Knowledge Creation within Geographically Dispersed Organisations: Collocation from a Sensemaking Perspective

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DECLARATION:

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SUMMARY

This thesis investigates the question of organisational knowledge creation in geographically dispersed settings.

In Chapter 1, I describe Nonaka's model of organisational knowledge creation and Weick's theory of organisational sensemaking in more detail.

In Chapter 2, the geographically dispersed organisation is examined in more detail, looking at socialisation, organisational culture and trust.

In Chapter 3, communication dynamics within the geographically dispersed organisation are examined, with a focus on Media Richness Theory and the impact this has had on theories of communication across distance.

In Chapter 4, the organisation is examined at the level of the team, discussing real world examples of dispersed knowledge creation from the knowledge management and sensemaking perspective, using research on globally dispersed software development teams practicing the Scrum methodology.

The thesis comes to the conclusion that it is possible for knowledge creation to occur amongst geographically dispersed individuals, if they have learned how to make sense together. However shared frameworks are quicker and easier to develop in face-to-face settings, but as soon as the basis for it exists, the influence of geographic dispersal is reduced.

OPSOMMING

Die tesis ondersoek die kwessie van organisatoriese kennisskepping in geografies verspreide situasies.

Die eerste hoofstuk beskryf Nonaka se model van organisatoriese kennisskepping en Weick se teorie van organisatoriese singewing.

In die tweede hoofstuk word die fenomeen van geografies-verspreide organisering van nader beskou en bespreek in terme van die effek wat dit het op sosialisering, organisatoriese kultuur en vertroue.

In die derde hoofstuk word die kommunikasie-dinamika in geografies verspreide organisasies ondersoek met 'n fokus op "Media Richness Theory" en die impak wat dit het op teorieë van afstandskommunikasie.

In die vierde hoofstuk word die organisasies bestudeer op die vlak van die span. Hier word voorbeelde van verspreide kennisskepping vanuit die kennisbestuurs- en singewingsperspektiewe bespreek aan die hand van 'n oorsig oor navorsing oor globaal-verspreide sagteware-ontwikkelingspanne wat die SCRUM-metodologie volg.

Die tesis kom tot die slotsom dat dit kennisskepping in sulke kontekste kan plaasvind as die lede van die span saam sin kan maak. Gedeelde raamwerke word egter makliker en vinniger in gesig tot gesig situaties opgebou, maar sodra die basis daarvoor bestaan word die invloed van geografiese verspreiding minder.

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Introduction

1.1. Background

This thesis examines the effect of geographic dispersal on organisational knowledge creation in the context of collegial interactions. It does so through an examination of Karl Weick's theory of Organisational Sensemaking and Ikujiro Nonaka's theory of Organisational Knowledge Creation.

Important to both theories is socialisation, which is tied to proximal interactions. And yet, the need to work collaboratively with dispersed colleagues is an increasingly common organisational reality faced by many knowledge workers. The preconception in these circumstances is that attempting to work meaningfully with a distant colleague is less effective than working with a colleague who is readily available for face-to-face discussion.

Now imagine a situation where there is a choice between working on a project face-to-face with a total stranger, or remotely with a well-established colleague. Assuming a good working relationship with the established colleague, it seems intuitively correct to expect that someone who chose to work with the remote colleague would still be able to work meaningfully, and that (initially at least) they could actually expect to generate better understanding with their remote colleague than they could from the proximal stranger.

If the situation were reversed, and the collaboration had to occur remotely with the stranger, it also seems intuitively correct to regard it as an extremely challenging endeavour.

The difference is that in the case of the established colleague, there has been the opportunity for socialisation, whereas in the case of the stranger there has not. In the case of the remote stranger, there is no obvious opportunity for socialisation to occur.

Can socialisation be achieved through technologically-mediated channels? How else would strangers truly be able to create knowledge together without great difficulty? To answer these questions, this thesis synthesises organisational sensemaking and knowledge management perspectives on organisational knowledge creation, through an examination of the effects of collocation and dispersion on task-oriented teams within geographically dispersed organisations. Since communication across distance is reliant on technologically mediated channels, the impact of the use of these channels is also examined.

1.2. The Geographically Dispersed Organisation

Many organisations in today's world exist in a state of geographical dispersion. The geography involved in the dispersion needn't be as dramatic as separation by continents and oceans. Any distance that makes regular face-to-face interaction between the members of an organisation expensive and/or impractical, and therefore infrequent, would qualify. We could therefore regard an organisation as geographically dispersed if its members are forced to rely on technologically-mediated rather than face-to-face interactions for regular contact and organisational communication.[1]

Many of us are already members of geographically dispersed organisations. In our current globalised economy this is often the company or institution for which we work, though the possibilities are not restricted to the working world, and it would be somewhat artificial to do so. If we see 'organisation' as any union of agents working collaboratively to achieve a "larger purpose"[2] (however ephemeral this union); then the number of geographically dispersed organisations to which people could belong increases dramatically. Being an active member of a now geographically dispersed network of former school colleagues would qualify, as would enthusiastic participation in any number of hobby groups with a globally dispersed membership, and so on.

Nevertheless, in the interests of scope, the primary examples from the literature used during the course of my arguments are drawn from studies of the working world. It should be understood, however, that the theory is applicable and relevant to all forms of geographically dispersed organisation.

1.3. Collocation and Proximity

1.3.1 Work Units

People will typically spend their working life surrounded by colleagues who are in most cases at first total strangers. This stranger status will only be reduced through interaction, as trust is built.[3] As the colleagues spend more time working together, they become less strange to each

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[1] The effect of this reliance on technologically-mediated rather than face-to-face communication is discussed in terms of media richness in chapter three.

[2] Choo, C. 1996. The Knowing Organization. 331. His reason for the existence of organisations is taken from Herbert Simon.

[3] More will be said on the issue of trust in chapter two.

other. They also learn to make sense of each other's actions within the work context[4] and this will allow more effective communication.

Even if people spend many years in the same organisation, there is no guarantee that they will get to know and make sense of the actions of all of their colleagues. In larger organisations the chances of regular and meaningful interaction lessen as employees are divided into different areas of work – which in larger organisations often means different physical areas as well. Where this occurs there is no reduction of 'stranger' status amongst colleagues.[5]

This means that once an organisation becomes large enough, it becomes both difficult and meaningless to attempt to observe evidence of the effects of successful interaction (such as successful knowledge creation) at the level of the whole. The accepted unit of analysis in the literature of organisational communication tends towards teams, workgroups and occasionally, dyads. Apart from limiting discussions to a manageable level, this also reflects the common organisational practice of clustering people by job function. Therefore the organisational unit under most scrutiny in this thesis will be the team.

However, nominal team members sharing space due to work function alone could share an office but only interact on a superficial level. As I will show, mere proximity does not guarantee effective communication. While being proximate would eventually have a positive effect on colleagues' facility to communicate with each other, it will be gradual and undirected. Merely sharing physical space is not enough, if there is no accompanying sharing of *tasks*. Therefore the focus will be on teams that are specifically required to work collaboratively towards a common goal.

1.3.2 Work Unit Collocation

Collocation is a problematic term, claimed by multiple contexts and even multiple spellings. For example, co-location (also collocation) in Information Technology could describe a specific kind of data centre; in product development co-location is the deliberate assembly of people into a shared space for the purposes of leveraging maximum efficiencies from cross-

[4] In sensemaking terms, they learn to "make mutually reinforcing interpretations" and act in ways that have "mutual relevance". Weick. 1995. *Sensemaking in Organisations,* 73

[5] This was brought very clearly to my attention when a colleague of mine went to visit a client's large offices while piloting a project that we were jointly managing. We had some proof-of-concept questions that required input from someone outside the department with which we were dealing at the time. Our client liaison selected an appropriate person using the company's internal phone directory, and when accompanying my colleague to the correct floor of the same office building, had to call the selected person's cellphone to get them to stand up, as there was no other way that they could identify who had been selected.

functional teams. In the context of this thesis, my use of the term 'collocation' is closer to, though not identical to, the latter example.

I choose to distinguish collocation from what I consider mere proximity in the following manner:

Collocation is the deliberate grouping of people selected for a specific task or project. People collocated in this manner are more than just colleagues, for the duration of their assignment they are a team, sharing task interdependency. Proximate colleagues may share spaces and similar *types* of work, but they will not necessarily have the same reliance on each other in order to achieve their shared goals (their particular subset of the organisation's 'larger purpose'). Nor will they necessarily need to interact in ways that make sense to each other in order to complete their work, as their work may be separated from the need for such interaction.

For example, two bookkeepers sitting next to one another in the finance department of a brokerage firm may perform the same job function but deal with the books of completely separate groups of companies. Whether they are seated next to each other or in completely separate offices has no real impact on their ability to perform their given task.[6] If however they were auditing the same groups of companies it would definitely have an impact on their ability to perform their task if they were not seated together.

I will be revisiting the concept of collocation in greater depth in Chapter Two.

1.4. Collaboration in the Geographically Dispersed Organisation

Having just discussed collocation and proximity, I will now present a couple of scenarios involving globally dispersed colleagues working together successfully. As can be expected, the people in these scenarios are communicating using technologically-mediated channels, but the technologies involved are different in each scenario, which will become important later.

[6] Unless one of these bookkeepers were very inexperienced in relation to the other, in which case being seated in the same office may impact positively on the less experienced bookkeeper, and negatively on the more experienced one. For the purposes of the example, however, we will assume the same level of basic competence.

1.4.1 First Scenario

In our first scenario, a pair of professionals in the New York offices of an organisation (in this example, a multinational corporation) are working collaboratively with a colleague in Sydney.[7] They are working through a white paper compiled by the New York-based professionals, who share an office. Their colleague in Sydney is considered the company's specialist on the topic covered by the white paper, and must give input on the document before it can be released for general circulation.

As it is a scheduled meeting they are communicating thanks to the company's videoconferencing facilities, but up to this point email has been the primary channel used for communication. All participants in the discussion are first-language English speakers with similar professional backgrounds. Since the colleague based in Sydney was transferred there only a year ago from the New York office, there are no issues with colloquialisms or cultural peculiarities. All of the participants in the discussion are of the same gender, social status and ethnic group.

However, one of the New York professionals shared an office with and worked together on some of the same projects as the specialist in Sydney for five years prior to the latter's transfer. The other, while very well qualified and having many years of relevant experience in the industry, has only been with this particular company for the past six months, and so this is the first time that they are actively speaking with their distant colleague.

During the course of their interaction, a section of the white paper is found to be problematic, and everyone decides that it needs to be rephrased in order to clarify the issue. This presents an opportunity for the New York based professional who has the longer company history to expound on a personal theory regarding the industry that is relevant to the matter at hand. The person in Sydney (at the other end of a videoconference connection) is able to follow and contribute to the argument and the two engage in a meaningful dialogue that allows them to rescue and even improve upon the problematic section.

The newer colleague, despite being in the same room as the primary driver of the new idea, has not been able to contribute to the discussion at all. Though their industry experience allows understanding and appreciation of the end result, this person contributed minimally to

[7] This could be almost any combination of locations and the example would still be valid for the majority of the argument; you could replace 'New York' with 'Cape Town' and 'Sydney' with 'Johannesburg' and most of it would apply. The exception is that I am intentionally adding a significant time zone difference to this scenario, as time zone differences are usually considered an additional complicating factor in studies of dispersed teams.

its generation because they were not able to make sense of the discussion while it was taking place. There is a richer connection between the geographically dispersed colleagues than between the two who were collocated.

1.4.2 Second Scenario

The second scenario involves successful collaboration, but in a different context:

An experienced vascular surgeon doing volunteer work for Medecins Sans Frontieres in Rutshuru in the Democratic Republic of the Congo is faced with a 16-year-old boy whose arm has been ripped off in a hippopotamus attack. By the time the boy is brought to the surgeon the wound has gone gangrenous, and the surgeon realises that the badly infected remains of the arm must be removed or the boy will die in a matter of days.

The surgeon knows that the procedure required to remove the arm successfully is called a 'forequarter amputation', meaning the collar bone and shoulder blade must be removed. Unfortunately the surgeon, while knowing about the procedure, has never actually performed it or even seen it performed before. In the United Kingdom, where the surgeon is based, it is a rare operation usually only performed on cancer patients.

Because of the rarity of the procedure, the surgeon is aware of which colleague in the UK has experience in performing the operation. He gets in contact with this colleague via SMS and proceeds to receive detailed step by step instructions, also via SMS.

After spending a day reflecting on the instructions, the surgeon performs the operation, during which he follows the instructions exactly. The operation is a success and the boy makes a full recovery.

1.4.3 Scenario Review

The first scenario is intentionally generic and loaded with a number of discussion triggers that will make more sense in retrospect. It's intended as a reasonably plausible yet run-of-the-mill example of collaboration in a modern corporation. The second scenario may seem less plausible – yet the operation actually happened as described, in October 2008.[8]

In the news article that describes this remarkable achievement, a statement made by David Nott, the surgeon who performed the operation provides an excellent illustration of one the

[8] The original article 'Surgeon saves boy's life by text', which also has some media embedded with a few extra details, is available at http://news.bbc.co.uk/2/hi/health/7761994.stm as of October 2011.

main themes of this thesis: "I knew exactly what my colleague meant because we have operated together many times." [9]

Despite the geographic separation of the surgeon from his colleague, and the very sparse method of communication available, the surgeon performing this complicated process for the very first time completed the procedure successfully, and saved a life. Because he had previously worked closely with his distant colleague, and also had time to reflect on the set of textual instructions, he was able to successfully make sense of the instructions and enact them; evidence that he had learnt a new process.

The initial scenario, though an artificial construct and with less at stake, includes the same principles. Successful collaborative knowledge creation over distance is achieved thanks to the existence of a prior set of meaningful interactions between two of the parties. This set of meaningful interactions forms what I would call an 'establishing context'.

If this establishing context were lacking, the effectiveness of the distance communication would be lessened, as illustrated using the example of the newest colleague, who could not contribute to a meaningful dialogue despite sharing an office with the dialogue's inceptor.

In the second scenario, if the same series of SMS instructions had been sent to a surgeon in the same situation,[10] but who lacked the establishing context formed by the prior interactions David Nott had with the surgeon in the UK delivering the instructions, it is unlikely that the boy would have survived. Not because of a botched operation, but because it is unlikely that a surgeon in that scenario faced with such a choice would have had the confidence to operate in the first place.

The people who were engaged in knowledge creation in these scenarios were communicating using technologically-mediated channels. They were not collocated or even proximal. They did however share experiences which allowed them to make sense of each other despite the lack of face-to-face communication. When David Nott stated "I knew exactly what my colleague meant because we have operated together many times", he was describing something that resonates with both organisational knowledge creation and organisational sensemaking. The fact that the colleague in question was thousands of kilometres away did not prevent successful sensemaking, and therefore successful knowledge creation, from

[9] 2008. Surgeon saves boy's life by text. news.bbc.co.uk

[10] An experienced surgeon in an unfamiliar and under-resourced operating theatre, unfamiliar with the specific operation, but with a boy's life in the balance and under time pressure.

taking place. The next section explains the importance of sensemaking and knowledge creation.

1.5. Methodology

This thesis is a meta-analysis of existing resources in the broad field of organisational studies that deal with organisational communication. There is a wealth of material relating to team work and collaboration in this field, and there have been numerous case studies describing the practical situations encountered by modern knowledge workers. I draw on this rich source of existing evidence to illustrate my argument. In choosing my resources I began by examining some of the earliest writings that inspired Weick and Nonaka, and used citation analysis to trace other relevant resources from this base. The inclusion of media richness theory is as a direct result of the influence it had on Weick.

I have already identified Karl Weick's theory of Organisational Sensemaking and Ikujiro Nonaka's theory of Organisational Knowledge Creation as the core theories driving the discussion in this thesis. This is because both theories are linked closely to organisational communication, both incorporate the idea of socialisation as part of their basic premise, and both operate within the Knowledge Management paradigm. The next two sections expand briefly on each of these theories.

1.5.1 Nonaka and Organisational Knowledge Creation

The concept of organisational knowledge creation has over the past few decades been dominated by the theories of Ikujiro Nonaka and several of his notable collaborators (Takeuchi, von Krogh, Toyama, Konno), and as such is a significant contribution to broader Knowledge Management theory.

According to Nonaka's widely accepted theory of organisational knowledge creation, new knowledge is created through the 'knowledge spiral', which is a continuous process of conversion between the tacit and explicit dimensions of knowledge through the process of the socialisation, externalisation, combination and internalisation of knowledge (or SECI).[11] In

[11] Nonaka had discussed this theory under the heading 'The Spiral of Knowledge' in his 1991 article 'The Knowledge Creating Company' (pg. 97), but the most popular definition stems from his refinement of it in his 1994 article 'A Dynamic Theory of Organizational Knowledge Creation' (pg. 19 & 20), where he introduced the diagrams of his SECI framework. These diagrams were later combined to form a single simplified image

his more recent writings, Nonaka has reconceptualised the knowledge spiral as "the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting it to an organisation's knowledge system".[12]

In order to achieve the externalisation of knowledge (or in order to make it available, to use the more recent terminology), there must be communication of some kind. Nonaka points to individual communication as the mechanism of knowledge exchange and combination,[13] but he also sees teams as central players in organisational knowledge creation due to their ability to "create new points of view through dialogue and discussion".[14]

Much more must be said on the topic of knowledge creation than is appropriate for this introduction. The second part of the next chapter will deal with this subject in more detail.

1.5.2 Weick and Organisational Sensemaking

Much as Nonaka has dominated the landscape of organisational knowledge creation, the field of organisational sensemaking is associated primarily with Karl E. Weick, who has been writing on the concept for many years. In 1995 he released a central text on the subject, *Sensemaking in Organisations,* in which he framed his ideas about organisational sensemaking at that time. While Weick's work has influenced Nonaka's, there is no real indication that the converse is true,[15] though organisational sensemaking has been claimed as one of the 'themes' in the second generation of Knowledge Management.[16]

That the relationship between organisational sensemaking and organisational knowledge creation seems one-way makes perfect sense when considering that sensemaking is part of the natural progression of the knowledge creation process. Choo explains it as follows:

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representing the SECI framework (for example on page 12 of his co-authored article from 2000 on 'SECI, *Ba*, and leadership').

[12] Nonaka & von Krogh. 2009. Tacit Knowledge and Knowledge Conversion. 635

[13] Nonaka. 1994. A Dynamic Theory of Organisational Knowledge Creation, 19

[14] Nonaka. 1991. The Knowledge-Creating Company, 104

[15] Weick is quoted in numerous publications where Nonaka is author or co-author (for example, A Dynamic Theory of Organizational Knowledge Creation (1994), SECI, *Ba* and Leadership (2000), A Firm as a Dialectical Being (2002), The Quality of Group Tacit Knowledge (2008), Tacit Knowledge and Knowledge Conversion (2009)). Weick is aware of Nonaka and Takeuchi's book, since he does refer to it, but only sparingly. I have found only two references to it (and to no other writings of Nonaka) in Weick's many publications. In both of the cases I have found, the reference is only in passing. The first was in chapter 8 of *Making sense of the organisation,* on page 210 (this chapter originally appeared in a 1996 publication). The second and most recent mention of *The Knowledge-creating Company* was in 2009 in *Making Sense of the Organisation: the impermanent organisation*, on page 153.

[16] Tuomi. 2002. The future of Knowledge Management

> "During *sensemaking*, the principal information process is the interpretation of news and messages about the environment. Members must choose what information is significant and should be attended to; they form possible explanations from past experience; and they exchange and negotiate their views in order to arrive at a common interpretation. Sensemaking supplies a meaningful context for all organisational activity and in particular guides the knowledge creation process. Knowledge resides in the minds of individuals, and this personal knowledge needs to be converted into knowledge that can be shared and transformed into innovations. During *knowledge creation*, the main information process is the conversion of knowledge. Members share their personal knowledge through apprenticeships and training, and articulate what they intuitively know through dialogue and discourse, as well as more formal channels."[17]

Sensemaking is personal – and therefore tacit – in nature, requiring externalisation of the results in order to inform organisational knowledge creation.

Sensemaking does not shut down during the knowledge creation process; it is not a binary stop/start process but rather one that is always active. The very 'apprentices and training' and 'dialogue and discourse' that Choo mentions in the above quote are themselves sensemaking opportunities that will allow the members of organisation to learn how to make sense of their environment, and inasmuch as the members of the organisation are inseparable from their environment, this also means learning to make sense of each other.

As with knowledge creation, there is a great deal to be explored with regard to organisational sensemaking. The third part of the next chapter will be devoted to this subject.

1.5.3 Scope of Argument

As noted in the beginning of the thesis, the argument of this thesis is applicable and relevant to all forms of geographically dispersed organisation. In the interests of scope, however, the primary examples from the literature used during the course of my argument are drawn from studies of the working world.

In the interests of maintaining a manageable scale and also to best illustrate the theory in practice, I chose as a proof of the veracity of the theory to focus on new product development in software development teams, showing how the implementation of the Scrum software

[17] Choo. 1996. The Knowing Organisation, 338. Emphasis in original.

development process framework resulted in examples of successful dispersed knowledge creation.[18]

The reliance on use of existing literature means that no original research tailored to the specific topic was enacted; rather conclusions are drawn by analysis of the existing literature using Nonaka and Weick's theories as the lens of interpretation. As such it may be seen as an exploratory study providing a Knowledge Management theory explanation for how knowledge creation can occur across distance between colleagues who have never met.

As an exploratory study, essentially a proof of concept, this thesis is necessarily bound within a very narrow context. The organisational context I have chosen to focus on is knowledge creation in software development, an area where the products under development are not physical artefacts. As such, the 'proof' provided by the examination of literature examining successful knowledge creation within organisations utilising the Scrum framework may seem spurious. The Scrum examples are typically generated by practitioners within the software development industry, who are not reflecting on their examples from a knowledge management perspective.

These nevertheless provide valid and valuable case studies, which despite the difference in focus provide evidence of successful knowledge creation across distance between colleagues who have never met. The explanation for this is found in the analysis of Sensemaking and Organisational Knowledge Creation theory.

1.5.3.1 A note on managers vs. knowledge workers

I note that a number of influential studies on organisational communication are centred on managers and executives exclusively as the organisational agent that formed the unit of measurement for their research.[19] Conclusions drawn in the literature are often applied to the manager specifically. This is not in keeping with the current idea of the 'knowledge worker', where every agent in the modern organisation has the potential for meaningful decision-making, and therefore the need for communication that this implies. Since the focus on the communication of managerial and 'key staff' in these earlier studies was related to the need

[18] There is a direct relationship between Nonaka's writings and the development of the Scrum framework, as will be explained later in this thesis.

[19] For example, Daft & Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design; Simon. 1987. Making Management Decisions; Daft et al. 1987. Message Equivocality, Media Selection, and Manager Performance

for information for the purposes of effective decision making, I feel it is valid to apply the insights from these studies to our modern 'knowledge worker' context.

1.6. Thesis Structure

There are four chapters following this introduction, each divided into multiple sections. In the first chapter I describe Nonaka's model of organisational knowledge creation and Weick's theory of organisational sensemaking in more detail. The second chapter explores the geographically dispersed organisation in more detail, examining the effect on socialisation, organisational culture and trust, as well as taking a more detailed look at collocation and proximity. The third chapter looks at communication dynamics within the geographically dispersed organisation, first looking at organisational communication more broadly, then continuing with an examination of Media Richness Theory and the impact this has had on theories of communication across distance. The concluding chapter examines the organisation at the level of the team. It also discusses real world examples of dispersed knowledge creation using research on globally dispersed software development teams practicing the Scrum methodology. Finally, the chapter sums the main findings of this thesis.

Chapter Two
Organisational Knowledge Creation and Organisational Sensemaking

2.1 Chapter Outline

This chapter will begin by providing a more detailed discussion of the process of organisational knowledge creation as developed by Nonaka and his various co-authors. The second part of this chapter will describe the primary components of Weick's theory of organisational sensemaking.

2.2. Organisational Knowledge Creation

2.2.1 The Dominant Model of Organisational Knowledge Creation

Nonaka's is not the only extant theory of organisational knowledge creation. A recent study has noted that at least five main frameworks have emerged from the system and management science literature in the last few decades.[20] The "Nonaka model of knowledge creation"[21] (as the authors of the study term it) is, however, the most prominent and influential of them, and has had a very profound impact on the literature, being cited 1636 times between 1995 and 2004.[22] This theory is most commonly represented by the SECI process that I briefly outlined in the introduction.[23] Even more recently, Nonaka's model has been described as "foundational in the (knowledge management) literature".[24]

The SECI model is not ironclad – it has naturally faced some criticism over the years. Various charges have been levelled against it – amongst these that it underplays the

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[20] Vaccaro, A. et al, 2008, Impact of Virtual Technologies on Organizational Knowledge Creation, 2.

[21] This is somewhat misleading. Nonaka has worked on this theory with the assistance of several collaborators over the years, and *The Knowledge-Creating Company*, the book which is probably most widely associated with this theory, was co-authored with Hirotaka Takeuchi.

[22] Vaccaro, A. et al, 2008, Impact of Virtual Technologies on Organizational Knowledge Creation, 2.

[23] For example, best selling business author Thomas Stewart refers to 'the SECI process' in *The Wealth of Knowledge*, and the typical two-by-two image associated with SECI is also reproduced (Stewart, T. 2001. *The Wealth of Knowledge.* 126).

[24] Gilbert, E et al. 2010. Knowledge Sharing and Decision Making in the Peace Corps, 129. Here the entire model is associated with the SECI process, showing it to be the most recognisable and established element.

complexity of tacit knowledge,[25] that it cannot be applied to complex environments,[26] and even that it is built on faulty assumptions.[27]

These and other various perceived faults are not however relevant for my purposes: even though this theory is still being updated and expanded by Nonaka and his co-authors,[28] the SECI model of organisational knowledge creation *as it appeared in the 1990s and early 2000s* is currently the dominant theory of organisational knowledge creation in management literature.[29] As such it is what I consider the valid 'knowledge management perspective' for the purposes of this thesis.

I will now briefly discuss the SECI model and related theory in more detail.

2.2.2 Basic outline of the SECI process

2.2.2.1 The Tacit and Explicit Dimensions of Knowledge

The SECI process is built on a view of the organisation as "an entity that creates knowledge through action and interaction".[30] This view was developed as a contrast to the view of the organisation as an 'information processing machine', which was the dominant view held by Western-style management theory at the time of Nonaka's formulation of the model.[31]

As a consequence of this traditional 'information processing' view of the organisation, only explicit forms of knowledge (such as quantifiable data and procedures) were being measured

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[25] Boisot, M. 1998. *Knowledge Assets,* 56-57

[26] Snowden, D. 2002. Complex acts of knowing, 106

[27] Smoliar, S. 2003. Interaction management, 338

[28] For example in Nonaka & von Krogh. 2009. Tacit Knowledge and Knowledge Conversion; and von Krogh, Nonaka and Rechsteiner. 2011. Leadership in Organizational Knowledge Creation.

[29] The importance and established nature of Nonaka's 1991 article, The Knowledge-Creating Company (where the basic SECI model was articulated in an earlier form) can be seen in that it was republished as part of the Harvard Business Review Classics series in 2008 – as the back matter states, each article selected for inclusion in the series is "a ground breaking idea that continues to shape best practices and inspire countless managers around the world". Furthermore, this 1991 article, along with his 1994 article 'A dynamic theory of organisational knowledge creation', his co-authored 1998 article 'The concept of "*ba"*: building a foundation for knowledge creation and his co-authored 2000 article 'SECI, *Ba* and leadership: a unified model of dynamic knowledge creation' (all of which established and elaborated on his theory of organisational knowledge creation) were included in a 2005 three-volume work edited by Nonaka (*Knowledge management: critical perspectives in business and management).* The primary purpose of this collection was to provide a broad, balanced and interdisciplinary overview of knowledge management in the hopes that this would influence future research (page 1, Introduction to Volume 1).That he was selected to edit such a collection demonstrates Nonaka's continued importance and centrality to Knowledge Management research.

[30] Nonaka and Toyama. The knowledge-creating theory revisited, 3

[31] Nonaka.1991. The Knowledge-Creating Company

and valued. Nonaka felt that this style of management represented a basic misunderstanding of knowledge, which in corporations meant a loss of competitive advantage.[32]

The nature of knowledge has been debated since classical times. There are numerous schools of thought on the topic and many definitions of 'knowledge'. From the perspective taken by Nonaka in developing the SECI model, the working definition of knowledge is as "justified true belief" and more specifically a "dynamic human process of justifying personal beliefs as part of an aspiration for the 'truth'".[33]

It is understandable that this reference to knowledge as a dynamic human process echoes Michael Polanyi's outlook on knowledge.[34] Polanyi was the originator of the concept of 'personal knowledge' – our knowledge is inextricably bound to who we are and what we have experienced, and as such "our knowledge may include far more than we can tell".[35] This perspective on knowledge influenced Nonaka.[36] While the idea of 'personal' or 'tacit' knowledge did not originate with Nonaka, his SECI process certainly increased awareness of the concept and helped to bring it into the current mainstream managerial literature.[37]

2.2.2.2 Components of the SECI process

As mentioned in the introduction, according to Nonaka's theory, knowledge is created through the 'knowledge spiral', a continuous process of conversion between modes of tacit and explicit knowledge through the (S)ocialization, (E)xternalisation, (C)ombination and (I)nternalisation of knowledge (thus, SECI).[38] Through these interactions, tacit and explicit knowledge "mutually enhance each other towards increasing the capacity to act (Nonaka 1991, 1994; Nonaka and Takeuchi 1995)".[39]

The typical illustration of that SECI process is included as Figure 1, below.

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[32] Nonaka.1991. The Knowledge-Creating Company, 96

[33] Nonaka. 1994. A Dynamic theory of Organisational Knowledge Creation, 15

[34] For example, "Knowledge is an activity which would be better described as a process of knowing". Polanyi, M. 1961. Knowing and Being, 466.

[35] Polanyi, M. 1961. Knowing and Being, 467.

[36] Polanyi's books *Personal Knowledge* and *The Tacit Dimension* are both referenced in Nonaka's "A Dynamic theory of Organisational Knowledge creation"

[37] The editor's note in the Harvard Business Review Classics edition of 'The Knowledge-Creating Company' opens with "This 1991 article helped popularize the notion of "tacit" knowledge".

[38] Nonaka. 1991. The Knowledge Creating Company. The original order of the description in the 1991 article was socialisation, combination, externalisation (called 'articulation' at that time) and internalisation.

[39] Nonaka and von Krogh. 2009. Tacit Knowledge and Knowledge Conversion, 638. That this more recent reference draws on Nonaka's earlier work nicely illustrates how the core theory has not changed.

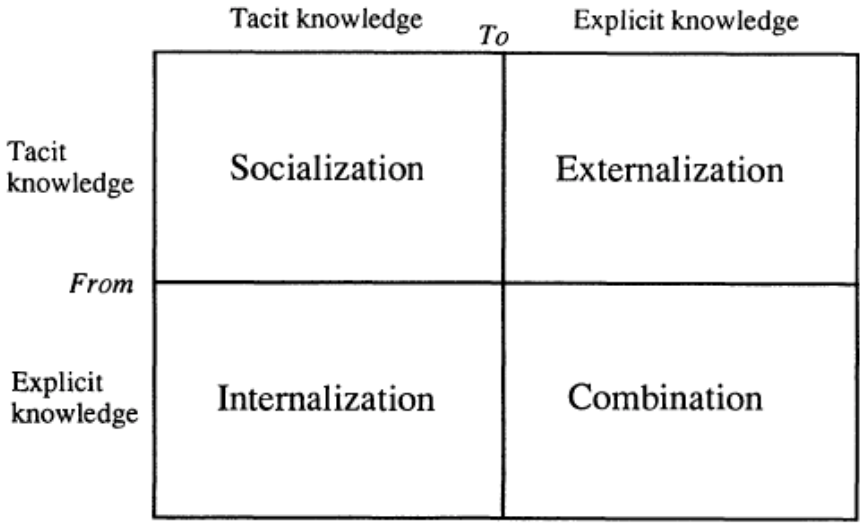

Figure 1: Illustration of the SECI process (from Nonaka, 1994)

To explain this further, I draw on Nonaka's original description of the process from his 1994 article, 'A Dynamic Theory of Organisational Knowledge Creation'[40]:

Socialisation

The socialisation mode usually starts with the building of a field of interaction, which facilitates the sharing of organisation members' experiences and perspectives. It is a conversion from tacit knowledge to tacit knowledge, in that during socialisation one person may learn ways of doing things from another, while neither may have spoken during this process, or be capable of explaining it afterwards.

Externalization

Once these tacit perspectives are shared, it enables a process of meaningful interactions or "dialogue" in which members are able articulate their own perspectives, thus allowing the externalization of tacit knowledge. It is a conversion from tacit knowledge to explicit knowledge.

Combination

When pre-existing data and externalized knowledge interacts with emergent concepts formed by this dialogue, it creates the opportunity for the combination of knowledge, leading to explicit knowledge artefacts. It is a conversion from explicit knowledge to explicit knowledge.

[40] Nonaka. 1994. A Dynamic Theory of Organisational Knowledge Creation, 20.

Internalization

Through their interaction with these concrete, explicit forms of knowledge, essentially through 'learning by doing', the members of the organisation undergo a process of internalization, where the knowledge acquired in this manner becomes part of their specific experiences and perspectives. This is a conversion from explicit knowledge to tacit knowledge.

2.2.3 The addition of *ba*

2.2.3.1 The concept of *ba*

The concept of *ba,* borrowed from Japanese philosophy, was combined with the SECI process in the late 1990s and represents the most significant addition (or, in the author's words, 'elaboration'[41]) to organisational knowledge creation theory during the period in which the model rose to prominence in the literature. As with many terms introduced into English from another linguistic context, there is no direct translation for this concept.[42] Roughly, it is a "context which harbours meaning", which can be thought of as a "shared space for emerging relationships".[43] More simply put, it is "the context shared by those who interact with each other".[44] This shared context enables the whole process of knowledge creation by fostering these emerging relationships.[45] With *ba*, people are able to work together more effectively because they become aware that they do in fact have a shared context, and can rely on more effective communication of ideas.[46]

2.2.3.2 The characteristics of *ba*

To describe *ba* as it relates to the SECI process I draw primarily on Nonaka and Konno's 1998 article, 'The Concept of "Ba"', in which they introduced *ba* to the SECI process and

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[41] Nonaka, I. and Konno, N. 1998. The Concept of *Ba*

[42] For example, David Snowden's *Cynefin* is a related concept that has a similar difficulty, coming as it does from the Welsh language and culture. Though related, Snowden takes pains to point out that his *Cynefin* differs from *Ba*. Snowden, D. 2002. Complex acts of Knowing, 104.

[43] Nonaka, I. and Konno, N. 1998. The Concept of *Ba*, 40.

[44] Nonaka, I. Toyama, R. and Konno, N. 2000. SECI, *Ba* and Leadership, 15

[45] von Krogh, G., Ichijo, K., Nonaka, I., 2000. *Enabling Knowledge Creation*, 7

[46] Stewart. 2001. *The Wealth of Knowledge*, 32

showed that each mode of knowledge described in the process has a corresponding type of *ba* that supports and speeds the conversion of knowledge:[47]

Originating *ba*

Socialisation is supported by *Originating ba*, which is the space in which feelings, emotions, experiences and mental models are shared by individuals and from which emerges care, love, trust and commitment. Individuals in this space exist in a state in which the barriers between themselves and others have been lowered, enabling tacit to tacit knowledge transfer. It is the primary *ba* from which the knowledge-creation process begins.[48]

Dialoguing *ba*

Externalization is supported by *Dialoguing ba*, which is a more conscious construct and comes about when individuals working towards a common purpose engage in dialogue. This dialogue allows individuals to share skills and mental models with others, while at the same time allowing them to reflect on and analyse their own, enabling tacit to explicit knowledge transfer. In this way a group of individuals is able to co-create knowledge.

Systemising *ba*

Combination is supported by *Systemising ba*, which is the context that allows an organisation's newly created knowledge to combine with existing organisational knowledge artefacts. This is an explicit to explicit knowledge process. *Systemising ba* was originally labelled '*Cyber ba*' because of most modern organisation's increasing use of information technology, which enhances the combination of knowledge through efficient distribution across networks. Due to the distributed nature of this knowledge, the 'space' of *Systemising ba* is considered virtual instead of physical.

Exercising *ba*

Internalization is supported by *Exercising ba*, which is the space in which individuals learn by internalising new knowledge through interaction and participation with existing explicit forms of knowledge. It is an explicit to tacit knowledge transfer. In this way an individual can achieve understanding of established knowledge.

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[47] Nonaka, I. and Konno, N. 1998. The Concept of *Ba*, 45-47. Note that while the underlying theory has not changed, Nonaka did alter some of the specific labels that were used to describe the various types of *ba,* therefore the *labels* used in this description come from a later paper, namely Nonaka, Toyama & Konno. 2000. 'SECI, *Ba* and leadership'

[48] Nonaka et al. 2006. Organizational Knowledge Creation Theory, 1181

2.2.3.3 The necessity of *ba*

The addition of the *ba* layer to the SECI process had become necessary because in some ways Nonaka's theory had become a victim of its own success. As he had predicted in 1994, companies were paying more attention to leveraging tacit knowledge in order to gain competitive advantage.[49] The growing appreciation of the competitive advantage that could be achieved by realizing an organisation's tacit knowledge had an unintended side effect. Now that more awareness had been generated about the potential of tacit knowledge, there was a misconception that with the correct systems and processes in place, this tacit knowledge could be isolated, extracted and treated as an organisational asset.[50]

Another managerial misunderstanding of knowledge had formed and tacit knowledge was being taken out of the shared context in which it had arisen. In Nonaka's view, people interpret information and create meaning from the unique perspective of their own personal context. While knowledge can be seen as a perspective on reality, it is only through the sharing of multiple contexts that a more complete picture of reality emerges.[51]

Context is therefore vital for knowledge creation. To harness knowledge that has been removed from this context will inevitably result in the misapplication of this knowledge and the erosion of any benefit that may be achieved. Thus by adding the explicit concept of *ba* as a framework within which the SECI process operates, Nonaka was highlighting the importance of context to the organisational knowledge creation process.

2.2.4 Knowledge Assets

2.2.4.1 Describing Knowledge Assets

An asset could be described simply as something that transforms raw material into a more valuable thing.[52] In the case of knowledge assets, as described by Max Boisot in his 1998 book *Knowledge Assets*, the initial 'something' is knowledge held by agents.[53]

In the knowledge creating organisation as described by Nonaka, knowledge assets are required in order to produce new knowledge, and they are also themselves the results of the knowledge creation process. These "inputs and outputs of the organisation's knowledge

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[49] Nonaka et al. 1994. Organizational Knowledge Creation Theory, 351

[50] Snowden, D. 2002. Complex acts of Knowing, 101.

[51] Nonaka, I. And Toyama, R. 2003. The knowledge-creating theory revisited, 3

[52] Stewart, T. 2001. *The Wealth of Knowledge,* 11

[53] Boisot, M. 1998. *Knowledge Assets*, 13

creating activities"[54] fall into one of four categories, as described in Nonaka, Toyami and Konno's 2000 article 'SECI, *Ba* and Leadership', which is the primary source of the descriptions that follow: [55]

Experiential Knowledge Assets

These are jointly built in the organisation as a result of the direct shared experiences of the members of the organisation, its customers, partners and suppliers. Examples of experiential knowledge assets include work experience, trust and the ability to read the organisation's 'mood'. Tacit in nature, these assets are part of an organisation's uniqueness and a source of competitive advantage.

Conceptual Knowledge Assets

These are the articulated expression of the organisation, such as brands and the distinctive 'look and feel' of the organisation. These are internal and external perceptions of the organisation. Examples of conceptual knowledge assets include the consistency in the design sensibilities of Apple's 'i' range of products, or the heraldry of a country (think of the organisational difference that was articulated by the change in the South African national flag). Though they are explicit, they are subject to many differences in perception and as such require constant monitoring to avoid a situation where internal and external perceptions become opposed.

ystemic Knowledge Assets

These are essentially knowledge artefacts that are easily transferred – "packaged explicit knowledge".[56] This is both the most visible and the most static type of knowledge asset. Examples include product specifications, instruction manuals and patents.

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[54] Nonaka, I. Toyama, R. and Konno, N. 2000. SECI, *Ba* and Leadership, 21

[55] Interestingly, unlike the characteristics of *ba*, which are explicitly mapped to specific corresponding quadrants of the SECI process, these four categories of knowledge assets are not overlaid in the two-by-two model. And yet it would appear quite logical to associate the categories of knowledge assets in this way – for example, experiential knowledge assets would appear to relate to the Socialisation process, conceptual knowledge assets to Externalization, and so on. However, no such direct comparison appears in the texts and we are therefore left to draw our own conclusions.

[56] Nonaka, I. Toyama, R. and Konno, N. 2000. SECI, *Ba* and Leadership, 21

Routine Knowledge Assets

These are the embedded practices and ways of doing things found in the organisation. Examples include the culture specific to a given organisation and routines for conducting business. Organisational values would also fall into this category of knowledge asset, and these can be powerful drivers of competitive advantage.[57]

2.2.4.2 (Re)-introducing Knowledge Assets to the Knowledge Creation model

Knowledge assets were the final element to be formally added to the organisational knowledge creation model. It may be a fairer representation of the situation to say that this element was simply re-introduced at a higher level of analysis. Just as context had always been part of the original model[58] but needed to be emphasised as *ba* in response to a misapplication of the theory, so too were knowledge assets a pre-existing part of the process[59] that had to be made more explicit in order to curb inaccurate organisational practices.

And it was in response to a similar issue to the one that prompted the explication of *ba* – new organisational roles were being created around the management of systemic knowledge assets *only*, to the exclusion of the other inputs and outputs of the knowledge creation process.[60] The dynamic nature of knowledge creation was being ignored, and a 'new model'[61] was needed to correct the view of knowledge assets as purely static exploitable resources.[62]

2.2.5 Leadership

Leadership is not a part of the formal knowledge creation model, but Nonaka and Konno point out that effective knowledge leadership is still very important to the success of the

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[57] For example, this knowledge asset is strongly displayed in the internationally respected consulting firm McKinsey & Company – see Rasiel and Friga, 2002. *The McKinsey Mind*

[58] In 'A Dynamic Theory of Organisational Knowledge Creation' Nonaka mentions that "it is possible to distinguish several "contexts" of knowledge creation such as the acquisition, generation, exploitation, and accumulation of knowledge" (Nonaka, 1994. A Dynamic Theory of Organisational Knowledge Creation, 32). Although we are only looking at labels without any further elaboration on the ideas behind them, it appears clear that these four 'contexts' share some similarities with the established characteristics of *ba,* and so in this 1994 paper we can see the seeds of the concept of *ba.*

[59] In 'The Concept of *Ba*', *Ba* is described as "the platform for the "resource concentration" of the organization's knowledge assets" (Nonaka, I. and Konno, N. 1998. The Concept of *Ba,* 41).

[60] This had also been recognised earlier in 'The Concept of *Ba*', where the authors cautioned that "The management of knowledge as a static stock disregards the essential dynamism of knowledge creation" (Nonaka, I. and Konno, N. 1998. The Concept of *Ba,* 53). Unfortunately it proved necessary to re-iterate this with a more explicit explanation of knowledge assets.

[61] Nonaka, Toyama & Konno. 2000. SECI, *Ba* and leadership, 30

[62] Nonaka, Toyama & Konno. 2000. SECI, *Ba* and leadership, 24

process.[63] It is not technically possible to *manage* the knowledge creation process – it can only be supported and encouraged through appropriate leadership. Nonaka et al. have identified a number of specific areas where leadership is important for knowledge creation:[64]

2.2.5.1 Leadership in Knowledge Creation

The primary responsibility of the leadership of an organisation is to provide a *knowledge vision* – a long-term objective that guides the evolution of the organisation's knowledge creation process, and aligns it with the organisation's strategic objectives. All other knowledge creation leadership functions are informed by this vision.

Leaders must develop and promote the *sharing of knowledge assets* that will be needed in order to achieve the knowledge vision. Existing knowledge assets must be examined in such terms. Should deficiencies be identified, top management and middle management (these latter are also called 'knowledge producers'[65]) must facilitate the development of appropriate new knowledge assets.

Knowledge is not created in isolation. It arises as the result of interactions.[66] Leaders need to be able to harness and direct these interactions *by building, connecting and energising ba***.** This might be through design, for example assembling the correct team of people, or by being able to recognise when *ba* has spontaneously emerged, and making sure this is used effectively. In either case, leaders succeed in this by providing the right conditions for *ba*, which are described in more detail in the next subsection.

Promoting the SECI process is another responsibility that leaders need to take in order to ensure uninterrupted knowledge creation within their organisation, though this role falls more to knowledge producers than top management. Middle managers tend to be best positioned to support all the modes of knowledge creation, though externalisation is the primary mode supported. These leaders promote dialogues between various parties (employees, management, partners and suppliers) that result in new ideas.

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[63] Nonaka, I. and Konno, N. 1998. The Concept of *Ba,*53.

[64] The next two sections (2.5.1 and 2.5.2) are primarily based on Nonaka, Toyama & Konno. 2000. SECI, *Ba* and leadership, 22-29

[65] "Middle managers work as knowledge producers to remake reality, or `produce new knowledge', according to the company's vision". Nonaka, Toyama & Konno. 2000. SECI, *Ba* and leadership, 22

[66] Kodama. 2005. New knowledge creation through leadership-based strategic community, 896

2.2.5.2 Fostering *ba*

While it is not possible to force *ba* into being, there are a number of ways in which Knowledge Leaders can ensure that the optimum operating environment exists for its natural development. Leaders can also learn to recognise nascent *ba* in their organisation and move to support its development. Nonaka et al. give some ideas into the kind of conditions in which they would expect *ba* to flourish,[67] which I will briefly describe here.

The first condition is *autonomy*. This essentially means that agents are considered responsible enough to self-organise towards achieving the objectives of the organisation.

Next is *creative chaos* – artificially stimulating a near-crisis state whereby agents are constantly challenged and forced to re-evaluate their assumptions. This condition must be carefully managed to avoid disorder, which would be counterproductive.

Redundancy is sometimes considered inefficient, and there are some dangers associated with it in terms of the total information load carried by each agent and the need to more carefully organise information within the organisation. However in terms of organisational knowledge creation, the overlap of information greatly assists in the transfer of tacit knowledge, and also enables self-organising agents (for example, in a self-organising team) to move fluidly between leadership and subordinate roles as and when needed, without costly interruptions of confusion or initiation.

Another condition considered necessary for optimal organisational knowledge creation is *requisite variety*, the matching of an organisation's internal composition to the challenges encountered within the organisation's operating environment. In the organisation knowledge creation context, requisite variety relies on equal access to information for all agents of the organisation, either through an open-access information system, or through equal access to organisational knowledge through task rotation.

The final condition is *love, care, trust and commitment* – and here knowledge producers need to lead by example. Without an organisational environment that promotes these values, knowledge sharing is curtailed, and in the absence of knowledge sharing, the SECI process breaks down.

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[67] At the same time, they carry the assumption that Knowledge Producers would be empowered to make the levels of decisions and provide the kind of environments that support these activities – i.e. in many ways the assumed starting point is an egalitarian organisation that is already a nurturing environment for knowledge creation.

2.2.5.3 "Reading the situation"

These leadership roles as defined by Nonaka and his co-authors a little over a decade ago continue to remain relevant to the process.[68] I would add one unstated overarching requirement for successful leadership in the knowledge creating organisation – being able to 'read the situation'.[69] This essentially requires the leaders of an organisation to be involved enough with the everyday reality of the organisation and each other as to allow them to agree on a common interpretation of the knowledge assets and interactions within the organisation, as well as those outside the organisation that impact on it. Furthermore it requires a level of self-awareness; as leaders of an organisation are naturally part of the organisation's interactions and will contribute to the organisation's knowledge assets, they cannot effectively 'read the situation' if they do not factor themselves into it as well.

2.2.6 Summary

The preceding section briefly covered the three elements that form Nonaka's model of organisational knowledge creation – the SECI process of knowledge conversion; *ba*, the context for knowledge creation, and knowledge assets. These latter two elements, while always being part of the original model, have been re-stated more emphatically in response to misunderstandings or misapplications of the original concepts. In a way the emergent nature of the theory over this time serves to illustrate Nonaka's own knowledge conversion process as the elements of his theory emerge more explicitly from the texts that he has produced through dialogue with his various co-authors.

I have shown that this model is the most influential and widely accepted framework of organisational knowledge creation in knowledge management literature, and briefly explained the three major components of this model, as well as acknowledging the role of leadership in the knowledge creation process. This model is what will be considered the 'knowledge management perspective' on knowledge creation for the purposes of this thesis.

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[68] For example, the 'SECI, *Ba* and leadership' article is relied on for its definitions of leadership in the knowledge creating process by Nonaka et al. in a 2006 article (Organizational Knowledge Creation Theory), and most recently by von Krogh et al. in a 2011 article (Leadership in Organizational Knowledge Creation).

[69] Unstated, because in 'SECI, *Ba* and leadership', the authors of refer to the need for leaders to 'read the situation' quite frequently – at least seven times from pages 23 to 27, referring to it again on pg 29 – but do not elaborate on what this actually involves.

2.3 Organisational Sensemaking

We now turn to a brief discussion of organisational sensemaking and a brief outline of the core themes.

2.3.1 Background

For the purposes of this thesis, the approach to sensemaking[70] adopted is the one outlined and continuously updated by Karl Weick in his many publications. However, it must be noted that Karl Weick is not the originator of the *concept* of sensemaking. This has its roots in psychology and was established in the literature before Karl Weick's application of it to the organisational context.[71] Weick has himself acknowledged that there are many different definitions of sensemaking.[72] The specific application of these definitions would depend on the context under examination.

For example, there are at this time at least three other prominent areas of study where sensemaking theory is used as a tool for furthering understanding: in Library and Information Science,[73] in psychology emphasising macrocognition,[74] and most recently in computer science, in the field of Human-Computer Interaction (HCI).[75] These all have a slightly different emphasis on sensemaking than is encountered in Weick, but they have not developed in a vacuum. Despite all of these being different applications of sensemaking theory, with different foci, there has been some mutual influence (or at least mutual

[70] This is also written as 'sense making' or 'sense-making' in some sources, I have chosen to standardise the term where used by other authors (except in direct quotations) in line with Weick's writings to eliminate confusion.

[71] Weick provides a convenient history of the writings that influenced the development of his theory in a section entitled 'Historical Roots of Sensemaking' in Chapter 3 of *Sensemaking in Organisations*. The earliest reference in this list is W. James' *The principles of psychology,* dating originally to 1890 (Weick. 1995. *Sensemaking in Organisations,* 64).

[72] Weick. 1995. *Sensemaking in Organisations,* 4

[73] And within this context, also in the field of in the field of communication research and practice. This methodology has been spearheaded since 1972 by Brenda Dervin. She has established a website of her work at http://communication.sbs.ohio-state.edu/sense-making/.

[74] As described by Gary Klein (see for example Klein et al. 2006. Making Sense of Sensemaking 1; Klein et al. 2006. Making Sense of Sensemaking 2).

[75] The origin has been attributed to a 1993 article by Russell et al., but the acceleration of interest in sensemaking in the HCI field can be traced to a major Computer–Human Interaction Conference in 2008 (See Pirolli and Russell. 2011. Introduction to this Special Issue on Sensemaking).

awareness) across them.[76] As such, a discussion of organisational sensemaking will illuminate the fundamentals of sensemaking theory in general.

Weick is a prominent figure in organisational studies, and has been writing about the process, or elements of the process, of organisational sensemaking for the past five decades.[77] Weick has frequently revisited and reworked his thoughts on sensemaking over the years and over many journal articles. Due to the evolutionary nature of Weick's work, any attempted explanation of his theory of organisational sensemaking must be read with the caveat that it merely describes a stage in an on-going process (Taylor and Van Every encountered a similar problem when engaging with Weick's writing on enactment),[78] and as such can only be treated with a 'broad sweep'.

There are certain consistent themes within Weick's writings on sensemaking, and these may for the most part be found in Weick's influential and much-referenced book explicitly on the topic, *Sensemaking in Organisations.*[79] It was published in 1995, the same year as Nonaka and Takeuchi's *The Knowledge Creating Company.* Unlike Nonaka, however, Weick provides no convenient diagrams or models to neatly summarise his theory.[80] *Sensemaking in Organisations* is very much a part of the on-going conversation that Weick is still having, both with his readers and himself. For our purposes this book provides a convenient anchor in the continuous flow of ideas that Weick expresses.

The sensemaking perspective adopted herein is primarily from *Sensemaking in Organisations*, but is also informed by a more recent article, 'Organizing and the process of

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[76] Weick draws on Klein in some of his work, and has co-written a short article with him in the past (Weick and Klein. 2000. Making Better Decisions); Both Klein and Russell reference Weick's *Sensemaking in Organisations* in the articles mentioned above, as well as in other writings. Weick lists Dervin amongst his references in a recent collection of his works (Weick. 2009. *Making sense of the organisation: the impermanent organization*), and Dervin includes Weick, Klein and Russell in her recent article on sensemaking in the 3rd edition of the Encyclopaedia of Library and Information Sciences (Dervin and Naumer. 2010. Sense-Making). The Dervin and Naumer article provides a convenient overview of these other perspectives, with the caveat that within the article there may be some bias towards Dervin's Library and Information Science approach, which has the closing paragraphs, and is set apart from the others.

[77] Weick points out that in some ways he has simply been building on and reiterating seeds of thought first sown in his 1961 dissertation on cognitive dissonance (Weick. 2006. Faith, Evidence, and Action, 1734).

[78] Taylor and Van Every. 2000. *The Emergent Organization*, 245.

[79] Ten years after *Sensemaking in Organisations* was published, the ISI Web of Knowledge showed that it had attracted 814 published references (Weber and Glynn. 2006. Making Sense with Institutions, 1639).

[80] As he warns his readers in the preface to *Sensemaking in Organisations,* "The sensemaking perspective is a frame of mind about frames of mind that is best treated as a set of heuristics rather than an algorithm" (Weick. 1995. *Sensemaking in Organisations*, xii).

sensemaking', co-written with Kathleen Sutcliffe and David Obstfeld in 2005.[81] This piece is acknowledged by Weick as an "updated view" of his work on sensemaking[82] and is the article to which Weick himself points when he wishes to refer his readers to the topic of organisational sensemaking in some of his more recent writings.[83] Therefore the 'broad sweep' that will follow is also informed and updated by this more recent view.

2.3.2 Criticisms of Organisational Sensemaking

As may be expected with a scholar of the scope that Weick encompasses, his work has been subject to certain criticisms over the years. The exact nature of this criticism varies. Some is relatively soft and amounts simply to concerns over lost opportunities. An example of this is the criticism that Weick missed an opportunity to explore organisational sentiments in *Sensemaking in Organisations.*[84]

A more substantial criticism is that he has ignored "larger social and historical contexts in sensemaking", [85] such as the charge levelled by Taylor and Van Every that Weick's work lacks understanding of institutionalization, and therefore glosses "inherent contradictions in organisational structure". [86]

Weick is aware of his shortcomings, such as they are. As he notes, "I'm weak on boundary conditions, strong on shameless generalizing". [87] As with the criticisms of Nonaka's theory of organisational knowledge creation, however, they in no way invalidate the use of Weick's theory of organisation sensemaking as the sensemaking perspective that will be used in this thesis. If anything, the existence of formal criticism from other thinkers is a tacit acknowledgement of the relevance of Weick's work.

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[81] Again, interestingly, much as Nonaka updated/revisited his thinking with his 2006 article Organisational Knowledge Creation Theory – so about a decade in each case.

[82] Weick, K. 2009. *Making sense of the organisation: the impermanent organisation*. 49.

[83] For example, Weick. 2011. Reflections; Weick. 2011. Organizing for Transient Reliability.

[84] This criticism, originally raised in a 1997 article by Magala, is noted and addressed in 'Organizing and the process of sensemaking', 418.

[85] Weber and Glynn. 2006. Making Sense with Institutions, 1639. They identified this criticism in an article designed to address the issue.

[86] Taylor and Van Every. 2000. *The Emergent Organization*, 275. This criticism did not deter Weick from referencing *The Emergent Organisation* in some of his later writings. In fact, in one example he even used a sentence from the very paragraph containing the pithiest criticism, noting that the language was 'colourful' (Weick et al. 2005. Organizing and the Process of Sensemaking, 409).

[87] Weick, K. 2007. The generative properties of richness, 14

2.3.3 Basic outline of Organisational Sensemaking

To Weick, sensemaking is exactly that; literally the process of making something sensible.[88] It is "a largely invisible, taken-for-granted social process"[89] that occurs when someone encounters a situation that differs from the situation that they were expecting;[90] therefore a condition for sensemaking is that situation must first be *perceived as different* or it will not prompt the process. [91] If a situation *is* recognised as different, it results in an interruption of thought. This occupies the sensemaker's attention until the interruption can be resolved. [92] Through this process, which involves selective noticing of the elements of a situation, people actively create their own reality. [93]

2.3.4 Resources for Sensemaking

Since at least the publication of *Sensemaking in Organisations* in 1995, Weick's discussion of organisational sensemaking has been fairly consistent in his description of seven elements that are present during the sensemaking process. In *Sensemaking in Organisations* they are called the 'seven properties of sensemaking' and form the second chapter of the book. In his more recent writings, they are referred to as 'resources for sensemaking'[94] rather than 'properties', but they serve the same purpose – representing the situation present during moments of sensemaking.[95]

The seven, as represented in the summary at the end of chapter two of *Sensemaking in Organisations*, are Identity, Retrospect, Enactment, Social, Ongoing, Extracted Cues and Plausibility.[96] These were later rearranged into the acronym 'SIR COPE' [97] (with 'extracted

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[88] Weick. 1995. *Sensemaking in Organisations*, 16

[89] Weick et al. 2005. Organizing and the Process of Sensemaking, 417

[90] Weick et al. 2005. Organizing and the Process of Sensemaking, 414. See also Weick. 1995. *Sensemaking in Organisations*, 100.

[91] Lack of appropriate sensemaking carries risk. Examinations of the fatal consequences of not recognising a situation as new or different are a rather sombre staple in Weick's writings; for example in his examination of the Bhopal disaster (1988/2010), or the fire at Mann Gulch (1993)

[92] Weick. 1995. *Sensemaking in Organisations*, 101

[93] Weick. 1995. *Sensemaking in Organisations*, 14.

[94] For example, in Weick. 2006. Faith, Evidence, and Action; Weick. 2011. Organizing for Transient Reliability

[95] Weick, 2010. Reflections on Enacted Sensemaking in the Bhopal Disaster, 544

[96] Weick. 1995. *Sensemaking in Organisations*, 61-62

[97] The earliest appearance of these seven elements repackaged as SIR COPE that I have found reference to is 'Weick. 1999. Sensemaking as an Organisational Dimension of Global Change', in Weick. 2001. *Making Sense of the Organisation*, 458 – 472. As of 2011, Weick still refers to SIR COPE in his writings (for example, Weick. 2011. Organizing for Transient Reliability, 24).

cues' used as the 'c'), and this is the order in which they are presented in the brief overview of these resources that follows.

2.3.4.1 Social

As previously mentioned, sensemaking is a social process, human thinking does not occur in a vacuum, but rather is influenced by the social relations of the sensemaker – what Weick refers to as the 'intertwining of the cognitive and the social'.[98] Crucially, for this thesis, this social aspect is true even when the social relation is *anticipated* rather than actively engaged by the sensemaker, and the social reality exists as a purely constructed artefact. [99]

Weick however warns against a too-simplistic reading of the social activities that allow sensemaking, pointing out that it occurs not just in the context of social construction, but that sensemaking is also social when "people coordinate their actions on grounds other than shared meanings, as when joint actions are coordinated by equivalent meanings… distributed meanings… overlapping views of ambiguous events…, or nondisclosive intimacy."[100]

2.3.4.2 Identity

Moments of sensemaking are influenced by the sensemaker's perception of their identity, but this identity is not fixed – rather, that identity is "constituted out of the process of interaction",[101] the sensemaker is constantly adjusting their self-perception in response to their awareness of the reactions of others. This 'destabilization' of identity is an opportunity for sensemaking. Weick elaborates: "From the perspective of sensemaking, who we think we are (identity) as organisational actors shapes what we enact and how we interpret, which affects what outsiders think we are (image) and how they treat us, which stabilizes or destabilizes our identity. Who we are lies importantly in the hands of others, which means our categories for sensemaking lie in their hands. If their images of us change, our identities may be destabilized and our receptiveness to new meanings increase".[102]

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[98] Weick. 1995. *Sensemaking in Organisations*, 38.

[99] Weick. 1995. *Sensemaking in Organisations,* 39-40

[100] Weick. 1995. *Sensemaking in Organisations,* 42. The consequences of distributed meanings are examined in more detail later, as they are particularly pertinent to geographical dispersion.

[101] Weick. 1995. *Sensemaking in Organisations,* 20

[102] Weick et al. 2005. Organizing and the Process of Sensemaking, 416

2.3.4.3 Retrospect

Meaning is attributed through the focussing of attention, but attention can only be attributed to events that have already occurred, even if the time between the event and the meaning assigned is very short.[103] The sense made of a situation in the past is dependent on whatever is occurring in the 'now'.[104] As the circumstances of the present change, then exactly the same past event can take on a new and different meaning. An example Weick gives is of a nurse who realises that the health of the infant she is monitoring has deteriorated in the space of a few hours – but the nurse can only determine that the condition is worsening by comparing her current observations against her observations of a few hours before. [105]

2.3.4.4 Cues

When an opportunity for sensemaking arises, the sensemaker selectively extracts cues from the environment. Weick defines extracted cues as "simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring." [106] They are described as *seeds* because simply extracting the cue is only a precursor to the sensemaking process. Sense is made when meaning is assigned to the extracted cues.[107]

It is during the extraction of cues that *context* is paramount. Weick uses the concept of 'frames' to represent the structure of context. Cues can only be extracted and made sense of if they are noticed, and a person's frames affect what cues that person can notice in the first place. [108]

In an organisation with differing norms and expectations, institutional and cultural politics, domain-specific knowledge and hierarchical levels, a multitude of frames will exist. [109] The consequence of this is that for any given sensemaking opportunity, people with different frames will notice different cues, leading to differences in interpretation of common events.

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[103] Weick. 1995. *Sensemaking in Organisations,* 26

[104] Weick. 1995. *Sensemaking in Organisations,* 27

[105] Weick et al. 2005. Organizing and the Process of Sensemaking, 411-412

[106] Weick. 1995. *Sensemaking in Organisations*, 50

[107] Weick. 1995. *Sensemaking in Organisations*, 52

[108] Weick. 1995. *Sensemaking in Organisations*, 51

[109] Weick. 1995. *Sensemaking in Organisations*, 53

2.3.4.5 Ongoing

Sensemaking is catalysed by breaks in flow, when people are forced to notice the 'now' by comparing it to the past. [110] This produces discomfort, and an initial response to this interruption is to attempt to return to the disrupted activity. [111] This is hardwired, occurring at the level of the autonomic nervous system[112] and this state of what is called 'autonomic arousal' lasts until the interruption is either removed or bypassed in such a way as to allow the interrupted flow to continue. [113]

While in this state of autonomic arousal and the longer this state persists, people experience an increase in emotional response. In the organisational context these emotions are more likely to be negative than positive[114] and this can influence sensemaking. People tend to be influenced by their mood – narrowing their retrospective sensemaking resources only to those that match their current mood in order to make sense of the current interruption. [115] Therefore, if the current response is negative, past negativity will influence the sense that is made of the current event.

2.3.4.6 Plausibility

In order for something to make sense, it needs to be plausible. Plausibility is not dependent on truth – rather "it is about continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism". [116] If something is *implausible*, on the other hand, it may be true but it may not be acknowledged as such.

Recognition of truth and plausibility are dependent on the frames of the sensemaker; if something is true but implausible it may be ignored if it falls outside of the available scope of

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[110] Weick. 1995. *Sensemaking in Organisations*, 43

[111] Weick et al. 2005. Organizing and the Process of Sensemaking, 409

[112] Weick. 1995. *Sensemaking in Organisations*, 45. The response is a defence mechanism – a precursor to the 'fight or flight' response, it puts people into a mode where they are receptive to cues that might otherwise have gone unnoticed.

[113] Weick. 1995. *Sensemaking in Organisations*, 46

[114] Weick. 1995. *Sensemaking in Organisations*, 48

[115] Weick. 1995. *Sensemaking in Organisations*, 49

[116] Weick et al. 2005. Organizing and the Process of Sensemaking, 418.

thinking,[117] whereas if something is plausible but not established as true it may see action. [118] This is because "people see and find sensible those things they can do something about." [119]

In organisations, the environment is often interrupted and confusing, with members of the organisation having limited attention with which to engage with multiple processes. Establishing the accuracy of something in this environment is unrealistic, and if accuracy were necessary for sensemaking to occur, organisations would routinely be paralysed and ineffective. Since something need only be plausible, however, members of an organisation "can act effectively simply by making sense of circumstances in ways that appear to move toward general long-term goals."[120]

2.3.4.7 Enactment

Action is a precondition for sensemaking. [121] It can be proactive or reactive, but without action, people would not be able to cope with disruption;[122] *enactment* is the 'making' in sense*making* –it is what unites action and cognition.[123]

To make sense is to act, and to act is to create an effect on the environment, the results of which can generate further occasions for sensemaking.[124] In other words, "people often produce part of the environment they face".[125] To try to separate the sensemaker from the environment in which sense is being made is futile. [126]

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[117] For example, the paediatricians who were unable to make sense of the evidence of what was later labelled battered child syndrome in the anecdote with which Weick opens chapter one of *Sensemaking in Organisations*.

[118] There are many examples of this on both the grand and small scale. An example of the former may be the claims about the existence of weapons of mass destruction that were used by some governments to justify the military action taken in Iraq.

[119] Weick. 1995. *Sensemaking in Organisations*, 60

[120] Weick et al. 2005. Organizing and the Process of Sensemaking, 415

[121] Weick. 1995. *Sensemaking in Organisations*, 30

[122] Weick et al. 2005. Organizing and the Process of Sensemaking, 418

[123] Weick. 1995. *Sensemaking in Organisations*, 30

[124] Weick. 1995. *Sensemaking in Organisations*, 31

[125] Pondy and Mitroff.1979. Beyond open systems models of organisation, 17. Quoted in Weick. 1995. *Sensemaking in Organisations*, 30

[126] Weick. 1995. *Sensemaking in Organisations*, 32

2.3.5 Drivers of Sensemaking

The resources that have just been examined are useful because they equip us with the necessary language to *recognise* and *describe* opportunities for sensemaking. As Weick demonstrates, this helps us to link events back to conceptual systems that are built around belief and action, [127] which are the drivers of the sensemaking process.

Weick identifies four ways in which action and belief drive sensemaking. With beliefs, the drivers are *arguing* or *expecting*; with actions they are *committing* or *manipulating.* [128]

Although they will be discussed sequentially, it is important to remember that in describing belief and action a starting point, while necessary, is arbitrary. Beliefs and actions are interrelated; beliefs are mediated by actions, and actions by beliefs; thus the processes of sensemaking can start with any of these drivers. [129]

2.3.5.1 Belief-driven sensemaking

An important sensemaking effect of beliefs is how they influence *noticing*. What people believe influences what they notice, the frames that people have, and the cues that can be accommodated by these frames.[130] All of which has a direct impact on their resources and opportunities for sensemaking. Belief-driven sensemaking can emerge through arguing and expectations, and as will be explained, Weick associates each of these with specific organisational artefacts in which they tend to manifest.

Arguing

Reiterating that sensemaking is a social process, we can see that when sense is made by an organisational actor, it is not a self-contained event; and a group making sense of the same event will tend to notice cues differently. Therefore the sense that is made in an organisation is open to contradiction, which results in arguing. [131]

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[127] Weick. 2010. Reflections on Enacted Sensemaking in the Bhopal Disaster, 544

[128] Weick. 1995. *Sensemaking in Organisations*, 135

[129] Weick. 1995. *Sensemaking in Organisations*, 155-156

[130] Weick. 1995. *Sensemaking in Organisations*, 133

[131] Weick. 1995. *Sensemaking in Organisations*, 136

Arguing is commonly encountered in sensemaking, and although arguments do not necessarily result in anger, they do tend to result in 'heated' exchanges.[132] Anger is counterproductive in sensemaking terms because it negatively impacts communications, and "degrades the quality of the argumentation through narrowed attention as a result of heightened arousal".[133] Thus in an organisation where members are emotionally engaged in argument, communication and sensemaking on areas outside of the immediate issue are likely to be minimal.

If left to run their course unchecked, arguments could compromise the goals of the organisation. It is therefore no surprise that organisations utilise a specific artefact to direct and frame argument – the meeting. Weick quotes Schwartzman, writing in 1989, to define a meeting as "a gathering of three or more people who agree to assemble for a purpose ostensibly relating to the functioning of an organisation",[134] To Weick, meetings "…create the infrastructure that creates sense".[135]

The importance Weick accords meetings also serves to illustrate that to his thinking at that time, this driver of sensemaking is necessarily experienced in face-to-face settings.

Expecting

Arguments involve the capacity for strengthening or weakening of beliefs depending on the relative strengths and weaknesses of the participants in the resultant sensemaking. Expectations, on the other hand, tend to be strongly held beliefs and serve to narrow attention towards the confirmation of the thing expected, while not being made available for contradiction.[136]

While this approach would necessarily sacrifice accuracy, it holds certain advantages. By fast-forwarding attention and plausibility in the way that it does, expectation allows people to make sense of the expected event far more efficiently, with far fewer cues, allowing scant

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[132] Weick. 1995. *Sensemaking in Organisations*, 137

[133] Weick. 1995. *Sensemaking in Organisations*, 138. The concept of narrowed attention will be revisited in this thesis, as it relates to media richness. To foreshadow this somewhat, however, Weick's description of the effects of anger on communication and sensemaking bode ill for anyone who hopes to achieve meaningful communication via lean channels when heightened emotions are involved.

[134] Weick. 1995. *Sensemaking in Organisations*, 144.

[135] Weick. 1995. *Sensemaking in Organisations*, 144

[136] Weick. 1995. *Sensemaking in Organisations*, 145

attention resources to be directed elsewhere more quickly.[137] The example Weick provides where expectations are the main sensemaking driver is of a person who has been newly introduced to another person, or a new job, or a new setting. When this occurs, "their expectations cannot help but be a force that shapes the world they try to size up".[138]

Weick identifies the organisational artefact associated with expectation as the 'self-fulfilling prophecy'.[139] These tend to be strengthened by power imbalances (as a more powerful party is less constrained by the organisation and can therefore impose their reality on others) and by the need for predictability and stability through the reduction of uncertainty.[140]

In an organisation where accuracy is valued and encouraged, there will be less room for self-fulfilling prophecies, but in many organisations "the costs of being indecisive frequently outweigh the costs of being wrong".[141] Where some people hold more power than the average member, and where those same more powerful people value predictability and stability over accuracy, the self-fulfilling prophecy will be the dominant form of organisational sensemaking.[142]

In conclusion, Weick reveals that his explanation of belief driven sensemaking is in fact a cycle between arguing and expectations. Arguing is only possible as a form of sensemaking when people are not ruled by expectations; and expectations will rule people until there is sufficient stability to allow the space that supports arguing.[143] Hierarchy will also play a part in certain organisations – in the absence of power imbalances, arguing would be the more typically encountered sensemaking process. Therefore it would be possible to have an organisation where a managerial layer made sense through argument, but this sense was then imposed on the next layer below them in the form of expectations.

2.3.5.2 Action

Organisations are assembled around goals, and achieving goals implies action. However, actions within organisations are often undirected by organisational goals– many actions occur

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[137] Weick. 1995. *Sensemaking in Organisations*, 146-147
[138] Weick. 1995. *Sensemaking in Organisations*, 148
[139] Weick. 1995. *Sensemaking in Organisations*, 147
[140] Weick. 1995. *Sensemaking in Organisations*, 150
[141] Weick. 1995. *Sensemaking in Organisations*, 153
[142] Weick. 1995. *Sensemaking in Organisations*, 153
[143] Weick. 1995. *Sensemaking in Organisations*, 154

autonomously, independently of formal structure, and are prompted by multiple sources.[144] From a sensemaking perspective, actions are interpreted rather than chosen.[145]

Weick identifies two types of actions involved in sensemaking – *commitment*, which is usually singular action for which a person is responsible; and *manipulation*, many simultaneous actions that have led to a 'visible change' in the environment, which must be explained.[146] Of the two, commitment is rarer, as the environmental change of manipulation is more generally more visible in an organisation.

Commitment

When someone performs an action that is public, irrevocable, and of their own volition, they are then 'bound' to it – they are committed to that action, and must justify it in order to render it sensible.[147] This is highly desirable from the sensemaking perspective, as the need to justify actions focusses attention, leading to the extraction of richer details from the environment, and generally leads to more sense being made in a more orderly manner.[148]

If however the organisational context is one where the factors influencing commitment are lacking, i.e. there is secrecy, deniability and coercion, then the organisation is effectively discouraging sensemaking and the ability of its members to make sense of the organisation. A lack of commitment means that too many options become available for sensemaking, which leads to senselessness[149] and threatens the identity of the organisation. Without sensemaking, there is no decision-making, and "An organisation that makes no decisions is a nonorganisation; it is disorganised." [150] Organisations that encourage commitment should therefore have well defined identities and substantial meaning.

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[144] Weick. 1995. *Sensemaking in Organisations*, 133

[145] Weick et al. 2005. Organizing and the Process of Sensemaking, 409

[146] Weick. 1995. *Sensemaking in Organisations*, 156

[147] Weick. 1995. *Sensemaking in Organisations*, 157-158

[148] Weick. 1995. *Sensemaking in Organisations*, 159

[149] Weick. 1995. *Sensemaking in Organisations*, 160

[150] Weick. 1995. *Sensemaking in Organisations*, 159

Manipulation

With sensemaking as manipulation, the action itself is not as important as the meaningful consequences of that action.[151]

In discussing manipulation, Weick argues that the organisational environment can be manipulated by organisational actors, and that people choose their own constraints, as "once people choose how to justify the action that they chose to perform, they fix the frame within which their beliefs, actions and associations will then make sense". [152]

He provides a very powerful example of a coalition of stakeholders who lobbied US Congress to get daylight savings time altered from the last Sunday in April to the first Sunday in April. This successful lobby had a material impact on the social reality for themselves and of course for that society at large. They successfully manipulated their environment and made it more sensible within the frame that they had fixed. [153]

In conclusion, manipulation is the process of generating things. Once a thing is generated, it can be engaged with and made sensible. Where commitment focussed on the 'why' of an action (justification), manipulation focusses on the 'what happened?', and, once what happened is visible, asks 'and what does this mean?' [154]

2.3.6 Summary

The preceding section briefly described Weick's pedigree as an established and relevant writer on sensemaking. The most prominent elements that form Weick's theory of organisational sensemaking were discussed in the form of the seven resources for, and the main drivers of, sensemaking. The seven resources are important because they also serve as our resources for engaging with the language of organisational sensemaking; while the

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[151] Weick. 1995. *Sensemaking in Organisations*, 168

[152] Weick. 1995. *Sensemaking in Organisations*, 164

[153] Weick. 1995. *Sensemaking in Organisations*, 165. A more recent example of the manipulation of the organisational environment is the case of the government of Prime Minister Tuilaepa Sailele Malielegaoi of Samoa. Samoa's major trading partners have in the last hundred years changed from the USA and Europe to Australia and New Zealand. As a result, Samoa found itself at a disadvantage due to being almost a full day behind Australia and New Zealand. Therefore, the Samoan government decided to switch time zones; this 'moved' Samoa to being 3 hours ahead of Sydney, at the cost of the 30th of December 2011, which will officially not have existed in Samoa ('Samoa loses day with dateline switch'. Available at http://www.news24.com/World/News/Samoa-loses-day-with-dateline-switch-20111229, Last accessed 30th December 2011).

[154] Weick. 1995. *Sensemaking in Organisations*, 168

drivers reveal the constant dynamic behind beliefs and actions that motivate the sensemaking process. This theory will be used as the 'sensemaking perspective' for the purposes of this thesis.

2.4. Conclusion

Nonaka's knowledge creation model and Weick's theory of organisational sensemaking have been presented in brief in this chapter. The central ideas for Nonaka's organisational knowledge creation are the SECI process, *ba*, knowledge assets and leadership, though the SECI process is the most prominent of these. The central ideas for Weick's organisational sensemaking are the resources for sensemaking, summarised by SIR COPE, and the drivers of sensemaking: beliefs and actions.

One concept that we encounter in both theories that may be considered boundary-crossing, linking both, is the importance of *context*. Nonaka aligns *ba* with meaningful contexts that nurture and generate opportunities for the creation of new organisational knowledge, while in his explanation of cues and frames Weick shows how the recognition of novelty (and therefore the meaning that can be extracted from the recognition) is contingent on the context of each individual and their environment. In combination, these theories provide valuable insight into the process of collaborative knowledge creation. When people who work together towards a shared goal also share contexts, they have the opportunity to communicate effectively because they will be able to extract similar meanings from the same events, so their sensemaking and knowledge conversion processes will tend towards mutual understanding. In the absence of a shared context, communications between collaborating agents can suffer a 'silent failure' as it breaks down within the sensemaking apparatus of each participant, who then extract different meanings from the same situations. Context, and an appreciation for its development, is therefore a crucial part of the organisational knowledge creation and sensemaking processes.

The dynamics of how agents are contextualised are discussed in the next chapter.

Chapter Three
Establishing Organisational Context

3.1 Chapter Outline

Having discussed the main points of the theories that will be used to examine organisational knowledge creation, this chapter will examine how organisational contexts are developed, through an examination of socialisation, an important dynamic common to the theories of both Weick and Nonaka.

In chapter one, I established that context is of particular importance in knowledge creation theory (being related to the concept of '*ba'*) and is also vital to organisational sensemaking (being related to the frames into which people pack the cues that they notice in their environment). The dynamics of organisational knowledge creation and organisational sensemaking call for *shared* context: From the knowledge management perspective, shared context leads to the opportunity for shared experience. When people share experience, they gain a tacit appreciation for each other's ways of thinking and skills.[155] This *tacit* appreciation corresponds to the socialisation element of the SECI model. In sensemaking, a shared context is an opportunity for people to learn to pack cues into frames in a similar manner, or in other words for people to become accustomed to the way in which other people (to whom there has been sufficient exposure) will make sense of things.[156] This is the social element of sensemaking. In both, this socialisation dynamic represents an opportunity for knowledge creation.

Therefore the upcoming discussion will initially focus on socialisation and organisational culture, and also examine the effects of dispersion on trust. Socialisation, trust and culture all contribute to the context of organisational agents.

In order to effectively investigate the dynamics of *distance* and its impact on communication in teams, this chapter concludes with a clarification of the states of *nearness* briefly mentioned in the introduction – proximity and collocation. These related concepts have implications for the communication dynamic in an organisational unit.

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[155] Nonaka and Takeuchi. 1995. *The Knowledge-creating Company*, 62

[156] In Weick's terms "People construct shared meaning for a shared experience". Weick. 1995. *Sensemaking in Organisations*, 188

3.2 Socialisation and the Geographically Dispersed Organisation

The process of organisational knowledge creation is inherently social,[157] and as such, the social contexts of those individuals engaged in co-creating knowledge have a direct impact on the quality, scope and nature of the knowledge created. Likewise, sensemaking has been identified as a social process, one that is influenced by the social context of the sensemaker. As stated above, in both knowledge creation and sensemaking there is an emphasis on *shared* context. Sharing organisational context can be problematized by geographic dispersion, but distance is not necessarily the death of context.

3.2.1 Organisational Socialisation Defined

The concept of organisational socialisation was well established before Nonaka included a very specific interpretation of it in his SECI frame. Louis defined it as "the process by which an individual comes to appreciate the values, abilities, expected behaviors, and social knowledge essential for assuming an organizational role and for participating as an organizational member" and identified it as a process that continued throughout an adult's life.[158] This is because as someone moves from organisation to organisation, they effectively need to recalibrate to each new organisational context,[159] though integration becomes smoother if they perform a similar type of job in similar kind of organisation.[160]

3.2.2 Revisiting Socialisation in Nonaka's Writings

In the theory of organisational knowledge creation, socialisation is a tacit interactive process – the individual learns what they need to know to assume their organisational role and to participate as an organisational member only through interaction with other organisational members. This learning is a tacit process but is also the only way to acquire tacit knowledge from within the organisation, bound as it is to "action and in an individual's commitment to a

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[157] Kodama. 2005. New knowledge creation through leadership-based strategic community, 896

[158] Louis. 1980. Surprise and Sense Making, 229-230

[159] Louis refers to this as 'learning the ropes'. During this time it is the most likely that a newcomer will make the most mistakes as they try to apply their prior experience to their new context. Where this prior experience is misaligned with the new organisation, "inappropriate and dysfunctional interpretations may be produced". (Surprise and Sense Making, 243). It is for this reason that an excellent induction programme would be of great benefit to any organisation, though in my limited experience, this is all too often overlooked.

[160] Louis. 1980. Surprise and Sense Making, 235.

specific context – a craft or profession, a particular technology or product marker, or the activities of a work group or team".[161]

As it is a process that occurs only on the level of the individual, Nonaka initially viewed it as a somewhat limited form of knowledge creation, not easily used by the organisation as a whole.[162] He later clarified this limitation by saying that "for new tacit knowledge to emerge through socialisation the group must be small: five to seven people".[163]

Later, Nonaka explicitly linked 'socialisation' with 'shared experience', pointing out that taking information out of the context of shared experience would strip it of meaning, [164] and defining socialisation as the "process of creating tacit knowledge through shared experience".[165]

When initially formally introducing his concept of *ba* to organisational knowledge creation theory, Nonaka further refined his definition and stipulated that, as socialisation was the vehicle for tacit knowledge sharing, and as tacit knowledge is exchanged through joint, proximal activity, "in practice socialisation involves capturing knowledge through physical proximity". [166]

In a more recent take on his organisational knowledge creation theory, Nonaka established socialisation as the starting point for knowledge creation and defined it as the "process of converting new tacit knowledge through shared experiences in day-to-day social interaction", which is achievable "only through shared direct experience, such as spending time together or living in the same environment". [167]

As he had in his 1991 article, Nonaka once again used the example of a traditional apprenticeship to convey his meaning when reviewing his theory, but later updated this to include informal interactions outside of the workplace, where tacit knowledge including world views, mental models, and mutual trust can be created and shared,[168] thus showing that

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[161] Nonaka. 1991. The Knowledge Creating Company, 98

[162] Nonaka. 1991. The Knowledge Creating Company, 99.

[163] von Krogh et al. 2000. *Enabling Knowledge Creation*, 14.

[164] Nonaka. 1994. A Dynamic theory of Organisational Knowledge Creation, 19

[165] Nonaka. 1994. A Dynamic theory of Organisational Knowledge Creation, 19

[166] Nonaka and Konno. 1998. The Concept of *Ba*, 42 – 43. This has negative implications for knowledge creation in geographically dispersed organisations, which will be discussed in the section on collocation.

[167] Nonaka, 2003, Knowledge creation theory revisited, 4

[168] Erden et al. 2008. The quality of group tacit knowledge, 5

spending time together outside of the workplace can also be part of the originating *ba,* where "individuals meet face-to-face, share emotions, feelings, experiences and mental models."[169]

To Nonaka, then, socialisation is the starting point of the virtuous cycle of organisational knowledge creation.

3.2.3 Socialisation in Weick's Writings

In Weick's theory, organisational socialisation is of interest as an opportunity for sensemaking, one that passes when the agent involved has managed to adapt to the new environment, but reoccurs when the agent is introduced to a new social context. As we have seen from Louis, socialisation is an ongoing process, and it is one that provides an important context, shaping and defining the organisational reality of the sensemaker. [170] During socialisation, new agents learn the language of their new organisation, and this limits their context to that which is socially acceptable within the bounds of the organisation.[171]

The introduction of newcomers to the organisation also provides an opportunity for sensemaking to the established organisational members – they are given the opportunity to express themselves more 'heedfully',[172] essentially making them more conscious of their own thoughts as they express these thoughts to newcomers.

While conducting these instructional narratives, they are at the same time helping newcomers to make sense of new situations within the organisation, by establishing (and reinforcing) the organisational context. [173]

The reshaping of organisational reality during moments of novelty, such as those provided by the introduction of newcomers, is an opportunity to redefine the organisational context.[174] This may lead to a temporary loss of organisational stability, [175] but is important for the continuity of the organisation. Without the process of organisational socialisation there can be no established basis for cooperation, no shared goals, and therefore no organisational

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[169] Nonaka et al. 2006. Organisational Knowledge Creation Theory, 1185

[170] Weick. 1993. Sensemaking in Organisations: Small structures with large consequences. In *Making Sense of the Organisation*, 20

[171] Weick, 1993. Sensemaking in Organisations. In *Making Sense of the Organisation*, 23

[172] Weick and Roberts, 1993. Heedful Interrelating, 367

[173] Weick and Roberts, 1993. Heedful Interrelating, 368

[174] Weick. 1995. *Sensemaking in Organisations*, 71

[175] Weick. 1995. *Sensemaking in Organisations*, 72

membership. As Weick says, “If the capability to make mutually reinforcing interpretations is lost when people are replaced, then neither organisation nor sensemaking persist”.[176]

Weick is careful to avoid claiming that organisational agents can share *meaning*, preferring to refer to shared experience that gets interpreted equivalently.[177] Meaning is then jointly negotiated and renegotiated when participants in these shared experiences revisit what they have just experienced, either codifying it in a commonly agreed manner,[178] or revisiting it through narrative.[179] Both techniques assist the organisational members to help to recapture the context of their shared experiences, reinforcing the equivalent interpretations of that experience within the group. The socialisation of organisational members allows them to “make mutually-reinforcing interpretations of their own acts and acts of others”.[180]

3.2.4 Organisational Culture

As Nonaka points out, socialisation and organisational culture are connected topics.[181] Snowden identifies culture as one of the ways in which knowledge “painfully created at cost over previous generations” is transferred to new organisational members.[182]

Schall defines organisational culture as "a relatively enduring, interdependent symbolic system of values, beliefs, and assumptions evolving from and imperfectly shared by interacting organisational members that allow them to explain, coordinate, and evaluate behaviour and to ascribe common meanings to stimuli encountered in the organisational context".[183]

According to Morgan, when we talk of shared values, beliefs, meanings, understandings or sensemaking, we are actually describing culture, which is “a process of reality construction

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[176] Weick. 1995. *Sensemaking in Organisations*, 73

[177] Weick. 1995. *Sensemaking in Organisations*, 188. So, like Nonaka, Weick sees the sharing of experience within specific organisational contexts as the main driver that allows people to work together effectively in the organisation.

[178] Weick. 1995. *Sensemaking in Organisations*, 188

[179] Weick. 1995. *Sensemaking in Organisations*, 189.

[180] Weick. 1995. *Sensemaking in Organisations*, 73

[181] Nonaka. 1994. A Dynamic theory of Organisational Knowledge Creation, 19

[182] Snowden. 2002. Complex acts of Knowing, 103

[183] Schall. 1983. A Communication-Rules Approach to Organizational Culture, 557

that allows people to see and understand particular events, actions, objects, utterances, or situations in distinctive ways."[184]

In Weick's view, culture socialises people to use "similar decision premises and assumptions", which leads to greater organisational robustness thanks to the resultant preservation of coordination and centralisation.[185]

From this, we could see socialisation as a process by which newcomers to an organisation learn to adapt to and understand the organisation's culture, which "acts as a frame of reference, a global context within which all that occurs is understood, [186] and is built by organisational members' 'collective understandings' of their organisation's history. [187]

As Schall points out in her definition, this can be 'imperfectly shared'; the result is different interpretations of the same events, where different groups (such as colleagues in different fields[188]) may attribute different meanings to the same story. [189] This leads to the potential for numerous subcultures within an organisation. Where an organisation's culture is not coherent, there is also an opportunity for a stronger external culture to shape organisational members' decision premises (such as the culture of one's profession, work division or nationality).

3.2.5 Implications of Organisational Socialisation for Distance

March and Levitt note that one of the classical observations drawn from Behavioural Studies of Organisations is that behaviour in an organisation is based on routines, which are transmitted through, amongst other things, socialisation. [190] As we have seen in chapter one, an organisation's routines are counted amongst its knowledge assets and can be a source of competitive advantage. As we have also seen, routine can be interrupted by novelty. Routine

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[184] Morgan. 1996. *Images of Organisation*, 138

[185] Weick. 1987. Organisational Culture as a source of High Reliability. In *Making Sense of the Organisation*, 340 – 341

[186] Schall. 1983. A Communication-Rules Approach to Organizational Culture, 560

[187] March and Levitt. 1988. Organisational Learning, 324

[188] Matson and Prusak. 2010. Boosting the productivity of knowledge workers, 3. The authors call the resulting obstacle to knowledge creation a 'contextual barrier'.

[189] March and Levitt. 1988. Organisational Learning, 324

[190] March and Levitt. 1988. Organisational Learning, 320

can also be undermined by weak organisational control, which could result from an organisation dealing with members separated by geographic and/or cultural distances.[191]

Weick has suggested that agents who have been socialised in the same way (or even if they are similar enough already when entering their working arrangements) will be able to anticipate each other's moves and will be able to effectively coordinate their actions over distance,[192] leading to fewer organisational controls being needed in order to facilitate this: "…whenever you have what appears to be successful decentralisation, if you look more closely, you will discover that it was always preceded by a period of intense centralization where a set of core values were hammered out and socialised into people before the people were turned loose to go their own "independent" "autonomous" ways."[193]

In the same vein, Grant suggests that groups of organisational agents who have achieved 'mutual recognition' will be able to attain "successful coordination even in novel situations," [194] while Tsoukas advises that when we are all grounded in the same context we can minimise misunderstandings, [195] and Roberts has argued that agents who are similarly socialised will have more initial success when attempting to coordinate via technologically mediated channels.[196]

It would seem, then, that the challenges of distance can to some extent be overcome by ensuring that organisational members are appropriately grounded in the organisation's culture, as this would mitigate the negative effects of people operating from within misaligned contexts. However, the benefits of smoother coordination and fewer misunderstandings must be weighed against the potential costs to the organisation in terms of innovation.

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[191] March and Levitt. 1988. Organisational Learning, 328. Mowery et al also found cultural and geographic distance was a significant barrier to inter-organisational knowledge transfer (Mowery et al. 1996. Strategic Alliances and Interfirm Knowledge Transfer)

[192] Weick. 1982. Management of Organizational Change Among Loosely Coupled Elements. In *Making Sense of the Organisation*, 393

[193] Weick. 1987. Organisational Culture as a source of High Reliability. In *Making Sense of the Organisation*, 341. This also serves to qualify claims of the existence of 'virtual' socialisation, such as those explored by Vaccaro et al. In an examination of the SECI dynamic over ICTs, they concluded that the team they were observing were able unlock tacit knowledge over distance due to 'virtual socialisation'. However, these conclusions were drawn based on evidence gathered observing a dispersed team who had previously been colleagues *in the same location*. Therefore the socialisation effect was already in place amongst the group, and what was observed simply vindicates Weick (Vaccaro et al, 2008. The impact of virtual technologies on organizational knowledge creation).

[194] Grant. 1996. Towards a knowledge-based theory of the firm, 116

[195] Tsoukas. 1996. The firm as a distributed knowledge system, 16

[196] Roberts. 2000, From Know-how to Show-how, 434.

3.2.6 Implications of Organisational Socialisation for Innovation

The adage 'great minds think alike' can also be explained by the homogenising effects of socialisation, but that's not always a good thing – DiMaggio and Powell have noted that "Many professional career tracks are so closely guarded, both at the entry level and throughout the career progression, that individuals who make it to the top are virtually indistinguishable",[197] they go on to add that "To the extent managers and key staff are drawn from the same universities and filtered on a common set of attributes, they will tend to view problems in a similar fashion, see the same policies, procedures and structures as normatively sanctioned and legitimated, and approach decisions in much the same way.[198]" They call this effect 'institutional isomorphism', and in their paper are more concerned with such effects across entire industries, leading entire organisations to resemble each other.

This phenomenon would still impact on approaches to novelty within a single organisation, however. Leonard and Sensiper show that if "…all individuals in the group approach a task with highly overlapping experiential backgrounds, they may be subject to "groupthink," i.e., a comfortable common viewpoint leading to closed-mindedness and pressures towards uniformity"[199] – which is death to knowledge creation. Simon identified that one of the only two ways in which an organisation can be said to learn is by "ingesting new members who have knowledge the organization didn't previously have"'. [200]

There would appear to be an inherent danger to sensemaking and indeed knowledge creation in this level of homogeneity in organisational socialisation. While it would lead to a greater ease of coordination amongst existing members, it is hard to see room for novelty or the acceptance of alternate world views. Variety being the spice of life – and requisite variety being an ingredient of innovation, it is clear that this homogenization effect can be undesirable if it leads to a reduction in the organisation's ability to adapt to change or to take on board new ideas.

Isomorphic effects would mean that new members would not in fact be bringing very much novelty into the organisation unless they were from different enough contexts, and opportunities for sensemaking, and knowledge creation, could be lost.

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[197] DiMaggio and Powell. 1983. The Iron Cage Revisited, 152-153

[198] DiMaggio and Powell. 1983. The Iron Cage Revisited, 153.

[199] Leonard and Sensiper. 1998. The Role of Tacit Knowledge in Group Innovation, 118

[200] Simon. 1991. Bounded Rationality and Organisational Learning, 125. The other way learning takes place in organisations is through the learning of its existing members.

Nonaka regards knowledge as "reality viewed from a certain angle", which can be interpreted differently "depending on from which angle (context) one sees it".[201] If an organisation is comprised only of individuals who see reality from one angle, opportunities for knowledge creation would be minimal. His recommendation is to try to "…see the entire picture of reality by interacting with those who see the reality from other angles, that is, sharing their contexts.[202]"

3.2.7 Culture as Contextual Constraint

Knowledge creation is inextricably bound to the context in which it occurred.[203] In organisations, that context is heavily influenced by the culture into which agents have been socialized. Culture is a constructed reality, and knowledge created in a specific culture is potentially valid only within that culture. Displacing this knowledge from the specific context in which it was created may invalidate it; "things that appear objective or 'accurate' in one context may take on a subjective complexion or be considered 'wrong' in another."[204]

Taking the knowledge *creators* out of context may have similar effects. A group that is very successful in creating knowledge together in one context may find that they are incapable of doing so in another. [205] Nonaka points out that when people acquire new knowledge, it is actively interpreted to fit into their own specific situations and perspectives, and "what makes sense in one context can change or even lose its meaning when communicated to people in a different context.[206]"

Therefore, knowledge created in and bound to very narrow or particular cultures is particularly vulnerable to contextual changes. Weick is in fact quite scathing of the process of knowledge creation within corporations where this knowledge is firm-specific, problem-

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[201] Nonaka. 2003. Knowledge Creation Theory Revisited, 3. This is borne out by an anecdote recounted by Polanyi (1961. Knowing and Being, 459), where he and a colleague believed that they had established the atomic structure of white tin. A visiting professor from Holland also claimed to have established an entirely different structure for white tin. Both teams had actually observed the same structure, but the professor from Holland had described it differently (at a 45 degree angle to Polanyi's team), making his structure unrecognizable to Polanyi and his colleague, just as Polanyi's was unrecognizable to him.

[202] Nonaka. 2003. Knowledge Creation Theory Revisited, 3

[203] Erden et al. 2008. The quality of group tacit knowledge, 5

[204] Baba et al. 2004. The contexts of knowing, 574. It is for this reason that cross-cultural ventures sometimes fail.

[205] Erden et al. 2008. The quality of group tacit knowledge, 10

[206] Nonaka. 1994. A Dynamic theory of Organisational Knowledge Creation, 30

specific, costly to preserve, and vulnerable to internal politics. In such cases "what appears to be knowledge creation in fact becomes the enlargement of ignorance.[207]"

3.2.7.1 Leadership during Contextual Confusion

It is an organisation's leadership that is responsible for performing a mediating role when there is contextual confusion.[208]

Both Weick and Nonaka see contextual awareness, in the form of wisdom, as the best weapon in a leader's arsenal against irrelevance.

Nonaka and Takeuchi see leadership as performing a custodial role in contextually appropriate knowledge creation through the application of what they call 'practical wisdom', defined as "tacit knowledge acquired from experience that enables people to make prudent judgments and take actions based on the actual situation".[209]

To Weick, sensemaking is about contextual awareness; [210] leaders need to be able to make sense of changing contexts by embracing uncertainty. The ability to do this, to balance belief and doubt, is a form of wisdom that allows greater organisational adaptability [211] and protects an organisation from "sudden and dangerous losses of meaning.[212]"

In such circumstances, however, leadership is rendered ineffective in the absence of trust,[213] another important contributing factor to how members of an organisation make sense of their experiences.[214]

3.3 Trust and the Geographically Dispersed Organisation

Broadly speaking, the value of trust to organisational knowledge creation is that it fosters an environment supportive of knowledge sharing and tolerant of experimentation.[215] In the

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[207] Weick. 1996. Drop your tools. In *Making Sense of the Organisation: the impermanent organization*, 255

[208] Kogut and Zander. 1996. What Firms Do? Coordination, Identity and Learning, 510

[209] Nonaka and Takeuchi. 2011. The Wise Leader, 60

[210] Weick. 2001. Leadership and the legitimisation of doubt. In *Making Sense of the Organisation: the impermanent organization*, 265.

[211] Weick. 1996. Prepare your organisation to fight fires, 148

[212] Weick. 1996. Prepare your organisation to fight fires, 143

[213] Weick. 1996. Drop your tools. In *Making Sense of the Organisation: the impermanent organization*, 252

[214] Sondak. 2002. Making Sense of the Phenomenology of groups and group membership. In *Toward Phenomenology of Groups and Group Membership*, 274

absence of trust, organisational agents are less forthcoming, as they perceive only risk, and no reward, in contributing their knowledge.[216]

In a usefully concise analysis, Mayer et al. gave a working definition of trust as "*the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party*.[217] " (italics in original)

The closing line is particularly relevant in the context of distance, which complicates the monitoring and controlling process.[218] To reiterate the opening point, trust implies the willingness to take a risk, [219] a lack of trust implies a lack of willingness to experiment with alternate ways of operating,[220] which limits organisational knowledge creation.

Mayer et al. also separated trust from other related concepts, all of which could obscure the dynamics of genuine trust. Cooperation and predictability are often mentioned in connection with trust, but these can occur in its absence where external control factors such as coercion are involved; confidence in others is also considered a sign of trust, but if it occurs without the potential for disappointment, this too is not trust.[221]

Finally, they highlighted the context-specific nature of trust – trust depends on perceived ability, and can be appropriate or inappropriate depending on the context, and what is being asked of the participants. [222]

There are two commonly-encountered trust dynamics at play in the organisational literature: trust that occurs in groups where there has been opportunity for shared experience and mutual familiarity; and trust that occurs in groups where said group is comprised of members who share no direct history and there has been no opportunity for socialisation. Both are examined below, and this is followed by a discussion of the implications of geographical dispersion on trust.

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[215] Carmeli and Spreitzer. 2009. Trust, connectivity, and thriving, 9

[216] Renzl. 2008. Trust in management and knowledge sharing, 216

[217] Mayer et al. 1995. An integrative model of organisational trust, 712.

[218] Greenberg et al. 2007. Creating and sustaining trust in virtual teams, 326

[219] Mayer et al. 1995. An integrative model of organisational trust, 712

[220] So for example attempts to work from home, where monitoring and control would be reduced or non-existent, is unlikely to be welcomed by an organisation that relies on rigid in-office control structures to monitor staff.

[221] Mayer et al. 1995. An integrative model of organisational trust, 713 – 714

[222] Mayer et al. 1995. An integrative model of organisational trust, 729.

3.3.1 Mutual Trust

Trust between organisational members is seen as an operating requirement for knowledge creation. [223] Mutual trust between organisational members is usually fostered through face-to-face contact[224] during the socialisation process,[225] where "trust and mutual understanding, developed in their social and cultural contexts, are prerequisites for the successful transfer of tacit knowledge."[226]

Nonaka sees trust amongst organisational members as a knowledge asset that is created as an output of the knowledge creating process[227] – it is generated amongst organisational members as a natural consequence of the tacit-to-tacit knowledge transfer between them.

In a group where trust is established through socialisation effects, individuals will tend to improve in their ability to work together as time progresses: "as individuals become familiar with each other they reinterpret the meaning of actions and become more trusting and cooperative and therefore they work together more effectively than those who are less familiar".[228]

Mutual trust in groups whose members have become familiar with each other also introduces a dynamic somewhat akin to the groupthink raised earlier in this chapter. Input from familiar group members will tend to be accepted with less argument, and it will be subjected to less rigorous scrutiny than if it had come from a stranger. [229] Though this mainly serves to facilitate communication processes in trusting groups,[230] there is then the danger of lost opportunities in contexts where greater interrogation of the facts would result in a higher quality group output. [231]

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[223] Nonaka, Toyama & Konno. 2000. SECI, *Ba* and Leadership, 28

[224] Roberts. 2000, From Know-how to Show-how, 434

[225] Nonaka. 1994. A Dynamic theory of Organisational Knowledge Creation, 24

[226] Roberts. 2000, From Know-how to Show-how, 434. She also points out that if the individuals involved are starting from significantly different cultural or contextual bases, a greater investment is required from the organisation in order to facilitate a trusting relationship

[227] Nonaka, Toyama & Konno. 2000. SECI, *Ba* and Leadership, 20

[228] Sondak. 2002. Making Sense of the Phenomenology of groups and group membership. In *Toward Phenomenology of Groups and Group Membership*, 273

[229] Gruenfeld et al. 1996. Group composition and decision making, 12

[230] Gruenfeld et al. 1996. Group composition and decision making, 11

[231] Gruenfeld et al. 1996. Group composition and decision making, 12

3.3.2 Trust and Unfamiliarity

In the trust that occurs in groups where said group is comprised of members who share no direct history and there has been no opportunity for socialisation, it is the presence of *some form* of mutual trust, rather than prior shared experience, which serves as the enabling context for interaction. [232]

Over the past few decades, the average tenure of employees in any one job has been decreasing, as the nature of work changes. [233] One result of this increased turnover is that people find themselves thrust into the company of strangers with greater regularity, and opportunities to build lasting rapport between co-workers are reduced. Temporary groups comprised of new and unfamiliar members are an existing organisational reality, as are groups from diverse backgrounds who are assembled temporarily for specific purposes.

In a scenario where the unfamiliar group members are given time to become socialised into the organisation's culture, to 'learn the ropes',[234] and where the incumbent members are aware of this newcomer status (and adjust their own expectations accordingly), the previously discussed socialisation dynamic will take effect; agents will share experiences and contexts, they will become familiar to each other and mutual trust will develop.

In a scenario where tasks are complex, results are expected in short order, and becoming socialised 'on the job' is not an option, a different type of trust is required. Weick and his co-authors suggest that this is provided by what they call 'swift trust'.[235]

3.3.2.1 Swift Trust

Swift trust is described in the context of temporary systems, which are defined as "a set of diversely skilled people working together on a complex task over a limited period of time.[236]"

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[232] Mayer et al. 1995. An integrative model of organisational trust, 710

[233] Stewart. 2001. *The Wealth of Knowledge*, 253. The example Stewart provides is from the 1990s, but is no less relevant in the current economic climate.

[234] From Louis' examination of the period for newcomer socialisation, we can say that this transition would take about a year. Louis. 1980. Surprise and Sense Making, 243

[235] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 166-195

[236] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 168. Note that 'diversely skilled' is itself somewhat subjective, e.g. software developers may all be seen as having basically the same skills when viewed from outside the industry, yet there are many skillsets, job descriptions and programming languages available within the industry. Each of these is a point of difference, making a group of software engineers assembled for a specific job potentially valid candidates for this definition, even though to the outsider it may appear that only one basic skill (programming) is represented by the group.

These systems are usually high in uncertainty, thus uncertainty reduction is a main goal. One of the ways to reduce uncertainty is to interact with other members of the group at the level of the role, rather than the individual. [237] While this could encourage stereotyping behaviour, in the context of a temporary system such behaviour could be beneficial. In the temporary system, there is an unspoken expectation of the competence of the group, an effect that has been labelled 'proxied trust'.[238] If the people filling the roles do in fact possess both the skillset and the mind-set associated with that role, so much the better, but the *anticipation* that they will is enough. [239]

If the members of the group then behave in a trusting manner, they serve to enact a virtuous cycle whereby "each individual enactment of swift trust in the group, no matter how small, contributes to the collective perception that swift trust is reasonable."[240] This very dynamic was also described by Kogut and Zander in their study of coordination within firms:

"Expected cooperation induces cooperative behavior. To a nontrivial extent, this dynamic is driven by the confidence held in the common knowledge that both parties to an exchange have the intention to cooperate."[241]

Another contributor to initiating this virtuous cycle is the concept of 'hedging' – where members of the group are initially prepared to behave in a more trusting manner when they have other options available to them, though as we will see this does carry some risks. [242]

Meyerson et al. also note that the swift trust of temporary groups may be easier to achieve for individuals who are practiced in that manner of interaction. [243] Therefore you might expect that people who are regularly hired out (or hire themselves out) for their skill-sets are better

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[237] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 173.

[238] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 187.

[239] I can draw on direct experience of seeing this effect in a work context: I was visiting a client with a senior colleague. We were working in conjunction with the client to assess the viability of a technical project. When we arrived we were told by our standard liaison that we would be working with a 3rd party (another one of our client's employees) who was at that time unknown to both of us. This infuriated my senior colleague because experience had taught him that in general the client's grasp of the scope of the project was poor. But, when he learned that this new person had an engineering background, he was delighted, because he had a more favourable predisposition to engineers based on the way, in his experience, they tended to think. Critically, this shift from negative to positive attitude and willingness to engage occurred before he was even introduced to the engineer. When the meeting occurred the interaction was immediately positive, based partly on my colleague's positive disposition, and good progress was made.

[240] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 186.

[241] Kogut and Zander. 1996. What Firms Do? Coordination, Identity and Learning, 507.

[242] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 188

[243] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 189

equipped to slot into a temporary system than someone encountering this form of temporary organisation for the first time. If people learn to recognise that their temporary colleagues are operating within the same broad context, it could result in improved interaction due to the effect of homophily.[244]

3.3.2.2 Swift Trust and Homophily

Homophily is the identification with other people who are perceived to share a similar group membership to oneself, [245] such as gender, age, status, interests and ethnicity. It is considered a critical factor in the formation of working relationships, [246] and has an impact on communication choice – people prefer communicating with others who share these perceived similarities.[247]

The significance for swift trust is that homophily re-enforces the 'proxied trust' effect: "Identification with others who share a common category membership, that is, homophily, increases the positive social expectations that underpin trust."[248] In our context of people thrown together into temporary systems, perceived sharing of the same group will assist with the formation of swift trust. The unfortunate converse, of course, is that if such a group is assembled and it consists of people from greatly different category memberships, the establishment of swift trust may be hampered.

3.3.2.3 Impermanence of Swift Trust

Although swift trust has the advantage of mimicking mutually built trust well enough to allow unfamiliar individuals in a temporary system to work together in the context of well defined, deadline-driven joint work, it is fragile. If it is not established swiftly enough in the first place, it will not get established at all. [249] Also, while the impermanent nature of the

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[244] van den Bulte and Moenaert. 1998. The Effects of R&D Team Co-Location on Communication Patterns among R&D, Marketing, and Manufacturing, S3

[245] MacDuffie. 2011. Inter-organizational trust and the dynamics of distrust, 39

[246] Huang et al. 2009. Virtually There, 2

[247] van den Bulte and Moenaert. 1998. The Effects of R&D Team Co-Location on Communication Patterns among R&D, Marketing, and Manufacturing, S3

[248] MacDuffie. 2011. Inter-organizational trust and the dynamics of distrust, 39

[249] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 192. At its most extreme, the consequences for a group who are thrown together in a temporary system not achieving swift trust can be fatal. To illustrate an extreme example, Weick refers to the fire at Mann Gulch, and shows how it was a breakdown in trust that led to the deaths of most of the people fighting the fire (Weick, 1996. Drop your

temporary system means that there is less scope for the development of complicated and distracting social dynamics, [250] it does mean that participants in such systems are potentially less personally invested. In such systems there may be little or no anticipation of future association (considered a driver of mutual trust[251]). If hedging was involved in the establishment of swift trust, some people may choose to exercise their alternatives if the current project becomes unattractive. A group member who is perceived to be hedging could undermine the virtuous cycle of swift trust by demonstrating what could be considered an act of distrust.[252]

'Swift trust' explains a mechanism that resembles trust closely enough[253] that, in the context of well defined, deadline-driven joint work, enables the environment supportive of knowledge creation associated with mutual trust. It cannot truly replace mutual trust, though, because it is necessarily temporary in nature. In a study of the mechanics of trustworthy behaviours by Riegelsberger et al., swift trust was the only trust mechanic recorded that existed purely in the opening stages of group interaction, rather than reaching some form of intermediate or mature stage.[254]

When the individuals involved in the temporary system once again disperse on completion of the task at hand, they leave no organisational knowledge asset behind. Rather, the asset is dismantled. If some potential for future interaction exists (for example, that group was originally drawn from and returned to the same larger organisation; or if that group was drawn from a reasonably small pool of individuals who would therefore tend to meet in work context fairly regularly), then some value is retained as any future interactions would now include a measure of shared experiences in shared contexts. Where the group exists for a significant duration, mutual trust will begin to replace swift trust as socialisation occurs.

Up to now, the discussion on trust has not specifically been concerned with the geographically dispersed organisation. When working with dispersed colleagues, there are

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tools. In *Making Sense of the Organisation, 252)*. See also Weick. 2003. Positive organising and organisational tragedy. In *Making Sense of the Organisation: the impermanent organization*, 216, where he notes that a lack of trust, trustworthiness or self-respect in interactions increases the chance of what he euphemistically terms 'an adverse event'.

[250] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 190. The kind of dynamics that the authors regard as 'messy' in this context include "conflicts, jealousy, misunderstandings, hurt feelings, revenge fantasies, and pursuit of hidden agendas."

[251] Jarvenpaa and Leidner. 1999. Communication and trust in global virtual teams, 792

[252] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 188.

[253] Meyerson et al. 1996. Swift trust and temporary systems. In *Trust in organisations*, 169.

[254] Riegelsberger et al. 2005. The mechanics of trust, 405

numerous complications, and the vulnerability inherent in showing trust is far more immediate than when dealing with groups who regularly meet face-to-face. [255]

3.3.3 "Trust needs Touch"

The section title is taken from an influential discussion on trust and dispersed organisations in the Harvard Business Review by Charles Handy. [256] The main thrust of Handy's argument is that 'trust needs touch', and by this he means that the more an organisation relies on technology for communication, the more the members of that organisation need to ensure that they have met in person. These meetings are not task-oriented, but rather are intended to ensure that when task oriented meetings *do* occur via technologically mediated channels (in Handy's example, videoconferencing), the result is productive: "Videoconferences are more task focused, but they are easier and more productive if the individuals know each other as people, not just as images on the screen."[257]

This is a very top-level, conceptual article that doesn't do much unpacking of the underlying rationale, but from what we have already seen of the relationship between trust and familiarity in organisations, it is not unreasonable to consider Handy's concerns in the light of the need to reduce 'stranger' status amongst people who work together in ordinary, rather than temporary, organisational systems.

Boisot obliquely supports the view that people need to interact physically in order to *build* trust, but is of the opinion that once this trust is established, a productive relationship can be maintained using electronic communication.[258]

However, even when a group have established mutual trust and subsequently dispersed, the use of electronic media brings its own challenges to communication,[259] as does the group's being located in disparate contexts,[260] all of which have a deleterious effect on trust.

Roberts is also wary of reliance on technologically mediated communication in order to develop trust, [261] but her view is built on the stance that even reliance on face-to-face contact

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[255] Greenberg et al. 2007. Creating and sustaining trust in virtual teams, 327

[256] Handy. 1995. Trust and the Virtual Organization

[257] Handy. 1995. Trust and the Virtual Organization, 46

[258] Boisot. 1998. *Knowledge Assets*, 225

[259] These will be discussed in depth in the next chapter

[260] Greenberg et al. 2007. Creating and sustaining trust in virtual teams, 327

is inadequate for trust development where this occurs outside of the particular organisational context, since "trust depends on the sharing of a set of socially embedded values, cultural institutions, and expectations."[262]

In the absence of trust, the full potential of a dispersed group will never be reached,[263] but a dispersed group that has managed to achieve a trusting interaction has the potential to outperform a collocated group that has not. [264]

3.3.3.1 Dispersed Swift Trust

Studies specifically examining the effects of geographically dispersion on trust generally agree that the type of trust that is most often encountered is closer to 'swift trust' as described by Meyerson et al. [265] In these cases, group composition and homophily effects may hold the solution to the puzzle of how any form of trust could be established amongst people who are not interacting in the same physical space.

For example, Jarvenpaa and Leidner's study generally supported the theory of swift trust as presented by Meyerson et al, and the authors were able to conclude that "trust can exist in teams built purely on electronic networks".[266]

However, the research was conducted using masters-level university students selected from within the same academic discipline,[267] a group who could broadly be said to share a set of 'socially embedded values, cultural institutions, and expectations' (as per the trust dependency conditions laid out by Roberts), since they were all selected from within similar environments.

Using this type of respondent assures a certain level of shared values, institutionalisation and expectations even across the barrier of differing national cultures. Also, there is some indication that gender, age and ethnicity become less important homophily considerations

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[261] Roberts. 2000, From Know-how to Show-how, 436

[262] Roberts. 2000, From Know-how to Show-how, 436

[263] Greenberg et al. 2007. Creating and sustaining trust in virtual teams, 325

[264] Gibson and Gibbs. 2006. Unpacking the Concept of Virtuality, 482 – 483.

[265] For example, Greenberg et al. 2007, Creating and sustaining trust in virtual teams; and Jarvenpaa and Leidner. 1999. Communication and Trust in Global Virtual Teams

[266] Jarvenpaa and Leidner. 1999. Communication and Trust in Global Virtual Teams, 813

[267] Jarvenpaa and Leidner. 1999. Communication and Trust in Global Virtual Teams, 794 – 795

when dispersed people interact in computer mediated distributed teams.[268] Therefore conditions in Jarvenpaa and Leidner's study appear to have been generally favourable for the adoption of some form of trust within these groups.

Although this may indicate a weakness in the study's broader applicability, one would expect geographically dispersed colleagues who are required to engage in joint work to also share values and expectations at some broad level. Therefore, to apply Jarvenpaa and Leidner's findings to a geographically dispersed group in a temporary system would be to suggest that geographically dispersed colleagues who share similar experiences and contexts will be able to build some form of swift trust in the absence of 'touch'. This would be especially valid in careers or professions with strong or distinctive cultures. The focus on roles and the assumed competence of the people filling those roles that helps facilitate swift trust could be seen as a form of 'proxy socialisation', where certain basic shared experiences are assumed.

3.3.3.2 Swift Trust, Touch and Socialisation

For Nonaka, communication is the process of building mutual understanding through the sharing of tacit knowledge,[269] and this is best achieved through face-to-face dyadic communication, which helps to foster care, trust and commitment.[270] Once such mutual understanding has been built, however, the groundwork for future communication has been laid. In SECI terms, it would be assumed that a group of people selected to complete a specific task will have surpassed the 'apprenticeship' stage of socialisation and we are now dealing with the interactions of journeymen and masters. Therefore we are past the level of tacit-to-tacit knowledge creation through socialisation; past the stage where the SECI framework assumes that interactions occur in a face-to-face setting.

In sensemaking terms, interactions move from the level of the individual (the intersubjective) to the level of generic roles (the generically subjective)[271], and people filling generic roles are assumed to have generic experience.

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[268] Yuan and Gay. 2006. Homophily of network ties and bonding and bridging social capital in computer-mediated distributed teams

[269] Nonaka et al. 1994. Organizational Knowledge Creation Theory, 339

[270] von Krogh et al. 2000. *Enabling Knowledge Creation*, 181

[271] Weick. 1995. *Sensemaking in Organisations*, 71

The caveat is that trust, and therefore the environment for knowledge creation, will break down very quickly if anyone in such a group is found to be lacking in competence and perceived shared socialisation.[272]

3.4 Nearness

In order to add context to what is meant by 'distance', I will expand on the 'nearness' dynamics mentioned briefly in the Introduction.

3.4.1 The Influence of Physically Shared Space

Whether collocated or simply in proximity, people who work together in the same location are subject to some influences not necessarily applicable to those who work on their own in a more broadly dispersed environment.

For a start, the physical setting itself has an impact on knowledge transfer – "learning occurs not simply through human interaction, but through people interacting within one or more particular physical contexts."[273] A much-used example of such a physical context, which has had an impact on shaping thoughts of and about an entire industry, is Silicon Valley.[274] A technology company physically located in Silicon Valley will be immersed in the broader context of the geographical area – in this case, technological innovation. This will in turn influence the context of the people who physically work at the company. Someone who works for a Silicon Valley company but does so at a distance – for example, for a foreign subsidiary – will not benefit directly from this contextual effect.

Another benefit of people physically sharing space is the power of routine to provide sensemaking opportunities. Weick notes that "When the same people show up day after day at the same time and place, their activities are likely to become more mutually defined, more mutually dependent, more mutually predictable, and more subject to common understanding encoded into common language".[275] The benefits of this dependable, mutual interaction are

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[272] This foreshadows a very important aspect to working effectively in teams, whether collocated or dispersed – the importance of selecting (if possible) right at the beginning of the life of a team one that is a good fit.

[273] Tyre and von Hippel. 1997. The Situated Nature of Adaptive Learning in Organizations, 73

[274] For example, Kogut and Zander. 1996. What Firms Do? Coordination, Identity and Learning, 508; Lam. 2000. Tacit Knowledge, Organisational Learning and Innovation, 506; Voelpel et al. 2005. Escaping the Red Queen Effect in Competitive Strategy, 41

[275] Weick. 1995. *Sensemaking in Organisations*, 74

an increase in opportunities for shared experiences and induction into both the broader organisational context, and also the specific context of that physical location. This provides some basis for richer communication between members of the same organisation who share space, even in the absence of the focus provided by collocation.

This routine can enforce a sense of 'belonging' in organisational members, which could result in better performance and greater loyalty, [276] and also help to reinforce organisational identity, and personal role and identity within the organisation,[277] an important part of sensemaking. The dispersed colleague is all the more distant because of their absence from this process.

3.4.2 Separating 'Collocation' from 'Proximity'

As stated in the Introduction, I define people who are collocated separately from those who are proximate. I do this because I have identified different sensemaking dynamics at play within groups that are (by my definition) collocated, rather than those that are simply proximate. I define collocation as the deliberate grouping of people selected for a specific task or project who are dependent on each other's input in order to complete the goal at hand. For collocated individuals, joint sensemaking is critical to task completion. Proximate organisational members, on the other hand, share physical spaces and broader organisational contexts, but may have no requirement for meaningful interaction. That is to say, they may never be required to engage in joint sensemaking activities with their proximate colleagues in order to complete their assigned organisational goals (even though their shared contexts would facilitate this). In this sense, I see proximity as *incidental nearness* and collocation as *purposeful nearness*.

On some occasions the sources on which I have drawn use the terms 'proximity' and 'collocation' interchangeably, which can obscure the discussion.[278] In such cases, I have been

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[276] Brown et al. 2005. Territoriality in organisations, 577

[277] Brown et al. 2005. Territoriality in organisations, 581

[278] For example, Rice and Aydin use the term 'proximity' but then have to differentiate between 'social proximity' (which is closer to my definition of collocation) and 'spatial proximity' (similar but not identical to the way I have defined proximity) when conducting their analysis (Rice and Aydin. 1991. Attitudes Toward New Organizational Technology). Rafii, on the other hand, uses the term 'collocation' but in his description defines it as a within-walking-distance proximity that includes people who are on the same broad campus, rather than requiring that they share the same immediate location (Rafii. 1995. How Important Is Physical Collocation to Product Development Success?).

careful to align descriptions of the intended communication dynamic with my own definitions, despite what may be conflicting terminology in the source material.

At times, the term 'co-presence' is also used synonymously with collocation.[279] This is another potential point of confusion. Co-presence simply describes when people are simultaneously in each other's presence, [280] so could be seen as a specific configuration of proximate people. It does not necessarily imply collocation, though collocated people *are* co-present. 'Face-to-face' is also a term used quite frequently in discussions of organisational communication to denote proximity during communication, often in direct contrast to computer-mediated communication (CMC).[281] When face-to-face communication between participants is examined, it is usually in the context of interactions requiring co-presence,[282] such as building enduring mutual trust.

3.4.2.1 Collocation, Proximity and SECI

Nonaka establishes that in both tacit-to-tacit (socialisation) and in tacit-to-explicit (externalisation) knowledge creation "it is important for participants to share time and space through direct experience."[283]

In his original article on the knowledge spiral, Nonaka used the master / apprentice interaction to illustrate tacit-to-tacit knowledge creation[284] and this dyadic relationship would qualify as an instance of collocation according to my definition. This definition also applies in the article where the SECI model is first explicitly illustrated – the emphasis is on shared experience, and socialisation can occur through observation, imitation and practice even in the absence of a shared language,[285] which again meets my definition of collocation, as it shows people who share physical spaces working together purposefully towards a common goal.

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[279] For example, in Aman and Nicholson. 2009. Managing knowledge transfer in offshore software development; or Patriotta and Spedale. 2009. Making Sense Through Face

[280] Sarbaugh-Thompson and Feldman. 1998. Electronic Mail and Organisational Communication, 694

[281] For example, Winger. 2005. Face-to-face Communication; MacDuffie. 2007. HRM and Distributed Work

[282] Sarbaugh-Thompson and Feldman. 1998. Electronic Mail and Organisational Communication, 685

[283] Nonaka and Toyama. 2002. A Firm as a Dialectical Being, 1002

[284] Nonaka.1991. The Knowledge-Creating Company, 99

[285] Nonaka. 1994. A Dynamic Theory of Organisational Knowledge Creation, 19

Nonaka and Takeuchi illustrate the importance of sharing physical spaces to socialisation and externalisation in *The Knowledge Creating Company* through a case study of a Nissan project that led to the development of the Primera; they highlight it again in their examination of a joint venture involving Caterpillar and Mitsubishi (Shin Caterpillar Mitsubishi), where key people were intentionally collocated.[286] In the case of Shin Caterpillar Mitsubishi, the GMs from each company even had their desks placed in the same room.[287]

However, in subsequent papers that discuss the established SECI model the position is less clear – the emphasis changes to physical proximity[288] and the requirements are merely spending time together or living in the same environment.[289] Eventually, as we have seen, socialisation is said to occur during "day-to-day social interaction"[290] with no qualification as to the level, intensity or joint task status of this interaction.

From this we may conclude that proximity too will satisfy the requirements for knowledge creation through socialisation and externalisation in the SECI model, to the extent that proximate colleagues in the same organisation are still socialised into the broader culture of that organisation.

The difficulty with socialisation achieved through proximity is that it would only truly be available to colleagues with an appreciable amount of overlap within the same organisation, having spent the time taken to 'learn the ropes'. In an organisation where people are expected to produce meaningful results in less time than this, relying on relatively slow proximity socialisation is simply not adequate.

3.4.3 Proximity

'Proximity' is a broader categorisation than 'collocation'. It represents the zone of incidental interaction between agents who share broad organisational contexts and goals, and who may also share broad task categories, without specific reliance on each other in order to achieve immediate goals. Within this zone, people will be peripherally aware of each other, will

[286] Nonaka and Takeuchi. 1995. *The Knowledge-creating Company*, 200 – 222

[287] Nonaka and Takeuchi. 1995. *The Knowledge-creating Company*, 215

[288] Nonaka, I. and Konno, N. 1998. The Concept of *Ba*, 43

[289] Nonaka, Toyama & Konno. 2000. SECI, *Ba* and leadership, 9

[290] Nonaka and Toyama. 2003. The knowledge-creating theory revisited, 4

slowly build mutual trust specific to their perceived roles and will be able to communicate effectively about their broader organisational context.

There are well-defined limits to this zone. Previous studies, most notably those conducted by Tom Allen in the 1970's, [291] have found that there is a distinct drop-off in levels of incidental social interaction as physical distances between individuals increase, with a threshold of about 30 meters.[292] Once outside this approximate area we are dealing with degrees of distance, rather than nearness, in terms of organisational communication. Co-workers placed at intervals of more than 30 meters can be considered "truly remote"[293] for the purposes of spontaneous, unplanned communication.

Although 'short distances' (sharing a building, campus, city, region or in some smaller instances, a country) will not negatively impact on the ability to regularly schedule face-to-face interactions, [294] frequent informal and spontaneous communications form the 'day-to-day social interactions that reduce conflict, build trust,[295] add to the resources for sharing tacit knowledge,[296] and improve appreciation of the local context.[297]

Moving beyond the zone of incidental interaction means losing the benefit of informal communication; the dependable, mutual interaction that is embedded in routine and encourages broadly shared experiences and the reduction of stranger status between colleagues. It could also lead to the development of silo mentalities between more distant groups even within the same building, [298] which would erode homophily effects as the distant group would be perceived as different.

However, informal communication within this zone could occur even to the extent that it could be inappropriate or distracting for other colleagues. If there is a mismatch between roles that share the same space, the incidental communication relating to one set of organisational goals will act as noise for anyone not engaged in the same endeavour, and

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[291] Allen. 1977. *Managing the flow of technology*

[292] See for example Rice and Aydin. 1991. Attitudes Toward New Organizational Technology, 224; Rafii. 1995. How Important Is Physical Collocation to Product Development Success? 78; Teasley et al. 2000. How Does Radical Collocation Help a Team Succeed?, 340; Huang et al. 2009. Virtually There, 2. The distance is quoted as 100 feet if the author is using Imperial measurements.

[293] Teasley et al. 2000. How Does Radical Collocation Help a Team Succeed?, 340

[294] MacDuffie. 2007. HRM and Distributed Work, 603

[295] Connaughton and Shuffler. 2007. Multinational and Multicultural Distributed Teams, 401

[296] Carter et al. 2004. Building Connections amongst Loosely Coupled Groups, 309

[297] Gibson and Gibbs. 2006. Unpacking the Concept of Virtuality, 457

[298] Rafii. 1995. How Important Is Physical Collocation to Product Development Success? 78

people 'trapped' in such arrangements may end up resenting their proximal co-workers. Care should be taken even with proximal placement.

Proximity alone is not enough to explain how a group of people who work together on a specific project gain the most from their interaction. It has been noted that proximity is a weak mechanism for social information processing, precisely because of the high noise factor in 'ambient stimuli'.[299] Frequent informal contact is not automatically equivalent to added value for work at hand, and reliance on informal verbal exchanges may lead to a relaxing of the discipline of formal communication, leading to costly mistakes.[300]

3.4.4 Collocation

Collocation includes all of the nearness dynamics just discussed. Someone who is collocated is also in proximity to their colleagues. Their communication mode is face-to-face, they are co-present – but being collocated generates additional communication dynamics and increases the appreciation of organisational context thanks to increased sensemaking opportunities.

Since physical space is often an organisational resource, there are usually constraints to the number of people who could be collocated. This is fortunate considering that we have seen that the benefits of close interaction are lost in teams of more than about seven people anyway,[301] making attempts to collocate much larger groups counterproductive.

When people are collocated, they not only share physical spaces, they do so with the purpose of engaging in joint activities such as collaborative work, which is by its very nature highly interdependent. Highly interdependent work necessitates constant communication[302] and in order for this communication to be effective, it must be mutually meaningful. This is

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[299] Rice and Aydin. 1991. Attitudes Toward New Organizational Technology, 225

[300] Rafii. 1995. How Important Is Physical Collocation to Product Development Success? 81

[301] Recalling the limitation to knowledge creation possible via socialisation mentioned in von Krogh et al. We will also see in the next chapter that interacting with more than about seven other people at any one time is also undesirable as it will typically an individual's attention beyond the level where errors of judgement can be avoided. The Scrum methodology that will be examined in the final chapter has a standard practice for dealing with larger groups – simply subdividing them into sub-groups (a 'scrum of scrums') coordinated by meetings between the project overseers of each group.

[302] Simon. 2000. Public Administration in Today's World of Organizations and Markets, 752

achieved when people share both context and experience.[303] When a team is involved in trying to accomplish a joint task they produce meaning through group sensemaking.[304]

As we have seen, shared organisational context is an important feature in socialisation, culture and trust building. In many ways, a collocated group working towards a specific shared goal could be seen as an organisation in miniature, building context-specific bonds of culture and trust, communicating internally with greater meaning and frequency than their proximal colleagues, and subsuming organisational affiliation beyond the immediately collocated group. Collocated interaction is in some ways a microcosm of organisational communication, reflecting the macrocosm of a less intense social context, incorporating proximal others. When people who are proximate are engaged in sensemaking, they are necessarily collocated.

3.4.5 'Collocation' and 'Proximity' are Inseparable

Proximity does not preclude the need for joint sensemaking or dependence on colleagues to achieve goals. People within an organisation could move from proximal to collocated as their work dictates, and while collocated they could be proximal to other colleagues, with whom they may then need to collocate at a later stage: From time to time it might be that proximate colleagues need to work together more closely in order to achieve a short term goal. In such a case their sharing of a broader organisational context would facilitate this.

To illustrate this I revisit the analogy of the bookkeepers that I used in the introduction, where they shared an office (proximity) but were working on totally different sets of accounts (therefore, not collocation). If they were suddenly required to work together on the same project, they would be better equipped to do so than if a totally new bookkeeper were brought in (for example, from a temping agency). They would also, for that duration of the shared task, be collocated rather than just proximal. The example also assumes that there were no 'messy' negative social dynamics at play[305] brought about during the previous period of proximity, which would otherwise sabotage joint work.

To draw on Stacey's interpretation, dyadic (and for my purposes, collocated) communication cannot be separated from the social context (the proximity) in which it arises. The "simple,

[303] Zack. 1993. Interactivity and Communication Modes, 212

[304] Patriotta and Spedale. 2009. Making Sense Through Face, 1227

[305] As my reference from Meyerson et al. highlighted in the discussion of swift trust.

familiar structures"[306] which people rely on in their day to day conversations help to frame the environment of the agents involved in these conversations. This environment is an inseparable part of the living present – the "particular situation at a particular time"[307] that constitutes communicative interaction.

When people who are not proximate need to make sense together, the importance of previously shared organisational context becomes starkly apparent. More than a decade ago, Weick identified strangers with diverse experience who have intermittent face-to-face contact and an inability to communicate and share experience as a challenge for organisations.[308] This has only become more relevant over the past decade, as we will see in the next chapter.

3.5 Conclusion

This chapter has discussed the organisational context, which is the environment in which knowledge is created. We have seen that during the course of their interactions with their colleagues in the organisational environment, agents are socialised into the culture of the organisation. There is no expectation that agents experience only one organisational culture – others, such as nationality and professional affiliation, are also relevant to the context of the individuals within any given organisation. These all combine to form a frame of reference unique to each agent, but if all agents within a broad organisational context share experiences, and learn to interpret them in equivalent ways, they will be able to make sense and create knowledge together. Also important to this process is trust – as mutual trust amongst members of an organisation facilitates the best environment for sharing of existing and exploration of new knowledge. Much was made of 'swift trust' in the previous section precisely because it is this form of trust, in the absence of prior socialisation, most often considered achievable when face-to-face interactions are not.

Organisational agents operate in varying levels of nearness, and 'dispersal' effects on *spontaneous* communication occur when people are separated even by small distances.[309] Modern technology makes it possible to encounter a 'locally dispersed' group, where

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[306] Stacey. 2001. *Complex Responsive Processes in Organisations*, 37

[307] Stacey. 2001. *Complex Responsive Processes in Organisations*, 173 – 174

[308] Weick. 1999. Sensemaking as an Organisational Dimension of Global Change', in Weick. 2001. *Making Sense of the Organisation*, 471

[309] As per the earlier discussion, this could be as little as 30 meters, but even within this rough range, temporary factors like having to cross an open courtyard when it's raining could also come into effect, as would physical barriers like having to interact with someone on a different floor of a shared building.

members of an organisation within the same city all work from separate venues. Even where there is a traditional office or central location, people will not always be available at this central location. Access to various communication technologies makes it easier for people to attempt to communicate with their colleagues while they are not co-present, whether or not they will have a subsequent opportunity to interact in a face-to-face setting.

If an environment that is favourable to knowledge creation (essentially a combination of socialising and dialoguing *ba*) can be achieved while agents are near, then *subsequent* dispersal of these agents is less disruptive for organisational routine.

Geographic dispersal still presents challenges for communications. The next chapter will examine communication over distance.

Chapter Four
Organisational Communication within Dispersed Organisations

4.1 Chapter Outline

Knowledge is not created in isolation. It arises as the result of communal processes,[310] and such processes require communication. This is especially relevant for new tacit knowledge.[311] For Nonaka, communication is the process of building mutual understanding through the sharing of tacit knowledge.[312] Knowledge creation is therefore evidence of successful communication. If knowledge creation has occurred, efforts at communication between participants have been successful. For Weick, the very existence of the organisation is tied into constant acts of communication: "If the communication activity stops, the organisation disappears. If the organisation activity becomes confused, the organisation begins to malfunction."[313] Both organisational knowledge creation and organisational sensemaking are dependent on successful acts communication in order to have any relevance.

Having examined how socialisation, culture and trust combine to form the organisational context that enables knowledge creation, this chapter will examine communication within the geographically dispersed organisation.

The next section of this chapter will discuss the relatively new organisational form that has become a growing reality in this century, leading to an increase in the need for communication across distance.

The problem of distance as an explicit issue has been examined more frequently from the sensemaking perspective than Nonaka's; Weick's sensemaking can be considered to have an overall concern with organisational communication[314] and his writings both influenced and

[310] Kodama. 2005. New knowledge creation through leadership-based strategic community, 896
[311] Erden et al. 2008. The quality of group tacit knowledge, 6
[312] Nonaka et al. 1994. Organizational Knowledge Creation Theory, 339
[313] Weick. 1995. Sensemaking in Organisations, 75
[314] Dervin and Naumer. 2010. Sense-Making, 4700

were influenced by Media Richness Theory.[315] The third section of this chapter is a brief discussion of the general communication theory that grounds Media Richness Theory. The fourth discusses the theory itself in more detail. The day-to-day reality for geographically dispersed organisations is that they rely on information and communication technologies in order to communicate. The final section of this chapter examines the impact of this reliance on technologically mediated communication, in light of the discussion of media richness.

4.2. Dispersed Organisations: The Organisation of the Present

In a piece written in the late 1990s, Charles Handy noted that the organisations of the next century would be dramatically different from those of the 20th century.[316] He also noted that a fundamental change in the way organisations function had by that time already occurred:

"Organisations aren't the visible, tangible, obvious places which they used to be. No longer, for instance, do you have to have everyone in the same place at the same time in order to get things done. Place and time are now independent of one another"[317]

The most obvious example of this is the organisation that exists on multiple continents and in multiple time zones, usually a multinational corporation. But even on a smaller scale there is, thanks to information and communication technology, increased opportunity for organisations to become geographically dispersed.

Ultimately, Handy posited that the ease of dispersal opens the door to the new organisational form, something that acts more as a folder for a variety of contracts that pass through it in an ever-moving mix of people and transactions.[318]

Standing on this side of the millennium, this organisational form certainly seems plausible – there are almost certainly organisations 'in the wild' that behave in this way; and there may plausibly have been such in the past – the difference is that Handy argues for this becoming the organisational norm, rather than a novelty.

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[315] Weick's use of Media Richness Theory to speak of channel richness was at a time when Daft & Lengel's model was prominent, so the use was artificially crystalized in his 1995 seminal work *Sensemaking in Organisations* (which is being used in contrast to Nonaka's 1995 seminal work). Subsequently, a series of counterarguments appeared in the literature. Nonetheless, much of Daft & Lengel's work still stands, and some authors have subsequently gone back to this source, so much like Nonaka's work-in-progress (as it was at that time), the Daft/Lengel view can be seen as definitive.

[316] Handy, 1997. Unimagined Futures. in *The Organisation of the Future*, 377

[317] Handy, 1997. Unimagined Futures. in *The Organisation of the Future*, 378

[318] Handy, 1997. Unimagined Futures. in *The Organisation of the Future*, 382

This is supported by Holmqvist, who a few years later observed exactly this phenomenon – noting that "organizations are becoming imaginary entities of complex partnership relations".[319]

The economist Friedrich Hayek's much-quoted article "The Use of Knowledge in Society" was published in 1945. In this article, Hayek discussed what he considered among the most formidable problems of economics at that time: the dispersal of knowledge.[320] The type of knowledge that Hayek identified and described over sixty years ago is still a problem today, contextual knowledge, "the knowledge of the particular circumstances of time and place".[321] It is perhaps an awkward juxtaposition, but it highlights the issue. We are currently operating in a changed and changing organisational landscape, one where more and more organisations of all kinds (and not just Western corporations) are independent of time and place. In the microcosm of the newly emerging organisation form, if time and place are separated, is there truly the opportunity for appreciation of contextual knowledge by organisational agents?

According to Holmqvist, the 'imaginary organisation' poses two significant challenges for mutual understanding – "lack of mutual knowledge and a lack of a legitimate authoritarian and managerial order",[322] and this is partially because there is the danger that organisational agents are no longer socialised within a single organisational culture.[323]

The organisation as a 'folder of contracts' as envisaged by Handy would be a good example of this potential for a lack of cohesive socialisation and a confusion of managerial roles between operational roles. These factors endanger the common ground of understanding, communication becomes complicated,[324] and this in turn complicates the environment for knowledge creation. Having everyone in the same place at the same time is not in and of itself a guarantee of effective knowledge creation, but doing so at least provides an environment supportive of the process.

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[319] Holmqvist, 1999. Learning in imaginary organisations, 426. I consider such 'partnership relations' as themselves fitting into the definition of 'organisation' for the purposes of the knowledge creation process under examination in this thesis.

[320] Hayek, 1945. The Use of Knowledge in Society. He later states that the problem is more broadly applicable than economics and "arises in connection with nearly all truly social phenomena" (pg 528).

[321] Hayek, 1945. The Use of Knowledge in Society, 522

[322] Holmqvist, 1999. Learning in imaginary organisations, 427

[323] Holmqvist, 1999. Learning in imaginary organisations, 427

[324] Holmqvist, 1999. Learning in imaginary organisations, 434

4.3. Mechanics of Communication in the Dispersed Organisation

What follows is a broad overview of the communication theory that features most prominently in the organisational literature on communication in geographically dispersed organisations, namely the mathematical theory of communication put forward by Shannon and Weaver. [325] As with 'trust', an in-depth analysis of the general topic of 'organisational communication' is well beyond the scope of this thesis; however, the intention here is to provide a context for the later discussion on media richness, and a background for the next chapter's discussion on communication within teams.

4.3.1 Communication Channels and their Capacity

The Shannon and Weaver model of communication is "the most familiar in organizational studies"[326] and therefore seems the logical place to start when conducting an overview of organisational communication. It has had, and continues to have, a great influence on thought relating to organisational communication and with it, knowledge management.[327] The communication system represented here is sometime also referred to as the 'conduit model' of information transfer.[328]

The basic model can be represented quite simply:

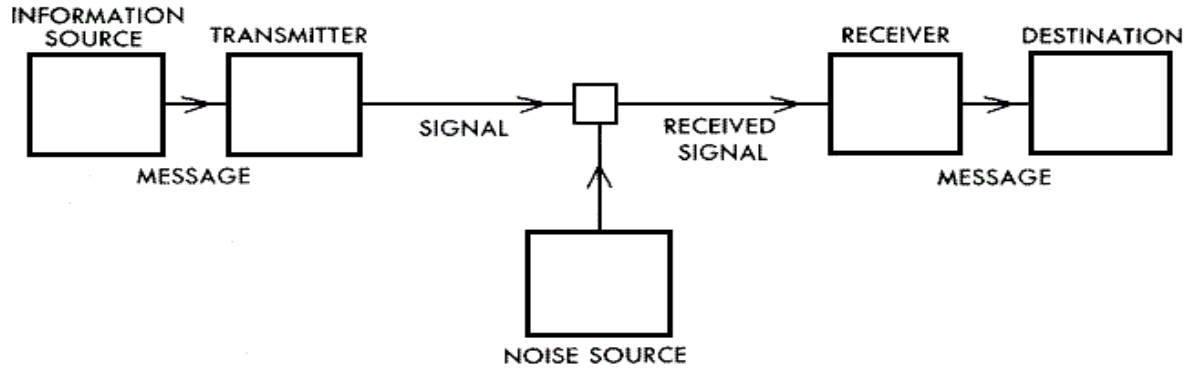

Figure 2: Schematic diagram of a general communication system (from Shannon and Weaver, 1949)

[325] Shannon and Weaver. 1998. *The mathematical theory of communication* (originally published in 1949)

[326] Boland and Tenkasi. 1995. Perspective Making and Perspective Taking in Communities of Knowing , 352

[327] Hislop. 2002. Mission impossible? Communicating and sharing knowledge via information technology, 168

[328] Boland and Tenkasi. 1995. Perspective Making and Perspective Taking in Communities of Knowing, 352; Hislop. 2002. Communicating and sharing knowledge via information technology, 168

To paraphrase Weaver's explanation of the above, the *information source* selects a *message* from a set of available options (written words, spoken words, pictures, music etc.). The *transmitter* represents the hardware required for converting the message into a *signal*, which is carried by the communication channel from transmitter to *receiver*, the counterpart to the transmitter on the other side of the channel. The receiver reconverts the signal to a message, which is passed to the *destination.*[329]

The system applies equally to electronically mediated systems or direct face-to-face human interaction. Consider the example of traditional land-line telephony, where both the *information source* and the *destination* are human agents, the *transmitter* and *receiver* are the equipment used to convert and reconvert the *signal* (which is the varying current) sent over the telephone cable (the channel in this case). In the example of face-to-face oral communication, the *information source* and *destination* are human brains, the *transmitter* is the human vocal mechanism, the *signal* is the resultant variances in sound pressure, carried over the channel of the intervening space between the human agents, where it is accepted by the *receiver* in the form of the human ear and nervous system.[330]

The big box labelled '*noise source'* illustrates the influence of noise on the communication. *Noise* is the introduction of signals into the channels that were not part of the intended message, but nevertheless arrive at the receiver and are part of the output from receiver to destination.[331] In the telephony example this could include static on the line, in the case of oral communication it could literally be background noise that occurs during conversation, for example a loud motorcycle driving past, or another nearby group having a loud conversation of their own. The message that arrives at its destination is therefore not entirely the message that was transmitted by the sender, and this allows for the introduction of error into the system.

4.3.1.1 Channel Capacity

With the rise in awareness of communication technology since Shannon and Weaver's book was originally published, some of the terminology that was considered very specialist and technical has become part of our vernacular. Technically speaking, in Shannon and Weaver's

[329] Shannon and Weaver. 1998. The mathematical theory of communication, 7

[330] Shannon and Weaver. 1998. The mathematical theory of communication, 7

[331] Shannon and Weaver. 1998. The mathematical theory of communication, 7 – 8

mathematical terms, the 'channel capacity' is the amount of information that channel can transmit in bits per second.[332] The intended use of 'channel capacity' has become synonymous with 'bandwidth',[333] and as such both 'channel capacity' and 'bandwidth' are used in organisational communication literature to refer generally to the information carrying capacity of the channel, though without specifically measuring it in bits per second. In this context, noise can be seen as something that occupies bandwidth, adding information that potentially reduces the value of the communication.[334]

4.3.2 Channel Capacity of the Reciever

In this theory, the message recipient is considered to have finite capacity to accept the information transmitted via the communication channel. If more information is transmitted than the capacity of the receiver, the result is "a general and inescapable error and confusion.[335]"

This observation was later expanded by Miller, who stated that the receiver's channel capacity represents "the greatest amount of information that he can give us about the stimulus on the basis of an absolute judgment. The channel capacity is the upper limit on the extent to which the observer can match his responses to the stimuli we give him."[336] After this capacity has been exceeded, we begin to see the introduction of errors of judgement.

4.3.2.1 Narrowing the Channel

The channel capacity of the receiver is finite, but it is not a fixed property. In times of stress, the ability to process information can become considerably reduced. Weick notes that in states of increased autonomic arousal caused by interruption, an agent's information processing capacity is diminished because arousal "uses up attention, reduces the cues that

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[332] Shannon and Weaver. 1998. The mathematical theory of communication, 16

[333] Walther. 1995. Relational aspects of computer-mediated communication, 188

[334] Shannon and Weaver. 1998. The mathematical theory of communication, 19

[335] Shannon and Weaver. 1998. The mathematical theory of communication, 27

[336] Miller. 1956. The Magical Number Seven, Plus or Minus Two, 82. This number (seven, plus or minus two) corresponds to the average number of things that an average person can pay attention to at a given time. It will also become significant when we examine ideal team sizes. This rough figure has already been mentioned in this thesis so may seem familiar. It falls neatly into the bounds that von Krogh, Ichijo and Nonaka put on the size of a group (five to seven people) that could achieve new tacit knowledge through socialisation. This overlap may perhaps also allay some concerns about this figure being a Western culture-specific phenomenon.

can be used in sensemaking, focuses attention on the interruption, and has the potential to escalate cognitive inefficiency. Loss of cues makes sensemaking harder, which raises arousal even higher, which leads to even more cue loss and even less sensemaking."[337]

Under these circumstances, someone will experience a narrowed channel capacity and become overloaded more easily. I will be covering information overload in more detail in the media richness section that follows.

4.3.3 Criticisms of the Conduit Model

This model has been criticised for been too mechanistic for appropriate use in discussions of knowledge transfer. Knowledge is bound to the context of its development and use, [338] therefore a view of information exchange denuded of context strips that information of underlying meaning.[339] For this reason it has also been argued that this model cannot be applied to the transfer of tacit knowledge.[340] In the absence of context, information and noise could be indistinguishable and it would then become very difficult to rescue the intended meaning of the transmission. These criticisms are valid, but belong more to those who have attempted to apply this model beyond its intended scope.

In his opening essay explaining Shannon's model in lay terms, Weaver carefully states that in the context of this model: "…*information* must not be confused with meaning".[341] Therefore we could see the validity of the concerns raised about reliance on this model for knowledge dynamics. However, there is still a valid application for this model within a broader organisational communication context.

Weaver in fact covers this when he points out that just because the ability to extract meaning from the information is not considered relevant to the technical discussion, it doesn't mean that the technicalities of information exchange are irrelevant to the transfer of meaning.[342] A closer reading of Weaver's contribution to the mathematical theory of communication could indicate that the critics of the conduit model have themselves missed part of the point. Much of Weaver's essay is dedicated to pointing out that there is a relationship between

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[337] Weick. 1995. Sensemaking in Organisations, 101

[338] Spender. 1996. Organizational knowledge, learning and memory, 75

[339] Boland and Tenkasi. 1995. Perspective Making and Perspective Taking in Communities of Knowing, 352

[340] Hislop. 2002. Communicating and sharing knowledge via information technology, 168

[341] Shannon and Weaver. 1998. *The mathematical theory of communication,* 8. Emphasis in original.

[342] Shannon and Weaver. 1998. *The mathematical theory of communication*, 8

understanding the mechanics of information transfer and the subsequent ability to properly investigate 'meaning', and as part of his closing statements he notes that "this theory is specifically adapted to handle one of the most significant but difficult aspects of meaning, namely the influence of context." [343]

4.4. Media Richness Theory

The conduit model is influential in organisational communication literature. It also shaped the communication paradigm in which the theory of Media Richness arose. It is primarily attributed to Richard L. Daft, who introduced the concept of media richness (originally 'information richness', and occasionally referred to as such by later authors) in a series of articles co-written over the course of the 1980's. The theory of media richness involves the idea that some media support richer communication than others. Inherent in this is the idea of 'channel capacity' – with richer media having a greater channel capacity, and less rich or leaner media having less channel capacity.

4.4.1 Information Richness Theory

Even before establishing this theory, in the late 1970's Daft had noted that there was "a strong relationship between the technology of a work unit and the amount and type of information participants require to perform effectively. Mismatches between the information system and work unit technology account for a large percentage of information system difficulties."[344] Finding ways to resolve this 'mismatch' would drive the development of Media Richness Theory.

Daft introduced the concept of 'information richness' in a later article, co-written with Robert H. Lengel (Daft's main co-author on the foundational media richness literature)[345] in which (building on theories developed by Lengel in his PhD dissertation) they defined richness as "the potential information carrying capacity of data."[346] They used the description of a fairly common physical gesture, a wink, to illustrate their point:

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[343] Shannon and Weaver. 1998. *The mathematical theory of communication*, 28

[344] Daft and Macintosh. 1978. A New Approach to Design and Use of Management Information, 83

[345] Daft and Lengel. 1983. Information Richness. A New Approach to Managerial Behavior and Organization Design.

[346] Daft and Lengel. 1983. Information Richness, 7

"If the communication of an item of data, such as a wink, provides substantial new understanding, it would be considered rich. If the datum provides little understanding, it would be low in richness".[347]

They then introduced a 5-point scale relating different communication media to differing levels of richness that could be achieved by using these media, based on the number and immediacy of cues that could be extracted. Face-to-face communication was placed at the top of the list, due to the immediacy of feedback and potential for extraction of the most cues; they listed the remaining items in a decreasing scale of cues and immediacy: next, the telephone, then written personal messages (such as letters and memos), then written formal messages (such as bulletins and formal documents) and ending with information in numeric format (such as computer output).[348]

From the start, though, the assigned 'richness' was merely the maximum information carrying *capacity* of the channel, rather than an absolute statement on the level of meaning *actually* conveyed via that channel. This is demonstrated by their example of the wink, which as face-to-face communication *could* carry the most information, but would convey different degrees of meaning depending on the recipient.

If the wink that had great meaning to its intended respondent was observed by an unintended recipient, it could lose all meaning to this accidental receiver. Indeed, the confused observer could even attribute an incorrect meaning to the message, which would then serve as no more than noise. In other words, meaning is entirely dependent on the specific circumstances, or contexts, of the agents involved in the communication.

This is important because, as will be discussed in the next section, as the theory was developed and expanded on by various academics, some of the intention behind it was lost in the focus on the actual media – most likely because this theory emerged alongside an increasing focus on technological solutions, which in turn led to an increasing focus on the technology itself, rather than the purpose behind that technology.

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[347] Daft and Lengel. 1983. Information Richness, 7

[348] Daft and Lengel. 1983. Information Richness, 7 – 9. The list is a sign of its times in terms of the lack of many of the now-common computer-related communication channels.

4.4.2 The Core Theory

The article that established Media Richness Theory was published in *Management Science* in 1986[349], and as such had a far wider reach than their previous article on the topic, which had been a special report subsequently added as a chapter in another publication. The 1986 article can also be considered the 'core' article on the topic for our purposes. It is to this article that Weick refers in *Sensemaking in Organisations* and even in some of his more recent works. [350]

In this journal article, Daft and Lengel built on their previous work on information richness, with the intention of answering the question "Why do organizations process information?",[351] they proposed as the answer "…to effectively manage both uncertainty and equivocality".[352]

This differed from the prevailing view of the time, which was mostly concerned only with the reduction of uncertainty.[353] Daft and Lengel drew on Weick's work to show that equivocality was also a valid and necessary addition to the answer, given that, unlike uncertainty (which decreases as information increases),[354] situations of equivocality are ambiguous, with multiple and conflicting interpretations, [355] and could even be worsened by the addition of information: "An information stimulus may have several interpretations. New data may be confusing, and may even increase uncertainty. New data may not resolve anything when equivocality is high."[356]

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[349] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design

[350] For example, Weick. 2009. Impermanent Systems and Medical Errors. In *Making Sense of the Organisation: the impermanent organization*, 164. Weick makes repeated use of Daft and Lengel's articles in his writings. For example, Weick and Bougon. 1986. Organisations as Cognitive Maps; Weick. 1987. Organisational Culture as a Source of High Reliability; Weick. 1993. Sensemaking in organisations; and several times in *Sensemaking in Organisations,* where he discussed appropriate use of media in the language of the Daft and Lengel's Media Richness Theory (Weick. 1995. *Sensemaking in Organisations,* 99 – 100). It is not surprising that there was so much overlap. Daft and Weick co-wrote an article that was published in 1984 (Daft and Weick. 1984. Toward a Model of Organizations as Interpretation Systems), so would have been in contact around the time that Daft was working on Media Richness Theory.

[351] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 554

[352] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 567

[353] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 554

[354] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 556

[355] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 556

[356] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 554

In Daft and Lengel's theory, reducing uncertainty relates to ensuring the correct *amount* of information is provided, while reducing equivocality relates to ensuring that information of the *appropriate richness* is available.

Daft and Lengel proceeded to make structural recommendations for organisations, to assist with the management of both uncertainty and equivocality. In brief, the structural design that they recommended in order to reduce uncertainty involved systems that emphasised coordination and control; such as formal management information systems, task forces and liaison roles.[357] To assist with the interpretation of equivocal situations, they recommended structural mechanisms that enabled debate, clarification, and enactment rather than just providing unnecessary amounts of data. [358] In other words, structural mechanisms that enabled the processing of rich information.[359]

They defined rich information as information able to change understanding within a time interval, and rich media as personal, involving face-to-face contact between managers. Media of lesser richness were defined as more rule-bound and impersonal.

The media/richness scale was again discussed, with face-to-face at the top. It was essentially unchanged since the previous listing: "In order of decreasing richness, the media classifications are (1) face-to-face, (2) telephone, (3) personal documents such as letters or memos, (4) impersonal written documents, and (5) numeric documents."[360]

They also pointed out that appropriate media selection can lead to the reduction of equivocality and uncertainty. For example, they showed that "face-to-face media were preferred for messages containing equivocality, while written media were used for unequivocal messages,"[361] and in general, media of low richness, while inappropriate for resolving equivocality, are considered effective for processing "well understood messages

[357] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 559

[358] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 559

[359] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 560

[360] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 560

[361] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 555

and standard data."[362] This last concept was specifically expanded on and tested in their next addition to the theory.

4.4.3 Updating the Core Theory

In a related article that followed closely on the heels of their main contribution,[363] Daft and Lengel (joined by Linda Treviño) examined media selection amongst a group of thirty managers[364] to see whether their selection of media impacted on their performance. This was essentially a field test of Media Richness Theory. Although the core of the theory expressed was unchanged since the 1986 article, they expressed it in simpler terms – possibly as the result of their own externalisation process, moving from theory to practice.

Also important for the purposes of this thesis, the article introduced 'new media' to the debate[365] (electronic messaging, video displays, and teleconferencing), though these were not included in their hierarchy of media richness (which differed from the scale previously present in that it was simplified to remove references to numeric documents, presumably to reflect the type of information most likely encountered and utilised by the subjects of their study).[366]

The 'new organisation' heralded by Handy would have been unfamiliar to the theorists of the 1980's. While information and communication technology was steadily advancing, the dependency on computers for everyday communication was not as widespread as it is today and they were still seen as novel ('new media'). For example, these technologies had not had an impact on the day-to-day work habits adopted by the subjects of this study:

"Executives continue to prefer oral, face-to-face communication for much of their work. Distributed environments have not occurred as quickly as some experts had imagined. Home computer terminals are used to allow employees to work extra hours at home, not to move the

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[362] Daft and Lengel. 1986. Organizational Information Requirements, Media Richness and Structural Design, 561

[363] Daft et al. 1987. Message equivocality, media selection, and manager performance

[364] As mentioned in my introduction, although much research of this time focussed on management, I feel it is broadly applicable to any knowledge worker who must rely on others in order to complete their own work

[365] Daft et al. 1987. Message equivocality, media selection, and manager performance, 356

[366] Daft et al. 1987. Message equivocality, media selection, and manager performance, 358

workplace to the home. The availability of teleconferencing and other electronic media have not reduced travel or face-to-face communications."[367]

4.4.3.1 The Theory in Practice

Daft et al. theorised that successful managers must match the appropriate level of richness to the information needed in a given situation, and this includes an appreciation that sometimes media can be inappropriately rich, in which case it becomes distracting without adding value, when all that is required is uncertainty reduction.[368] Therefore, a quality of successful managers is that they can recognise whether a situation is one of equivocality rather than uncertainty.

Where managers communicate from different frames of reference, equivocality will be high. They define equivocal situations as being novel and nonrecurring, requiring hunches, discussion and social support.[369] Mutual understanding is required to bridge disagreement, and in order to do this, organisational members must develop a shared system of meaning.[370] They restate their core message that different media have varying capacity for resolving equivocality,[371] depending on the level of conveyable richness, as "A rich medium facilitates insight and rapid understanding".[372]

The authors unpack how richness is achieved by explaining the properties they consider as criteria for richness: Feedback speed (immediate feedback is most beneficial); the number of social cues that could accompany and facilitate understanding of the message (more cues mean greater understanding is possible); the variety of languages supported by the media (numbers give more precision, but natural language can carry a greater range of concepts and

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[367] Daft et al. 1987. Message equivocality, media selection, and manager performance, 356

[368] Daft et al. 1987. Message equivocality, media selection, and manager performance, 359

[369] Daft et al. 1987. Message equivocality, media selection, and manager performance, 357

[370] Daft et al. 1987. Message equivocality, media selection, and manager performance, 357. The difficulties of actually sharing meaning were discussed in the last chapter, but given the primary author's overlap with Weick and the use of the term 'frames of reference' (also from Weick), this turn of phrase could be interpreted here as sharing experiences that allow individuals to pack cues into the frames in a similar manner.

[371] Daft et al. 1987. Message equivocality, media selection, and manager performance, 358

[372] Daft et al. 1987. Message equivocality, media selection, and manager performance, 358

ideas); and finally, personal focus (personal feelings and emotions accompanying a message make it more understandable).[373]

Only face-to-face communication meets all of their criteria, and therefore this is considered the richest communication medium.[374] This conclusion is vindicated in their analysis of the media choices made by their sampled population, where their findings suggested that managers preferred rich media in dealing with communications of high equivocality (involving ambiguity and differing frames of reference); that low richness media were preferred in cases where frames of reference were shared and the content of the message was clear; that managers select media depending on the nature of the communication (for example, when there are no perceived problems of understanding, managers prefer written media); and that managers who know how to communicate effectively tend to be higher performing, and part of effective communication is appropriate media selection.[375] This includes knowing when face-to-face communication is an unnecessary or overly rich mode of communication, given that it is "weak and inefficient for processing data or resolving objective problems".[376]

According to Media Richness Theory, the richness required to reduce equivocality and build mutual understanding explains managers' continued reliance on face-to-face communication even when presented with the newer options: "Equivocality, as an information problem, is difficult to resolve with technology".[377]

4.4.3.2 The New Media

Although they did not formally adjust their hierarchy of media richness, the authors did slot the 'new media' into their existing frame: They placed videoconferencing above telephony, though still below face-to-face, due to the restriction of some cues such as body language and nonverbal messages; and by default their description of email placed it between telephone and personal documents – as the authors found that it had similar characteristics to both. It has the capacity for rapid feedback and the ability to reach a geographically dispersed

[373] Daft et al. 1987. Message equivocality, media selection, and manager performance, 358
[374] Daft et al. 1987. Message equivocality, media selection, and manager performance, 358
[375] Daft et al. 1987. Message equivocality, media selection, and manager performance, 361 – 362
[376] Daft et al. 1987. Message equivocality, media selection, and manager performance, 363
[377] Daft et al. 1987. Message equivocality, media selection, and manager performance, 357

audience, but it removes visual cues. [378] These technologies fit into the existing media richness paradigm and as such must be used appropriately to ensure maximum communication effectiveness.

4.4.4 Social Presence – a complimentary theory

Around the time that Daft and Lengel were developing their Media Richness Theory, Sproull and Kiesler conducted a study of the use of email for communication in organisations.[379] While this study was contemporaneous with the emergence of the theory of media richness, it did not explicitly draw on it. It did, however, share some distinct similarities with Daft and Lengel's idea of variable richness of communication media, in that Sproull and Kiesler noted that part of the context of communication involved what they called 'static and dynamic cues.'

Static cues consist of the trappings and accoutrements that indicate the social status of the communicating parties, and dynamic cues are the feedback provided by nonverbal behaviour while engaged in communication.[380]

Only face-to-face communication allowed all of these cues to come to bear; telephonic communication reduced dynamic and static cues by removing the visual element of the interaction, while standardised written media were limited in the static cues they could convey, and stripped out all dynamic cues.[381] This last is important for email communication – it is a written medium, but at the time of the study (and largely, still today) it could contain many different types of information, from the trivial to the crucial,[382] so this format carried even fewer static cues than print media of the time.[383]

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[378] Daft et al. 1987. Message equivocality, media selection, and manager performance, 363

[379] Sproull and Kiesler. 1986. Reducing Social Context Cues. This study is early enough in the wide scale adoption of email that they describe it as a new communication technology.

[380] Sproull and Kiesler. 1986. Reducing Social Context Cues, 1495

[381] Sproull and Kiesler. 1986. Reducing Social Context Cues, 1496

[382] Sproull and Kiesler. 1986. Reducing Social Context Cues, 1497

[383] Note that the research has somewhat dated – the authors were talking about very simple text exchanges – email today has become a richer media than in the mid-1980's. It is now common practice to attach images, documents, signatures and disclaimers, which help to contextualise the message, and in the age of spam the address of the sender is another 'static cue'. The problems of email spam, which would essentially act as noise, were also not a factor. The main point remains valid, however. It can sometimes be very difficult to determine the contents or validity of an unsolicited organisational email just from the subject line.

Interestingly, Sproull and Kiesler's study found that the lack of social cues conveyed by email led to a lowering of inhibitions caused by traditional organisational hierarchies, promoting cross-organisational communication. People were more willing to share their opinions with organisational members who were hierarchically superior if they were using email.[384]

Daft and Lengel's concept of richness overlaps with the idea of dynamic cues, but the idea of static cues mentioned above relate to the context of the communication in a way not explicitly covered in the core Media Richness Theory, and the apparent lack of contextual awareness would be a major source of contention for Media Richness Theory. In later studies examining media richness, the idea of social cues was typically bundled into the same general category as Daft and Lengel's properties of richness. [385]

4.4.5 Media Richness, Sensemaking and Information Overload

The description of media as channels for information in Media Richness Theory has its roots in Shannon and Weaver's conduit model.[386] As mentioned earlier, both the channel itself and the receiver can be said to have a finite capacity for information processing, and both are vulnerable to 'overcrowding'.[387] Miller later added that the average person experiences errors of judgement when faced with more stimuli than they can handle.[388] In Shannon and Weaver's terms, this overstimulation would make it easier to overcrowd the channel. This is now more commonly called 'information overload'.

The typical example of information overload is of someone who is overwhelmed by too much information,[389] but overload isn't just about getting too *much* information – it also relates to the inability to make sense of or contextualise existing information.[390] Sensemaking skills are

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[384] Sproull and Kiesler. 1986. Reducing Social Context Cues, 1511

[385] See for example Zack. 1993. Interactivity and Communication Modes, 209-210; Chidambaram. 1993. A Comparison of Face-to-Face and Dispersed Meetings, 470; Hinds. 1995. Communication across Boundaries, 375; Walther. 1995. Relational aspects of computer-mediated communication, 188; Yoo. 2001. Media and Group Cohesion; 372-373

[386] Boland and Tenkasi. 1995. Perspective Making and Perspective Taking in Communities of Knowing, 352

[387] Shannon and Weaver. 1998. The mathematical theory of communication, 26 – 27

[388] Which is on average around 2.5 bits per judgement, or "about six equally likely alternatives" after which people begin to get confused (Miller. 1956. The Magical Number Seven, Plus or Minus Two, 84)

[389] Sutcliffe and Weick. Information Overload Revisited. In *Making Sense of the Organisation: the impermanent organization*, 69

[390] Sutcliffe and Weick. Information Overload Revisited. In *Making Sense of the Organisation: the impermanent organization*, 72

used to help people manage overload by contextualising otherwise irrelevant or inexplicable information.[391]

Media Richness Theory, as we have seen, is concerned with ensuring correct fit between sender and receiver. Channels supporting appropriate richness should be used to ensure that information of appropriate richness reaches the receiver, without overcrowding either the channel or receiver's capacity. Another factor, however, is that people already in a state of overload may not be able to make sense of information that under other circumstances would have been of appropriate richness.

Weick argued that when an agent is in a state of autonomic arousal, their information processing capacity is diminished as attention is focussed on the source of the arousal, narrowing the scope of their immediate frame and meaning that cues that would ordinarily be noticed (and may have been beneficial) instead pass unobserved.[392] This too curtails their ability to make sense, as their ability to deal with stimuli has essentially been reduced – their channel has been narrowed.

In these circumstances, media fit becomes harder to predict but more important to get right. Removing ambiguity may require not only ensuring that the media channel is matched appropriately (for example, explaining something to a colleague face-to-face when telephonic attempts have failed), but also that the receiver's channel is robust. For example, in extreme cases of channel narrowing, it may even be difficult for someone to make sense of things in a face-to-face environment where the information is being transmitted by someone with whom the receiver has not shared prior experience, because a suitable frame has not yet been established into which to fit the cues.[393] This is another indication of the importance of sharing context.

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[391] Sutcliffe and Weick. Information Overload Revisited. In *Making Sense of the Organisation: the impermanent organization*, 75

[392] Weick. 1995. Sensemaking in Organisations, 101

[393] Weick's analysis of the Mann Gulch fire provides a compelling demonstration of this unfortunate phenomenon. Weick. 1993. The collapse of sensemaking in organisations. In Weick. 2001. *Making Sense of the Organisation*, 100 – 124.

4.4.6 Criticisms of Media Richness Theory

Walther has shown that as of the mid-1990s some arguments linked media choice to the *perceived* utility of a medium rather than the theoretical richness thereof,[394] while a few years later Ngwenyama and Lee were able to report that academic opinion was moving away from Daft's theory. [395] Much of the shift away from Daft's formulation of richness was due to the misconception that in Media Richness Theory, richness was "an invariant, objective property of the communication medium itself, independent of the social context where the communication takes place".[396] Subsequently, the 'new' perspectives on the theory focussed on rediscovering the importance of context,[397] not appreciating that it was a part (though perhaps too understated a part[398]) of the theory from the start.

In the original theory the interpretation of meaning always lies with the agents, richness is a potential, not an absolute, and rich media is used "for the resolution of *subjective* issues that involve divergent perspectives" (my emphasis).[399]

However, later studies of mediated communication continued to focus rather specifically on the technology of communication and not on the underlying situations behind the use of the technology – despite the original Media Richness articles not themselves being particularly focussed on the technology itself. This is perhaps a reflection of the times – the build-up to the end of the 20th Century was very technologically focussed, but with an air of suspicion not necessarily appreciable today, since we now have more tangible threats than the millennium bug.

By the close of the 20th century, DeSanctis and Monge could (in an introduction to a special issue of *Organisation Science* especially dedicated to communication in virtual organisations) practically dismiss Daft's findings as a superstition, finding no support in the studies of the

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394 Walther. 1995. Relational aspects of computer-mediated communication, 188

395 Ngwenyama and Lee. 1997. Communication Richness in Electronic Mail, 146

396 Ngwenyama and Lee. 1997. Communication Richness in Electronic Mail, 148

397 Ngwenyama and Lee. 1997. Communication Richness in Electronic Mail, 148. "…these alternative explanations all regard communication richness or leanness as following not from the properties of the communication medium alone, but as emerging from the interactions between the people, and the organizational context."

398 Much of the appreciation of communication in context was only explicated in Daft et al.'s 1987 article, so criticism of the earlier incarnations of the core theory as abstracted from context are understandable.

399 Daft et al. 1987. Message Equivocality, Media Selection, and Manager Performance, 364

time for "the belief that face-to-face interaction is more powerful than mediated interaction," despite its continued existence in "popular writing on virtual organizations". [400]

Despite the criticisms and misunderstandings that Daft's original theory has been subjected to over the years, it has made a great contribution to organisational communication and is still considered significant. [401]

Media Richness Theory has an underlying core of plausibility. It makes sense that some element of a message may get lost or misinterpreted when restrictions are placed on the conduit. As mentioned in an earlier section, in cases of overload, and with channel narrowing, this can even occur in a face-to-face setting.

This core is only bolstered, rather than disproved, by later studies of media richness that paid explicit attention to the importance of context.

4.5. Impact of Media Richness Theory

In the decade that followed the introduction of Media Richness Theory to the organisational literature, many studies[402] either incorporated the theory into their arguments, or tried to demonstrate how their findings disproved this theory. Whatever their initial stance, these subsequent studies contributed to understanding of communication dynamics within organisations that rely on mediated communication.

4.5.1 Extensions of Media Richness Theory

Daft and Lengel's concept of matching media of appropriate richness to the task at hand is enriched by DeSanctis and Monge's later observation that the removal of unnecessary cues can aid communication, since additional stimuli could act as more than just noise or distraction; in certain contexts they could actually be actively counterproductive. [403]

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[400] DeSanctis and Monge. 1999. Introduction to the Special Issue: Communication Processes for Virtual Organizations, 697.

[401] Byrne and LeMay. 2006. Different Media for Organizational Communication, 154 – 155.

[402] For example, a JSTOR search of articles citing Daft and Lengel's 1986 paper shows that from 1986 to 1996 there were 59 items that cited it, the majority of which were from within the organisational management literature (8 from the *Strategic Management Journal,* 9 from *Management Science*, 16 from *Organization Science* and 19 from various *Academy of Management* publications*).* This excludes the earlier references to Weick's use of the theory during this period.

[403] DeSanctis and Monge. 1999. Introduction to the Special Issue: Communication Processes for Virtual Organizations, 696. The example they give is of stereotyping when visual cues are used.

From Zack we see that lean media can be incorporated into a regular organisational routine to streamline operations and avoid *unnecessary* face-to-face interactions, since these interactions carry a cost to the organisation in terms of the attention of (at least) two participants who are occupied in parallel, and could therefore be inefficient.[404]

Hinds indicated that richer channels may be favoured by people in positions of relative power over others in an organisation because the higher bandwidth is necessary for expressing social dominance. [405] This recalls the static cues mentioned by Sproull and Kiesler,[406] though power dynamics were not explicitly investigated by Daft and Lengel. Nevertheless it is a real and important part of the context of communication; where interactions are not between peers, the importance of static cues increases.

The communication medium selected can itself provide static cues to the recipient. Cook and Brown point out that different media have different embedded contextual associations, and therefore the medium selected for communication can add context-specific meaning to a message.[407] An example of such that they use is the difference in perceptions between receiving a hand-written note from a colleague, versus receiving a formal letter on a company letter-head. Another example may be the difference between receiving a company email and a personalised company letter. In certain circumstances this would be cause for elation; in others, dread.

4.5.2 Misperceived Richness

From Carlson and Zmud's investigation of channel expansion we see that the nature of experience of using a medium has more of an effect on the perceptions of that medium's richness than the simple length of experience.[408] Therefore a person's *expectation* of richness of a channel depends on prior *achieved richness* in communication using that channel. [409] If someone is accustomed to achieving a certain level of richness using (for example) email

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[404] Zack. 1993. Interactivity and Communication Modes, 218.

[405] Hinds. 1995. Communication across Boundaries, 377

[406] Sproull and Kiesler. 1986. Reducing Social Context Cues, 1495

[407] Cook and Brown. 1999. Bridging Epistemologies, 391

[408] Carlson and Zmud. 1999. Channel Expansion Theory and the Experiential Nature of Media Richness Perceptions. 154

[409] Carlson and Zmud. 1999. Channel Expansion Theory and the Experiential Nature of Media Richness Perceptions. 155

communication, it will be their basic expectation that a similar level of richness could generally be achieved via that channel.

This could be problematic; meaning is bound to the context of the sender and receiver of a message, and the channel is secondary to the amount of meaning that can be achieved. Therefore someone in email communication with a well-established colleague could send a reasonably lean message that is nevertheless rich with meaning. This may establish an artificial expectation of the capacity of a channel. If the reason for the effectiveness of the communication is assumed to be the channel (or more likely, if the communication process is not considered in the first place), it could lead to confusion in subsequent email communications with new parties.

The converse is also possible – if two colleagues are testing a new channel of communication but don't themselves have a well-established shared context, they could dismiss the channel as inadequate, when in fact it is their ability to communicate over *any* mediated channel that is inadequate.

From a practical perspective, the variable effect of past experience on use of a communication medium implies that active training in the use of a medium should occur as part of socialisation, rather than relying on the assumption that people automatically enter an organisation with an aligned appreciation for the use of that medium.[410] This is especially relevant if the medium is new; Robertson et al. found that people would only be prepared to learn the use of new information technologies for communication where they believed that there would be a great enough uptake of that medium to justify it.[411]

4.5.3 Communication via the 'New' Channels

In Daft et al's 1987 article, the authors suggested that further research on the 'new media' was required to see how they could be used most effectively.[412] Media Richness Theory was

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[410] I turn once again to anecdotal evidence to illustrate this – I recently had an interesting sensemaking experience with a colleague, the opportunity for which was provided by different assumptions of email conventions. This colleague had sent out an email on which I was carbon copied, but had meant the email to also be for my explicit attention. Only when I did not respond in the way my colleague expected did it emerge that we had different appreciations of what it meant to be carbon copied on an email (mine was the more mainstream understanding that it was informational, rather than operational). At no point had our experiences with the medium been aligned, and in a sense my colleague was operating at a disadvantage, having an understanding that differed from the majority of the organisation.

[411] Robertson et al. 2001. Survival of the Leanest, 341

[412] Daft et al. 1987. Message equivocality, media selection, and manager performance, 364

originally investigated at managerial level,[413] and knowledge workers at this organisational level tend to have access to resources (such as communication technologies) not generally available to the majority of the organisation's members.[414] As a consequence, many of the technologies now widely in use were available for study well before they became part of the common fabric of organisational communication. Because of this, their potential impact on organisational communication could be examined well before they became part of the mainstream toolset available to all knowledge workers.

Interestingly, the types of communication seen as 'new' at that time are now part of the everyday working reality for many knowledge workers. In fact, the basic communication options available have not changed significantly since 1987:

Email is the most prominent, and oldest, of the 'new' media.[415] Voice-only communication via telephone is still a common method of organisational contact, but now there's also the option of using Voice over Internet Protocol (VoIP) to make a voice call. Text-based communication via email has been around for decades but email itself has become more sophisticated in the years since its origins, and text-based communication has more recently been augmented by various types of instant messaging (IM) services, amongst which mobile telephony-based short-message service (SMS) could be included. IM, though reasonably prominent, is less used for collaboration in organisations than email,[416] which is most entrenched as a means of organisational communication.[417]

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[413] Daft et al's 1987 article is a standard example, where the survey work was done amongst executives. The trend has continued; for example the Economist's recent survey of collaboration in businesses was conducted exclusively amongst executives (Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works)*.

[414] For example, one application of telepresence systems currently being examined is outfitting a room in someone's private home with a telepresence end-point, to allow them to work from home and participate more easily in international conversations that occur across time-zones. The cost is however currently quite prohibitive, so it may not be surprising to note that this solution is only being considered for people in top management positions (Mason. 2011. *Telepresence Is Coming Home: Are you Ready?*).

[415] In a recent survey conducted by the Economist, 96% of respondents personally used email. Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works*

[416] The Economist survey found that only 41% of respondents personally used Instant Messaging – still a significant number, but less than half of the use of Email (Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works*).

[417] It is perhaps no accident that the Economist survey found it the most established tool; most respondents had direct experience of using it for collaboration, recalling Carlson and Zmud's conclusions about prior exposure to a medium influencing perceived utility of that medium (Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works*).

The other 'new' media, videoconferencing, is still in use, but is now one of a number of video-based communication options, from personal computer-based video enabled VoIP services (such as Skype) to high-end telepresence systems.

From this we see that none of the previously-established technologies have become obsolete, which is contrary to the usual pattern for evolving technology. When a new communication technology arises it tends to be seen as an augmentation of the existing options, rather than as a replacement.

4.5.3.1 Channel Limitations

Subsequent studies of technologically mediated communication by other researchers led to an acceptance of the informal positioning of 'new media' into the hierarchy of media richness that Daft et al. had previously identified in their 1987 paper.[418] This meant that until relatively recently, the next-best thing to face-to-face interaction was considered to be videoconferencing, with email considered somewhat behind the telephone in terms of richness. This placement is supported by the literature. For example, Markus found that even when email was considered more efficient for work-related communication, email communication needed to be supported by regular telephone calls in order to build and maintain relationships with co-workers.[419]

The inadequacy of email to support richer communication, and the need to be more expressive over this lean channel led to the manipulation of existing available keystrokes to form new symbols, called 'emoticons'.[420] They are now a standard feature of text-based communication; be it email, SMS or IM. Their existence illustrates the inherent limitation of richness available via a pure-text channel, as they add some vital context.[421]

The relative leanness of text-based systems can be an advantage – they are immediate, leave a written record, and in many ways are less intrusive than video communication. Also, the lack

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[418] For example, Rice considers email as "relatively information lean" and videoconferencing as "relatively information rich", in keeping with the distinctions suggested by Daft et al. (Rice. 1992. Task Analyzability, Use of New Media, and Effectiveness, 482 – 483)

[419] Markus. 1994. Email as a medium of managerial choice, 520

[420] Sarbaugh-Thompson and Feldman. 1998. Electronic Mail and Organisational Communication, 686

[421] Consider the impact of a message from a relative stranger that says "You are an idiot." as compared with one that says "You are an idiot ☺". As a further aside, the fact that emoticons are now firmly established in text communication seems proven when a word processor automatically 'translates' the keystrokes ":)" to the symbol "☺".

of visual cues allows the sender of the message more control;[422] inadvertent communication through gesture or facial expression can be avoided.

Another drawback of using internet-based video communication (especially in a country with lower general quality of available bandwidth) is that an interrupted video signal could result in odd, jerky-seeming motion in the person on the other side of the camera. This has an unconscious negative psychological association with dishonesty.[423]

In general, video communication is constrained by the inability to appreciate the immediate context experienced by the distant correspondent, [424] and the inability to control or standardise aspects of the conditions of the remote location could lead to distortions of people's appearance.[425]

Reliance on mediated communication, with its reduction of social cues, creates communication that is more task-focussed and less social,[426] which narrows the appreciable context of the communicants and restricts opportunities for sensemaking, leading to reduced understanding and increasing factionalism between groups.[427]

Perhaps the greatest limitation to mediated communication, however, is that it is not face-to-face. Even without an appreciation of the role that collocation and proximity play in organisational knowledge creation, there is a prevailing opinion that "there is no substitute for eye contact and other intangibles when building relationships."[428] In fact, there is some speculation that this urge for eye contact when building relationships is nothing short of a biological imperative.[429]

4.5.3.2 Telepresence

An attempt to nullify the deficiencies of distance communication is the telepresence system, which is an attempt to simulate face-to-face interaction. Telepresence, put simply, is "the

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[422] Olson and Olson. 2003. Human-Computer Interaction, 508

[423] Olson and Olson. 2003. Human-Computer Interaction, 506

[424] Olson and Olson. 2003. Human-Computer Interaction, 509-510

[425] Olson and Olson. 2003. Human-Computer Interaction, 509-510

[426] Wainfan and Davis. 2004. Challenges in Virtual Collaboration: videoconferencing, audioconferencing, and computer-mediated communications, 61

[427] Wainfan and Davis. 2004. Challenges in Virtual Collaboration: videoconferencing, audioconferencing, and computer-mediated communications, 61

[428] Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works,* 19

[429] Winger. 2005. Face-to-Face Communication, 251

impression of sharing space" [430] and telepresence systems are designed to as closely as possible create the impression that the participants in a conversation are actually in the same room, even when they are geographically dispersed:

"Telepresence requires engaging the senses of users such that they feel that they are dealing with people who are not physically present. It requires filling the user's entire field of vision with high-definition video, as well as sensing the movements of the user's head so that rotating the head also rotates the user's field of vision. Technologies that complete the illusion include surround sound and gloves that capture hand movements and provide tactile feedback. A sophisticated telepresence system can allow participants in different locations to make eye contact and interact in a convincing way".[431]

This 'illusion' would then represent the acme of technologically mediated communication, and even here, the illusion is broken the moment the participants leave the room and return to their own separate contexts, without really being able to shake hands or have a sidebar conversation in the corridor on the way out of the venue, ironing out the one or two minor items that may still linger from their conversation, an issue that telepresence shares with all mediated communication.[432]

Furthermore, such systems are currently very expensive, and are not likely to form part of most organisation's realistic communication options.[433] Even where an organisation has deep enough pockets to support such a system, they would tend to use it only for their most expert or senior decision-makers,[434] returning us to the situation where new or emergent technologies are restricted to the privileged (or critical) few in an organisation.

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[430] van der Kleij et al. 2005. On the Passage of Time, 523

[431] Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works,* 19

[432] Wainfan and Davis. 2004. Challenges in Virtual Collaboration: videoconferencing, audioconferencing, and computer-mediated communications, 16

[433] As of a report from August 2011, the set-up costs were estimated at about $100 000 per point of installation (so, $200 000 to connect two areas), with another $3 000 to $5 000 per month required in system management fees (Mason and Morrison. 2011. *MarketScope for Telepresence and Group Video Systems*, 3)

[434] Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works,* 19

4.5.3.3 Novelty of Communication Channels

When someone encounters new technology, the novelty of it is an opportunity for sensemaking.[435] In the case of communication technology, the effect of having to make sense of the very thing one is attempting to use to communicate will crowd out the channel and leave little room for interpreting the messages being sent via this channel. van der Kleij et al found that it took about three weeks before their test subjects had adapted to a new communication technology well enough to overcome the effects of the novelty of using it.[436] Only when familiarity with a technology is achieved will the potential richness of the channel really be available.

On the more extreme side, Roberts speculates that people who have been socialised with technologically mediated communication from their earliest schooling should be able to use them as a complete substitute for face-to-face interaction.[437] While this is not yet reflective of society as a whole, it casts an interesting light on early-adopters of technology, such as the people who are likely to be involved in the information technology professions.

4.5.4 Mobility

Roberts summarises the limitations of technologically mediated communication succinctly (and with a sensemaking slant) when she states that "Two individuals on different sides of the world can read the same codified knowledge embedded in a document delivered to them simultaneously through e-mail. However, these individuals cannot share tacit knowledge effectively, even with the help of desktop videoconferencing, unless they share a common social and cultural context. If this condition is fulfilled they may *share* tacit knowledge by assimilating codified knowledge and thereby creating new tacit knowledge that will be largely, though not completely, the same."[438] (Emphasis in original)

The biggest change in recent years has not been the *types* of communication technologies as much as the mobility of these options. Telephony became mobile some time ago, but more recently mobile telephones have evolved to enable videoconferencing from the self-same

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[435] I have had the privilege of observing an adult experiencing an elevator for the first time. It was a very effective demonstration of how technology can fade into the background once it has been subsumed into everyday life.

[436] van der Kleij et al. 2005. On the Passage of Time, 525 – 526

[437] Roberts. 2000, From Know-how to Show-how, 439

[438] Roberts. 2000, From Know-how to Show-how, 435

device used for conventional voice calls. Laptops with mobile internet connections are also increasingly common. The mobility of communication technologies means that geographic dispersal can occur within the same local organisation; within the same city. In many organisations, the workplace could move from the central office to the individual home, coffee shop or wherever the workforce happens to be at that time.

This is however only a concern for knowledge creation if, in instances of channel narrowing, members of the organisation so dispersed pass up the opportunity to assemble in favour of their mediated channels.

4.5.5 Organisational Knowledge Creation and Media Richness Theory

Nonaka does not appear to draw on Media Richness Theory for the construction of his theory of organisational knowledge creation.

This is understandable in that those aspects of the SECI framework that deal with tacit to tacit and tacit to explicit knowledge conversion (those aspects that deal with sharing experience and socialisation in the general sense) are assumed to be at least proximal, so the communication dynamic is by default considered to occur in a face-to-face context.

When scholars examine knowledge creation or knowledge transfer in a dispersed environment, however, references to both Nonaka and Daft are not uncommon. For example, Johannessen et al. draw on both Daft and Nonaka to show a link between externalisation and rich information media. [439] Athanassiou and Nigh draw on references from both Daft and Nonaka to show how building tacit knowledge requires the ability to capture the full 'bandwidth' of interactions, which is most effectively achieved with face-to-face communication.[440] Thomas et al draw on Daft and Nonaka's writings when linking rich media to the transfer of tacit knowledge and the sharing of experience.[441]

Many studies of the organisational communication impact of emerging communication technologies were conducted from the perspective of Daft's theory, whether they agreed with it or sought to refute it. It is no longer sensible to assume that organisational members are at all times proximate. A discussion of organisational knowledge creation that abandons the

[439] Johannessen et al. 2001. Mismanagement of tacit knowledge, 13

[440] Athanassiou and Nigh . 2000. Internationalization, Tacit Knowledge and the Top Management Teams of MNCs, 475

[441] Thomas et al. 2001. Understanding "Strategic Learning", 341

assumption that all participants are proximal is then a discussion that involves technologically mediated communication. A discussion of technologically mediated communication cannot ignore the impact of Media Richness Theory.

4.6. Conclusion

This chapter has discussed various aspects of communication in dispersed organisations.

We have seen how the dispersed organisation is a growing reality, and we have observed the mechanics of the conduit model proposed by Shannon and Weaver, which underpins Media Richness Theory. We have also seen how the importance of meaning and context has been present in both the Conduit Model and Media Richness theory, though this has sometimes been missed or misunderstood in subsequent discussions.

We have seen how the capacity of the receiver is an important element in the transmission of meaning, and how channel capacity is a variable depending on the context and current sensemaking capacity of the sender and receiver. We also considered the communication technologies in common use by organisations, as well as the emergent technology of Telepresence, which promises to resolve many, but not all, of the issues with the current options.

The next chapter examines organisational communication dynamics within the context of the team.

Chapter Five
Organisational Knowledge Creation in Geographically Dispersed Teams

5.1 Chapter Outline

In this chapter I will discuss organisational knowledge creation within teams. I have previously identified teams as the primary mechanism for knowledge creation within the organisation. Here I follow Nonaka and Takeuchi who, in *The Knowledge-creating company*, used the product development team to demonstrate proof of knowledge creation. The specific sub-type of product development team that will be examined in this instance is the software development team. This is because the very nature of software development lends itself to distributed work very readily,[442] and in many ways software developers, working as they do with information and communication technologies, can be seen as a glimpse into a future society more generally comfortable and familiar with communicating via mediated channels.[443]

The chapter begins with a discussion of teams and the team dynamic in general as applied to the geographically dispersed context. I will then discuss software development teams, using a few case studies from this industry that appear to show successful knowledge creation in a dispersed context. In doing so, I also introduce a software design management methodology called 'Scrum', which is practiced by the teams in the given examples. I will show how this methodology supports practices that promote shared contexts amongst team members. This chapter concludes the thesis with a retrospective on the main findings.

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[442] Hoegl and Proserpio. 2004. Team member proximity and teamwork in innovative projects, 1154

[443] As devices acquire more intuitive interfaces, the barriers to interacting with technology seem to be decreasing. From personal observation it is clear that current touchscreen technology on smartphones makes them accessible to even very young children. Even though children may currently wish to use smartphones for games, rather than communication, it means that they are becoming comfortable and familiar with these devices while still very young.

5.2. Teams

Knowledge creation is a social process,[444] and the social nature of knowledge creation is especially necessary for tacit knowledge.[445] New knowledge begins with the individual making their personal knowledge available to others.[446] The diversity of this personal knowledge drives the knowledge creation process: "...the sharing of tacit knowledge among multiple individuals with different backgrounds, perspectives, and motivations becomes the critical step for organisational knowledge creation to take place".[447]

From this we see that when speaking of organisational knowledge creation, we refer more specifically to knowledge creation that occurs within distinct sub-sets of the organisation. The organisation provides the context within which knowledge is generated, but it is the interactions of individuals that provides the actual generation of knowledge.

Conscious interaction is crucial to innovation,[448] and from this we can see that new product development teams – groups of individuals assembled for a specific purpose – play a central role in the knowledge creation process. Innovation in organisations occurs at the level of the team,[449] which provides a platform for dialogue and discussion,[450] and lends direction to the knowledge creation process.

Working in a team presents many sensemaking opportunities[451] and successful teams can be thought of as groups of people who have learned how to make sense of and with each other. When a team has achieved socialisation, the members "not only come to understand each other's definition of shared situations but also agree on a common definition and come to hold justified true belief about how to act in that situation".[452]

Focussing on the interaction of individuals, rather than 'the organisation' as a monolithic knowledge-generating whole, makes it possible to more accurately assess the dynamics of

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[444] Kodama. 2005. New knowledge creation through leadership-based strategic community, 896

[445] Erden et al. 2008. The quality of group tacit knowledge, 6

[446] Nonaka.1991. The Knowledge-Creating Company, 97-98

[447] Nonaka and Takeuchi. 1995. *The Knowledge-Creating Company*, 85

[448] Leonard and Sensiper. 1998. The role of tacit knowledge in group innovation, 115

[449] Gibson and Gibbs. 2006. Unpacking the Concept of Virtuality, 451. See also von Krogh et al. 2011. Leadership in Organisational Knowledge Creation, 31

[450] Nonaka.1991. The Knowledge-Creating Company, 104

[451] Patriotta and Spedale. 2009. Making Sense through Face, 1229

[452] Erden et al. 2008. The quality of group tacit knowledge, 7

organisational knowledge creation; it also has a positive implication for management, since the interactions of individuals can be managed and directed.[453]

5.2.1 Team Composition

In the project teams that Nonaka studied, he observed that there were usually four or five people who formed a team's core. This core membership assured "appropriate redundancy of information within the cross-functional team."[454] Redundancy is important because it promotes information sharing that ultimately assists team members in making sense not only of each other, but also of the roles which each team member occupies.[455]

The success or failure of a team may depend on the composition of this core. So important is getting the 'casting' of a team right that it should not be left to chance, but is part of the necessary skill of management. Nonaka and Takeuchi referred to team selection, post-selection monitoring of the team, and the removal, addition or replacement of team members as 'subtle control'.[456] This 'subtle control' is part of ensuring team success, but is also a way of ensuring that no 'unusually able people' are left in inappropriate or wasteful roles.[457]

Another benefit of this kind of managerial awareness is that moving selected team members around within an organisation (especially one concentrating on new product development) provides an easy and reliable way of sharing knowledge,[458] which is very important to successful knowledge creation.[459]

5.2.2 Ad Hoc Teams

There is a difference in outlook and behaviour between teams whose members have been gathered on an ad hoc basis for a specific task (and may expect to disband once the job is

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[453] Grant. 1996. Towards a knowledge-based theory of the firm, 112

[454] Nonaka. 1994. A Dynamic Theory of Organisational Knowledge Creation, 23

[455] Nonaka. 1994. A Dynamic Theory of Organisational Knowledge Creation, 27

[456] Nonaka and Takeuchi. 1986. The new new product development game, 8

[457] Nonaka and Takeuchi. 1986. The new new product development game, 9

[458] Söderquist 2006. Organising Knowledge Management and Dissemination in New Product Development, 516

[459] von Krogh. 2002. The communal resource and information systems, 100

done) and teams whose members have a rich shared history and anticipate future involvement with the same group.[460]

As was seen in the section on trust, there are advantages and disadvantages to both groups,[461] but where new product development is undertaken in technology companies it is more likely that the teams involved have been thrown together on an ad hoc basis for a specific project.[462] In such organisations, these project-specific teams drive the generation of organisational knowledge.[463] There are benefits to this kind of team in terms of creativity and innovation. Constantly being thrown into new situations with new team members promotes the probing and questioning behaviour associated with new group development,[464] avoiding the problems of stagnation and the passive acceptance of in-group information.

There are also some risks to operating in this manner. An ad hoc team is likely to be less robust in the face of adversity than an established team, and could experience channel narrowing and a breakdown in their ability to achieve their task if faced with disruption.[465]

A greater challenge for ad hoc teams may be in overcoming the lack of shared experiences with other team members, and the challenge of constant rebuilding. Established teams who work together effectively tend to achieve an internal cohesion over time that assists in their ability to communicate,[466] something that would not be built in an ad hoc team.

Established teams are also likely to have less exposure to turnover of team members than in ad hoc teams, where members may be added to or removed from the team at unpredictable intervals. High team member turnover is detrimental for knowledge creation as it means a loss of awareness of each other's competencies, potential loss of redundancy, and a temporary breakdown of sensemaking.[467]

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[460] van der Kleij et al. 2005. On the passage of time, 524

[461] In brief, the trust elements most pertinent to team dynamics relate to the possibility of mutual trust existing in the established team, versus the necessity for swift trust that would exist in the ad hoc team. Most worrying for established groups is the chance that they will stop critically examining in-group contributions, which would have a negative impact on innovation. The main obstacle for the ad hoc group is if it emerges or is suspected that there is an imbalance of the requisite competence within the group – this would sabotage the necessary swift trust dynamic.

[462] Morgan. 1996. *Images of Organisation*, 52

[463] Hedlund. 1994. A Model of Knowledge Management and the N-form Corporation, 74

[464] Weick and Roberts. 1993. Collective Mind in Organizations, 375-376

[465] Weick and Roberts. 1993. Collective Mind in Organizations, 374

[466] Hinds and Bailey. 2003. Out of Sight, Out of Sync, 627

[467] Gibson and Gibbs. 2006. Unpacking the Concept of Virtuality, 459

There are a few options available to an organisation that relies on ad hoc teams to mitigate their drawbacks. Establishing consistent behaviour rituals in the organisation minimises the impact of high team member turnover,[468] while the potentially detrimental effect of a lack of team history on inter-team communication is to some extent offset by the effects of swift trust. Interestingly, as we shall see, the Scrum methodology utilizes some very basic and effective behaviour rituals to enhance communication.

5.2.3 Leadership and Teams

The most important factor in successful knowledge creation of teams, well established or thrown together, is the quality of leadership available to the organisation. As was mentioned in Chapter 1, it is a function of an organisation's leadership to assist knowledge creation by providing structure, continuity and shared direction. Tolerating poor or short-sighted leadership is a good way to choke the potential of an otherwise excellent team.[469]

Encouraging and enabling creativity from a specially assembled team is made more important when (as they often do) the team operates autonomously and is set slightly apart from the remainder of the organisation.[470]

5.3 Geographically Dispersed Teams

Thus far the conversation on teams has not discriminated on the basis of proximity. The dynamics so far described are essentially applicable to all teams, dispersed or not. Having directed the conversation to date from the level of the organisation as a whole to the level of the team, I will now focus specifically on the geographically dispersed team. This is defined as a group of people who need to work together in order to achieve a common goal, but where some or all members of the group are reliant on electronically mediated communication in order to conduct their day-to-day interactions with each other.

Organisations deploy geographically dispersed teams for a variety of reasons. In some cases, the organisation is genuinely global and therefore assembling the best team may actually involve selecting people in different time zones and on different continents.[471] Even if some

[468] von Krogh. 2002. The Communal Resource and Information Systems, 93.

[469] von Krogh et al. 2011. Leadership in Organisational Knowledge Creation, 31-32

[470] von Krogh et al. 2011. Leadership in Organisational Knowledge Creation, 32

[471] Majchrzak and Malhotra. 2003. *Deploying Far Flung Teams*, 6

of the team members thus selected could be centrally relocated, some of the value of the individuals involved in the team may be tied to their local context, so that their removal from this context would invalidate their involvement in the team.[472]

In other cases, such as with offshoring in software development, geographical dispersion is an attempt to gain financial advantages from arbitrage in the labour market. In these cases the organisation engaging in the offshoring may find that the costs involved are much higher than initially expected, as coordination between distributed teams tends to be costly.[473]

5.3.1 Benefits of Geographically Dispersed Teams

There are some benefits to using geographically dispersed teams. Operationally, having a team distributed between multiple time zones increases the amount of available daily hours spent working on a given project, and allows rare skills to be obtained no matter where the particular expert is resident.[474]

The reliance on technologically mediated communication also has a mitigating effect on groupthink, thanks to a minimisation of the influence of high-status individuals (due to the reduction of static cues) and as a side effect of the reduction of the visibility of compliance.[475] This effect is strong enough that potentially problematic cultural differences could even be obscured in an existing dispersed team,[476] as demographic attributes and group affiliation continue to influence status in organisations.[477] Reliance on technologically mediated communication also leads to continued scrutiny, streamlining and redefinition of processes, potentially leading to efficiencies that would otherwise have been missed.[478]

There is also a benefit to the knowledge creation process that could be gained due to the diversity of the personal knowledge that could be expected in a geographically dispersed team.[479] Such teams, especially those globally dispersed, will tend to incorporate team

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[472] Majchrzak and Malhotra. 2003. *Deploying Far Flung Teams*, 26

[473] Baba et al. The contexts of knowing, 551

[474] Nidiffer and Dolan. 2005. Evolving Distributed Project Management, 67

[475] Wainfan and Davis. 2004. Challenges in Virtual Collaboration: videoconferencing, audioconferencing, and computer-mediated communications, 70

[476] Bjørn and Ngwenyama. 2008. Virtual team collaboration, 241

[477] Crampton and Hinds. 2005. Subgroup dynamics in internationally distributed teams, 234

[478] Nidiffer and Dolan. 2005. Evolving Distributed Project Management, 71

[479] Remembering Nonaka and Takeuchi's point that diversity of personal knowledge is a driver of knowledge creation. Nonaka and Takeuchi .1995. *The Knowledge-Creating Company*, 85.

members embedded in different contexts. This is a challenge, as we will see in more detail in the very next section, but it also presents an excellent opportunity to harness the generative properties of diversity – if the organisation's leadership is equipped to do so: "diverse groups may be more creative – or experience more conflict – depending on the nature of their differences, how well they manage them, and forces in the larger environment in which they are embedded".[480]

5.3.2 Challenges of Geographically Dispersed Teams

Geographically dispersed teams generate many challenges for those involved, whether as team members or as management. These challenges revolve around distance, diversity, information sharing and communication technology.

5.3.2.1 Challenges of Distance

We have earlier examined the dynamics of nearness, so it is apparent that geographically dispersed teams could suffer from the drawbacks associated with its lack. These drawbacks include: the dilution of organisational context, a lack of a sense of belonging, disruption of organisational identity, a dearth of opportunities for shared experiences and a loss of dependable, mutual interaction.

Sharing contextual information is particularly challenging across distance as it is "time consuming, unwieldy and uninstinctive".[481] Furthermore, Nonaka's Socialisation and Externalisation components of SECI are driven by the proximity of agents. What remains at a distance, in terms of the SECI model, is interaction with and synthesis of explicated knowledge through Combination and Internalisation. While part of the knowledge creation spiral, these components are not associated with innovation to the same degree as the interaction of Socialisation and Externalisation, since in Nonaka's theory Socialization represents the creative element of the knowledge creation cycle, while Externalization is crucial to the explicated communication of knowledge.

Lack of proximity is also linked to a decrease in spontaneous communication, which can be detrimental to innovation,[482] as well as the ability to incidentally notice when other team

[480] Crampton and Hinds. 2005. Subgroup dynamics in internationally distributed teams, 234

[481] Crampton and Hinds. 2005. Subgroup dynamics in internationally distributed teams, 251

[482] Hoegl and Proserpio. 2004. Team member proximity and teamwork in innovative projects, 1156

members are struggling with something, which in a collocated environment would lead to support and quicker overcoming of obstacles.[483]

5.3.2.2 Challenges of Diversity

A team of essentially homogenous individuals who happen to be geographically dispersed face fewer challenges than a team of dispersed individuals made up of members of different backgrounds, cultures, languages, knowledge and values.[484] Cultural differences in particular can be very subtle – team members who share the same language and superficial heritage may assume an overlap that simply isn't there, resulting in misunderstandings further down the line.[485] For example, South Africans from an English background who work with English people in the United Kingdom may find that the culture is actually significantly different to their expectations. Translated to the work place, they may find that they fail to communicate effectively, in part due to this unexpected depth of difference. The false expectation of shared culture could lead to larger problems and misunderstandings than would have arisen from a more aware and conscious approach arising from expectations of cultural differences.

Even when collocated, these differences would cause initial barriers to interaction, though these conflicts could eventually be broken down by sustained social interaction.[486] However, without this sustained social interaction to break down barriers, as teams become aware of their differences these will potentially lead to conflict.[487] To recall the negative impact of increased emotions (especially anger) on sensemaking, the presence of conflict implies the absence of effective communication.

The paradox for those responsible for assembling geographically dispersed teams is that, as we have seen, diversity is a desirable feature, if correctly managed: "pay-offs from access to distributed knowledge enabled by global teams depend on the team's capacity to bring together and integrate divergent sources and ways of knowing".[488] Unfortunately these 'pay-offs' can be very hard to realise in practice.

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[483] Hoegl and Proserpio. 2004. Team member proximity and teamwork in innovative projects, 1156

[484] Lagerström and Andersson. 2003. Creating and sharing knowledge within a transnational team, 86

[485] Baba et al. The contexts of knowing, 552.

[486] Lagerström and Andersson. 2003. Creating and sharing knowledge within a transnational team, 94

[487] See Hinds and Bailey. 2003. Out of Sight, Out of Sync: Understanding conflict in distributed teams.

[488] Baba et al. The contexts of knowing, 548.

5.3.2.3 Challenges of Information Sharing

Often when dealing with dispersed teams the structure is such that there are dispersed subgroups, rather than perfectly isolated individuals. Either the team is structured like this from the start, or an existing team is supplemented with a dispersed element. The latter has the potential to be far more disruptive, as Baba et al. illustrate,[489] but the end result is the same; subgroups form at each separate location, and when subgroups form, power dynamics emerge, which can compromise communication. For example, the recent Economist survey on collaboration found that information hoarding (with a view of information as a source of power) was perceived to be the top barrier to internal collaboration.[490]

With so much sensitivity around information, imbalanced communication is a challenge that needs careful attention, whether dealing with isolated individuals or subgroups of individuals. If information is distributed unevenly (for example, a team member is accidentally omitted from the distribution list of a piece of correspondence) it can lead to a breakdown in sensemaking due to a lack of shared cues for on-going work, and an increase in emotive responses.[491] If distant team members feel that they are not being kept up to date on correspondence, they will feel less engaged with their fellow team members and the organisation as a whole.[492] If disparity of information sharing occurs and is perceived as a power struggle between subgroups, it could lead to a breakdown of cooperation and trust,[493] essentially sabotaging attempts at knowledge creation.

Increased inclusiveness is not a given for solving the issue. Including distant team members on irrelevant issues (such as carbon copying team members on an email relating to the parking situation at a building in a different country that they will never visit) could generate unnecessary noise on the channel, contributing to feelings of information overload and increasing the likelihood that pertinent messages could be overlooked. It is the *appropriate* sharing of information that is the key to managing this challenge.

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[489] Baba et al. The contexts of knowing, 583. ey were looking at a global team that was originally a collocated Francophone team with an established leader. After a merger with a US company, the team was supplemented with Anglophone members loyal to a different leader, and the result was factionalism that compromised communication efforts already complicated by the language issue.

[490] Economist Intelligence Unit. 2007. *Collaboration: Transforming the way business works*

[491] Hinds and Bailey. 2003. Out of Sight, Out of Sync: Understanding conflict in distributed teams, 621 – 622.

[492] Majchrzak and Malhotra. 2003. *Deploying Far Flung Teams*, 71

[493] Baba et al. The contexts of knowing, 553

5.3.2.4 Challenges of Technology

The use of technology itself presents challenges to communication in dispersed teams. Functional issues such as network reliability and differences in bandwidth speeds will depend on where the various team members are located and are quite explicit, therefore easier to plan for or plan around.

The limitations to richness have already been discussed, but misunderstanding from these can be very dangerous to teams in a dispersed setting, since they will take longer to diagnose and understand.[494] Team members will need to maintain an awareness of and a tolerance for the inherent limitations of the media.[495] Part of managing this is a requirement that dispersed team members stay informed of and be able to utilise the most appropriate available communication options.[496] This will serve to mitigate the disadvantages of reliance on technology, though it will not be able to eliminate them entirely.[497]

5.3.3 Methods for Coping with Geographic Dispersion in Teams

In terms of the discussion thus far, the best method for empowering a dispersed team to create knowledge together is to first collocate them; to bring them physically together in a work environment that enables them to share experiences while working interdependently within this context. This allows them to build shared meanings prior to their subsequent dispersal.[498] This is more of a challenge with people from very different backgrounds, but as long as the work context can be built, they will be able to interact on a work level, even if they have little in common outside of the work context. A team of established colleagues who are subsequently dispersed should already have this base of shared experience within the work context.

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[494] Mark and Abrams. 2005. Differential Interaction and Attribution in Collocated and Distributed Large-scale Collaboration, 9

[495] Baba et al. The contexts of knowing, 583

[496] Badrinarayanan and Arnett. 2008. Effective virtual new product development teams, 244

[497] Hinds and Bailey. 2003. Out of Sight, Out of Sync: Understanding conflict in distributed teams, 627

[498] This conclusion is reached here through a discussion of organisational knowledge creation and organisational sensemaking. It is supported by similar conclusions about effective solutions to distance that have been reached in other areas. For example, team performance (Fontaine. 2002. Teams in Teleland, 129); organisational behaviour (Baba et al. The contexts of knowing, 583); general management theory (Gupta and Mattarelli. 2007. Towards the 24-Hour Knowledge Factory, 9) professional communication (Guo et al. 2009. Improving the Effectiveness of Virtual Teams, 12) and transdisciplinary scientific collaboration (Stokols et al. 2008. The Ecology of Team Science, S103).

One caveat, especially with a team that does not share a deep store of shared context, is the need to ensure 'refresher' meetings occur. Not only does the passage of time erode the benefits of shared experience between agents, but organisational contexts continue to develop as time progresses. There will therefore be a need to regularly reintroduce distant team members both to the organisation and to each other.[499]

5.3.3.1 Establishing Context at a Distance

It is not always possible to ensure that dispersed team members are brought into a shared context at the beginning of a project. Sometimes the only choice is to work with people who are essentially strangers. Where the interaction occurs at the level of the generically subjective, at the level of the role rather than the individual, the mutual assumption of a similar enough background between people occupying the same role could act as a 'proxy socialisation', as introduced in the section on swift trust in Chapter Two. This would allow the creation of an environment that enables knowledge creation, although it would be fragile.

A potentially useful coping strategy for teams of relative strangers operating at a distance is the establishment of a set of processes and procedures for operation, negotiated project-by-project via available media prior to commencement of work. This would essentially establish a limited 'bare bones' context for work immediately at hand. [500]

5.3.3.2 Trust in Dispersed Teams

We have seen that trust between organisational agents is crucial for building an environment conducive to knowledge creation. This impacts directly on the effectiveness of dispersed teams, where trying to operate without trust is ill-advised.[501] Trust is especially important when distant team members have little in common.[502] If the organisation as a whole has a culture of trust, it is easier to ensure trust between distant members of that organisation. [503]

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[499] Hinds and Bailey. 2003. Out of Sight, Out of Sync, 627

[500] Fontaine. 2002. Teams in Teleland, 124

[501] Lai and Burchell. 2008. Distributed work, 62

[502] Stokols et al. 2008. The Ecology of Team Science, S103

[503] Mueller. 2010. The Influence of Cultural Values on Knowledge Sharing across Organizational Boundaries, 6

Since trust is easier to establish and maintain in a smaller team,[504] limiting team size or subdividing teams into smaller distinct workgroups is one way to facilitate trust building in dispersed groups, though it would complicate coordination.

5.3.3.3 Leadership in Dispersed Teams

Leadership in dispersed teams is no less crucial than leadership in teams in general. The main difference is that additional skills are required. The leader is responsible for the communication culture of the team,[505] thus poor leadership in a distributed team would result in a poor culture of communication.

Leaders of dispersed teams need to be able to manage team diversity in a way that realises its creative potential, rather than simply resolving the disputes that differences will generate.[506] Weick has suggested that one way of managing diversity effectively without stifling creativity is 'moderated coordination', a form of leadership by example: "To moderate coordination means to monitor variety, preserve conceptual slack, dispel the idea that a good team is synonymous with people all of one homogenous mind, protect minority perspectives, and make your own sensemaking public by stating what you see as the situation, the task, the goal, the concerns, and asking others to do the same".[507]

Leaders of dispersed teams also need to have excellent coordination and communication skills, not only for facilitating communication within the team, but also in communicating with external stakeholders.[508]

Consistency and discipline is also needed. It is very easy to bypass established channels when communicating with dispersed team members, but such short-cuts are ultimately harmful.[509] Also, leaders of dispersed teams need to be unbiased in their attitudes towards different

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[504] Lai and Burchell. 2008. Distributed work, 68

[505] Lindqvist, Lundell and Lings. 2006. Distributed Development in an Intra-national, Intra-organisational Context, 6

[506] Majchrzak and Malhotra. 2003. *Deploying Far Flung Teams*, 81

[507] Weick. 2009. Impermanent Systems and Medical Errors. In *Making Sense of the Organisation: the impermanent organization*, 165

[508] Majchrzak and Malhotra. 2003. *Deploying Far Flung Teams*, 81

[509] Bjørn and Ngwenyama. 2008. Virtual team collaboration, 244

locations. While it is natural that people may not feel as personally involved in issues occurring at a remote location, this should not delay reaction to issues.[510]

5.4 Knowledge Creation in Geographically Dispersed Software Development Teams: An Illustration

The conventional wisdom in software development is that working in collocation is better than working in dispersion, as collocation results in increased productivity.[511] Dispersion is to be avoided if at all possible; if your circumstances force you to work with a dispersed team you are 'out of luck' and are at that point just trying to minimise damage.[512]

However, due to the intangible nature of the knowledge artefacts involved, and the perceived cost benefits of offshoring, new software development projects are increasingly incorporating dispersed elements.[513] Therefore, even though it is not considered desirable, it is perhaps more common to encounter dispersed teams in software development than in many other, more traditional industries.

5.4.1 Features of Software Development Teams

Software developers have some advantages when it comes to working in dispersed environments. Team members tend to be more open towards working with new technologies, thus removing some sensemaking barriers when relying on mediated communication.

They are also potentially likely to benefit from certain cultural overlaps. Teams working within the same industry may in general benefit from a form of 'proxy socialisation' brought about by similarities in culture. We have seen this before in the negative light of institutional isomorphism in a professional community.[514] In creative areas such as new product development such moulding would be undesirable, and an advantage of cross-discipline teams is that the diversity of viewpoints would break or at least challenge the hold of professional culture that may grip some members of the team.

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[510] Lindqvist, Lundell and Lings. 2006. Distributed Development in an Intra-national, Intra-organisational Context, 6

[511] Teasley et al. 2000. How Does Radical Collocation Help a Team Succeed?, 342

[512] Kniburg. 2007. *Scrum and XP from the Trenches*, 58

[513] Holmström et al. 2006. Agile practices reduce distance in global software development, 7

[514] In some contexts, however, there are benefits to this similar moulding of individuals, for example where compliance with existing standards, rather than innovation, is deemed desirable.

In software development, however, there is less danger of institutional isomorphism due to a lack of canonical national or international training and certifying bodies. Here, individuals may instead be influenced by the company culture of major employers (such as Google or Microsoft) seeding the industry with past employees who have shared similar experiences. Cultures may also or additionally form around an individual developer's chosen language of software development or preference of operating system.[515] There are even some signs that people who choose to go into the profession of software development have similar experiences of popular culture.[516]

All of these build to an identity of the 'software developer' that surpasses any one specific organisation and provides "norms of behaviour that constitute a shared basis for coordination".[517]

5.4.2 Dispersed Software Development using Scrum

Scrum is a project management methodology used in software development. The term 'Scrum' was assigned by Jeff Sutherland and Ken Schwaber in 1995, but the central ideas were developed from Nonaka and Takeuchi's 1986 paper "The New New Product Development Game".[518]

Using the Scrum framework allows software development teams to work on products for clients whose requirements may change numerous times before the 'finished product' stage, as the nature of cutting-edge industries means that the product may be poorly understood at the time that development begins.[519] This is possible because Scrum employs minimalist structures and an iterative approach to planning. Scrum's structures also lend themselves very

[515] To give very local examples of each, the Cape Linux User Group (http://wiki.clug.org.za) is an example of a community formed around both an operating system, and the Cape Town Python User Group (http://ctpug.org.za/) is an example of a community formed around a development language. There are overlaps between the two groups, but members of these groups would also share some norms and values with Linux and/or Python devotees around the world.

[516] Haefliger and von Krogh. 2004. Knowledge Creation in Open Source Software Development. In Tsoukas and Mylonopoulos. 2004. *Organizations as knowledge systems*, 117

[517] Bogenrieder and Nooteboom. 2004. The Emergence of Learning Communities. In Tsoukas and Mylonopoulos. 2004. *Organizations as knowledge systems*, 47

[518] Haight. 2011. *DevOps: Using Agile Techniques in IT Operations, Part 2 (Scrum),* 2

[519] Rising and Janoff. 2000. The Scrum Software Development Process for Small Teams

well to effective organisational communication as the iterative approach enforces regular communication with all stakeholders.[520]

5.4.3 The Scrum Process Briefly Described[521]

Scrum provides a project management framework built around relatively few set pieces. There are three **roles**: the Product Owner, who interacts with both the client and the developers and keeps track of the larger organisational context; the ScrumMaster, who handles day to day operations and removes impediments encountered by the team; and the team itself, which is expected to be self-managing when it comes to the actual production process.

Central to the process are a series of **meetings:** Initially there are the Sprint Planning meetings, where the work requirements are planned and committed to by the team, and an initial list of itemised tasks is generated – this is called the Sprint. Thereafter there is a daily Scrum Meeting, which is restricted to 15 minutes and as such is often shortened to the 'standup' meeting. This is where the team synchronise their work for the next 24 hours. During the sprint the Product Owner may call one or two Estimation Meetings in order to scrutinise the itemised tasks to ensure they are appropriately sized. Once the sprint is concluded there follows a Sprint Review, where all stakeholders are invited to inspect the results delivered by the development work completed during the sprint and give feedback that would allow the team to improve their next sprint. Finally, following on from the review, there is the Sprint Retrospective, which unlike the review is a closed meeting of the team that candidly discusses the processes used during the last sprint and where this could be improved in the next.

Finally, there are four **artefacts** that Scrum teams use to guide, track and report on their progress: These are the Product Backlog, essentially a to-do list prioritised by the Product Owner; the Sprint Backlog, a task board that shows the team and any other interested parties the current, finished and upcoming work items for that particular sprint. The Burndown Charts help the team (and passers-by) to monitor the team's progress over time, and allow the team to start being able to estimate how much time new items will take. Finally, the

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[520] Lindqvist et al. 2006. Distributed Development in an Intra-national, Intra-organisational Context, 4

[521] The cameo of Scrum that follows draws primarily on Hundermark. 2009. *Do better scrum*, pages 6 to 14.

Impediment Backlog, which is a list of items delaying the team's progress which need to be addressed by the ScrumMaster.

The ideal team size in Scrum is no larger than eight to ten people; [522] if a project requires a larger number of developers to work on it, the standard method adopted is to create a 'scrum-of-scrums', where multiple separate Scrum teams are created, and this is coordinated by having a representative of each different Scrum team (usually the ScrumMaster) joining a special daily 'standup' meeting of representatives.

5.4.3 Dispersed Scrum in Action

Both Jeff Sutherland and Ken Schwaber are signatories of the 'Agile Manifesto,' which commits them to certain software development principles, one of which is that "The most efficient and effective method of conveying information to and within a development team is face-to-face conversation".[523] Given this attitude in its founders, we could conclude that Scrum was not originally designed as a distributed project management methodology.

Despite this, there are a number of instances where Scrum has reportedly been used effectively when working in a dispersed setting, as will be outlined below.

5.4.3.1 Sutherland's OneTeam Method

Jeff Sutherland has discussed a number of case studies outlining successful projects in dispersed software development teams utilising Scrum.[524] He noted that the primary reason for the failure of dispersed teams was that they tended to degenerate into multiple sub teams with separate agendas, unhealthy competitiveness, and breakdowns in trust.[525] This led him to the conclusion that "The most important ingredients for building a team are communication,

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[522] In this respect, the Scrum team size is more or less in keeping with the ideal team sizes for knowledge creation already discussed in this thesis, Miller's 'seven, plus or minus two', and von Krogh, Ichijo and Nonaka's 'five to seven people' recommendation for group size that can new tacit knowledge through socialisation.

[523] Highsmith et al. 2001. *Manifesto for Agile Software Development*, available at http://www.agilemanifesto.org/ (last accessed 31st December 2011)

[524] Sutherland et al. 2006. Adaptive Engineering of Large Software Projects with Distributed/Outsourced Teams; Sutherland et al. 2007. Distributed Scrum: Agile Project Management with Outsourced Development Teams; Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams; Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India

[525] Sutherland. 2009. *Take no prisoners*

shared vision, active participation, shared ownership and shared goals."[526] These lessons learned developed into the 'OneTeam' model,[527] which standardises operating procedures for dealing with distance. The sharing of vision, ownership and goals means that for the duration of the project the different groups of people (clients, contractors, sub-contractors) who are all working together in this manner effectively form a temporary organisation.

5.4.3.2 One team over multiple locations

The core of the OneTeam approach is the splitting of teams over multiple locations.[528] This forces reliance on the Scrum structures in order to coordinate activities and also introduces novelty, which forces people to make sense of their new dispersed work context. Putting team members into new contexts also erodes the formation of subgroups in the separate locations, as trust is built through increased contact between representatives of each group. The formulaic interaction also has the effect of breaking down cultural barriers between the dispersed team members,[529] since team members will find themselves working with colleagues of different nationalities.

5.4.3.3 Coordination by team representatives ('scrum-of-scrums')

The projects were scaled up in a manageable fashion by utilizing the scrum-of-scrums approach. Not only does this ensure that team size does not grow too large to encourage innovation, it also removes dependencies between teams.[530] This allows individual teams to generate work at their own established pace while also allowing cross-fertilisation of ideas between teams.[531] The regularity of meetings between team representatives (usually the

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[526] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 279

[527] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 278; Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 3

[528] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 279

[529] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 2

[530] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 278

[531] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 278

ScrumMasters) also means that the organisational context as a whole remains visible to all stakeholders.

5.4.3.4 Standardisation of resources

A lot of attention is paid to making sure that all new teams gain duplicate experiences when they are added to the project. Sutherland has described this as a "cell division like process".[532]

The OneTeam approach is therefore designed to ensure the standardisation of tools, resources and definitions used across the entire temporary organisation.[533] The intention is to organise the project into "a single whole with an integrated global code base".[534]

Part of the standardisation is also ensuring that all developers working on the project have a similar level of talent,[535] so special attention is paid to the matching of people both with the organisational culture and their expected tasks.[536] The logic is that trying to work with a team that is not completely effective in a face-to-face environment is even more counterproductive when that team is dispersed.[537]

Controlling the tools and processes leads to a similar set of experiences for all team members; controlling the 'talent' of the team also means screening for people who are at a similar professional level, which in software development may assist by gathering a group of people who already share some basic cultural overlap regardless of nationality. This similarity of context will contribute to fulfilling the OneTeam requirement that teams learn to share the same goals.

5.4.3.5 Initial period of collocation

Another important component of the OneTeam process is the collocation of team members at one of the locations (usually the location where the client is based) at the very beginning of

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[532] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 6

[533] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 279

[534] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 3

[535] Sutherland. 2009. *Take no prisoners*

[536] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 5

[537] Sutherland. 2009. *Take no prisoners*

the project.[538] This is an intentional exercise in the building of a shared context.[539] The goal is that this period of collocation will result in the establishment of good working relations between the various team members, as well as to align all participants with the project environment, processes and requirements.[540]

Therefore, while these teams are collocated, they actively engage in the work of the organisation for a short while – usually about two weeks, but sometimes longer.[541] During this time, thanks to the communication structures enforced by Scrum, they learn to make sense with and of each other. When they subsequently disperse, it is with an established context.

5.4.3.6 Other Examples of Distributed Scrum

It should be noted that Sutherland typically worked on very well resourced projects, typically with no more than two locations that needed to be managed, where he enjoyed a great deal of influence and could apply 'subtle control' and knowledge leadership in an unrestricted fashion. In a sense he represents an ideal, rather than typical, application of the theory to practice. He acknowledges this himself when he notes that, in his assessment of the previous year, 90% of software teams following similar development methodologies would not be capable of replicating his successes.[542]

In addition to the success stories originating from Jeff Sutherland and his co-authors, there have been other recent examples demonstrating the effectiveness of Scrum in a distributed setting.

Norton describes a case study that involves coordination of a team comprised of Russian and American developers.[543] He describes how the Russian developers intentionally worked in collocation with their American counterparts and the client for four months in order to build a

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[538] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 6

[539] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 6

[540] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 6

[541] Sutherland et al. 2009. Fully Distributed Scrum: Linear Scalability of Production between San Francisco and India, 279

[542] Sutherland et al. 2009. Fully Distributed Scrum: Replicating Local Productivity and Quality with Offshore Teams, 7

[543] Norton. 2008. *Making the Most of 'Agile' in a Distributed Development Environment*

relationship.[544] During this period of intense socialisation, the various team members also aligned their language – speaking of a separate 'Russian' or 'U.S.' team was forbidden, people would only speak of 'the team'.[545] Once in their separate time zones, the team adjusted their working hours to ensure the maximum reasonable overlap.[546] The project was successful and critical features of this success were deemed to be collaboration and simplicity,[547] both of which are built into Scrum.

In an approach that is quite similar to Sutherland's OneTeam strategy, Kniberg allocated people to teams that spanned distance. He was hoping to capitalise on the Scrum framework's encouragement of collaboration to ensure that the team members regularly communicated and became used to each other as far as possible over lean channels.[548]

Paasivaara et al found that using Scrum in a geographically dispersed team led to an increase in informal communication and a lowering of barriers to arranging ad-hoc meetings.[549] Unfortunately where these occurred via lean channels these informal communications were still subject to the problems associated with a lack of media richness, most notably when the issues under discussion were complex.[550] Nevertheless, they found the very structured nature of communication using Scrum to be greatly beneficial; and with this came improved trust, motivation and quality.[551]

Although not specifically using Scrum, Williams and Stout describe a geographically dispersed project that was successfully scaled up using the 'scrum-of-scrums' approach borrowed directly from the Scrum methodology,[552] which provided the necessary level in inter-team and inter-location coordination.

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[544] Norton. 2008. *Making the Most of 'Agile' in a Distributed Development Environment,* 5

[545] Norton. 2008. *Making the Most of 'Agile' in a Distributed Development Environment,* 5

[546] Norton. 2008. *Making the Most of 'Agile' in a Distributed Development Environment,* 6

[547] Norton. 2008. *Making the Most of 'Agile' in a Distributed Development Environment,* 7

[548] Kniburg. 2007. *Scrum and XP from the Trenches*, 123

[549] Paasivaara et al. 2008. Using Scrum in a Globally Distributed Project, 537.

[550] Paasivaara et al. 2008. Using Scrum in a Globally Distributed Project, 538

[551] Paasivaara et al. 2008. Using Scrum in a Globally Distributed Project, 540

[552] Williams and Stout. 2008. Colossal, Scattered, and Chaotic (Planning with a Large Distributed Team), 360

5.4.4 Lessons of Dispersed Scrum

When collocated teams work together following the Scrum processes they can become very productive.[553] This is unsurprising when we consider that the artefacts and rituals of Scrum have the effect of imposing regular contextual interactions on the team, who therefore quickly learn how to make sense together if they did not already know each other. The daily meetings (the 'stand ups') result in defining shared frames for each team member, while also being an example of Externalisation. Retrospect, one of the components of sensemaking, is actually built into Scrum's framework in the form of the Sprint Retrospective, where the team actively makes sense of the previous work period and seeks to improve on it.

The technologies available to software developers using Scrum who work in a dispersed fashion are similar to those available to any other dispersed team[554] with the addition of some methodology-specific software for the artefacts, like electronic Sprint Backlogs and Burndown Charts. Yet something about Scrum seems to lead to a process that is generally effective even at a distance. On analysis, there is nothing mysterious about it. Scrum institutionalises good communication and contextualisation habits that, if followed consistently, result in an environment conducive to organisational knowledge creation.

[553] Kniburg. 2007. *Scrum and XP from the Trenches*, 108

[554] Kniburg. 2007. *Scrum and XP from the Trenches*, 121 – 122

Chapter Six
Conclusion

6.1 Summary

The first chapter introduced Nonaka's Organisational Knowledge Creation and Weick's Sensemaking, and showed how each of these theories is widely respected and relevant. It also served to establish the importance of context to the organisational knowledge creation process.

In the second chapter organisational context was discussed in more detail. It was seen that the individual experiences of organisational agents result in unique frames of reference. If, however, all agents within a broad organisational context share experiences and learn to interpret them in equivalent ways they will be able to make sense and create knowledge together. It was also here that the concept of 'swift trust' was introduced to show how it is possible for agents to operate in an environment supportive of knowledge creation in the absence of prior socialisation. In preparation for the discussion of communication over distance that would occur in chapter three, the degrees of nearness (proximity and collocation) were also examined.

The third chapter discussed communication in dispersed organisations from the perspective of Media Richness Theory, which is underpinned by the conduit model of Shannon and Weaver. It was found that the context and current sensemaking capacity of the agents involved in communication had more impact on the quality of the message than the channel used for its transmission, though certain channels have certain restrictions. With an eye to these restrictions, the communication technologies commonly in use by organisations were also briefly examined.

The fourth chapter examined the combination of the previous findings as they occur at the level of the team, which was identified as the primary mechanism for knowledge creation within the organisation. Because software development lends itself to distributed work very readily, the focus then shifted to software development when examining dispersed teams. In the context of new software development, one management methodology, namely Scrum, stands out in its ability to promote shared contexts amongst team members, and this was examined in the context of case studies from the industry. The chapter showed that even on

the cutting edge of available communication technologies, in an industry where virtual products and environments were first built, people prefer to avoid dispersion where possible. Where it does occur, dispersion is tolerated as a necessary evil driven by business needs.

6.2 Implications

It was my contention that someone who had to work with a geographically distant colleague would be in a much better position to do so if they had established a collaborative work context prior to the introduction of that distance. It was also my contention that proximal colleagues who lacked an established work context would initially struggle to make sense together, and in fact two distant colleagues sharing this establishing context would fare better than the proximal colleagues who did not. Furthermore, I identified the most challenging collaboration as being one that had to occur between colleagues who were geographically and contextually distant, and asked how knowledge creation could occur over these distances.

Having examined myriad factors, it is clear that distance problematizes the organisational knowledge creation process as outlined by Nonaka, but the significance is best explained from Weick's organisational sensemaking perspective. When things cause an interruption to our routine, it becomes more difficult to communicate. The introduction of novelty is such an interruption, and making sense of the interruption in a meaningful way is the vital first step in the process of organisational knowledge creation.

In other words, it is just when an opportunity for sensemaking arises that our ability to make sense together is impaired. This occurs even when we are co-present, but the impairment is much greater when we are required to communicate via lean channels, which trim the cues that can be interpreted. We could more easily experience a total breakdown in sensemaking when removed from a face-to-face context, to the detriment of the organisational knowledge creation process.

Studies of organisational communication in general, but organisational knowledge creation in particular, may benefit from an awareness of the establishing context shared by agents in an interaction, or the lack thereof.

Those who are responsible for managing dispersed colleagues would also benefit from this awareness. Prior exposure to each other's sensemaking processes through shared experiences will mitigate the negative effects of distance on communication between colleagues by building on an establishing context. Our case studies have shown that two weeks of

collocated mutual sensemaking should be enough to establish this context, though these shared experiences will fail over time as these colleagues continue to engage with their geographically separate contexts.

It is also possible to achieve some degree of success when strangers are forced to use exclusively technologically-mediated channels for knowledge creation. We have seen that 'swift trust' is one option for short bursts of meaningful joint work, though it is fragile and has limited applicability for an organisation trying to foster a long-term culture of knowledge creation. Similarly, where agents occupy roles that by their nature carry an assumption of similar backgrounds or cultures, it can act as a 'good enough' environment for knowledge creation. Like swift trust, this is not a robust basis for knowledge creation and as such these 'proxy socialisations' are more suited to an organisation that operates as a holder of contracts binding various adhocracies.

6.3 Conclusion

Whether we *can* eliminate the need for nearness in work is one thing. Whether we *should* is quite another. Despite the improvements to collaborative technologies, Kniburg's stance on working with a dispersed team, that you are just trying to minimise damage,[555] is not outdated. Sutherland's OneTeam model, despite being an example of distributed Scrum, *still* incorporates collocation into the mix of standard practices that allow hyperproductivity. This is despite it being an effective current example of the utilization of good set of operational practices (Scrum) for new product development in software design. This in an industry whose professionals are probably the best suited to conduct work via mediated channels, being both more comfortable with technology, and more likely to share the 'proxy socialisation' effect from broadly similar contextualisation.

Sensemaking is social. Sharing contexts with other people but never interacting with them physically is simply deeply unsatisfying. This is something we learn very quickly when trying to maintain a distance relationship (business or personal). As Clay Shirky, a prominent commentator on the internet, has noted "…even in a mediated age, people crave real human contact."[556]

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[555] Kniburg. 2007. *Scrum and XP from the Trenches*, 58

[556] Shirkey. 2008. *Here comes everybody*, 199. This also lends weight to Winger's speculation (mentioned in chapter three) that eye contact during relationship building is a biological imperative.

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