Information Management in Response to Increased Police Demand

This dissertation is submitted in part fulfilment of the requirements for the degree of MSc Information Systems and Information Management

Acknowledgements

My two exceptional dissertation supervisors have been invaluable in assisting with this project and have gone above and beyond in all aspects. Thank you.

I'd also like to thank the focal points in the police that not only provided access but gave thoughtful feedback on the survey design. I am so grateful for their time.

Finally I'd like to thank the N8 Policing Research Partnership for funding this project, and others like it, to encourage collaboration between universities and the policing sector. I'm honoured to be a contributor.

Abstract

This study explores the relationship between information culture and increasing demand within the policing sector. By surveying police staff, their information culture profile is measured and analysed. It is found to be highly varied amongst individuals, suggesting a lack of cultural cohesion in the behaviours, values and norms of information use. The results suggest that defining and developing an optimum information culture is the best approach for tackling demand.

Funding

This project was funded by the N8 Policing Research Partnership.

Abbreviations

IT: Information Technology

IM: Information Management

RQ: Research Question

The force: the participating police force in the North of England that was sampled as the subject of the study.

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Chapter 1: Introduction

We rely on the police to safeguard society. They are responsible for protecting the public, responding to emergencies, enforcing the laws and preventing crime. It is a core foundation of a safe and functional civilization. Any problems the police have is a problem for all. Our safety depends on a capable, functional and responsive police force.

The policing sector today is facing a monumental challenge. Police demand is increasing; meanwhile budgets and resources are decreasing. Due to newer more complex crimes, funding cuts, increasing expectations of police and other factors, police staff and resources are being stretched thin. This increased demand on police staff has led to increased risk in many areas. Due to the overwhelmed support services, emergency calls are being demoted to less serious (HMRCFIS, 2016). Vital police services are provided at the expense of others (HMRCFIS, 2016). A survey of superintendents found that less than a third had sufficient resources or staff to fulfil their duties, and over a third reported that demand had increased excessively in the previous year alone (Home Affairs Committee, 2018). The most vulnerable people are not being protected because demand on the policing sector is becoming unmanageable (HMRCFIS, 2016, Home Affairs Committee, 2018).

The policing sector needs to find ways to respond to and manage this sharply increasing demand if it is to be able to provide the protection that we need.

1.2 This Research

The literature on police demand highlights internal demand as a critical component and one that the policing sector has direct control of. The behavioural and cultural aspects of this demand is presented as a promising but underdeveloped avenue for change, unlike the more frequent optimization attempts that typically focus on cost efficiency. A gap is identified in the literature applying information culture theory to the policing sector. Therefore this study seeks to fill that gap by exploring the relationship between the information culture and internal demand. Three research questions form the basis of this study:

RQ1: What is the information culture profile of the force?

RQ2: What relationship exists between information culture and demand in the force?

RQ3: How can information management strategy alleviate increasing demand in the force?

Chapter 2: Literature Review

This section evaluates literature relating to the relevant themes contained within this research project and highlights the research gap it intends to address. Firstly, domain-specific literature on the rising demand in policing assessed. From this foundation, two key themes emerge – information management and organizational culture. Literature regarding these two themes is evaluated, and both are found to have a thematic link with information culture. Literature on information culture is is then surveyed to explore key models and research instruments, with their strengths and weaknesses, to inform the methodology of this study. As a result of this process, a critical research gap is identified: there has not been an application of information culture theory to the police demand issue. Lastly, three research questions are formed to address this gap.

2.1 Rising Demand in Policing

According to the Office for National Statistics (2019), the crime rate in England and Wales has been consistently falling for decades. In the last few years, whilst different categories of crime have shown some notable variance, the overall figures have been stabilizing (Office for National Statistics, 2019). Instances where total reported crime rates have shown an increase can be attributed to improvements in crime reporting, rather than a trend in actual crime rates (Office for National Statistics, 2019). Yet we can observe from policing literature, external reports, and in the press a growing recognition of how, in spite of falling crime rates, the demand on police forces has been increasing in recent years (College of Policing, 2015, National Police Chief's Council, 2017, Berry, 2010, HMRCFIS, 2016, Home Affairs Committee, 2018, Financial TImes Editorial Board, 2018). This is counterintuitive; one could expect that if crimes generate a particular amount of demand on police forces, and the frequency of those crimes are decreasing, then that would result in a lesser amount of demand produced. But police and government documents tell a different story. This is the most appropriate place to begin investigating the nature and causes of this demand, although partiality may be an issue. It is not beyond imagination that there could be motivation to misrepresent the severity of the issue.

One early report on this increasing demand by the College of Policing (2015) offers insights and hypotheses into rising demand that would later be expanded upon by other related bodies such as the National Police Chief's Council (2017). As a response to what it describes as "a widespread perception across forces that officers and staff are at least as busy as ever" (2015, p. 2), the College of Policing put together this report to collect data on the elements of the policing sector that are changing, and to discuss their effect on police demand in order to gain insight into the causes. It draws from sources such as crime statistics data released by the government and their associated costs, papers and commission reports on individual categories of crime such as mental health related incidents, and volumes of emergency calls. The paper then combines this data to generate hypothetical explanations for the increasing demand.

Firstly, they state that whilst crime figures will of course shape the amount of demand on police, in reality the work generated as a direct response to increased demand only makes up part of the

overall workload, and in fact much of the demand on police is generated through other means. They observe an increase in these other types of non-direct demand (College of Policing, 2015).

They also note that whilst crime rate quantities are falling and stabilizing, new types of crime are emerging such as digital crimes, child exploitation and modern slavery. These generate demand both because of their contemporary nature (police have not fully adapted to being able to easily handle such cases) and their complexity (such crimes may likely require more resources in order to investigate them) (College of Policing, 2015). Also mentioned are the increasing statutory and strategic responsibilities that the police must work with, which means more obligations and requirements for forces to now work on than previously. Some examples given are the need to meet protective statutory requirements, duties to handle counterterrorism and organised crime, and maintain public order (College of Policing, 2015).

This report goes a long way in creating evidence-based hypotheses as to why demand is increasing, albeit recognising the difficulty with the limited techniques for measuring demand. It sufficiently highlights the issue, creating a good argument for *why* demand is increasing, and to some extent, *how* it is increasing. What this report does not give us is the *nature* of the demand- *what* this increased demand is, and how it manifests within the policing sector. Fortunately, that is what a National Police Chief's Council (2017) report addresses. Put together by an extensive amount of professionals working in many parts of the policing sector in all 43 forces, and collating many of their individual studies, workshops and analyses, it follows on directly from the College of Policing (2015) report to explore a variety of aspects of demand. Findings on the causes of rising demand closely resemble to that report by identifying the increasing expectations of forces, a change in policing context, and the nature of the work becoming more complex as the most likely factors for increasing demand (National Police Chief's Council, 2017). It also discusses quite extensively another factor which has had little mention previously – reductions in budget and resources. It explains that we are not simply seeing an increase in work generated to cause demand, but the rate at which police can process work is being reduced due to spending cuts. This is supported by a report by the Natonal Audit Office (2018) which estimates a *"*19% real-terms reduction in total funding… to police and crime commissioners, 2010-11 to 2018-19*"* (p.4).

As to how this demand might be managed, the report argues the importance of understanding the nature of the demand instead of responding directly to these root causes, in particular budget reductions. It highlights the failures of previous efforts to tackle increased demand by initiatives such as improving cost efficiency in response to falling budgets. Talking generally, it describes the attitude of such initiatives as "*trying to do more for less*" (National Police Chief's Council, 2017, p.16). With cost reduction as the focus, the results were described as "*de-humanising*" (p. 16) and reduced the quality of services which actually increased expenses by creating more end-to-end costs. The argument being made is that the mistake in these cases was the wrong type of thinking – focusing on costs and outputs rather than value and outcomes.

2.2 Internal Demand

To better understand the nature of this demand, the report breaks it down into three distinct categories (National Police Chief's Council, 2017). The first category is *reactive demand* (also

referred to as public demand in this report). This is demand caused as a direct result of responding to incidents or reports of crime, such as emergency calls. The second type is *proactive* demand (also referred to as protective or pre-emptive demand). This includes all of the activities police undertake to support public safety and reduce crime, such as policing large events, where crime is anticipated. The third type is *internal demand.* Unlike reactive and proactive demand, which is generated by the public's actions (or anticipated actions), internal demand is generated from within the organisation itself. It is the "*processes, protocols, administrative tasks and bureaucracy*" (National Police Chief's Council, 2017, p.19) the policing sector does in order to function. The focus and the source of this type of demand, is *internal* rather than *external*.

Focusing on internal demand is a reasonable approach to thinking about how the police might better manage and reduce this demand. Whilst there are surely improvements and innovations as to how police reactively and proactively respond to incidents of crime, this does only make up a portion of police work and, perhaps more importantly, the policing sector has only a limited amount of control on the types and frequency of crimes with so many other factors involved. It would be unwise to ignore the strong words of this report: "The significance of internal demand as a drain on resources, capacity and cost cannot be underestimated and the potential gains are huge if it is understood and addressed" (National Police Chief's Council, 2017, p.48).

One report that provides surface level detail on the workings of internal demand is an independent report on reducing bureaucracy in policing (Berry, 2010). Although perhaps out of date in the modern climate, it still chronicles the inner workings of police bureaucracy, a highlighted element of internal demand in the report by The National Police Chief's Council (2017). Whilst the report recognises that bureaucracy is essential for maintaining the accountability of the policing sector, excessive bureaucracy can negatively impact the quality of work and, more relevantly, increase demand on staff through "*overengineering, duplication and waste*" (Berry, 2010, p.1). This problem is illustrated with some colourful examples that help us understand exactly what this looks like: In order to evidence compliance with the Protective Services Standard, personnel were required to incorporate 162 separate standards and answer 1,099 questions. To gain permission to initiate a surveillance operation, a 16 page form needed to be completed. Some officers had to enter suspects' details into eight separate databases. Berry (2010) estimated that one third of personnel time was being spent on excessive bureaucracy.

Each cited resource presents the internal demand problem as either an information management problem or a symptom of organizational culture. This isn't presented explicitly, but the connection is evidential: from Berry's (2010) insight into a culture where demonstrating authority manifests as information demands on personnel, to the National Police Chief's Council (2017) illustration of friction between the information needs of various parts of the policing sector. Therefore the scope of literature widens here to resources relevant to these themes in order to provide a better understanding of the mechanisms in play.

2.3 Information Management & Organizational Culture

Although internal demand literature in policing is still arguably in infancy, the elements of internal demand as presented are certainly nothing new. These individual elements, "*processes, protocols, administrative tasks and bureaucracy*" (National Police Chief's Council, 2017, p.19), have been associated with various causes and complications. In their empirical study on organisational bureaucracy, Kaufmann et al. (2018) finds a statistically significant relationship between administrative delay and bureaucratic elements. Whilst the causality of the relationship was not discussed, likely due to the incredible difficulty that this would cause to demonstrate empirically in such a setting, it would not be such a leap to believe that this is because administrative delay is one of the causes of such internal demand.

An earlier study identifies the organizational culture as an important "moderating influence" (Pandey and Moynihan, 2006, p.133) in internal demand, and finds that large hierarchies (as can be seen in the policing sector) distort the upward and downward flow of information, causing a strain on processes and protocols and therefore performance – not necessarily due to the decisions and actions taken to control and coordinate the flow of information, but rather the "*aspects of culture*" such as "*traditions rather than rules*" (Pandey and Moynihan, 2006, p.133). They provide convincing evidence to suggest that particular types of organizational culture, specifically ones that value efficacy and meaningful work over achieving targets, had higher performance.

This relationship between culture and effectiveness has been studied with keen interest in the management field (Cameron, 2015). Yet in the field of information management, this is often not the case. Marchand et al. (2002) provides a commentary on the evolution of the information management domain to perhaps explain why. They argue that because there has not been a solid academic foundation for information management in the past, it has mainly been practitioners who have been advancing the field. Because of this, there has been a branching of the ways in which information management is treated and understood. They identify three prominent schools of thought:

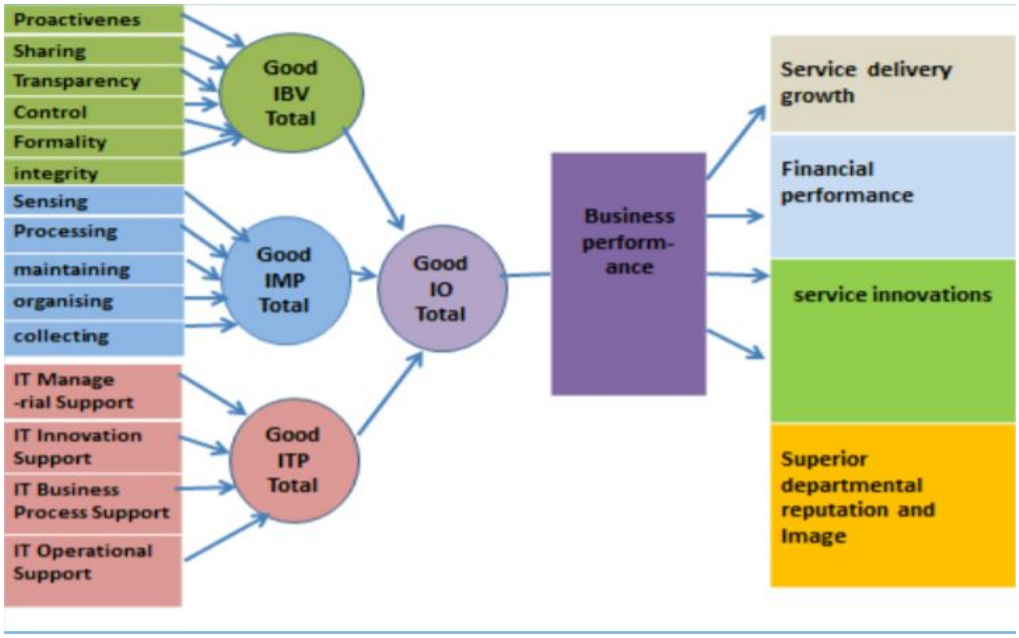
- The *IT school* where technology and systems are the solution to information management challenges.
- The *IM school* where information is treated as both a resource and a process.
- The *behaviour and control school* which promotes good behaviours and values.

They explain that the reason why the IT and IM schools have been so predominant is because typically the need for good information practices manifests itself at the low level, operational, practical activities. Practitioners have therefore understandably not focused on behavioural aspects, and also not held the power and authority necessary to drive major behavioural changes. Marchand et al. (2002) see this as a critical mistake, because they view information management as people-centric. Shifting away from IT systems and towards harnessing skills and knowledge instead was a popular managerial trend at the time (Scarborough et al., 1999).

Marchand et al. (2002) stress the importance of this distinction between the three schools because they suggest the IM and IT schools are mostly effective at tackling operational challenges, but the behaviours and values school works with organizational challenges. This is a convincing argument, given that IT projects for example will be expected to have particular functional goals to solve a problem. But what happens if the problem is multifaceted, complex and evolving? Too challenging for any particular information system to solve (such as rising internal demand)? Perhaps a shift in the behaviours, values and attitudes of personnel could permeate throughout an organization and affect all of the decisions made – the organizational structure, division of labour, objectives and priorities, and valued skills. This could mean organizational culture might not just shape how the specific demands of today are handled, but also how demand is managed generally over time.

Marchand et al. (2002) developed a research instrument called the IO tool to investigate the relationship between organizational culture and performance. Their process was thorough – illustrated by their confirmatory research which ensured the terms they were using were deemed valid by senior managers, before progressing with more comprehensive work (Marchand et al., 2002). Noting a lack of research linking these three schools, they sought to identify their interplay instead and found that a combination of efforts along each of these three vectors was a much better predictor of performance than any one individually. Their *coalignment model*, represented below (figure 1), formed the basis of a research project where a calculated information orientation score had a stronger correlation than its individual components.

Figure 1 : Information Orientation Coalignment Model



Note however the indicators of performance used in this context, such as financial performance. Such measures are typically effective measurements of private organisations, and may not translate effectively to public organisations such as police forces.

Nevertheless, categorizing the aspects of information behaviours and values in this way (proactiveness, sharing, transparency, control, formality and integrity) proved to be an effective method for producing meaningful results. These six components have since informed further research and theory development since, in a thematic area focusing on organizational culture and information use – *information culture* (Choo, 2013, Choo, 2016, Choo, 2002, Choo et al., 2008, Oliver, 2008, Oliver, 2011, Oliver, 2004, Sinitsyna, 2014, Cameron and Quinn, 2011).

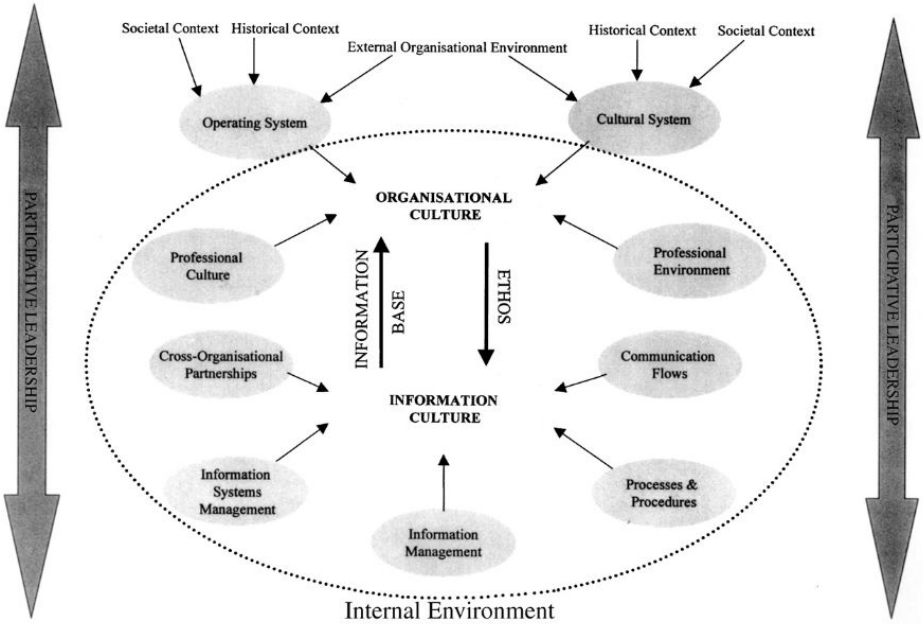
2.4 Information Culture

Running parallel to the work of Marchand et al. (2002) in developing theory on the relationship between culture and information use, Curry and Moore (2003) were developing a model to assess the information culture of an organisation. At this point, there was a lack of coherence in the understanding and definition of information culture, and so they sought to homogenise the field by providing a clear definition and a model for exploring its nature. Their provided definition is:

"A culture in which the value and utility of information in achieving operational and strategic success is recognised, where information forms the basis of organizational decision making and Information Technology is readily exploited as an enabler for effective Information Systems" (Curry and Moore, 2003, p.94)

Interestingly they include both information technology and information systems as key components, similar to how the coalignment model of Marchand et al. (2002) signified the important relationship between them. Yet whereas Marchand et al. (2002) sought to quantify the cultural element in order to directly impact business and financial performance, the model of Curry and Moore (2003) is exploratory to seek contextual understanding, and to evaluate, rather than to measure (figure 2).

Figure 2: Curry and Moore's Conceptual Model (Curry and Moore, 2003, p.95)

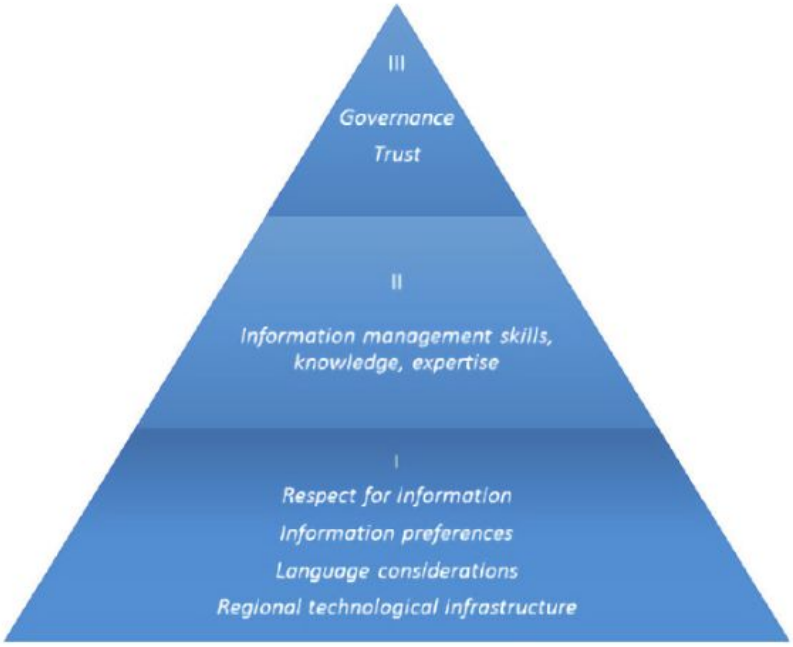


This serves as a roadmap of sorts. They encourage organisations wishing to capitalise on the "ideas, information and knowledge" (Curry and Moore, 2003, p.94) of the employees to try to synchronise their information culture with their organizational culture in all of these components. This model may be useful in exploring elements of an organisation where information culture plays a key role, and intends to guide further research. However the paper does not provide sufficient evidence that this specific process has been shown to be beneficial to an organisation. Their findings were "considerably abbreviated and edited" at the request of the study participants in the single organization in the case study (Curry and Moore, 2003, p.100).

Oliver began exploring the relationship between organizational culture and information use in 2003, analysing cultural models (primarily that of Hfstede (1997, cited in Oliver, 2003))and their applicability on an organization's information management. There was little direct mention of information culture in this paper, although given Curry and Moore's definition, this was exactly what Oliver was looking at. In this case study, Oliver identifies that behaviours and values towards information use are shaped by communication across and between "national, occupational and corporate" channels (Oliver, 2003, p.288). By 2008, Oliver's take on information culture had

matured, aligning with Curry and Moore's definition (2003), and resulting in the presentation of a three-layered model. The model was further developed and more recently re-introduced in an article discussing its conceptual and implementation issues (Oliver, 2017).

Figure 3: Three Layer model (Oliver, 2017, p.8)



In Oliver's model (figure 3) the first level of the pyramid is the foundational aspects of which information culture has an impact. For example, Oliver argues that differences across national cultures, such as more *individualist* or *collectivist* cultures, will affect the way information is respected or preferred. A more collectivist country like Australia will typically trust and utilize research in their decision making, whereas a more individualist country like South Korea may typically value information from peers or colleagues. Such cultural differences can impact the types of information that is valued and utilized (pictorial versus text, qualitative versus quantitative) and their willingness to share information. These four categories in the first level are presented as foundational aspects because are very hard to change, as well as have a significant influence on the other two layers. The next layer concerns information literacy. Oliver argues that any training is "*doomed to failure*" (2017, p.11) if the cultural aspects of the foundational layer are not taken into account. At the top of the pyramid is information governance and trust. Just as with the middle layer, taking the layers underneath it into consideration when developing governance is effective. Information trust will be shaped by the cultural influence on the attributes below it also. She presents this layer as the most easy to change.

It would be difficult to apply this model in relation to increasing demand in the police force, as it is primarily designed for implementing change in multinational organisations. But the concept of a strong cultural foundation that is difficult and slow to change may apply.

Choo is a key contributor to the information culture space. Many of the more recent literature on information culture has expanded upon and borrowed from Choo's concepts, definitions, and models (Oliver, 2008, Oliver, 2011, Oliver, 2004, Sinitsyna, 2014, Cameron and Quinn, 2011). One key paper that Choo contributed to on information culture (Choo et al., 2008) draws heavily from two areas - their own previous findings in organizational culture , where they identify cultural knowledge as an essential attribute of an intelligent organization much like Oliver would suggest some time later (Choo, 1995, Oliver, 2011), and the work of Curry and Moore (2003) in describing and measuring information culture. But instead of investigating the topic with a focus on business performance (Marchand et al., 2002), or seeking to explore the information culture in an organization (Curry and Moore, 2003), Choo et al.'s efforts were *explanatory*. They surveyed three organizations with these research goals:

"(a) develop a method to profile information culture, (b) compare information cultures across organizations, and (c) examine the effect of information culture on information use outcomes" (Choo et al., 2008, p.794).

The given definition for information culture is the "socially shared patterns of behaviours, norms, and values that define the significance and use of information" (Choo et al., 2008, p.792)

For their survey, Choo et al. adopt the six variables that constitute information culture generated by Curry and Moore (2003) (table 1).

Table 1: Summary of research variables (Choo et al., 2008, p.796)

TABLE 1. Summary of research variables.

IBV (Independent variables)	Definition
Information sharing	Willingness to provide others with information in an appropriate and collaborative manner
Information proactiveness	Active concern to obtain and apply new information to respond to changes and to promote innovation
Information transparency	Openness in reporting information on errors and failures, thus allowing learning from mistakes
Information integrity	Use of information in a trustful and principled manner at the individual and organizational level
Information informality	Willingness to use and trust informal sources over institutionalized information
Information control	Information is presented to people to manage and monitor their performance
Information use outcome (dependent variable)	The construction of new knowledge and new meanings; the transformative act of shaping decisions and influencing others; and the movement and exchange of information with colleagues

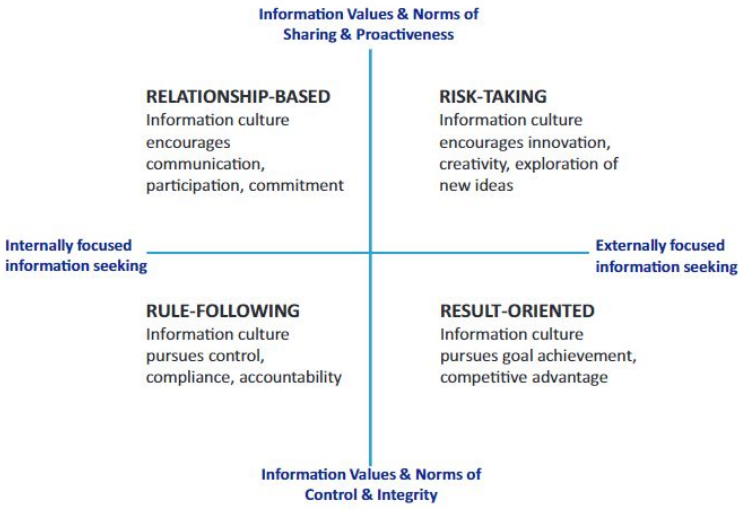
Choo emits the control from the study due to its relevance to the participating organizations. Interestingly, the dependent variable is *information use outcome*. Choo sought to link information culture not specifically with overall business performance but with "shaping decisions" and the "movement and exchange of information", and did find that in all three cases, these dimensions had a significant impact on information use outcomes. As for their research goals (a) and (b), by measuring information culture with these variables for each organization, Choo was able to describe and explain their differing information culture properties. They note for example that whilst two organisations had high transparency values, in light with their cooperative relationships with stakeholders, the third did not - perhaps due to their commercial impetus.

The transferability of Choo's findings here is somewhat questionable. With just three organisations studied, the findings may not translate to other organizations so neatly. Yet as this approach achieved an effective way of identifying, communicating and explaining information culture properties, and showing that they at least in this case have a significant effect on effective information use, this is a promising method and principle with which to apply to the UK policing sector.

Choo's efforts to distinguish and describe information culture continues in another paper (Choo, 2013). Citing the lack of developed theory in informational culture up until this stage, Choo borrows from a more established organizational culture framework, the competing values framework

(Cameron and Quinn, 2011) and combines it with his previous findings on information culture to create a topology that can differentiate information cultures (figure 4).

Figure 4: Four Quadrant Model (Choo, 2013, p.777)



This is not a singular classification model. Choo argues that organizations will show various alignments with each of these quadrants independently - even possibly having none of these attributes (or all of them). From this model, Choo generates three hypotheses. Firstly, that information culture in line with the organization's mission, strategy and beliefs will be more effective. Secondly, an organization that has a mix of all of these different elements will be more effective. And finally, that the information culture of an organization is heavily influenced by its lifecycle stage (Choo, 2013).

2.5 Research Gap

Throughout this development of information culture research, there has not been an attempt to analyse the information culture of the policing sector. The potential relationship between information culture and demand has not been explored either. This research project therefore intends to fill this gap by investigating the information culture element of the policing sector and its effect on the capability to manage increasing demand.

2.6 Research Questions

RQ1: What is the information culture profile of the force?

RQ2: What relationship exists between information culture and demand in the force?

RQ3: How can information management strategy alleviate increasing demand in the force?

Chapter 3: Methodology

The subject of this study is a police force in the North of England. To protect anonymity, this will be referred to herein as 'the force'.

3.1 Research Philosophy

The philosophical paradigm of a research project will shape the research questions, choice of participants, methodological approach, research instruments, and data analysis, and therefore the findings and outcomes (Saunders et al., 2016). It is important therefore for the researcher to be verbose about the philosophical makeup of the project. This allows the researcher and the reader to be aware of the limitations, biases, nature, and value of the knowledge that it intends to generate, as well as guides the design the research strategy.

The philosophical paradigm dictates "not only what we do but we understand what it is we are investigating" (Saunders et al., 2016, p.108). A pragmatic view on determining the philosophical position is to allow the research questions to dictate the appropriate stance (Saunders et al., 2016).

The ontology of a research project is the stance taken on the reality of phenomena. The first research question is: What is the information culture profile of the force? Because this question seeks to generate knowledge on culture, it is inherently ontologically subjectivist. An assumption being made here is that there is a socially constructed mechanism, the information culture, that is not independent of the actors that make up that culture but is actually a product of the opinions and feelings of the participants - It is therefore best measured by collecting data on those thoughts and feelings, and cannot be expected to act in an identical fashion across different organisations, thus an expectation is that the subjects will have a measurably different information culture profile. In contrast, the second research question suggests that some generalisations can be made about information culture, such as the relationships it may have with performance and information outcomes in some cases as identified in the literature review. By searching for such a relationship, the research question promotes a positivist epistemological approach. By seeking to apply the theory and models of information culture as part of the research, it is expecting that generalizations can be made about information culture that do apply across boundaries, and that such relationships give the information culture theory validity. Axiology concerns the role of the researcher in the process, findings and outcomes. Because of the deductive nature of the research questions (applying predetermined ideas to the subject in order to further insight) the researcher will certainly impact the direction of the project. The interpretivist axiological researcher understands and embraces the subjective nature of the research process.

The overall philosophical paradigm is therefore a mix of both positivist and interpretivist, which appropriately address the research questions in a pragmatic fashion and is aligned with the research design.

3.2 Research Approach

The research questions will guide the research approach in this project. Our first two research questions are:

What is the information culture profile of the force?

What relationship exists between information culture and demand in the force?

Answering these questions will be a deductive exercise, because the existing information culture theory is being applied to the police force to gain insight. The third research question is:

How can the policing sector improve their information management in response to increasing demand?

Answering this question will be both a deductive and inductive exercise. The literature will be drawn from to design the data collection and analysis but the aim here is to draw understanding directly from the data collected in order to explore new ideas. This will therefore be a parallel mixed-method project. Quantitative data will be collected and analysed to answer the first two questions and qualitative data will be collected and analysed to answer the third.

As is appropriate for a study on business and management, which is typically "a means to an end rather than the end itself" (Saunders et al., 2016, 140), this will be a descriptive and exploratory study, seeking to *describe* the information culture (RQ1) and *explore* its relationship on internal demand (RQ2) which in turn, will help in exploring the causes and effects of failure demand (RQ3).

3.3 Research Strategy

Choo et al. generated a survey in order to measure and profile an organisation's information culture (Choo et al., 2008), modified from the Information Orientation tool of Marchand et al. (2002). It is an appropriate instrument given that Choo sought to measure values, norms and practices, and so collected data on the opinions of actors in those information cultures. It is suitable for this project for three reasons. Firstly, this will mean that the results can be compared with the findings of Choo et al. (2008) in order to increase the diversity of data to be analysed and further understand the distinctions between information culture types. The second reason is that the responses received through this survey were found to have a significant relationship to information use outcomes in those cases (Choo et al., 2008). Thirdly, this data collection method can be repeated in the future either with the same participants to create a longitudinal study, or with other organizations, increasing the pool of data and therefore opportunity to generate insight.

Therefore the likert scale multiple choice questions have been replicated for the most part (the language of some questions have been adjusted slightly to be applicable to the policing sector). As well as these, some questions on demand have been included. There are numerical questions to measure perceived increase demand and failure demand (and to compare with information culture data), and open questions to investigate their opinions on what is causing demand and how it can

be solved. Furthermore, there are likert scale questions to measure both understanding and quality of received information as dependent variables to be compared with Choo's questions.

The questionnaire was reviewed by a focal point within the force to ensure that the questions were suitable and comprehensible for participants. As a result, definitions were added for particular concepts such as failure demand and internal demand, and examples of information were given in order to homogenise responses and elicit more accurate and thoughtful responses. The survey can be found in appendix A.

In deciding which sections of the organization to sample, there were two different perspectives in the literature. Berry points out that "front-line officers know precisely what the causes are, they know what the barriers to improvement are and they know the solutions" (Berry, 2010, p.31). The insightful analysis of the nature of demand by an assortment of senior police personnel in (National Police Chief's Council, 2017) suggests otherwise. Therefore the distribution of this survey is indiscriminate, collecting data from any level of seniority in the police, as there seems to be no particular subsection to focus on in order to investigate internal demand.

The survey was generated using the Qualtrics application in order for ease of distribution and data quality via validation and input restrictions. This was distributed via the focal point by email and by posting the link onto their intranet and web forum.

All survey data is encrypted and hosted on the Leeds University Business School servers. No personally identifiable data was collected, the survey was optional, and responses could be withdrawn by request. These measures were to fulfil the ethical responsibilities of a researcher to avoid "to embarrassment, harm or any other material disadvantage" (Saunders et al., 2016, p.160)

3.4 Data Analysis

As directed by the research questions, the philosophical paradigm, and the literature, descriptive quantitative methods are applied to answer the first research question. Pearson's correlation is calculated between variables to answer the second question with inferential statistics (Pallant, 2013). The popular thematic analysis technique is used for the qualitative analysis of the third research question as outlined by Braun and Clarke (2006) due to its philosophical and practical flexibility, and its appropriateness for exploring the qualitative data collected in this study. After separating individual comments, the six phases of thematic analysis were followed as a guide for the analysis procedure. However, first some a priori codes were deduced from both the policing and information culture literature. This alteration to the thematic analysis method is appropriate for this study because it is both deductive and inductive as the research question demands.

After familiarization, more codes were generated as appropriate. Each comment was marked with a code, or divided into sub comments where necessary. Throughout the process, codes were often revised in order to more accurately distinguish comments. For example, many comments were coded under duplication, but it soon became clear that some duplication of efforts were due to procedures, and others were because of information system overlapping but not communicating.

Codes were then grouped into themes, some of which were deductive (such as the three schools of information management solutions discussed by Marchand et al. (2002)) and others were inductive (such as demand caused by meetings and risk assessments). Examples of this process can be seen in Appendix B.

Chapter 4: Findings and Discussion

A total of 197 responses were received, however only 75 completed the process so only those completed responses have been analysed.

Respondents held a wide range of positions in a wide range of units. The most frequently surveyed role was that of Constable (23%). The most senior recorded role was Chief Inspector. The most frequent recorded unit was the Neighbourhood Patrol Team (NPT).

Figure 5: Roles of respondents

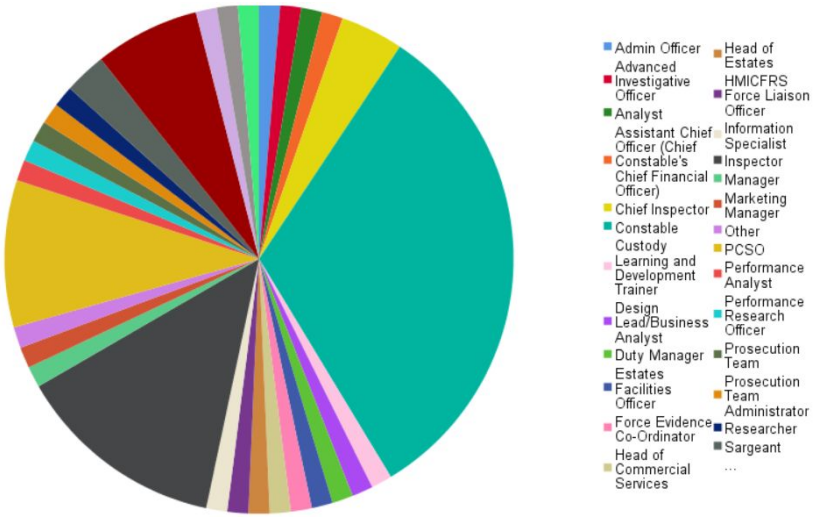
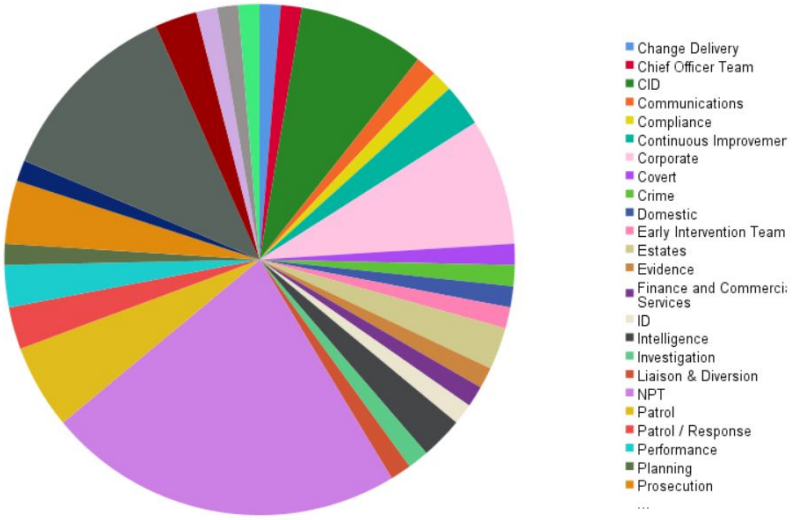


Figure 6: Units of respondents



The variety in roles and units will ensure a good range of qualitative perspectives into rising demand. As for the quantitative analysis, it's useful to be aware of the most frequently recorded role and unit. Due to the size of the sample, controlling for the unit of the participants will be unfeasible as the median number of respondents in a unit is 1.

4.1 Quantitative Analysis

4.1.1 Reliability

This survey includes multi-item measures for the six dimensions of information culture identified in the literature review. If each of the questions for a particular dimension are a valid measure of the same dimension, it can be expected that the responses given for that group of questions would be similar for each participant. In order to test for this reliability, Cronbach's alpha (α) is calculated for each multi-item measure (table 1). This tests whether these items are really uni-dimensional (Cortina, 1993, Pallant, 2013).

Table 2: Chronbach's alpha

Dimension	α
Sharing	0.67
Proactiveness	0.78
Transparency	0.82
Integrity	0.55
Informality	0.59
Control	0.10

The control, integrity and informality dimensions must be rejected here as they have unacceptable α values (DeVellis, 2016). Failing this reliability test suggests that either these specific questions are not a good measure of these dimensions or that these dimensions are invalid. The responses to these questions are therefore not useful for measuring the degree to which integrity, informality and control shape the information culture and demand of the force.

4.1.2 Descriptive Statistics: What is the Information Culture Profile of the Force?

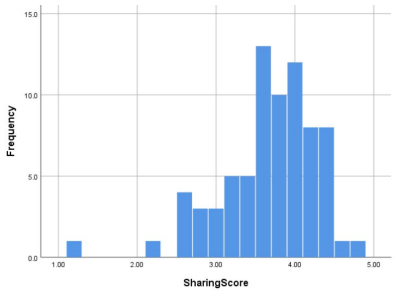
The variables for sharing, proactiveness and transparency are now calculated as the average scores given by respondents (table 3).

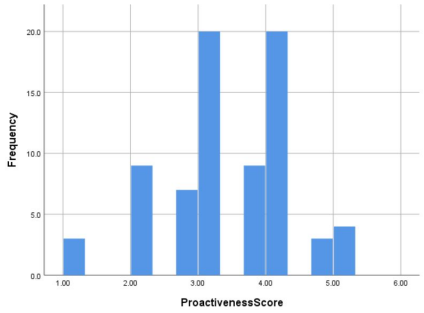
Table 3: Means of multi-item measures

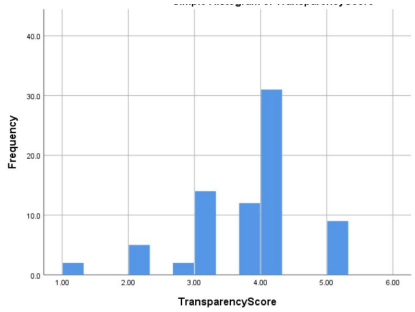
Variables	Means	s.d.
Sharing	**3.63**	0.74
I often exchange information with the people with whom I work regularly	4.46	0.82
I often exchange information with people outside of my regular work unit but within the policing sector	3.79	1.03
In my work unit, I am a person that people come to often for information	4.01	0.94
I often exchange information with citizens or stakeholders outside the policing sector	2.49	1.08
I often exchange information with partner organizations	3.42	1.03
Proactiveness	**3.36**	0.27
I actively seek out relevant information on changes and trends going on outside the policing sector	3.13	1.21
I use information to respond to changes and developments going on outside the policing sector	3.28	1.12
I use information to create or enhance police services and processes	3.66	1.07
Transparancy	**3.68**	0.28
Managers and supervisors of my work unit encourage openness	3.96	1.01
The people I work with regularly share information on errors or failures openly	3.70	1.04
The people I work with regularly use information on failures or errors to address problems constructively	3.40	1.05

If the force has a distinct information culture, we can expect the distribution of responses to be close to these mean values with a normal distribution. An organisation with no clear information culture profile will have a large variance in individual beliefs, values and norms. An organisation with a very distinct culture would have individual behaviours, values and norms very close to each other. As can be seen in Figure 7, all three dimensions have a left tailed unimodal normal distribution with a high variance.

Figure 7: Histograms of sharing, proactiveness and control scores



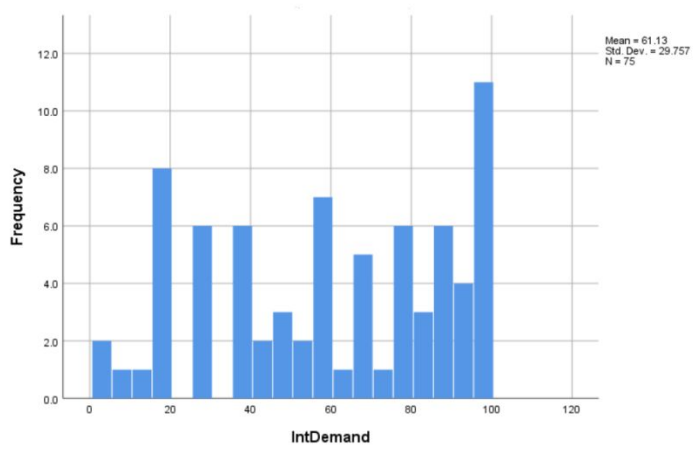




Given that a completely neutral set of responses would result in means of 3.00, it can be said that the force scores slightly positively in all three dimensions. Therefore the information culture can be described as one of sharing, proactiveness and transparency to a small degree. But the high variance evidences a lack of a distinct information culture profile.

As expected, a high amount of time is reportedly spent dealing with internal demand. For the question '*what percentage of your working time is spent responding to internal demand?'*, the mean percentage is 61%. This was with uniform distribution (figure 8) and a high variance, ranging from 3% to 100%. This shows that there is no typical amount of time spent on internal demand, which is to be expected - it can be assumed that this is highly affected by other variables such as role, unit, and years spent in the policing sector.

Figure 8: Distribution of time spent responding to internal demand



The mean percentage of time responding to failure demand by respondents was 27%, the cause of which was divided quite evenly between low quality information (40%), missing information (33%), and the slow transfer of information(28%). Out of the three categories, low quality information was given slightly higher percentage on average by respondents.

4.1.3 Multivariate Analysis: What Relationship Exists Between Information Culture and Demand in the Force?

The Pearson product-moment correlation coefficients were calculated corresponding with p values to test for significance (table 3 & appendix C).

Table 3: Pearson correlation between variables, marked with statistically significant p values

Correlations

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Years in Police	15.93	9.57											
2. Internal Demand %	61.13	29.76	.258*										
3. Failure Demand %	26.75	21.25	-.05	.09									
4. Missing Information %	32.93	28.22	-.05	.19	.432**								
5. Low Quality Information %	39.72	32.62	-.06	.14	.323**	.497**							
6. Slow Information %	27.64	30.02	-.09	.04	.251*	.669**	.526**						
7. Sharing	3.67	.62	.384**	.236*	.11	-.04	-.12	-.14					
8. Proactiveness	3.39	.93	.266*	.249*	-.01	-.08	-.09	-.02	.443**				
9. Transparency	3.72	.86	.238*	.02	.11	-.14	-.08	.02	.314**	.358**			
10. Policy Understanding	3.79	.95	.11	.18	.11	-.10	.02	-.10	.17	.330**	.318**		
11. Sufficient Information Quality	3.37	.96	.04	-.11	-.17	-.08	-.03	-.05	.16	.12	.370**	.432**	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Years in Policing - Information Culture

The amount of years spent in the police has a positive correlation with the sharing (r = .384, p = .001), proactiveness (r = .266, p = .021) and transparency (r = .238, p = .04) dimension scores. Using the Pearson correlation coefficients as a measure, the correlation with the sharing score has a medium strength whilst the other two have weak correlations (Cohen, 1988, pp.79-81).

Internal Demand - Information Culture

A statistically significant positive correlation exists between the percentage of time spent responding to internal demand and two of the information culture dimensions, sharing (r = .236, p = .042) and proactiveness (r = .249, p = .031). The time spent responding to internal demand may be a mediating variable between the amount of years spent in the police and the information culture, as the amount of years was found to correlate with all of these variables. Therefore, years spent in the police are controlled for in a partial correlation analysis (table 4).

Table 4: Pearson correlation between internal demand % and information culture dimensions

Correlations (controlling for years in policing)

		1	2	3
1. Internal Demand %	r			
	p			
2. Sharing	r	.15		
	p	.19		
3. Proactiveness	r	.19	**0.383****	
	p	.10	**.00**	

When the amount of years spent in the police is controlled for, there is no significant correlation between the percentage of time spent responding to internal demand and the sharing and proactiveness dimensions.

Failure Demand - Information Culture

The percentage of failure demand and the three shares of failure demand (missing, low quality, and slow information) are all positively correlating. This is expected and provides no further insight - a low amount of failure demand will clearly result in a lower amount of its three contributors and vice versa. Failure demand variables did not correlate with information culture variables.

4.2 Qualitative Analysis

Two of the questions in the survey were open questions:

> *What information processes has the organisation created internally that is, in your view, a waste or a failure?*
>
> *What changes do you think would help to alleviate failure demand?*

Failure demand was identified in the literature as a significant contributing cause to rising internal demand and a promising avenue of research. Following the thematic analysis (Appendix D), here the most prominent emerging themes of the data are presented.

4.2.1 Causes of failure demand

Theme #1: Problems with processes

Out of seventy statements on what is a waste of a failure, 25 concerned wasteful processes and procedures. Crime reporting procedure was presented as being particularly problematic.

> "Creating a system whereby every police officer can input their own crime report etc. has got to be the biggest area of work requiring errors to be corrected"
>
> "duplication where crimes are processed by various teams repeatedly"

Duplication was a frequently mentioned problem even outside of crime reporting procedures.

> "Duplicating FOI requests when other departments have already responded to them"

Other processes were deemed unnecessary altogether by respondents.

> "Community Support Officers are required to complete a 'patrol plan' each set, which sets out what we intend to do and accomplish throughout the set of shifts. However, I find this a waste of time as we spend time filling out the plan when in reality it is unlikely that we will stick to it due to other demands such as call handling or scene guarding… It therefore feels that filling them out and outlining what we will be doing for the set seems pointless and not worth the time it takes to do them"

Theme #2: Problems with information systems

This was the second most prominent theme with 20 mentions, and the main issue presented was with the particular design of the current systems.

> "Tobi is a new IT system and is creating a lot more work for front line officers. Emailing was much better and more timely"

> "Our tasking database for some reason generates chase emails to the entire team on a near daily basis. These have no purpose and have to be immediately deleted with no thought wasting time and clogging email boxes."

Lack of communication between information systems was also a common cause of waste and failure.

> "Recording errors and corrections on the Crime database, but also on two other spreadsheets and then on an email to those involved to advise them of the corrections."

> "Use of Niche and HOLMES for recording major incident property and cases (Niche is the Force system but HOLMES is the Home Office mandated system for major inquiries)"

Theme #3: Problems with the management of information

Other respondents cited issues with information availability, quality, delivery method, and information overload. These had 12 mentions.

> "Not enough information given to search the databases can be a problem"

> "Time is wasted cleaning and validating data before it can be used to produce any meaningful analysis"

4.2.2 Solutions for failure demand

Respondents also gave 52 statements on possible solutions for solving these problems. Again, the three most prominent themes are presented here.

Theme #1: Organizational / Management Solutions

The most common suggestions were organizational and management related (19 mentions), and these were mostly suggesting increased training for staff.

> "Better training for officers. I sympathise with them - they spend most of their time arresting and investigating, which is how it should be... they don't do as much paperwork as us Police Staff so they forget how to do basic things. Better training could help"

> "Improved training for officers in relation to statement taking - often statements are of such poor quality they have to be done again or important information has been omitted."

Others suggest organizational restructure to redefine divisions of labour.

> "Complaints to the Police and crime commissioners officer often result in revisiting jobs where the initial decision was correct. Eliminate all police and crime commissioners"

Theme #2: Information Systems Solutions

Seventeen suggestions found hope in improving and connecting current information systems, as well as adding new systems and removing redundant ones. Many of these were calls for data validation rules to avoid errors.

> "Any errors that are made with regards confusion of which information box/dropdowns/ areas to populate with information will at some point require rectification by someone"

Others called for the unification of, or integration between, systems – both in the force and between them.

> "integrated systems that can seamlessly autopopulate from one system to another"

Theme #3: Information Culture Solutions

Eight of the suggestions called for more accountability for errors made. This has been themed as cultural due to the aim of promoting a change in the values, norms and beliefs of staff in relation to the importance of quality and accuracy in information.

> "By having officers take personal responsibility and pride in their work and to act upon/learn from feedback that is given. Supervisors should actively encourage their staff to follow correct processes and not cut corners"

> "Officers acting more professionally and entering details correctly / answering chasers correctly"

> "More accountability for your own errors to encourage more accuracy up front"

Each of these respondents promotes an information culture of accountability, integrity, and control to reduce demand.

Chapter 5: Discussion

This research project seeks to address three research questions.

RQ1: What is the information culture profile of the force?

RQ2: What relationship exists between information culture and demand in the force?

RQ3: How can information management strategy alleviate increasing demand in the force?

Researchers cited in the literature review agree that organizations have a distinct information culture that can be measured, and that by profiling, analysing and comparing these we can study its relationship with areas such as performance and information use outcomes. This is supported in many cases by empirical evidence.

For this project, the distinction of the information culture within the force is not as clear as it is in comparable studies, even with a very similar research instrument. Although responses to questions in specific dimensions were somewhat similar, there was a high amount of variance. From this data it would be difficult to confidently model the profile using the four quadrant model (Choo, 2013) because three of the dimensions had to be disregarded entirely.

Similarly, none of the three included information culture dimension scores were correlated with any of the demand variables. What seemed initially like a significant positive correlation with time spent responding to internal demand was actually found to be due to a mediating variable: years spent in policing. This was surprising, given that every dimension was found by Choo et al. (2008) to be a predictor of information use outcomes. What both the quantitative and qualitative findings of this project suggest is that applying information theory to one police force may not be the same as applying information theory to other organisations. The ideas of a distinct and unilaterally shared set of behaviours, values and norms might be breaking down because the force studied, or perhaps the policing sector as a whole, functions differently.

What the data does tell us is this: The force has a culture of sharing, proactiveness and transparency to a degree. Had there been a more distinct and uniform information culture profile, with clear strengths or weaknesses in particular dimensions, this would have answered some useful questions: What aspects of information culture should be developed? What is working well in spite of weaknesses? Does the information culture synergise with the overall missions and strategy of the police? Which specific dimensions have a relationship with demand?

There are two possible reasons why a distinct information culture has not been measured, and both reasons are evidenced by the reliability test in section 4.1.1 and the variance in responses presented in section 4.1.3.

The first possible reason would be a failure of the research instrument in measuring the information culture. The three of the dimensions failing the reliability test does evidence the first problem, but when combined also with the findings of Choo et al. (2008), where these three

dimensions also failed the same reliability test to different degrees, the instrument must be called into question. Any further related research should be aware of these shortcomings.

Another possible reason is that the six dimension model does not apply to the force. As a public service organisation with a long history, theory generated by other organizations may just not be appropriate. As Curry and Moore (2003) suggests, societal and historical factors will influence the organizational culture and therefore the information culture. If any organization was to be culturally influenced by historical and societal factors, the policing sector would surely be an example case. So what would the information culture profile look like then if there was no particular shared culture? Perhaps it would look exactly like it does in the findings – a highly varied response which does not lean towards or away from any particular dimension. What may have been discovered in these findings is a cultural disarray, a lack of unity in information behaviours, values and norms.

Such cultural disarray is also evidenced in the qualitative findings. Many of the responses given for the possible causes and solutions for failure demand demonstrate differences in information behaviours, values and norms. Values differ in the importance of information quality captured in reports and information systems. Norms differ in the way information is processed multiple ways by multiple people or units. Behaviours in the way external communication is handled, systems are used, and crimes are reported. The suggestions for problems and causes combined tell a dark tale of a problematic feedback loop. As demand on staff increases, information quality and consistency falls, leading to calls for new systems and procedures, thereby increasing demands on staff, and so the cycle goes on. This is perhaps the relationship between information culture and demand in policing.

This hypothesis is supported by the literature. Pandey and Moynihan (2006) describe how information flows become distorted in large hierarchies, in a way that cultural belief systems impact information flows more than specific operational processes. Marchand et al. (2002) detail the tendency to solve organizational problems with IT and IM solutions at the operational level, but believe that cultural change would be more productive. This misdirected approach to managing internal demand in the force is evidenced in the National Police Chief's Council (2017) report, highlighting the failures of reactionary “de-humanising” (p.16) projects which have failed to focus on values rather than outputs. Not only are value and belief systems often overlooked, Oliver (2017) argues that they are also the hardest and slowest elements of a culture to change.

It seems that cultural definition is needed more than process and information system reengineering. Choo (2013) and Marchand et al. (2002) hypothesise that an organisation that aligns its cultural dimensions with its overall objectives and values will find success. If the force, or perhaps the policing sector at large, defines and promotes a developed and aligned information culture, this may harmonise the decisions, systems, and governance whose conflict are evidently causing internal demand. Guidance on this process is provided in the literature. Cameron and Quinn (2011) outline a practical process to follow – reflect on the information culture profile, decide on a preferred culture, and compare the two to identify what changes would benefit the organisation. There may be challenges in this process as “having a comprehensible picture of a culture makes it

easier to systematically implement change in a consistent, coherent, and consensual way" (Cameron and Quinn, 2011, p.80) although Curry and Moore's model (2003) may be useful in guiding what specific areas should be investigated further. The difficulties and successes of previous efforts can also inform this process. In a case study of 15 Finnish companies' attempts to develop a knowledge sharing culture, Widén-Wulff and Suomi (2003) found that it was "difficult to change in a short period" (p. 48). Another study found an indirect approach was most effective, as "overcoming the cultural barriers has more to do with how the organization designs and implements the management effort into the culture than with changing the culture" (McDermott and O'dell, 2001).

Method aside, the development of a consistent information culture could be the key to alleviating internal demand. In doing so, overall demand on the police would become more manageable. If that were to happen, we could be optimistic about a future where the most vulnerable are protected, emergencies are dealt with swiftly, the laws are upheld, and the public are kept safe.

Chapter 6: Conclusion

6.1 Summary of Research Findings

This research project sought to address a gap in the literature by answering three questions:

RQ1: What is the information culture profile of the force?

There was no measured distinct information culture profile of the force studied. Instead, a high degree of variance was measured, evidencing cultural disarray. An issue with the reliability of the research instrument was also discovered.

RQ2: What relationship exists between information culture and demand in the force?

Likely due to this cultural disarray, no meaningful relationships were apparent in the exploratory process. A relationship was found between years spent in the police force and the development of the three included information culture dimensions, but this finding does not contribute to answering the research question.

RQ3: How can information management strategy alleviate increasing demand in the force?

Respondents have provided some useful suggestions to directly address specific problems that cause failure demand (a subset of internal demand caused by waste or failure). There are three prominent themes to these suggestions: organisational and managerial reform, improving information systems, and promoting changes in information culture. By looking at the qualitative data in its entirety, two main conclusions were drawn. Firstly, problems caused directly by contrasting behaviours, values and norms were identified. Secondly, these cultural conflicts may be feeding a cycle of revisions to processes and information systems that in turn cause more demand, which in turn elicits more revisions. An effective approach to the problem of demand therefore would be to address the cultural disarray by formulating an ideal information culture blueprint and then encourage a cultural transformation towards that ideal. The literature, and the evidence, suggests that this would be wider reaching than mitigating short term demand issues by solving individual processes alone, which may be contributing to the demand problem instead of resolving it.

6.2 Limitations

As this study used convenience sample and not a random probabilistic sample, the findings cannot be translated to the policing sector, and so any generalization made in this study can only be hypothetical (Diez et al., 2012).

Due to the small sample size, information cultures could not be compared across forces, units or work groups. The multivariate quantitative analysis in section 4.1.3 therefore compares individual

behaviours, values and norms to aspects of demand instead of comparing different information cultures.

6.5 Future Research

Both of the stated limitations can be overcome with a larger, stratified sampling technique. By using random probabilistic sampling in each relevant stratum of the policing sector, the findings can be generalized (Diez et al., 2012) and the information culture profiles can be compared.

The unreliability of the research instrument in this project and elsewhere suggests further development of a more reliable methodology for measuring and describing information culture.

Reference List

BERRY, J. 2010. Reducing Beaurocracy in Policing.

BRAUN, V. & CLARKE, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*.

CAMERON, K. 2015. Organizational effectiveness. *Wiley Encyclopedia of Management*, 1-4.

CAMERON, K. S. & QUINN, R. E. 2011. *Diagnosing and changing organizational culture: Based on the competing values framework*, John Wiley & Sons.

CHOO, C. W. Information management for the intelligent organization: roles and implications for the information professions. Digital Libraries Conference, 1995. National Computer Board of Singapore Singapore.

CHOO, C. W. 2002. *Information management for the intelligent organization: the art of scanning the environment*, Information Today, Inc.

CHOO, C. W. 2013. Information culture and organizational effectiveness. *International Journal of Information Management,* 33, 775-779.

CHOO, C. W. 2016. *The inquiring organization: How organizations acquire knowledge and seek information*, Oxford University Press.

CHOO, C. W., BERGERON, P., DETLOR, B. & HEATON, L. 2008. Information culture and information use: An exploratory study of three organizations. *Journal of the American Society for Information Science and Technology,* 59, 792-804.

COHEN, J. 1988. Set correlation and contingency tables. *Applied Psychological Measurement,* 12, 425-434.

COLLEGE OF POLICING 2015. College of Policing Analysis: Estimating Demand on the Police Service. College of Police.

CORTINA, J. M. 1993. What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology,* 78, 98.

CURRY, A. & MOORE, C. 2003. Assessing information culture—an exploratory model. *International journal of information management,* 23, 91-110.

DEVELLIS, R. F. 2016. *Scale development: Theory and applications*, Sage publications.

DIEZ, D. M., BARR, C. D. & CETINKAYA-RUNDEL, M. 2012. *OpenIntro statistics*, OpenIntro.

FINANCIAL TIMES EDITORIAL BOARD. 2018. UK Police Forces are Under Excessive Strain. *Financial TImes* [Online]. Available: https://www.ft.com/content/f1fa9db0-d6a4-11e8-a854-33d6f82e62f8 [Accessed 25 September 2019].

HMRCFIS 2016. PEEL: Police Effectiveness 2016: A National Overview.

HOME AFFAIRS COMMITTEE 2018. Policing for the Future: Tenth Report of Session 2017-19.

KAUFMANN, W., TAGGART, G. & BOZEMAN, B. 2018. Administrative Delay, Red Tape, and Organizational Performance. *Public Performance & Management Review*, 1-25.

MARCHAND, D. A., KETTINGER, W. J. & ROLLINS, J. D. 2002. *Information orientation: The link to business performance*, Oxford University Press.

MCDERMOTT, R. & O'DELL, C. 2001. Overcoming cultural barriers to sharing knowledge. *Journal of knowledge management,* 5**,** 76-85.

NATIONAL POLICE CHIEF'S COUNCIL 2017. Better Understanding Demand – Policing the Future. NPCC.

NATONAL AUDIT OFFICE 2018. Financial Sustainability of Police Forces in England and Wales 2018.

OFFICE FOR NATIONAL STATISTICS 2019. Crime in England and Wales, year ending March 2019. Author London, England.

OLIVER, G. 2003. Cultural Dimensions of Information Management. *Journal of Information & Knowledge Management,* 02**,** 53-61.

OLIVER, G. 2004. Investigating information culture: A comparative case study research design and methods. *Archival Science,* 4**,** 287-314.

OLIVER, G. 2008. Information culture: exploration of differing values and attitudes to information in organisations. *Journal of Documentation,* 64**,** 363-385.

OLIVER, G. 2011. *Organisational culture for information managers*, Elsevier.

OLIVER, G. 2017. Understanding information culture: conceptual and implementation issues. *J. Inf. Sci. Theory Pract,* 5**,** 06-14.

PALLANT, J. 2013. *SPSS survival manual*, McGraw-Hill Education (UK).

PANDEY, S. K. & MOYNIHAN, D. 2006. Bureaucratic red tape and Organizational performance: Testing. *Public service performance: Perspectives on measurement and management***,** 130.

SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2016. *Research methods for business students,* Harlow; Munich, Pearson.

SCARBOROUGH, H., SWAN, J. & PRESTON, J. Knowledge management-the next fad to forget people. Proceedings of European Conference on Information Systems, Copenhagen, 1999. 668-678.

SINITSYNA, A. 2014. Impact of information culture and information behaviour on information quality.

WIDÉN-WULFF, G. & SUOMI, R. Building a knowledge sharing company-evidence from the Finnish insurance industry. 36th Annual Hawaii International Conference on System Sciences, 2003. Proceedings of the, 2003. IEEE, 10 pp.

APPENDIX A: SURVEY

Start of Block: Section 1: Basic Information

Q23 *This research aims to explore information management within the police. The following survey is being conducted by ----------, a Masters student at the University of Leeds, under the supervision of ----------. This research is an N8 Policing Research Partnership (PRP) dissertation project in part fulfilment for the MSc in Information Systems and Information Management. This study abides by the University of Leeds ethical code of practice and has been granted full ethical approval.*
We have not included any personal data in this survey. Please DO NOT include personal data in your responses. All answers will remain anonymous and no individuals or organisations will be identified in the write up, or any subsequent publications. Data will be aggregated and stored securely on a University of Leeds approved computer with encryption.
The results of the survey will be analysed and used for the purposes of the dissertation and will be shared with members of the N8 PRP. It may also be used for academic conference papers and publications.
Your participation in this research is very much valued and can help towards gaining a better understanding of how information is used and managed within policing. The survey should take around 15-20 minutes to complete. If you have any questions about this research feel free to contact ----------.
Thank you for your time and participation.

Q1 **Which Police force do you work in?**

_____

Q2 **What is your role?**

- ○ Special Constable (1)
- ○ Police Community Support Officer (2)
- ○ Police Constable (3)
- ○ Sargeant (4)
- ○ Inspector (5)
- ○ Chief Inspector (6)
- ○ Superintendent (7)
- ○ Chief Superintendent (8)
- ○ Assistant Chief Constable (9)
- ○ Deputy Chief Constable (10)
- ○ Chief Constable (11)
- ○ Volunteer (13)
- ○ Contractor (14)

○ Police Staff/other (12)

Display This Question:

If What is your role? = Police Staff/other

Q4 **Please clarify your role**

_____

Q5 **Which unit do you primarily work in? (e.g. intelligence, criminal investigation)**

_____

Q6 **For how many years have you worked for the Police in total? (including both officer and staff roles)**

_____ Years (1)

End of Block: Section 1: Basic Information

Start of Block: Section 2: Demand

Q18
This section regards internal demand, which can be described as the time and resources spent on activities created by and for those in the police service. This concerns day-to-day admin, attending meetings, and other processes we follow and work we generate. This includes internal demand generated from any related public organisation, such as (but not limited to) the 43 forces, Police Scotland, requests from local authorities, Office of the Police and Crime Commissioner, and the National Crime Agency. Any work that is not generated as a direct response from public contact (public demand), or work to anticipate and prevent problems (protective demand), can be described as internal demand.
What percentage of your working time is spent responding to internal demand?

	0	10	20	30	40	50	60	70	80	90	100
What percentage of your working time is spent responding to internal demand? ()											

Q19 In an independent 2010 report titled Reducing Bureaucracy in Policing, some information processes are identified that were wasteful of time and resources or failed to achieve their intended purpose. For example, to prove they are up to required standards, some forces were required to answer 1,099 questions regarding major crime investigations. In another example, police officers had to record a suspect's details in eight different databases.

What information processes has the organisation created internally that is, in your view, a waste or a failure?

_____

_____

_____

_____

_____

Q20 Here is a quote from a 2017 report by the NPCC Performance Management Coordination Committee:
"One of the more forgotten elements of internal demand is the amount of 'failure demand' in all its forms i.e. the amount of work done to correct errors or to revisit things missed or omitted the first time around. It could be the time spent redoing things; It could be the effort needed to recover lost ground because someone hasn't done what they should; Or perhaps time spent having to justify or apologise".
Please use the sliders to answer the following questions. (0% - 100%)

	0% 100% 0 10 20 30 40 50 60 70 80 90 100
Please estimate the percentage of your working time spent on 'failure demand' ()	
How much of this failure demand would you attribute to missing or unavailable information? ()	
How much of this failure demand would you attribute to low quality information? (For example inaccurate, incomplete, irrelevant information) ()	
How much of this failure demand would you attribute to the slow arrival of crucial information? ()	

Q21 What changes do you think would help to alleviate failure demand?

_____

_____

_____

_____

_____

End of Block: Section 2: Demand

Start of Block: Section 3: Information Culture

Q9
The following questions are about how information is used. Because they are standardised questions, the term 'information' is quite ambiguous. Here are some examples to help you frame the questions depending on your role:*Locations and times of incidentsPersonnel and vehicle availability and locationContact information for colleagues or members of the publicWhere to access a fileRecords and statisticsPolicy changesManagement decisionsReports Work orders*

To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
I often exchange information with the people with whom I work regularly (1)	○	○	○	○	○
I often exchange information with people outside of my regular work unit but within the policing sector (2)	○	○	○	○	○
In my work unit, I am a person that people come to often for information (3)	○	○	○	○	○
I often exchange information with citizens or stakeholders outside the policing sector (4)	○	○	○	○	○
I often exchange information with partner organizations (5)	○	○	○	○	○
I actively seek out relevant information on changes and trends going on outside the policing sector (6)	○	○	○	○	○
I use information to respond to changes and developments going on outside	○	○	○	○	○

the policing sector (7)					
I use information to create or enhance police services and processes (8)	○	○	○	○	○
Managers and supervisors of my work unit encourage openness (9)	○	○	○	○	○
The people I work with regularly share information on errors or failures openly (10)	○	○	○	○	○
The people I work with regularly use information on failures or errors to address problems constructively (11)	○	○	○	○	○
Among the people I work with regularly, it is common to knowingly pass on inaccurate information (12)	○	○	○	○	○
Among the people I work with regularly, it is common to distribute information to justify decisions already made (13)	○	○	○	○	○
Among the people I work with regularly, it is normal for individuals to keep information to themselves (14)	○	○	○	○	○
Among the people I work with regularly, it is normal to leverage information for personal advantage (15)	○	○	○	○	○
I trust informal information sources (e.g., colleagues) more than I trust formal sources (e.g., memos, reports) (16)	○	○	○	○	○
I use informal information sources (e.g., colleagues) extensively even though formal	○	○	○	○	○

sources (e.g., memos, reports) exist and are credible (17)					
I use informal information sources (e.g., colleagues) to verify and improve the quality of formal information sources (e.g., memos, reports) (18)	○	○	○	○	○
Information is so scattered that it is difficult to control people and processes (19)	○	○	○	○	○
Information is distributed on a 'need to know' basis so I know what to do but not why I am doing it (20)	○	○	○	○	○
Information on performance is presented to me and influences my working behaviour (21)	○	○	○	○	○

End of Block: Section 3: Information Culture

Start of Block: Section 4: Further Questions

Q22 **To what extent do you agree with the following statements?**

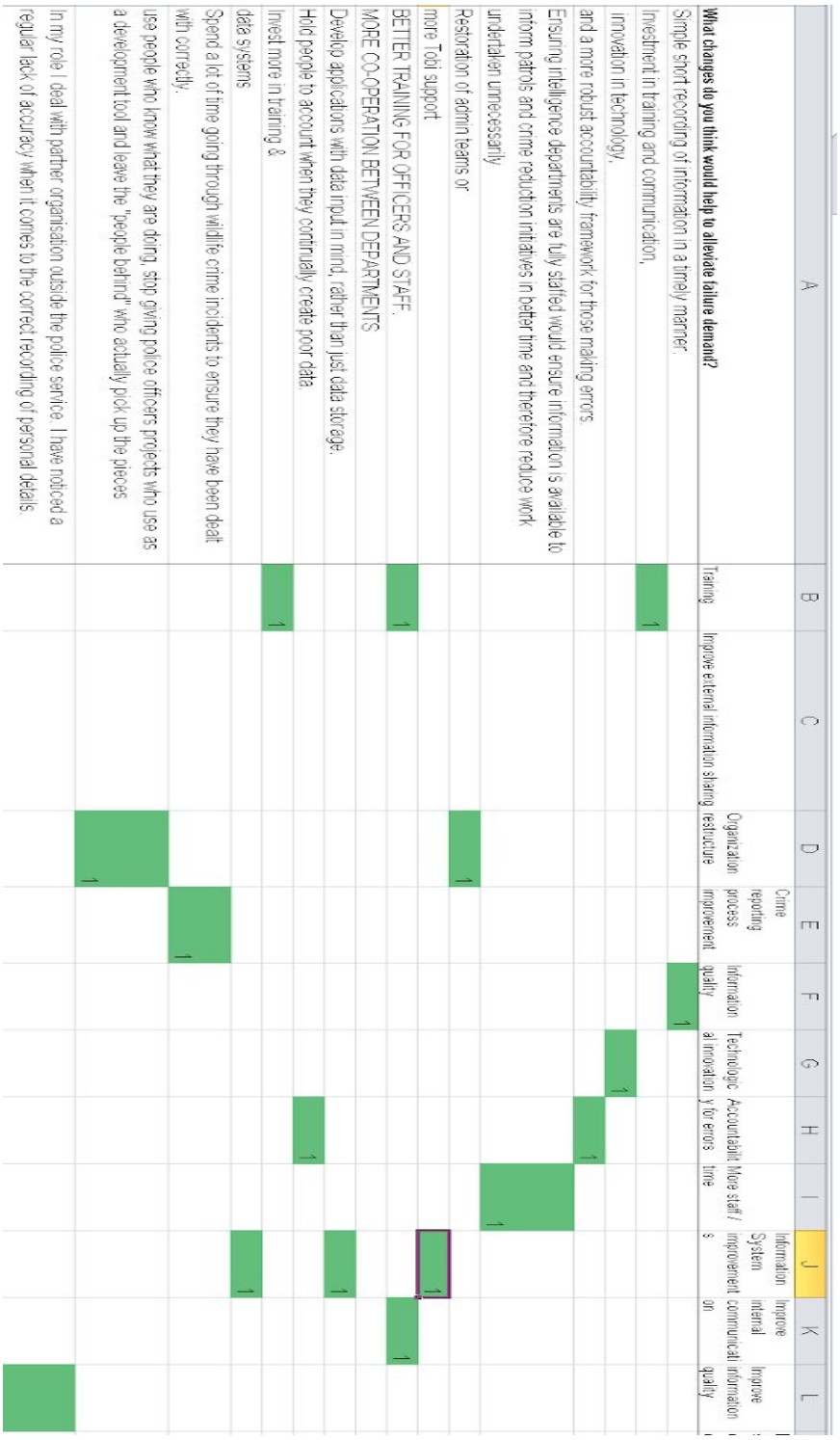
	Strongly disagree (1)	disagree (2)	neutral (3)	agree (4)	strongly agree (5)
I have a good understanding of the policies and legislations in place regarding data use (1)	○	○	○	○	○
I believe that the quality of information that I receive is sufficient in order for me to effectively carry out my work (2)	○	○	○	○	○

Q23 What are the three most common types of information that you seek out to perform your work duties? For each type, please state the method or information system that you use to gather that information (e.g. phone call, website, social media, police software, radio)

_____

_____

Appendix B: Qualitative Coding Example



What changes do you think would help to alleviate failure demand?	Training	Improve external information sharing	Organization restructure	Crime reporting process improvement	Information quality	Technological innovation	Accountability for errors	More staff / time	Information System improvements	Improve internal communication	Improve information quality
Simple short recording of information in a timely manner.					1						
Investment in training and communication,	1										
innovation in technology,						1					
and a more robust accountability framework for those making errors.							1				
Ensuring intelligence departments are fully staffed would ensure information is available to inform patrols and crime reduction initiatives in better time and therefore reduce work undertaken unnecessarily.								1			
Restoration of admin teams or			1								
more Tobi support.									1		
BETTER TRAINING FOR OFFICERS AND STAFF.	1									1	
MORE CO-OPERATION BETWEEN DEPARTMENTS											
Develop applications with data input in mind, rather than just data storage.									1		
Hold people to account when they continually create poor data.						1					
Invest more in training &	1										
data systems									1		
Spend a lot of time going through wildlife crime incidents to ensure they have been dealt with correctly.				1							
use people who know what they are doing, stop giving police officers projects who use as a development tool and leave the "people behind" who actually pick up the pieces			1								
In my role I deal with partner organisation outside the police service. I have noticed a regular lack of accuracy when it comes to the correct recording of personal details.											1

Solutions for failure demand		
Code	**Count**	**Theme**
More training	12	Organizational solutions
Information system improvements	10	IS solutions
Crime reporting process improvement	8	IM solutions
Accountability for errors	8	Cultural solutions
More staff / time	7	More resources
Improve internal communication	5	IM solutions
Improve external information sharing	4	IM solutions
Organization restructure	4	Organizational solutions
Improve information quality	3	IM solutions
Information system communication	3	IS solutions
More information systems	2	IS solutions
Less information systems	2	IS solutions
Less compliance and regulations	2	Organizational solutions
Information quality	1	IM solutions
Technological innovation	1	Technology solutions
Reduce unnecessary bureaocracy	1	IM solutions
Less meetings	1	Organizational solutions

Theme	**Frequency**
Organizational solutions	19
IS solutions	17
Cultural solutions	8
More resources	7
Technology solutions	1
IM colutions	0

Causes of failure demand		
Code	**Count**	**Theme**
Information system design	13	IS
Crime recording/reporting procedure	8	Process
Duplicated procedures	8	Process
Unecessary procedures	5	Process
Information systems communication	5	IS
Meetings	3	Meetings
Risk assesment	3	Risk assessment
Reports	3	Reporting
Information delivery method	3	IM
Information quality	3	IM
Amount of information to record	3	IM
Information availability	2	IM
Procedure flows	2	Process
Authorization	2	Process
Mental health	1	Changing crime
Organizational structure	1	Organizational structure
Receiving unnecessary information	1	IM
Too many information systems	1	IS
Unnecessary governance	1	Governance
Lack of information systems	1	IS
Collaboration with partner agencies	1	Partner agencies

Theme	**Frequency**
IS	20
Process	25
IM	12
Meetings	3
Risk assessment	3
Reporting	3
Changing crime	1
Organizational structure	1
Governance	1
Partner agencies	1

Appendix C: Correlation Matrix Output

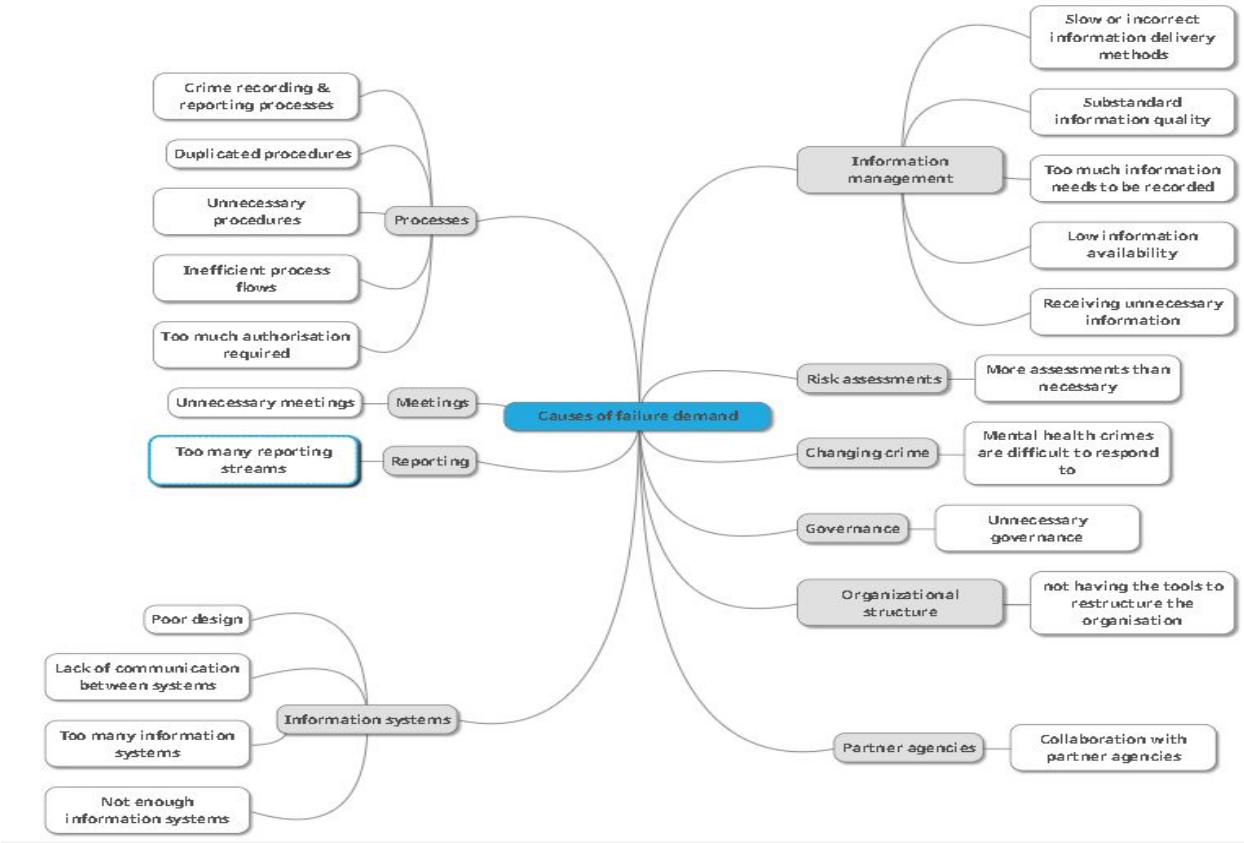
Correlations

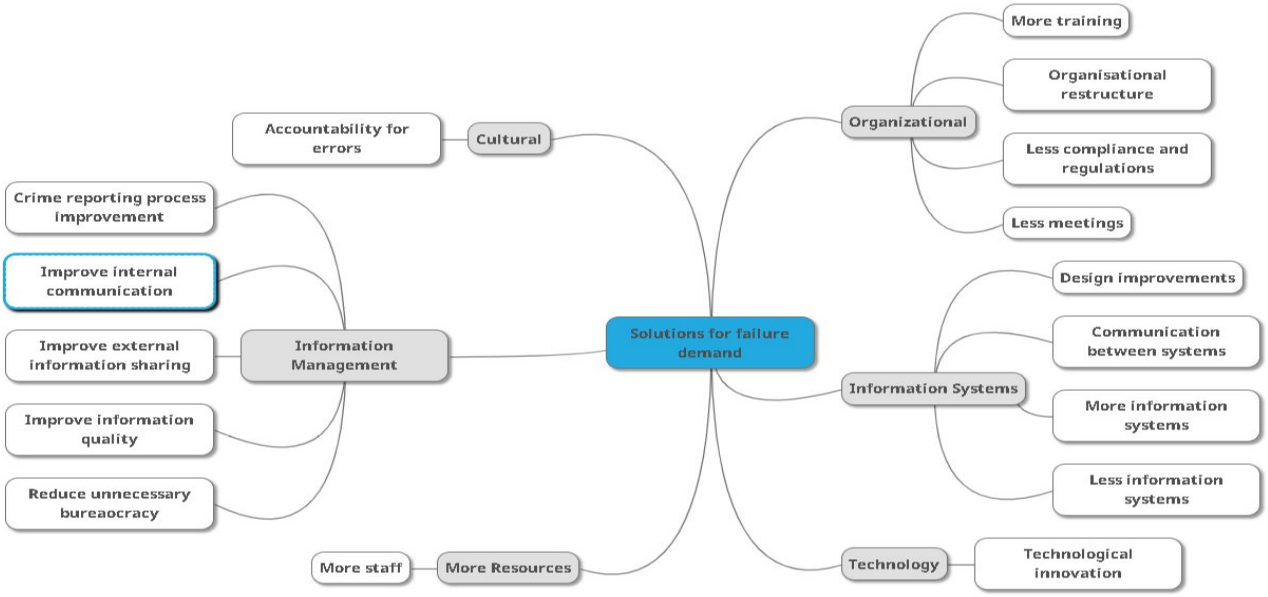
		Years	IntDemand	FailDemand	MissingInfo	LowQualitityInfo	SlowInfo	SharingScore	ProactivenessScore	TransparencyScore	IntegrityScore	InformalityScore	ControlScore	PolicyUnderstand	InfoQuality
Years	Pearson Correlation	1	.258*	-0.051	-0.049	-0.059	-0.092	.384**	.266*	.238*	0.070	-0.029	-0.227	0.113	0.040
	Sig. (2-tailed)		0.025	0.662	0.675	0.614	0.433	0.001	0.021	0.040	0.549	0.803	0.051	0.334	0.735
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
IntDemand	Pearson Correlation	.258*	1	0.095	0.188	0.135	0.036	.236*	.249*	0.022	-0.130	0.137	-0.146	0.182	-0.109
	Sig. (2-tailed)	0.025		0.419	0.105	0.248	0.761	0.042	0.031	0.851	0.266	0.242	0.212	0.118	0.351
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
FailDemand	Pearson Correlation	-0.051	0.095	1	.432**	.323**	.251*	0.107	-0.006	0.109	-0.200	-0.201	0.142	0.111	-0.173
	Sig. (2-tailed)	0.662	0.419		0.000	0.005	0.030	0.359	0.960	0.354	0.085	0.084	0.225	0.342	0.138
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
MissingInfo	Pearson Correlation	-0.049	0.188	.432**	1	.497**	.669**	-0.039	-0.080	-0.138	-0.215	-0.127	0.037	-0.104	-0.085
	Sig. (2-tailed)	0.675	0.105	0.000		0.000	0.000	0.741	0.495	0.238	0.063	0.276	0.755	0.377	0.470
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
LowQualitityInfo	Pearson Correlation	-0.059	0.135	.323**	.497**	1	.526**	-0.121	-0.094	-0.078	0.024	0.046	0.004	0.023	-0.031
	Sig. (2-tailed)	0.614	0.248	0.005	0.000		0.000	0.300	0.421	0.507	0.839	0.693	0.970	0.845	0.793
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
SlowInfo	Pearson Correlation	-0.092	0.036	.251*	.669**	.526**	1	-0.136	-0.021	0.019	-.232*	0.113	0.116	-0.103	-0.045
	Sig. (2-tailed)	0.433	0.761	0.030	0.000	0.000		0.243	0.861	0.869	0.046	0.334	0.323	0.378	0.700
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
SharingScore	Pearson Correlation	.384**	.236*	0.107	-0.039	-0.121	-0.136	1	.443**	.314**	0.001	0.013	-0.188	0.174	0.157
	Sig. (2-tailed)	0.001	0.042	0.359	0.741	0.300	0.243		0.000	0.006	0.994	0.910	0.106	0.136	0.178
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
ProactivenessScore	Pearson Correlation	.266*	.249*	-0.006	-0.080	-0.094	-0.021	.443**	1	.358**	-0.023	0.049	-0.005	.330**	0.120
	Sig. (2-tailed)	0.021	0.031	0.960	0.495	0.421	0.861	0.000		0.002	0.846	0.679	0.969	0.004	0.307
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
TransparencyScore	Pearson Correlation	.238*	0.022	0.109	-0.138	-0.078	0.019	.314**	.358**	1	.330**	-0.021	-0.169	.318**	.370**
	Sig. (2-tailed)	0.040	0.851	0.354	0.238	0.507	0.869	0.006	0.002		0.004	0.859	0.147	0.005	0.001
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
IntegrityScore	Pearson Correlation	0.070	-0.130	-0.200	-0.215	0.024	-.232*	0.001	-0.023	.330**	1	-.325**	-.494**	.300**	.460**
	Sig. (2-tailed)	0.549	0.266	0.085	0.063	0.839	0.046	0.994	0.846	0.004		0.004	0.000	0.009	0.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
InformalityScore	Pearson Correlation	-0.029	0.137	-0.201	-0.127	0.046	0.113	0.013	0.049	-0.021	-.325**	1	0.181	-0.021	-0.157
	Sig. (2-tailed)	0.803	0.242	0.084	0.276	0.693	0.334	0.910	0.679	0.859	0.004		0.120	0.858	0.178
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
ControlScore	Pearson Correlation	-0.227	-0.146	0.142	0.037	0.004	0.116	-0.188	-0.005	-0.169	-.494**	0.181	1	-.322**	-.403**
	Sig. (2-tailed)	0.051	0.212	0.225	0.755	0.970	0.323	0.106	0.969	0.147	0.000	0.120		0.005	0.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
PolicyUnderstand	Pearson Correlation	0.113	0.182	0.111	-0.104	0.023	-0.103	0.174	.330**	.318**	.300**	-0.021	-.322**	1	.432**
	Sig. (2-tailed)	0.334	0.118	0.342	0.377	0.845	0.378	0.136	0.004	0.005	0.009	0.858	0.005		0.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75
InfoQuality	Pearson Correlation	0.040	-0.109	-0.173	-0.085	-0.031	-0.045	0.157	0.120	.370**	.460**	-0.157	-.403**	.432**	1
	Sig. (2-tailed)	0.735	0.351	0.138	0.470	0.793	0.700	0.178	0.307	0.001	0.000	0.178	0.000	0.000	
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix D: Thematic Analysis Diagrams




Solutions for failure demand
Organizational
More training
Organisational restructure
Less compliance and regulations
Less meetings
Information Systems
Design improvements
Communication between systems
More information systems
Less information systems
Technology
Technological innovation
Cultural
Accountability for errors
More Resources
More staff
Information Management
Crime reporting process improvement
Improve internal communication
Improve external information sharing
Improve information quality
Reduce unnecessary bureaocracy