualitative data for analysis, and it provides Army with a profile of its learning capability (Stothard et al. 2011). The next phase of the research program involves further investigation of the behaviours, social structures and factors which contribute to the ALO profile, and includes both a case study approach and an individual longitudinal qualitative study. This multi-modal approach of the current ALO profile will allow Army to investigate opportunities for improvement and will provide Army with greater confidence to achieve its adaptive aspirations (Stothard et al. 2011). The focus for this paper is on the case study approach.

Case studies are often used when the investigator endeavours to provide a more detailed picture of what happened in a particular case or setting, and particularly where/when there is an interesting or unique story to be told (Neale, Thapa & Boyce 2006). The case study approach allows researchers to capture the complexity of a particular case, allowing investigators to begin with broad questions which become more narrow in focus as the experiment progresses, rather than attempting to predict or assume possible outcomes before the study is conducted (Baxter & Jack 2008; Yin 2009). The ALoQ yielded mainly statistical data regarding Army's learning organisation principles and aspirations. Case studies are a well suited and complementary approach to the current research project as they enable the researchers to further address and explore learning related issues in Army's as they manifest in a variety of contexts or situations.

Since the case study approach allows researchers to study complex phenomena within their contexts, case studies have a long history of use and account for a large portion of articles and books in various disciplines, such as psychology, sociology, anthropology, history, political science, education, economics, medical science, biology, and management (Rifkin & Fulop 1997; Matlay 2000; 2006; Baxter & Jack 2008; Flyvbjerg 2011). The present

paper provides a theoretical framework for the next phase of the research program, that is, a case study. The literature review is based on case studies that have been conducted in a defence context, as well as other external studies that have utilised the case study approach to examine learning related issues.

3. Defining the case study approach

The case study approach is valuable for social scientists as this approach allows researchers to examine real-life situations, develop theory, evaluate programs and develop suitable interventions (Soy 1997; Baxter & Jack 2008; Yin 2009). Yin (2003, p.3) offers detailed and technical definition of case studies, as follows:

1. A case study is an empirical inquiry that
 - investigates a contemporary phenomenon within its real-life context, especially when
 - the boundaries between phenomenon and context are not clearly evident
2. The case study inquiry
 - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
 - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
 - benefits from the prior development of theoretical propositions to guide data collection and analysis’.

An important aim of the case study approach is to capture the complexity of a single case, and that is usually achieved by incorporating different levels of strategies, techniques, methods or theories (Kohn 1997; Johansson 2003). This process is often referred to as triangulation, a process where many methods are combined in order to ensure the validity of case study research (Johansson 2003). Case studies, thus, cannot be defined through its research methods but rather through an interest in what is to be studied, and given the definition above it should be noted that a case study is not a method but a research strategy (Kohlbacher 2006).

4. Types of case study

According to Yin (2003) and Stake (1995), because case studies are by nature driven by different kinds of research questions, they acquire different definitions. In other words, a case study design is informed by the overall study purpose, depending on whether one is trying to describe a case, explore a case, or compare between cases. Accordingly, Yin (2003) differentiates between three types of case studies: explanatory, exploratory, and descriptive.

- *Explanatory* case studies are used to explain phenomenon, causal relationships and to develop theory. Explanatory case studies are employed when the phenomenon is too complex for either experimental studies or survey design. In such explanatory studies, a detailed description of the facts of a case is offered, together with a discussion of alternative explanations that are congruent with the facts (Harder 2010).
- The *exploratory* case study explores situations or interventions which have no clear, or single, sets of outcomes. These studies are often used in a research context that is not clearly specified (i.e. which lacks detailed preliminary research, or specifically formulated research questions or hypotheses) and/or where a research environment limits the choice of methodology. Hence, exploratory case studies are often used as a preliminary step for an explanatory case study approach due to their broad focus (Streb 2010).
- *Descriptive* case studies, as the name suggests, describe an intervention or phenomenon as well as the real-life situation in which it occurred. These case studies are very focused and detailed, as they carefully assess a case based on a descriptive theory¹ where any questions or propositions are cautiously scrutinised. Descriptive case studies are powerful in their own way as they add significantly to the rigor of the finished study. They can help set the boundaries of the case, and potentially raise abstract interpretations of data and theory development (Tobin 2010).

Yin (2003) further distinguishes between *single-* case studies and *multiple-*case studies in order to answer the research question. A single case study is usually conducted when:

- there is a critical case in testing of a particular theory;
- when the case itself is a unique or an extreme case;
- if a single case is the representative/typical case;
- when a case is the revelatory case (i.e. previously inaccessible for scientific examination); and
- if a case is the longitudinal case (i.e. studying same case at different points of time).

A multiple case design refers to a study that contains more than a single case and it allows the exploration of differences within and between cases (Yin 2003).

Stake (1995) on the other hand, categorises case studies as intrinsic, instrumental and collective.

- The *intrinsic* study is one where the aim of researchers is to better understand the case itself, as opposed to intending to understand some abstract concept or generic phenomenon.
- The *instrumental* type of case study is used when the researchers want to improve a theory or gain something else other than understanding of a particular situation or case itself.

¹ Descriptive theory is an articulation of what is already known about the phenomenon.

- Finally, the *collective* case study is a study that provides general understanding by using a number of case studies. The collective study is very similar to Yin's multiple case study in terms of its nature and description (Stake 1995).

When using multiple case studies it is typical to distinguish 'within case analysis' or describing each case and present the themes within the case, from 'cross case analysis' which includes thematic analysis across cases (Harling 2002).

5. Case study as methodology

As noted in this report, one of the primary strengths of employing the case study as a research strategy pertains to its ability to provide an in depth analysis of a particular context, or setting, as well as greater explanatory power to quantitative data. By taking an inductive, iterative and exploratory stance, the case study approach enables researchers to use 'soft' (qualitative) data to explain the nature of relationships often hidden within 'hard' (quantitative) data (Mintzberg 1979). Ironically, the strength derived from this 'softer' stance can be a source of weakness if not applied in a methodical manner.

The case study approach has long been criticised as the weak social science method of scientific research. In this regard, this approach is often criticised for introducing layers of subjectivity during the implementation, evaluation and presentation of case study research (Flyvbjerg 2006; Yin 2009). However, the looser format of case studies allows researchers to understand vast and complex issues, that is, it enables researchers to begin with a broad research question which can be narrowed down as their inquiry progresses. This narrowing down leads to more robust problem identification and verification as the initial problem space becomes more finely tuned through the iterative cycle of data collection and analysis. One should also understand that there is a rigorous methodological path to follow when designing and adopting case study research (Yin 2009). The path starts with a comprehensive literature review that evolves into the careful posing of a research question or questions/objectives. It also includes procedures that are fundamental to all types of research methods, including protecting against the threats to validity when conducting research (such as maintaining the study evidence and examining rival explanations) (Yin 2009).

According to Flyvbjerg (2006; 2011) there are five misconceptions about case study research. These include:

1. Theoretical knowledge is more valuable than practical knowledge;
2. One cannot generalise on the basis of a single case and thus this method cannot contribute to scientific development;
3. The case study is most useful for generating hypotheses while other methods are more suitable for hypotheses testing and theory building;
4. The case study is prone to a researcher's bias toward verification or tendency to confirm his/her preconceived notions, and lastly;

5. That case studies are often difficult to summarise and develop general propositions and theories.

Flyvbjerg (2006; 2011) comprehensively examines each and every one of the five common misconceptions about case study research and contends that they oversimplify the nature of case study research. In response, he contends that:

1. In the study of human affairs, practical or context-dependent knowledge is more valuable than theoretical or context-independent knowledge (i.e. predictive theories or universals).
2. One can generalise on the basis of a single case, particularly when the case study adopts a variety of research methods. The case study approach is extremely valuable when identifying deviant cases because of its in-depth approach, stimulating further investigations and theory building.
3. The case study method is suitable for both generating and testing hypotheses. Case study generalisability can be increased by the strategic selection of cases. This is particularly important when a researcher is trying to gather the greatest amount of information on a given phenomenon or problem. For example, a typical or average case is often not richest in information, while atypical cases tend to reveal more information.
4. The criticism regarding a bias towards verification applies to all methods. The case study has its own rigour which is different but no less strict than the rigor of quantitative methods.
5. Even though it is difficult to summarise case studies due to their narrative nature, it is important to understand that this difficulty is not due to the case study as a research method, but very often due to the property or complexity of the case or phenomenon studied.

As with any research design, there are criteria for judging the quality of case study design. Namely, there are four methods that are commonly used in social science methods to test trustworthiness, credibility, conformability and data dependability (Yin 2009). The social science literature summarises the four tests as follows:

- *Construct validity* which encompasses the operationalisation of measures for the concepts that are studied (i.e. using appropriate measures to explore contexts, or making sure that measures actually measure what they intend to measure).
- *Internal validity* is only a concern in explanatory (or casual) case studies where a study proposes casual claims. Tests for internal validity determine whether all the explanations and possibilities have been considered and whether the evidence is convergent. It strives to eliminate spurious effects or false relationships between sets of data.
- *External validity* deals with the generalisation of findings, that is, it identifies domains to which findings can be generalised.
- *Reliability* is the fourth test and the goal is to keep good guidelines regarding the method that has been employed in a study so that further research could repeat the procedure or replicate the results (Yin 2009).

It is also important to note that as with any research process, whether qualitative or quantitative, the priority is to determine the research question, and then; to identify the case, that is, to identify what phenomenon the researcher intends to analyse (for example, a program, an individual, a process, the difference between organisations etc.) (Baxter & Jack 2008). In addition to that, the researcher must determine what type of case study to conduct as well, and whether to conduct a single case study or multiple case studies (Baxter & Jack 2008).

Generally speaking, case studies are the preferred method when it comes to answering 'how' and 'why' questions, when there is little control over events, and when the investigator is trying to examine a particular phenomenon in a real-life situation or context (Kohn 1997; Yin 2009). The purpose of a case study approach can vary.

Researchers should consider using a case study approach when striving to:

- explore new areas with a limited theoretical background,
- describe the effects or process itself of an intervention and circumstance, and
- answer how and why questions (Kohn 1997).

A case study involves collection of in-depth and detailed data, and it includes multiple sources of information such as direct observation, participant-observation, documentation, archival records, interviews, and physical artefacts. Data collection, however, is not only limited to the above mentioned sources, the sources of evidence can be extensive and they may consist of films, photographs, videotapes, projective techniques and psychological testing, life histories and the like (Stake 1995; Tellis 1997; Yin 2009). Hence, case studies are designed to incorporate a wide array of data from multiple sources of information, in order to capture an in-depth picture, (Tellis 1997; Harling 2002).

Similarly, Yin (2009) identifies six main sources of evidence: documentation, archival records, interviews, direct observation, participant-observation, and physical artefacts. Not all of these sources are essential in all case study research. Nonetheless, it is still important to use multiple sources of data as this adds to the reliability of the study. In case studies, data collection is imperative for enhancing the construct validity, internal validity, external validity and reliability of the study. Examples of documentation include letters, study reports, memoranda, diaries, e-mail correspondence or any other documents that could add to the data base. Archival reports include service records, maps, charts, lists of names, survey data and personal diaries. Interviews may take few forms such as open-ended (i.e. where participants are asked to state their opinions or views); focused (i.e. short-time interviews); or structured (i.e. when a formal survey is required). Direct observations can be formal or casual in their nature and occurs when the examiner makes a site visit. Participant observation is a special type of observation since the investigator is not only a passive observer but may actually participate in the event that is being examined. Physical artefacts may include evidence that might be gathered during a site visit, and can include various physical or cultural artefacts such as tools, instruments, art works, and computer output (Tellis 1997; Yin 2009).

There is no one particular source of information that is superior to the others, with each source having its own strengths and weaknesses. For instance, documentation and archival records are exact and stable, they can be reviewed often and may have broad coverage, however accessibility may be restricted due to confidentiality, and they may also reflect the biases of an author. Interviews tend to be very insightful and focused directly on the topic of interest, but they are also open to researchers' biases, and in addition to that, inaccuracies may happen due to incomplete recollections on behalf of participants. Direct observation and participant-observation can cover events in their context and real time, but on the other hand, might miss certain facts (e.g. selectivity), observer's presence might cause change (e.g. reflexivity) or the whole process might be time and/or cost consuming. Along the same lines, artefacts may offer valuable insights into cultural features or technical operations, and yet still be prone to selectivity and availability (Yin 2009). In order to overcome the above mentioned shortcomings, a case study should use multiple sources of data (as opposed to relying on one only) that are complementary and relevant for a particular case (Tellis 1997).

It is important to mention that a case study design should not be confused with qualitative research because a case study approach can use both or any mix of qualitative and quantitative research methods. Both qualitative and quantitative methods are useful in research but it is the goal of a study that determines what approach is the most relevant to pursue. Specifically, the quantitative methods can tell us what works, while the qualitative methods can tell us how it works (Condelli & Wrigley 2004). For instance, looking from an educational or learning perspective it would be possible to identify how long students take to learn particular material using quantitative methods, but it would be hard to get information regarding how students learn, and how instructions were interpreted. On the other hand, qualitative methods such as interviews and focus groups can provide insights into how findings work and how findings can be translated in practice. In the above mentioned example, a qualitative approach can provide information on how students actually learn and/or how the given instructions worked.

The main strength of the case study approach is its ability to facilitate in-depth research and the collection of detailed information about a particular phenomenon or specific case. The phenomenon can be understood in its specific context, allowing the researcher to gain insights into the causes of the phenomenon under investigation, including the relationship between causes and outcomes. Case studies provide high conceptual validity and allow new research questions, hypotheses and emergent theories to be tested (Flyvbjerg 2011). In order to provide the complete picture of an issue, case studies allow data to be collected from multiple methods as opposed to providing information that is available from one method i.e. surveys (Neale et al. 2006). On the other hand, the case study approach has its limitations as well, namely this approach has been commonly criticised for its difficulties to allow generalisation from one case to another. Other limitations include a weak understanding of how widespread a phenomenon is across a population, how its statistical significance is often unknown or imprecise, and how selection bias may overstate or understate relationships (Flyvbjerg 2011). Lastly, it should also be noted that case studies involve an intense data collection process which can produce an overload of information (Kohn 1997). These factors suggest that case studies can be quite a lengthy and time consuming undertaking (Neale et al. 2006).

When conducting case studies the data collection and analysis usually occur synchronously. Data analysis involves examining, categorizing, tabulating, testing, or otherwise combining quantitative and qualitative evidence (Yin 2003). The type of analysis that will be employed depends on the type of case study (Baxter & Jack 2008). Yin (2003) notes that analysing case study evidence can be somewhat challenging or difficult considering that analytical strategies and techniques have not been well defined. There are three general strategies that can be used in practice to define priorities for what to analyse and why, such as: (1) theoretical propositions such as following a theoretical orientation that led to one's case study, this helps a researcher to focus attention on certain data and to ignore other; (2) setting up frameworks based on rival explanations to define and test rival explanations; and (3) developing case descriptions as narrative framework for organising the study (Yin 2003). The second strategy or rival explanations has been especially useful for increasing the confidence of findings (i.e. the more rivals a case study addresses and rejects the more confident the findings are). Yin (2003) further describes five techniques for analysis that can be based on any three of the above mentioned strategies: pattern matching, explanation building, time-series analysis, logic models, and cross-case synthesis. These techniques can produce possibilities that then can be further explored with other methods.

5.1.1 Pattern matching

The pattern matching technique is considered as one of the most suitable techniques for case study analysis (Tellis 1997; Yin 2003). This technique compares an empirically or model based pattern with one or a few alternative predictions. If the comparison between the predicted and actual pattern match then the internal reliability of the study is improved. This sometimes may create some issues as researcher discretion is required for interpretations. These issues can be addressed by having teams analyse data, providing inter-rater reliability and increased confidence in findings.

5.1.2 Explanation building

When the explanation building technique is employed, the analysis of the case studies is carried out by building an explanation of the case. This technique is considered a special type of pattern. The goal of this technique is to analyse the case study data by building plausible explanations about the case and to develop ideas for further study. A limitation of this technique is that sometimes investigators may drift away from the topic of interest as the study objective is to build explanations. This problem can be eluded if researchers make a concerted effort to remain focussed on research aims, and by including alternative explanations for research problems. Note that this process of developing hypothetical explanations needs to be put through the test of seeking disconfirming evidence in order to reach rigorous conclusions.

5.1.3 Time series analysis

Time-series analysis is used in experimental or quasi-experimental analysis. This technique can be much simpler when compared to the pattern-matching technique, as it can include just one dependent and one independent variable. The problem with this technique is that sometimes there are multiple changes in a variable, which can make

starting and ending points unclear. This potential problem can be tackled by using relevant statistical tests to analyse the data. It is important to note that one of the major strengths of case studies is not merely assessing time series but also generating rich explanations for the complex patterns of relationships which may inform the interaction between variables.

5.1.4 Logic models

This technique is based on a logic model theory, which takes a linear approach to provide and understand the relationship between planned work (i.e. resources/inputs-activities) and intended results (i.e. outputs-outcomes-impact). It shows the chain of events that link inputs to results, it illustrates the cause-effect linkages between program activities and outcome based results. However it is important to note that the logical evaluation is focused more on the justification for program goals and not the program with its actual flow of events. This technique matches empirically observed events to theoretically predicted events and for that reason has become particularly useful in doing case study evaluations. Here events are staged in repeated cause-effect-cause-effect patterns. This technique is very similar to the pattern matching technique mentioned above, but because of their sequential stages, the logic models technique has been distinguished as a separate analytic technique. A challenge with this technique is that multiple stages may exist over an extended period of time, as opposed to stages occurring in a sequence. When using this technique for analysing case study data, researchers need to define their logic models prior to collecting data and then test their models, and compare how well they match or how well the data support their proposed models. Note that the limitation of this approach is being based on causal chains, as opposed to the more realistic view of networked causal and influence pathway.

5.1.5 Cross case synthesis

Cross-case synthesis is especially relevant for the analysis of multiple case studies, or if a case study consists of at least two cases. Cross-case synthesis treats each individual case as a separate study. This technique can be performed when the individual case studies have been conducted as independent studies or as a pre-designed part of the same study. One example of this particular technique would be to create word tables which show data from the individual cases according to some uniform framework. The analysis of word tables (or data that they display) enables the investigator to draw cross-case conclusions about the objects of interests and their outcomes. A challenge in this particular technique is that the investigator who is conducting cross-case synthesis examines word tables for cross-case patterns primarily on argumentative interpretation as opposed to numeric counts, which is why a case study investigator must be prepared to develop solid and rational arguments that are supported by the data (Yin 2003). This challenge can be met through the use of software tools for the management and analysis of qualitative data. These tools allow the researchers to keep track of the numbers of times key words/themes appear in the data, along with their situational context. For example, a variety of programs/software are available such as: NUDIST, ATLAS/ti, HyperRESEARCH, AQUAD etc (Kelle 1997; Barry 1998).

6. Rationale for case study and case selection

In recent years researchers have taken a more collaborative approach to case studies, acknowledging that different methodological approaches have different strengths and weaknesses which are not necessarily conflicting, but complementary. It is important to highlight that case study research is problem driven rather than methodologically driven. In this respect, the research question dictates those methods which should be adopted to collect data and answer the research question (Stake 2006; Yin 2009; Flyvbjerg 2011).

There are various forms of sampling and case selection depending on the purpose of the study. For example, when the objective of the study is to investigate a specific phenomenon, selecting the typical or average sample is not suggested as such a sample will often not yield the richest information. Rather, selecting a sample that consists of extreme or atypical cases is suggested as they may reveal richer information. On the other hand, if the purpose of the study is to achieve a representative sample that can be generalised for the entire case population, a random sample or representative case is the most appropriate strategy to employ (Flyvbjerg 2011). Flyvbjerg summarises strategies for the selection of samples and cases depending on the purpose of the study:

- A. Random Selection: To avoid systematic bias in the sample. Random selection incorporates the following two sampling techniques:
 - 1. Random sample: To achieve a representative sample that allows for generalisation for the entire population.
 - 2. Stratified sample: To generalise for specially selected subgroups within the population.
- B. Information-oriented selection: To maximise the utility of information from small samples and single cases. Cases are selected on the basis of expectations about their information content. This includes:
 - 1. Extreme/deviant cases: To obtain information on unusual cases to understand the limits of existing theories and to develop new concepts, variables, and theories.
 - 2. Maximum variation cases: To obtain information about the significance of various circumstances for case process and outcome, e.g., three to four cases which are very different on one dimension: size, form of organization, location, budget, etc.
 - 3. Critical Cases: To achieve information that permits logical deductions of the type, 'if this is (not) valid for this case, then it can (cannot) be applied to all (no) cases'.
 - 4. Paradigmatic cases: To develop a metaphor or establish a school for the domain² that the case concerns (Flyvbjerg 2011, p.307).

² Flyvbjerg argues a paradigmatic case operates as a reference point for best practice and may function as a focus for the establishment of school of thought.

Yin suggests that both single and multiple case designs can serve one or a combination of the three purposes: exploratory, descriptive or explanatory (Yin 2009). However, Yin further proposes that methodological guidelines differ for case selection between single and multiple case designs. For single case selection, Yin (2009) proposes the following five strategies:

1. the critical case (for testing a theory);
2. the extreme case or the unique case (for documenting a rare case);
3. the representative or typical case (for capturing the circumstances of a common situation);
4. the revelatory case (for analysing a phenomenon that is inaccessible to scientific investigation); and
5. the longitudinal case (for studying the same single case at two or more different point of time).

When the study contains more than one case, a multiple case design is used and thus strategies for case selection change. When selecting the multiple cases, one should follow a 'replication' design and not a 'sampling' design. When selected cases predict similar results this is known as a *literal replication*, but when selected cases provide contrasting results, or when rival theories have subtle differences and one wants to increase the degree of certainty of results, this is categorised as a *theoretical replication* (Yin 2009). The development of a detailed theoretical framework is a vital characteristic of replication procedures. This theoretical framework should note the conditions or circumstances under which a particular phenomenon is likely to be found (i.e. a literal replication) or not to be found (i.e. a theoretical replication).

7. Presenting a case study

It can be difficult to report case studies due to the complexity of this approach, thus, researchers normally endeavour to present findings as a story or narrative that will capture the complexity and contradictions of the study, and the phenomenon in question (Soy 1997; Baxter & Jack 2008). Typically, case studies are extensively descriptive since the goal of the written report is to present a complex issue into one that can be understood in a meaningful way. By displaying sufficient amounts of detail, the report allows the reader to determine whether the study findings could be applied to their own situation, encouraging the reader to question the study and reach their own conclusions independent of the researcher (Soy 1997; Baxter & Jack 2008).

There are different techniques that can be employed when composing the report, for instance the report may include each case as a separate chapter, or it may narrate the case with respect to chronology (Soy 1997). Yin (2009) suggests six methods, or structures, for reporting a case study which differ in their application according to research purpose. These include:

1. The unsequenced method (for descriptive case studies). For this model no particular importance is associated with the sequence of sections or chapters, rather each section/chapters describes a particular issue or matter (such as organisation, context);
2. the linear-analytic method (for descriptive, exploratory and explanatory case studies). This model can be described as a standard approach for composing research reports (i.e. the issue being studied first, then review of the relevant previous literature, then methods that were used, how data were collected and analysed, and finally conclusions and implications of the findings);
3. the suspense method (for explanatory case studies). This model reverses the aforementioned linear-analytic structure, as the outcome of the case study is presented in the first section or chapter, after which the discussion in relation to the study's outcome takes place;
4. the theory building method (for explanatory and exploratory case studies). Here, the sequence of chapters or sections in the case study report will follow some theory-building logic ;
5. the comparative method (for descriptive, exploratory and explanatory case studies). This model repeats the same case study two or more times in relation to a different conceptual model (i.e. in order to show the degree to which the facts fit each model); and,
6. the chronological method (for descriptive, exploratory and explanatory case studies). Finally, this model as the name suggests presents case study issues, or evidence, in a chronological order (i.e. the sequence of chapters follow phases of a case history).

Thus, there is no single, or 'right,' way to present case studies. It has been suggested, however, that case studies like all other evaluation reports need to include information regarding the justification and methodology of the study. Neale, Thapa and Boyce (2006, p.10,11) suggest a format to follow if the case study is presented as a stand-alone report:

1. Introduction and justification.
2. Methodology:
 - a. How was the process carried out? (Describe the process of selecting the case and data collection sources, as well as how data was collected).
 - b. What assumptions are there (If any)?
 - c. Are there any limitations with this method?
 - d. What instruments were used to collect data? (You may want to include some or all in the appendix).
 - e. What sample(s) is/are being used?
 - f. Over which period of time was this data collected?
3. The problem.
4. The steps taken to address the problem.

5. The results.
6. The challenges and how they were met.
7. Beyond results.
8. Lessons learned.
9. Conclusion.
10. Appendices.

It is also important to note that, as suggested by scholars, the final preparation for the case study data collection is to conduct a pilot study (Ellinger, Watkins & Marsick 2005). The conduct of a pilot study allows researchers to polish the overall approach to data collection and the questions that are going to be addressed in the study. In other words, it is not a pre-test but rather a way of providing multiple insights to the researchers on the practicability of their case study procedures and protocols (Ellinger et al. 2005).

8. Review of case studies looking at learning

The following section highlights some of the ways in which case studies have been employed to look at learning. Examples of case studies include studies conducted in the Australian Defence Force (ADF) context and were available through the Defence Library research database; studies which use the case study approach as part of their intervention approach but in a wider military context; as well as studies that employ the case study approach to investigate learning and/or organisational issues in various organisations (including learning organisation research).

8.1 Case studies employed in the defence context (ADF / DSTO reports)

After exploring the Defence online library database, seven research papers were identified that utilised the case study approach in order to examine learning or organisational related issues within a Defence context. These case studies investigated various matters such as: improving software (training) packages (Kingston 1999; Kingston 2000); investigating population reaction to stimuli on different samples (Dexter 2004; Dexter 2005; Dexter 2007; Kikkert & Dexter 2007); investigating current procedures in relation to information sharing and provision of innovative approaches (Prekop, Phuong, Burnett & Chapman 2005) ; providing useful insights of emergent behaviour (Gill, Egudo, Dortmans & Grieger 2002) ; exploring issues regarding collective training and learning (Stothard & Schliebs 2008); and examining potential impact of knowledge loss (Massingham 2008).

A study conducted by Kingston (1999) utilised a case study approach to investigate how joint software reviews could be improved (as those reviews are important in capturing quality control of software intensive systems). The study described how a multi-disciplinary team assessed a design (i.e. software system). In her methodology section, Kingston included both a case study design and the software engineering literature

review. The software engineering literature was included to identify strengths and weaknesses in how software reviews were conducted. The Information Technology Division team had a series of three meetings with planned activities. The data, that is, the planned and actual activities conducted at each meeting were summarised and presented in tables. Based on the weaknesses identified in the architectural review of the project, a new review process was proposed. The findings provided concrete recommendations on how joint software reviews could be improved, such as changes to the review procedures, training in review procedures, and developing new procedures (when integrating material from several information sources). A couple of significant research questions were also proposed, for further research and development. Another case study conducted by Kingston (2000) focused on the review of software designs based on a Specific Software Analysis Method. A case study approach was conducted as it allowed a more detailed observation and analysis of areas than otherwise allowed by an experimental approach. Also by using a case study approach Kingston obtained information from several sources of information such as the documents produced by an activity, observational techniques, and questionnaires (i.e. pre-review questionnaire, a post-review survey, observation of the review, and documentation of the review).

Kikkert and Dexter (2007) used a case study design to investigate populations' reactions to stimuli in a historical context over a large time period. The researchers obtained qualitative data from a broad literature search on Fijian history. The historical events of interest were identified and the underlying stimuli elucidated from this narrative as causes and triggers. These stimuli and events were linked graphically using a modified influence diagram and a matrix. The case study provided contextual information and guidance on socio-cultural issues for planners in multi-agency operations in the region and it demonstrated valuable insights into trends or patterns of population behaviour over that period (by analysing the stimuli which have in past resulted in reactions from the population). In a similar vein, Dexter in 2007 and in her earlier studies (2004; 2005) also employed the case study approach to analyse historical data in order to investigate probable causes of the population reaction of the Solomon Islands, Aceh, and Papua New Guinea.

In a study conducted by Prekop et al. (2005) a case study approach was utilised to discuss how specific approaches and web services were used in DSTO to make corporate information available within Microsoft's SharePoint. Specifically, the study focussed on the visibility and accessibility of information within SharePoint, addressing the issue of sharing core data between different corporate applications (i.e. by using the Automated Research Management System). The findings of this case study provided an outline of the approaches and techniques that are used to access corporate data, and provided further suggestions for use of innovative approaches.

Gill et al.(2002) adopted a case study approach to investigate modelling approaches in order to examine the significance of emergent behaviour that arises from interactions of combatants in the battlespace (providing support to the development and analyses of new warfighting concepts). The researchers conducted a 3-day workshop and they reported that the case study allowed them to produce a number of useful insights into their topic of interest (i.e. force mix problem). For example, the workshop assisted with developing baseline scenarios, determined the limits of applicability of EINSTEIN (Enhanced Neural

Simulation Toolkit), and facilitated a level of group competency in using Agent Based Distillations (a concept of manoeuvre operations).

Stothard and Schliebs (2008) conducted a case study to explore issues surrounding collective training and learning. Namely, the study investigated the understanding of Army employees' roles and expectations focusing on collective learning and training, drawing on Combat Training Centre (Live) war fighting and operational peace-keeping experiences. Focus group interviews were conducted with various personnel from 3RAR and their discussions were audio taped and transcribed. By using the focus groups as their method, the researchers were able to gather data more quickly than if they conducted individual interviews, additionally participants were able to exchange their experiences and responses with other group members.

Massingham (2008) conducted an in-depth case study of an organisation within the Australian Department of Defence, referred to as EngServ (this organisation is part of Defence and provides services for the Royal Australian Navy). The study examined and provided a description of the potential impact of knowledge loss (i.e. employee exit or downsizing) and the way knowledge loss may affect the organisation at individual and group levels. A series of workshops were conducted, where participants completed detailed questionnaires. Knowledge loss was found to decrease organisational output and productivity, reduce organisational memory, diminish organisational learning, and produce disrupted external knowledge flows.

8.2 Case studies employed in a wider military context

Case studies have been employed within the military context to explore issues such as: resistance to organisational change (Kelly 2008); reporting an organisation's efforts to cope with change processes (Landau 2005); exploring critical factors of knowledge management adaptation (Jafari, Akhavan & Nour 2007); and investigating approaches to enhance learning for the organisation (Trainor, Brazil & Lindberg 2008) .

Kelly (2008) used a case study approach to examine the significance of resistance to organisational cultural change in the military. According to Kelly, military leaders often have difficulties with change management and implementing change management because the organisation itself strives to maintain consistency and stability. This case study explored the progress of the U.S. Army and Air Force when a major change amongst the two services occurred (i.e. an agreement was achieved between the U.S. Army and U.S. Air Force to enable the use of Close Air Support throughout the Army's battlespace). Kelly further argued that it is likely that such change amongst the two services will result in cultural change, as both services were required to change the way they operate, train, and ultimately conduct combat operations. This case study used the exploratory approach, that is, the progress of the Army and Air Force change implementation was compared and contrasted to Kotter's (2007) organisational change challenges, along with Garvin and Roberto's (2005) persuasive communications campaign. Data included an examination of cultural artefacts and contracts. The implementation of a cultural coach was considered as an option to better manage change.

In another examination of change, Landau (2005) employed a case study approach to outline the experience of Nationslab, an Israeli defence research and development organisation, who were experiencing transformational changes in their operating environments. The organisation was faced with a situation where it was required to rapidly implement comprehensive changes or risk defaults, and the case study reported the organisation's efforts to cope with the change process and its challenges. The data for this research was obtained from two different sources: ethnographic observations; and various documents (such as letters from the general manager, organisational messages, memos and reports). The study described and analysed the organisation's efforts and experiences associated with the implementation of a change initiative, while considering its internal and external factors. In doing so, the author considered various organisational change behaviours and processes (such as establishing clear definitions of the organisation of work, removing unnecessary compartmentalisation and bureaucratic limitations etc.) and their relevance to desired and actual results (i.e. increased accessibility of general manager, greater levels of responsibility for researchers, increased number of technological sections etc.).

Jafari et al. (2007) conducted a study on issues of knowledge management adaptation in an Iranian Aerospace Industries Organisation (AIO). This study used the case study approach to identify critical factors of knowledge management. The study included a literature review, and a questionnaire instrument. The findings of this case study outlined eight factors as critical issues in AIO. The critical factors were as follows: team working and KM features; leadership and commitment; appropriate organisational infrastructure; pilot and benchmarking of KM systems; job enrichment and security; culture, change management and strategy; collaborative and flexible organisation; and training and learning.

Trainor et al. (2008) investigated approaches to enhance learning of the US Army, specifically to enhance learning for the organisations which are involved in developing base camps to support military forces worldwide. The researchers reviewed a series of workshops that led to the creation of a knowledge management system and useful methods to improve learning.

8.3 Case studies examining learning in various organisational settings

Romme (1998) used the case study approach to investigate how by using a circular re-engineering approach³ an organisation's learning 'disability' can be reduced. Particularly, this study investigated an industrial company (Matrex) and their efforts to introduce the circular re-engineering approach to overcome inhibitors of learning. The findings demonstrated that the introduction of the circular re-engineering approach seemed to stimulate learning and communication throughout the organisation, increasing its problem solving capacity. A major limitation of this study is that the researcher omitted the detailed description of the methodology used, and was rather focused only on explaining the theoretical work model and implications of this case study.

³ i.e. This approach focuses on human learning and decision making rather than work as the key business process, and this focus/approach is then used to re-engineer and re-organise work processes.

Selamat and Choudrie (2007) examined the behaviours of employees including understanding of the humanistic elements such as meta-abilities (i.e. cognitive skills, self-knowledge, emotional resilience, and personal drive) in order to encourage employees to contribute the inputs necessary for learning-based systems development. The case study approach was employed to illustrate the framework for learning-based information systems in a real life setting for a large manufacturing organisation in Malaysia. An in-depth case study process (specifically a qualitative approach) was used to illustrate the application of a conceptual framework in a real life situation. The findings suggested that human aspects of knowledge creation (such as when employees acquires better knowledge and understanding) are crucial for sustaining learning-based systems within organisations, and that such systems are subject to continuous re-examination and modification.

A longitudinal case study (Keane, Barber & Munive-Hernandez 2007) was conducted in order to describe and understand the application of the knowledge management system to assist management and to support the creation of a learning organisation (a large packaging company that employs). According to Keane et al. (2007) this approach allowed them as researchers to generate familiarisation and a direct involvement with the company, its employees, systems and operations. Furthermore, it helped them to analyse operational and management databases, develop maps, and integrate the different elements of the knowledge management systems over a long period of time. This longitudinal case study used action research methods in particular to gain a more comprehensive understanding of the knowledge management system application. Additionally, Liebowitz (2003) in his case study presented a knowledge management implementation plan for a leading US technical government organisation. Liebowitz further suggested that his plan for knowledge management implementation can be used for other organisations which are considering instituting a similar program.

Yeo (2006) employed a case study approach to explore how reflective inquiry and action learning influence job and organisational effectiveness in a Singapore higher learning organisation. In addition, due to the exploratory nature of this case study, an inductive approach to data collection was chosen, and qualitative methods were employed (such as in-depth interviewing using semi-structured and structured approaches along with ethnographic observations).

Kerrin (1999) suggests that the case study strategy can be very useful when investigating continuous improvement. In her study, Kerrin investigated the development of a sustainable continuous improvement programme and how it contributes to the productivity and efficiency within the manufacturing setting. The research focused on assessing a specific framework for the development of continuous improvement capability within one organisation. Multiple data collection methods were used, such as direct observation, interviews, documentation and participant observation.

Daghfous (2004) utilised the case study approach to investigate a technology transfer project from a university's engineering research centre to a private firm in order to illuminate learning and knowledge-based determinants of the outcomes of such projects.

8.3.1 Case studies used in learning organisation research

A study conducted by Ford, Voyer and Wilkinson (2000) utilised the case study approach to report the change of an engineering organisation into a learning organisation. The study evaluated the degree, nature and causes of the engineering organisation's success in its process of becoming a learning organisation. The researchers collected and analysed the data using an action science approach. The findings were grouped according to the following five learning organisation dimensions: personal mastery, shared vision, mental models, team learning and systems thinking.

Smith (1999) also conducted a longitudinal case study to explore a specific organisation (i.e. the Canadian Imperial Bank of Commerce) in relation to its development as learning organisation over a period of ten years. The study illustrated how this specific organisation has learned to operate in new and more successful ways by implementing learning organisation principles.

Du Plessis, du Plessis and Millett (1999) in their case study described and discussed the practical steps taken by an Australian company in its transition to a learning organisation. In particular, three different areas were explored. These areas included: the organisation's strategy, the organisation's structures and systems, and the role of leadership and teams and their relevance to learning processes and positive learning outcomes. A case study conducted by Lien et al. (2007) also explored firms which chose organisational learning as part of an organisation's development strategy. They used a multiple qualitative case methodology since they investigated six different high-technology organisations and examined issues such as how to implement organisational learning, how individuals, groups and organisations learn, and the impact of organisational learning activities on organisational performance.

Adams, Day and Dougherty (1998) utilised the case study approach to investigate issues relating to organisational learning in fifteen large firms (i.e. different industrial product firms such as chemical and building products, packaged goods, and office equipment). Specifically, this study employed a case study strategy to identify processes through which organisational barriers obstruct market learning. Of particular interest to the researchers was the extent to which people might cope with these barriers. The authors provided suggestions for improving market tools and techniques to help overcome these barriers. Similarly, Robey, Ross and Boudreau (2002) conducted an exploratory case study that compared thirteen (industrial) firms based on their learning processes. Basically, all firms had to overcome knowledge barriers, and the researchers observed different implementation approaches and they investigated the mechanisms through which firms attempted to overcome knowledge barriers. In his empirical review of organisational learning, Matlay (2000) utilised a case study methodology to examine the impact of learning strategies and knowledge management upon organisational goals and outcomes. A comparative case study methodology was used to analyse and compare the data. For example, the study incorporated a telephone survey of six thousand organisations; a sub-sample of owners/managers selected for in-depth, face-to-face interviews; and 60 matched case studies were compared to and contrasted according to their learning-related processes and outcomes.

Goh (2003) examined two case studies from a longitudinal perspective, and described a tool to measure an organisation's learning capability. The researcher utilised a case study approach to describe how a diagnostic tool can be employed to manage change and improve the learning capability of an organisation.

Johnson (2002) conducted a case study to examine the actions of a leader that can transform an organisation into a learning organisation. The data was collected from a qualitative source of information (i.e. primarily using semi-structured interviews) and the researcher closely examined four leaders from generally diverse organisations, who had embraced the learning-organisation concept in order to improve learning capabilities within their organisations.

Hill, Bullard, Capper, Hawkes and Wilson (1998) conducted five case studies in order to investigate the implications of new initiatives such as total quality management and learning organisation concepts that were implemented in five organisations in New Zealand. A wide range of New Zealand organisations were included covering food processing; whiteware manufacture, computer consultancy services, business, training, health and social services for Maori; and telecommunications. The researchers used a mix of qualitative and quantitative methods. The findings from this three-year research programme presented a new paradigm for examining critical organisational characteristics, including a consideration of cultures that facilitate learning. The implications for managers, human resource practitioners and training providers were also considered. Following the lead of Hill et al. (1998), a case study strategy has also been employed by Terziovski, Howell, Sohal and Morrison (2000) to determine the extent to which total quality management and learning organisation change strategies are mutually sustaining practices. In their study, the researchers included five Australian companies that have established practices in the total quality management field. Qualitative data were collected and a multiple cross case content analysis was undertaken in order to establish the existence of mutual dependency between total quality management and learning organisation strategies.

A study conducted by Watkins and Cervero (2000) applied the case study approach to determine whether two different certified public accountancy practices (CPA) produced substantially different or equivalent learning opportunities for staff. The researchers focused on the context of learning in the workplace, and they investigated the nature of learning and development opportunities that were available to personnel. The study examined three information sources of data, a work history (i.e. time and billing reports divided up in categories and activities), surveys (i.e. identified 31 learning opportunities), and interviews (i.e. interviewed 3 individuals to identify the learning opportunity examples and illustrations available in each organisation).

Baruch and Lambert (2007) conducted a case study where they investigated issues surrounding organisational learning and change interventions. In particular, the researchers investigated how when encountering crisis, confusion, and difficulties, both individuals and organisations can suffer from anxiety-related problems. They created a conceptual model that regarded anxiety to be an organisational phenomenon, and provided indicators and strategies to assist with anxiety recognition, prevention, and treatment. In this regard, the authors outlined potential ways of recognising and

implementing effective coping strategies which may lead to a healthier and more responsive organisation (and thus enjoy improved productivity and quality of working life). The preventive strategies included regular and ongoing training on threat appraisal and response to any management team, as well as routine evaluations of the effectiveness of appraisal and communication systems since they may prevent unnecessary anxiety at both individual and organisational levels. The treatment strategies comprised of short-term consultancies for the evaluation of threats and responses.

In sum, the case studies identified in this paper investigated different issues in relation to organisational learning, such as:

- investigating a specific approach in order to reduce an organisation's learning disability (Romme 1998)
- illustrating the application of a conceptual framework in a real life situation (Selamat & Choudrie 2007)
- describing and understanding the application of knowledge management systems to support the creation of a learning organisation (Keane et al. 2007)
- reporting and evaluating change within organisations once they converted into learning organisations (du Plessis et al. 1999; Smith 1999; Ford et al. 2000)
- exploring how inquiry and learning influence job and organisational effectiveness (Yeo 2006)
- investigating and reporting continuous improvement (Kerrin 1999)
- implementing a knowledge management plan (Liebowitz 2003)
- describing a tool that measures an organisation's learning capability (Goh 2003)
- examining a leader's actions that can transform an organisation into a learning organisation (Johnson 2002)
- investigating learning outcomes when a project has been implemented (Daghfous 2004)
- investigating (learning) outcomes as results of different implementation approaches/learning strategies (Adams et al. 1998; Matlay 2000; Robey et al. 2002; Daghfous 2004)
- determining whether two different organisational settings produced equal learning opportunities (Watkins & Cervero 2000)
- investigating implications of new initiatives such as total quality management and learning organisation concepts (Hill et al. 1998; Terziovski et al. 2000)
- investigating arising issues in relation to organisational learning (Baruch & Labert 2007).

9. Discussion

As noted above, there are a number of studies which looked at learning related issues in a variety of organisational contexts. With their emphasis on problem identification and solving, the case study approach allows researchers to explore the underpinnings for a variety of complex issues and offer nuanced solutions to these issues. For the most part, case studies were employed to:

- describe a particular problem, and try to understand the organisational/social contexts under which 'problems' manifest (i.e. determine/evaluate the effectiveness of new initiatives according to setting/context)
- provide advice for possible interventions.

However, these case studies were primarily used to explore a particular problem or set of behaviours, retrospectively, within a given time and space (i.e. the effects of the application of a new knowledge management system). In this sense, case studies were rarely used to examine how behaviours, understandings, or the nature of problems change over time, through the use of case studies as part of a longitudinal research strategy. This lack of temporality does not allow the exploration of how problems change, disappear and reappear within settings over time, reducing opportunities for ongoing analysis and follow up. Additionally, given that case studies are often problem orientated, and consequently, client focussed, more attention is often given to understanding the problem and its contextual underpinnings, rather than methodological considerations. This makes the replication of these methods by other researchers more difficult.

Like all research methods case studies have their limitations. Due to sample size, it is often hard to generalise beyond the given sample and to draw definite cause-effect conclusions. They are also subject to researcher bias. Biases in data collection and interpretation can occur especially when one researcher gathers and analyses the data, or when researchers put a lot of attention into a particular area of interest to the detriment of others. However, when used in tandem with other methods, case studies can be a very powerful research approach, especially when a researcher attempts to discover meaning and generate a greater understanding about a particular issue, rather than trying to predict outcomes, or generate truth claims.

When considering the case study approach, there are few recommendations that can increase the generalisability of findings:

- Use of multiple cases
- Triangulate with other means (i.e. data triangulation - more than one source of data; observer triangulation - more than one observer; methodological triangulation - combining different types of data collection methods; and theory triangulation - considering alternative theories)(Runeson & Host 2009).
- Control for confirmation bias while collecting evidence and before making conclusions or recommendations. Hence, it is necessary to actively seek out for disconfirming evidence and not just evidence that will support tentative hypotheses

- Use of longitudinal design.

In addition, Runeson and Host (2009, pp.160-61) offer a frame of reference for researchers when conducting case study research, that is, a thorough checklist for researchers and readers to evaluate case study research for its quality and reliability (see Appendix A).

The next section will briefly discuss case study options to further examine the ALOQ findings.

10. Case study options to examine Army learning principles

This paper provides a theoretical framework for the next phase of the DALO research program, namely, the use of a case study methodology to further examine the results generated by Army Learning Organisation Questionnaire (ALOQ). The profile of (aggregated) results generated by the ALOQ were consistently in the mid-range, suggesting there are currently practices, processes and systems in place to facilitate learning at the individual level, and (to a lesser degree) at the team and organisational level. Data, however, also suggested that there are demographic differences in regards to personnel's perceptions of Army's learning environment. In this respect, perceptions differed according to rank, age, length of service, deployment history and the type and location of unit.

A case study approach will allow the DALO Research Team to gain a contextualised and an in-depth understanding of questionnaire results. Cases will be both exploratory and explanatory in nature. In this respect, the case studies will allow the research team to test tentative hypotheses and examine possible (causal) links between perceptions of/and attitudes toward learning and learning outcomes, providing greater explanatory power to the data collected by the ALOQ. The case studies will also provide the research team with a valuable opportunity to explore the extent to which ALOQ results manifest across Army in similar or different ways according to a variety of contextual and situation concerns.

In particular, the case study approach will allow the DALO researchers to investigate the extent to which learning organisation principles are understood and practiced across selected sites within the Australian Army. Drawing on the profile generated by the ALOQ, cases will be strategically selected from the surveyed Army population. Following the lead of Flyvbjerg (2011), cases will be extracted based on information-oriented selection. Namely, attention will be given to those cases (from specific sites) who received high and low benchmark scores so as to investigate potential enablers and barriers to learning. By strategically selecting extreme or deviant cases, the DALO researchers will be able to gain more nuanced insights on the learning within these extreme cases which will assist with the development of organisational theories for learning in the Army context.

Given the breadth and specificity of results derived from the ALOQ, a multiple case study design will be employed allowing within and cross case comparison to be made. Further cases will be included in order to examine emergent themes which arise from data collection, or those cases which have the potential to offer rival explanations so as to increase the confidence of findings. Thus, theoretical and purposive sampling techniques will be employed for the development of theory. In this respect, cases will be chosen in regards to the extent to which they replicate previous cases or extend emergent theory (Glaser & Strauss 1967) .

The proposed case study approach is appropriate when dealing with complex processes associated with learning, as it allows an in-depth understanding of the research phenomenon by incorporating multiple techniques. This approach will thus enable the DALO team to identify aspects of the Army Learning Organisation profile that Army stakeholders consider have the greatest potential to influence the Adaptive Army. The key outcomes of this research will be client case reports, original scholarly contributions to the fields of learning (organisational and individual), organisational studies, change management and the development of social theory.

What this means for the client, that is Army, is that by employing a case study approach the DALO research team will be able to provide Army with a nuanced view as to what is going on in respect to their learning capability. Consequently, appropriate recommendations will be generated for Army as to what aspects of the ALO profile are most likely to influence the Adaptive Army, and on what aspects to specifically concentrate on to assist Army in enhancing its learning capability and thus become more adaptive.

11. Conclusion

The Chief of Army recognised the importance and need for Army to create an environment where continuous learning will occur at all levels of the organisation. By improving learning practices, Army will be better able to respond to changing government, military, and organisational requirements in a more efficient manner. In support of these aspirations, the DALO team has developed a long term research program that aims to explore, measure and monitor Army's learning organisation principles. The initial phase of the research program involved measuring ALOP by using the ALOQ leading to the creation of Army's learning profile. The next phase of the research program involves further investigation of those factors which contribute to the Army learning organisation profile and includes a case study approach as well as an individual longitudinal qualitative study.

The case study approach has been chosen to advance the current research project as it would enable the researchers to further address and explore learning related issues in a variety of meaningful contexts. Aligned with the ALOQ results, the findings and insights generated from the case studies will assist Army to better deal with complexity, and in response to this, become more adaptive. This paper provides a theoretical basis for the

planned case studies. In doing so, the report provides an outline of key elements for the design and implementation of case study research, as well as a range of templates for presenting cases studies to client and stakeholder groups.

This paper highlights gaps in the current literature. Firstly, some research studies failed to provide enough details in relation to their methodology and study design which makes it difficult to replicate the results, which may call into question the reliability of such studies. There is also a dearth of research literature that employed a case study methodology to study learning and/or organisational phenomena particularly within the Defence context. Furthermore, if used in isolation the case study approach could be missing a wider context, especially when not used in a longitudinal manner, where it is important to track to track changes over time. The next stage of the DALO research program, presents an opportunity to overcome these limitations and significantly add to the current literature on learning within organisations.

One can conclude that the literature on public and private sector organisations generally views the case study approach as a valuable tool for investigating organisational learning issues, particularly with regard to how organisations learn, but also for exploring how individual and collective learning occurs. This paper has also been composed to provide an overview of the case study approach together with its strengths and weaknesses, highlighting the complexity of this approach but also recognising its remarkable value when investigating learning issues which are both complex and multifaceted. This paper adds to the area of learning in organisations by providing examples of ways in which the case study approach has been applied to investigate learning and/or organisational related issues in a variety of organisational contexts. In this sense, the case study as an empirical research method assisted researchers to gain a deep understanding of a phenomenon in its context, especially in settings where researchers had little control over variables.

The understanding of issues in their context is particularly important for Army, as Army operates in a broad range of complex and dynamic environments. By addressing and understanding learning related issues within their specific context, Army can gain a better appreciation of its learning capability, and harness it in ways to promote greater organisational agility.

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Appendix A

Researcher's checklist (Runeson & Host 2009, pp.160-61)

Case study design

1. What is the case and its units of analysis?
2. Are clear objectives, preliminary research questions, hypotheses (if any) defined in advance?
3. Is the theoretical basis – relation to existing literature or other cases – defined?
4. Are the authors' intentions with the research made clear?
5. Is the case adequately defined (size, domain, process, subjects...)?
6. Is a cause–effect relation under study? If yes, is it possible to distinguish the cause from other factors using the proposed design?
7. Does the design involve data from multiple sources (data triangulation), using multiple methods (method triangulation)?
8. Is there a rationale behind the selection of subjects, roles, artifacts, viewpoints, etc.?
9. Is the specified case relevant to validly address the research questions (construct validity)?
10. Is the integrity of individuals/organizations taken into account?

Preparation for data collection

11. Is a case study protocol for data collection and analysis derived (what, why, how, when)? Are procedures for its update defined?
12. Are multiple data sources and collection methods planned (triangulation)?
13. Are measurement instruments and procedures well defined (measurement definitions, interview questions)?
14. Are the planned methods and measurements sufficient to fulfill the objective of the study?
15. Is the study design approved by a review board, and has informed consent obtained from individuals and organizations?

Collecting Evidence

16. Is data collected according to the case study protocol?
17. Is the observed phenomenon correctly implemented (e.g. to what extent is a design method under study actually used)?
18. Is data recorded to enable further analysis?
19. Are sensitive results identified (for individuals, the organization or the project)?
20. Are the data collection procedures well traceable?
21. Does the collected data provide ability to address the research question?

Analysis of collected data

22. Is the analysis methodology defined, including roles and review procedures?
23. Is a chain of evidence shown with traceable inferences from data to research questions and existing theory?
24. Are alternative perspectives and explanations used in the analysis?
25. Is a cause–effect relation under study? If yes, is it possible to distinguish the cause from other factors in the analysis?
26. Are there clear conclusions from the analysis, including recommendations for practice/further research?

27. Are threats to the validity analyzed in a systematic way and countermeasures taken? (Construct, internal, external, reliability)

Reporting

28. Are the case and its units of analysis adequately presented?

29. Are the objective, the research questions and corresponding answers reported?

30. Are related theory and hypotheses clearly reported?

31. Are the data collection procedures presented, with relevant motivation?

32. Is sufficient raw data presented (e.g. real life examples, quotations)?

33. Are the analysis procedures clearly reported?

34. Are threats to validity analyses reported along with countermeasures taken to reduce threats?

35. Are ethical issues reported openly (personal intentions, integrity issues, confidentiality)

36. Does the report contain conclusions, implications for practice and future research?

37. Does the report give a realistic and credible impression?

38. Is the report suitable for its audience, easy to read and well structured?

Reader's checklist

39. Are the objective, research questions, and hypotheses (if applicable) clear and relevant?

40. Are the case and its units of analysis well defined?

41. Is the suitability of the case to address the research questions clearly motivated?

42. Is the case study based on theory or linked to existing literature?

43. Are the data collection procedures sufficient for the purpose of the case study (data sources, collection, validation)?

44. Is sufficient raw data presented to provide understanding of the case and the analysis?
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45. Are the analysis procedures sufficient for the purpose of the case study (repeatable, transparent)?

46. Is a clear chain of evidence established from observations to conclusions?

47. Are threats to validity analyses conducted in a systematic way and are countermeasures taken to reduce threats?

48. Is triangulation applied (multiple collection and analysis methods, multiple authors, multiple theories)?

49. Are ethical issues properly addressed (personal intentions, integrity, confidentiality, consent, review board approval)?

50. Are conclusions, implications for practice and future research, suitably reported for its audience?

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19. ABSTRACT In support of the aims of the Defence Army Learning Organisation (DALO) research programme examining learning in the Australian Army, this report presents an outline of the case study approach. In doing so, this report provides an overview of: (i) case study research and its theoretical underpinnings; (ii) methodological considerations including the purpose of case studies and rationale for their use in social research; (iii) the types of case studies and issues concerning sampling, data collection and analysis; and (iv) different approaches to reporting case study research. In addition, this report provides examples of some of the ways in which the case study approach has been employed by researchers to examine the significance of learning in Defence, wider military, and organisational contexts.					