**Have You Been Identified?
Hidden Boundary Work In Emergency Services Classifications**

by
Carrie Sanders, B.A.

A thesis submitted to
The Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Arts

Department of Sociology and Anthropology

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the Faculty of Graduate Studies and Research
acceptance of the thesis

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submitted by Carrie Sanders, B.A. Hons.
in partial fulfillment of the requirements for
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Department of Sociology and Anthropology

Rob Shields, Co-supervisor

Janet Siltanen, Co-supervisor

Chair, Department of Sociology and Anthropology

Carleton University
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Abstract

Information technologies, such as the computer aided dispatch (CAD) system, have fundamentally changed workplace protocols. This thesis examines the impacts that the CAD system and its standardized processes have on the labour of 9-1-1 / police call-takers. Analyzing the labour of 9-1-1 / police call-takers and their processes for locating wireless call(er)s and classifying emergency call(er)s, uncovers the negotiated labour between human and machine. Throughout the thesis I argue that the CAD, and its standardized processes, do not remove the social from call-taking, but instead emphasize the use of the social as a resource for classifying call(er)s. The present analysis illustrates how emergency classification is *not* a standardized process, but instead an actively constructed virtual image performed in real space and time by call-takers. It is the call-takers' tacit knowledge and ability to work across the virtual, abstract and material worlds that makes them essential players in emergency response.

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List Of Abbreviations

<i>ANI / ALI</i>	Automatic Number Identifier / Automatic Location Identifier
<i>ANT</i>	Actor Network Theory
<i>CAD</i>	Computer Aided Dispatch
<i>E9-1-1</i>	Enhanced 9-1-1
<i>EMS</i>	Emergency Medical Services
<i>EPS</i>	Emergency And Protective Services
<i>I. E.</i>	Institutional Ethnography
<i>KM</i>	Knowledge Management
<i>MSAG</i>	Master Street Addressing Guide
<i>PERS</i>	Public Emergency Reporting System
<i>RMS</i>	Report Management System

Chapter One: Introduction

1.0 Introduction

Within the past decade there has been a growing demand for the use and implementation of information technologies in the workplace. Information technologies, such as the computer aided dispatch (CAD) system, have fundamentally changed workplace protocols. There are few organizations with a higher demand or need for information technologies as Emergency and Protective Services (EPS). Without tight integration of computer, radio and telephone systems, the current form of emergency preparedness and response would not be possible.

There are growing demands for emergency services to standardize and centralize their communication systems. These growing demands have led many Emergency and Protective Services (EPS) to install advanced information technology, such as the computer aided dispatch (CAD) system. This thesis deals with the case of one such city in which emergency response is being actively centralized. In order to maintain the anonymity and confidentiality of the officials and workers who generously cooperated in the research, the name of the Canadian case-study city has been changed to *Adacan*.

This thesis assesses the impacts that the CAD and its standardized work processes have on the labour and identity of Adacan's 9-1-1 / police call-takers. Through an examination of the labour of call-takers and their processes for locating wireless call(er)s and classifying emergency call(er)s, I argue that the CAD does not remove the social from call-taking, but instead emphasize the use of the social as a resource for classifying call(er)s.

1.1 The Emergency Communications Problem

The terrorist attack on September 11th 2001, clarified the need to take communication disruption and interoperability into greater consideration in emergency preparedness. These concerns have since been reinforced in many of the EPS around the world. Since the attacks, there have been many investigations into the operation of emergency services. A recent investigation by *The New York Times* revealed that the emergency communications in New York City were so poor during the terrorist attacks:

that on one side of the trade center complex, in the city's emergency management headquarters, a city engineer warned officials that the towers were at risk of "near imminent collapse," but those he told could not reach the highest-ranking fire chief by radio. Instead, a messenger was sent across acres, dodging flaming debris and falling bodies, to deliver this assessment in person. He arrived with the news less than a minute before the first tower fell (Dwyer and Flynn, 2002: A1).

Concerns regarding the communication challenges and decentralized operations within EPS have been recognized throughout many cities. Quotes such as the following are not uncommon in the Canadian press.

Many would argue the emergency response system is even more confused here than in New York. At amalgamation . . . the new city inherited . . . fire radio systems from the lower-tier municipalities, including a 1982 – vintage network that one official said was near its "breaking point." . . . ***The first thing that fails in an emergency situation is communications*** (Doyle, 2002).

In response to communication concerns, Adacan, like many other Canadian cities, has been taking steps to centralize its communication systems within EPS. Centralizing its service is a big step and a time consuming adventure that will span the next few years. EPS is a large department that encompasses many emergency services. This thesis will

focus on the process of centralization within the 9-1-1 / police communication centre. 9-1-1 / police communications was the first centre to undergo major organizational and technological changes, leading other emergency agencies (such as fire and emergency medical services (EMS)) to consider the possibility of piggybacking onto the police communication system.

Adacan's police department is seen to have a '*state-of-the-art communication network*', which makes the department an excellent place to analyze the impact of standardization and classification within EPS. Adacan's 9-1-1 and police are the first agencies, within Adacan's EPS, to implement advanced information technology through the CAD system, into their communication centre. They are also the first players contacted during an emergency call, thereby making them the central player and decision-maker within EPS.

Adacan's police communication centre operates and manages the 9-1-1 emergency reporting system (General Manager of EPS, 2002). Adacan's 9-1-1 / police communication centre has undergone many technological changes in addition to the new CAD system, such as a migration into the Public Emergency Reporting System (PERS)¹ with Bell Canada (General Manager of EPS, 2002). EPS regards these information technologies as an "integral component of enhancing efficiency and performance within EPS" (General Manager of EPS, 2002). Information technologies, such as the CAD system and PERS, have been implemented to create a standardized approach for call-

¹ Before PERS was implemented all 9-1-1 calls were "routed based on telephone number regardless of the address assigned to the caller. In order to be able to segment subscribers for 9-1-1 charging purposes based on whether their municipality did, or did not have 9-1-1 service, it became apparent that the subscriber's location was a critical factor and one that could play a significant role in the method of delivering 9-1-1 calls" (www.bell.ca/9-1-1) PERS enables all emergency calls to be routed "based on the address of the caller and the associated telephone number becomes secondary for default routing"(www.bell.ca/9-1-1).

takers to classify and prioritize emergency call(er)s, while simultaneously maintaining continual communication and information sharing amongst each other.

The CAD system is perceived as a tool to remove the social impacts of classifying a call(er) by creating a standardized approach for collecting, retrieving and storing information. For present purposes, I use 'the social' to refer to two forms of experiential and contextual information: the experiential knowledge that call-takers acquire and use when classifying call(er)s; and, the characteristics which place people in contexts, relationships and identities. An example of the former is the tacit knowledge of call-takers, while examples of the latter are socioeconomic status, gender and occupation.

The present analysis uncovers the negotiated labour, between human and machine, involved in call-taking, while further illuminating the inherent limitations in information technologies and standardized processes through the examination of three disruptions prevalent in call-taking: locating the wireless call(er); classifying the call(er); and, the identity and labour of call-takers.

The analysis of these three disruptions uncovers the social and technological aspects involved in classifying and prioritizing a call(er), while further demonstrating how the identity of the call-taker is incorporated into the communication technology. From this analysis, I argue that *the social refuses to be standardized*. The police organizations move towards standardization has resulted in the implementation of information technologies (CAD and PERS) that *do not remove the social* from call-taking, but instead *emphasize the use of the social as a resource for classifying the call(er)*. I further argue that 9-1-1 / police call-takers are the unrecognized central

players involved in emergency response whose labour and identity are incorporated into their work processes and information technologies.

Now that the main points of my argument have been outlined, I will take a closer look at standardization and how locating wireless call(er)s, classifying the call(er), and the identity and labour of call-takers have created anomalous events and disruptions to the standardized work processes in 9-1-1 / police communications.

1.1 Standardization and Anomalies

An anomaly is defined as a disruption to one's work process and standards (Star and Gerson, 1986). For example, when a call is received in 9-1-1 it is accompanied by an Automatic Number Identifier and an Automatic Location Identifier (ANI/ALI) provided through Bell Canada's Public Emergency Reporting System (PERS). The call(er)s accompanying ANI/ALI provide call-takers with the name, number and address of the caller. However, when a call is received through a mobile phone, particularly cellular phones, it is not integrated into Bell Canada's PERS. The missing ANI/ALI information creates immediate problems for call-takers because they are unable to classify the call(er) until all address and location information has been provided. Unfortunately, many cellular phone callers often do not know their location. Without the ANI/ALI information call-takers are faced with a disruption to their work process as they attempt to locate the call(er) through other means. This is just one example of an anomalous event created and confronted by standardized work processes.

Events, such as the one described above can be classified by, and thus acted towards, in different manners depending on the context in which they are defined or placed within the network. Therefore, "anomalies point to a critical link between

problem structures and work practices” (Star and Gerson, 1986: 163). When anomalies occur or standards change “it is easier to see the invisible work and the invisible memberships that have anchored them in place” (Star, 1991: 44; see also Pickering, 1995; Fujimari 1993, and Latour, 1987). Anomalous events arise from a problem or change within a standard. Standards exist through a continually negotiated process between groups of people and may be characterized by: agreed upon rules for the production of objects; the spanning of more than one community of practice; a rendering of distance and time as insignificant; reinforcement by legal bodies; and, an imposition of a classification process (Bowker and Star, 1999).

Defining standards in this way illustrates the negotiated process behind their development. However, the more people take up and engage with these objects, the easier it is to lose sight of this negotiated development. Therefore, standards and classifications, such as the CAD system and the standardized questions incorporated in call-taking, are interdependent and involve continual negotiation. “Whatever appears as universal or indeed standard, is the result of negotiations, organizational processes, and conflicts” (Bowker and Star, 1999: 44). 9-1-1 and police call-takers have standardized procedures for classifying and prioritizing call(er)s, that are in place to reduce classification and response ambiguity and uncertainty. The present analysis illustrates the negotiated labour involved in the application of the CAD system for classifying and responding to call(er)s.

The CAD is a technology of formal representation that attempts “to regularize the movement of information from one context to another; to provide a means of access to information across time and space” (Bowker and Star, 1999: 290). The act of

classification, such as identifying an emergency as a ‘Domestic Assault’ instead of a ‘Robbery’, or as a ‘Priority 1’ instead of a ‘Priority 2’, is both organizational and technological. As “sets of classification systems coalesce into working infrastructures they become integrated into information systems of all sorts” (Bowker and Star, 1999: 323).

Information technologies, such as the CAD system, become powerful tools that are viewed as self sufficient or “black boxes” that remove the human labour involved in their development, maintenance and application (Latour, 1987). Black boxes contain multiple memberships, negotiations and complexities, but these activities are rendered invisible by the acceptance that “no one is going to dispute” a black box (Latour, 1987: 29). When technology, such as the CAD, is incorporated into the everyday work processes of an organization, the human agency involved in its application can be rendered invisible, thereby creating an image of the CAD as a ‘black box’ (Latour, 1987; see also Berg, 1997 and Pickering, 1995). A “black box moves in space and becomes durable in time only through the actions of many people; . . . understanding what facts machines are is . . . understanding who the people are. If you describe the controlling elements that have been gathered together you will understand the groups which are controlled” (Latour, 1987: 137/140).

Conceiving standardizations and classifications as powerful tools that incorporate heterogeneous groups, interests and activities, highlights the prejudices and desires of the designers that are enmeshed with the technologies they develop (Star, 1995). Completing an ethnographic analysis of EPS sheds light on the aforementioned activities and where they lie / originate in the network. It further exemplifies how the social world must be

examined through the intermingling of both humans with nonhumans, which is exactly what this research has done (Pickering, 1995 and Latour, 1987). Now that the theoretical conceptions and literature reviews have been laid out, I will provide a brief synopsis of the upcoming chapters.

1.2 Chapter Outline

Chapter Two: Methodology

This chapter takes a descriptive and reflective look at the methodological approach taken and the struggles faced throughout the research process. During this chapter I account for my epistemological and ontological position and how it affected the data collection and analyses. The chapter draws attention to the contributions that institutional ethnography, actor network theory and conceptions of systems as fluid have played throughout the research. This further illustrates how I incorporated aspects of these approaches but moved beyond them to create an ethnography of actors, networks and fluidity within Emergency and Protective Services.

Chapter Three: Emergency And Protective Services

This chapter acts as a guiding map through Adacan's EPS network. It begins by developing a simple picture of the EPS network through the provision of a descriptive account of the players' roles and responsibilities within the network. The chapter assesses how each player views their own, as well as other actors' roles within the system. Developing a detailed description of the police communication centre, and the responsibilities of call-takers, identifies the background need and purpose of advanced 'information management' strategies and information technologies, such as the CAD system.

Chapter Four: The Computer Dispatcher

This chapter describes the 9-1-1 and police CAD system. The chapter assesses the capabilities of the technology, such as mapping, classifying, and prioritizing call(er)s. The discussion is entrenched within references to knowledge management (KM) and information technologies. KM literature demonstrates how the organization perceives the CAD as a technology of ‘information management’. The CAD is seen as a tool to aid call-takers in producing informed decisions about call(er) classification by removing social and human influences, such as ethnicity, race, social class, sexual orientation, etc. Developing this chapter through an organizational and technological perspective provides the defining element of the research question. The arguments outline a conception of the CAD as a standardized ‘expert system’ that removes the social from classifying and prioritizing emergency call(er)s. Chapters Five, Six and Seven illuminate their own disruption within the standardized work processes of 9-1-1 and police call-taking.

Chapter Five: Locating The Wireless Call(er)

This chapter highlights the anomalous event created by cellular phones for both the call-taker and the CAD system. When a call is received at 9-1-1 it is accompanied with the phone number and address (ANI / ALI) of the caller. As cellular phones are mobile they do not transmit such information. This chapter demonstrates how an anomaly, such as a cellular phone call, disrupts the flow of ‘knowledge’ and communication within the police communication network, thereby altering the network and flow of communication. The chapter assesses the impacts of cellular phones on each player within the EPS network (i.e. organization, technology and emergency call-taker). Examining each player’s actions and perspectives illustrates how ‘information technologies’ (i.e. CAD

system) have changed the everyday work routine of call-takers. The chapter further demonstrates how public privacy becomes an issue by situating everyone as ‘mapped and located’ within information technology.

Chapter Six: Classifying The Call(er)?

This chapter explores how the call-taker’s emergency classification creates a tension within the organization’s standardized classification process. When a call(er) is received by 9-1-1, the call-taker first locates the call(er) and then assesses who the appropriate agency is to handle the situation (i.e. fire, police, or ambulance). From here the call-taker, in conjunction with the CAD, creates a virtual map of the situation. This virtual map is then used to socially construct an emergency classification and a concrete response (such as dispatching a police officer, or paramedic). Analyzing the classification process illuminates the tangible and intangible components involved in constructing emergency classifications, further demonstrating how the identity of the caller is pivotal for the classification process. By focusing on the tangible and intangible aspects of classification, I untether the knowledge worker and their role in socially constructing the emergency classification. From this hidden ‘boundary’ work mediating between caller and system the inherent limitations and disruptions present in the standardized processes of call-takers become identified.

Chapter Seven: Call – Taker’s Hidden Boundary Work

This chapter looks at the perception and everyday actions of 9-1-1 call-takers. Call-takers and dispatchers are actors within the police communication centre but, throughout their everyday activities, they act as ‘inter-networkers’ who cross the multiple network boundaries. This chapter brings to light the contradictory perspectives (of the

organization, technology and other emergency agencies), of the labour and identity of 9-1-1 / police call-takers. The chapter further illustrates how these identities are shaped into the system, technologies and everyday work routines of emergency call-takers.

Chapter Eight: Are You Identified?

This final chapter develops the entire picture of Adacan's EPS network and the impact of standardization for both emergency call-takers as well as society at large. The chapter provides an overview and summary of the impact of 'information technologies' on call-takers' ability to create informed-decisions. This allows a synthesis of the information to be presented as well as some critical reflections and future considerations.

Chapter Two: Methodology

2.0 Research Approach & Struggles

The purpose of this chapter is to provide a descriptive and reflective account of my methodological approach. Taking an exploratory look at the research process, I identify the struggles encountered when: gaining entry into the research field; maintaining the heterogeneity of EPS; analyzing the data; and, maintaining the anonymity and confidentiality of the research participants.

Throughout my studies I have become aware of the extent to which my presence and identity are entrenched in the research process; including such things as the choice of topic, data and method of analysis. While this can be viewed as problematic, or to a greater extent biased, I argue that it is our previous knowledge that allows us to enter the field and find peculiarities or interests within it. “What makes the field ‘interesting’ is its violation of some expectation, and an expectation is nothing other than some theory waiting to be explicated” (Buroway, 2000: 28).

When entering into the research I wanted my study to be concerned with the everyday activities of emergency call-takers. Only by immersing myself in their world and activities can I begin to comprehend their labour and identity as call-takers. Ethnography² enabled an exploration of the daily lives of emergency call-takers and identified the interdependencies and linkages between the activity and labour of call-takers with other actors in Adacan’s EPS network.

² Prus (1997) describes ethnographic research “as the study of the life-worlds of particular groups of people through active interchange with the participants in those worlds” (192). For the present analysis I became a participant-observer in 9-1-1 / police call-taking. I collected photos and texts to analyze, as well as conducted open-ended semi-structured interviews.

2.1 Entering The Field

The first struggles encountered during the research process involved gaining entry into Adacan's EPS and obtaining interview consent from participants. Entering into a research field and conducting interviews is never an easy task, particularly when it involves a high-risk field such as emergency work. There were many obstacles faced before entering this field and one of the largest was ethics. Observing an area, such as 9-1-1, places both my research and myself in an arena filled with concerns for confidentiality and security. Entering Adacan's EPS required extra precautions to ensure the anonymity and confidentiality of the participants involved as well as information obtained during calls. Once I had passed the University's ethical review board, I began the journey into the world of EPS.

When I first began this research, I was primarily interested in the effects of cellular phones on the work of emergency call-takers and dispatchers. Although this area of interest is addressed in a later chapter, it is no longer the sole focus of the research. It was only by entering into the field that I began to find other avenues of interest and themes that engaged my sociological mind and led to further examination and discovery.

I am quite indebted to one city council representative, out of the seven contacted, for responding to my email with the name and number for the General Manager of EPS. By some stroke of fortune I had compiled 24 interviews and an immense amount of textual data within two months. This, I have been told by my advisors and fellow colleagues, is not always the case when conducting an ethnographic analysis.

To better understand EPS, and particularly emergency response, I became a participant observer in 9-1-1 / police call-taking. This opportunity came with the

concerns and reservations on behalf of the Inspector of the communication centre, who spoke of employee morale as not being where it should be and questioned my interest in their work. It was during my second visit in the communication centre that these concerns became more evident. The Inspector stood behind me asking if I had obtained enough information and was I ready to go.

While these initial reservations created concern about my presence within the field, they were quickly eased by my interactions with the call-takers. During the first field observation, I felt overwhelmed and excited by what was occurring around me. The communication workers were welcoming and open to my presence and my inquiries. Many would discuss their work and the effect it had on their personal life, as well as the skills it took for them to complete their duties.

During the field observations I began to see how attempts at standardization were creating anomalous events for call-takers and dispatchers. The more I studied the process and impact of standardization the more evident it became that *the social refused to be standardized*. From the interviews and field observations I recognized three disruptions present in the standardized procedures and information technologies present in 9-1-1 / police call-taking: locating wireless call(er)s; classifying and prioritizing the call(er); and, the labour and identity of call-takers.

2.2 Data Collection

To assess the three disruptions and their impacts on standardization, a number of interviews were conducted. Figure 1 is a map of Adacan's EPS illustrating the agencies incorporated and the people interviewed (*italicized terms*):

Figure 1**Organization and Interview Map** **Figure 2****9-1-1 / Police Communication Centre Technology Interviews**

2 County Representatives from a different city were also interviewed
Total of 24 interviews

Numerous texts, training documents, algorithms / flip charts and photographs were analyzed

2.3 Ethnography Of Actors, Networks & Fluidity

The above map illustrates the players incorporated in Adacan's EPS and their position and relation to each other. Figure 1 creates an illusion of a static and clearly defined

map. However, in reality EPS is a complex and multivalent system. The heterogeneity of EPS became evident during the field observations and I wanted the analysis to be sensitive and attentive to this quality. The need to illustrate EPS' heterogeneity presented a second research struggle of whether to regard EPS as a 'network' or 'fluid system'. Engaging with the research material identified EPS as a network that incorporated fluid objects, such as 9-1-1 / police call-takers. Thus my ethnographic analysis drew inspiration from Actor Network Theory (ANT) as well as Fluid Systems.

Actor Network Theory (ANT) was first developed to illustrate the mixed qualities of a system that incorporated both humans and nonhumans as active agents (Law, 1999; Latour, 1991). ANT illustrates how both humans and nonhumans have action and how their action is a reflection of their spatial and temporal place within the network: "... entities achieve their form as a consequence of the relations in which they are located. But this means that it also tells us that they are performed in, by, and through those relations" (Law, 1999: 4).

Viewing EPS as a network creates concrete boundaries and regions, with these regions intersecting other networks. However, the static and concrete image of ANT has led many science and technology researchers to move away from ANT toward 'fluid systems' where the boundaries are vague and continually moving. "Effective actors need not stand out as solid statues but may fluidly dissolve into whatever it is they help achieve" (de Laet and Mol, 2000: 227). Fluid systems shed light on the multiplicity of realities for humans and nonhumans.

By recognizing the multiple realities and fluidity of actors, the discovery of more intricate and complex systems and recognition of ever-evolving transformations is made

possible. Therefore, while realities may counter each other at points throughout the system, elsewhere these objects may work together or even be dependent on each other.

Sometimes fluid spaces perform sharp boundaries. But sometimes they do not - though one object gives way to another. So there are mixtures and gradients. And inside these mixtures everything informs everything else - the world doesn't collapse if some things suddenly fail to appear (Mol and Law, 1994: 659).

A fluid system does not possess distinct or clear boundaries or defined identities, instead the elements and objects within the system continually inform each other.

ANT, on the other hand, has clearly defined boundaries and borders, with each depending on the other: "it says that the space in which regions can be drawn and differentiated exists" (Mol and Law, 1994: 648/9). By these definitions, the difference between a network and a fluid system is the clearly defined boundaries and the extent that these boundaries are dependent upon the other. Within a fluid system if one area breaks down it does not mean that the entire system will cease to function³. Objects do not collapse easily within fluid systems and there is no point of translation or entry (Mol and Law, 1994). In this sense, a fluid system is nothing more than a 'flexible and open system', where modifications within the system can be continually made.

While fluid systems pay attention to the ever-evolving and fluid shape of objects, ANT also recognizes that objects are able to flow and change definition and shape throughout the different hubs of the network. However, ANT provides clearly

³ An example of a fluid system analysis is deLaet and Mol's, (2000) examination of the *Zimbabwe Bush Pump*. The Zimbabwe Bush Pump is not one solid object but a multiplicity of objects that when placed together operate as a water pump. deLaet and Mol (2000) demonstrate how the pump does more than pump water, but also provides health and reinforces the bonds of Zimbabwe communities. The analysis further demonstrates how the pump can continue to function if different parts break or becomes loose, thus illustrating the flexibility of the network.

defined boundaries within a network to examine these ever-evolving definitions, and it is the defined boundaries within ANT that were most useful for the present analysis.

ANT pays attention to the activity that occurs within the network to assess how actors perform as they do. As Latour asserts “actantiality is not what an actor does. . . but what provides actants with their actions, with their subjectivity, with their intentionality, with their morality” (1999: 18). ANT allowed me to discover how various performances are incorporated and dependent on other actions. “ANT allows that the concepts of dependency and belonging can be applied recursively. So, in any study we may ask what elements provide for those elements that provide for a given capacity to act” (Lee and Stenner, 1999: 93). I do not view ANT as a static network analysis, but instead recognize the benefits of maintaining defined boundaries. The clearly defined boundaries within EPS illuminated the fluid definitions and shapes that actors take throughout the network.

After defining EPS as a network that incorporates fluid objects and actors, I realize that I had drawn inspiration from both ANT and Fluid Systems but had moved beyond them both. I adopted ANT’s intermingling of humans and nonhumans, while simultaneously adopting the fluidity of call-takers’ labour within the EPS network. By adapting elements of ANT and Fluid Systems I constructed an *ethnography of actors, networks and fluidity* within emergency response.

EPS has distinct and clearly defined boundaries that are dependent on each other. For example, if 9-1-1 has a breakdown so do police, fire and EMS, because they are dependent on them. This dependency was strongly illustrated during the terrorist attacks in New York in 2001 when the police and fire communications shut down leaving both

unaware of the dangers they faced. The clearly defined boundaries in Adacan's own EPS network created an opportunity to document how 9-1-1 and police call-takers act as 'internetwork-boundary workers'⁴, who cross the many boundaries and borders, enabling information to flow throughout the network (Downey, 2002; see also Mol and Law, 1994).

Performing an ethnographic analysis of actors, networks and fluidity demonstrated how each node relies on the other, while further illustrating how norms emerge from different locations within the network. This uncovers "the complex hierarchies of power" (Wellman and Berkowitz, 1997: 38). Both interviews and texts were analyzed to develop a detailed analysis of Adacan's EPS network.

2.4 Emergency Interviews and Texts

The 24 interviews conducted with Adacan's EPS actors were semi-structured and open-ended, which provided for a detailed description of the perceptions and work activities of emergency communication workers. All the interviews were recorded and later transcribed allowing me to continually return to the information and pay attention to different aspects of the interview at different moments in the analysis process. The 24 interviews illuminated how call-takers, dispatchers, trainers and managers are interconnected through their ongoing everyday activities.

⁴ Internetwork-boundary worker has been adopted from Greg Downey's (2002) analysis on the *Telegraph Messenger Boys*. Downey used the description of internetworker to demonstrate how the telegraph messenger boy occupied a key position in the internetwork (consisting of telegraph industry, post office and telephone) for maintaining the flow of information. Therefore, boundary workers, such as telegraph messengers and call-takers, "knit disparate communications networks together on a daily basis" (Downey, 2002,211).

When I first entered the field I wanted to complete an institutional ethnographic⁵ (I.E.) analysis of 9-1-1 / police call-takers, but throughout the analysis, I moved from I.E. to an ethnography of actors, networks and fluidity within emergency response. After closer examination and engagement with I.E., the difficulty of distinguishing the ruling relations⁶ as a sole entity became evident. I recognized that power was disbursed throughout the EPS network within its different nodes and hubs. Furthermore, I.E. did not provide a description for data analysis and many studies placed⁷ more emphasis on analyzing texts than the ‘doing of activity’. Placing higher importance on texts removes importance and agency from the participants. Ethnography, on the other hand, begins in the everyday activities of call-takers to see how their activity is coordinated within the network of EPS, while continually allowing these actors agency throughout the analysis.

The research also incorporates numerous documents including: EPS reports, Bell Canada 9-1-1 reports, 9-1-1 / police call-taking reports, training manuals, job descriptions, newspaper articles, field observation notes, CAD documents and photographs of 9-1-1 / police, fire and EMS communication centres. This wide variety of

⁵ Institutional ethnography was first coined by Dorothy Smith to “explore methods of thinking that will organize our inquiry and write our sociological texts so as to preserve the presence of actual subjects while exploring and explicating the relations in which our everyday worlds are embedded” (Smith, 1987, 111). Smith believes that we must give both our subjects and ourselves presence within the methods of our writing, our “epistemology must be an ontology, a method of thinking (a theory if you like) of how the social can be said to exist so that we can describe it in ways that can be checked back to how it actually is. . . in the ongoing active recreation of a world in common” (Smith, 1987, 122). For a more detailed understanding of Smith’s institutional ethnography see her book (2000) entitled *Writing the Social* and pay close attention to her chapter “Telling The Truth After Postmodernism”, Pp.96-130.

⁶ Smith defines Ruling Relations as coordinating “the activities of people in the local sites of their bodily being into relations operating independently of person, place and time. . . ruling relations ‘extract’ the coordinative and concerting of people’s everyday/everynight activities and subject them to technological and technical specialization, elaboration, differentiation, and objectification. . . They become independent of particular individual’s; individuals participate in them through the forms of agency and subjectivity they provide” (Smith, 1999, 75/77).

⁷ To better illustrate the importance of textual analysis in I.E. see Roxana Ng, 1995; George Smith, 1995; Liza McCoy, 1995.

information has resulted in a detailed description of EPS and information technology, in addition to a riveting portrayal of the tensions inherent in call-taking.

Texts have been chosen to illustrate “the text-mediated discourses that frame issues, establish terms and concepts, and in various ways serve as resources that people draw into their everyday work processes” (DeVault & McCoy, 2002: 765). By analyzing both texts and interviews, I have been able to move between them: “analysis is always a matter of moving back and forth between collected speech and the context that produced it” (DeVault & McCoy, 2002: 769).

2.5 Data Analysis

Analyzing the collected texts and interviews presented the fourth research struggle. There are few books or even researchers who fully explicate how they come to their conclusions. Very few provide a step-by-step process for analyzing texts and interviews. Thus, I found myself left to my own devices where I employed numerous methods in order to establish an ethically sound and strategic approach to analysis. To analyze the texts and transcribed interviews, I first thoroughly read them through. I subsequently developed a list of the themes, patterns and highlights evident throughout the material.

Once I had read through the material and identified themes and highlights, I then looked for the metaphors used during interviews because “language reflects how things are in its descriptions, representations and accounts” (Potter, 1997: 97). By looking at metaphors and descriptions, I wanted to see how social facts are created and implemented: “a central feature of any description is its role in categorization; a description formulates some object or event as something; it constitutes it as a thing, and

a thing with specific qualities. . . .The process of fact construction is one of attempting to reify descriptions as solid and literal” (Potter, 1997: 111/12).

I recognize descriptions and facts as discourses created to perform actions. One of the valuable aspects of descriptions and metaphors are their ability to isolate pieces of information deemed relevant while ignoring other potential ones. Justifications, like descriptions and facts, “rely on the engagement of objects or other elements of the situation (as relevant backing for an argument), and they must meet the requirement of offering proof for their assertion” (Lamont and Laurent, 2000: 237). My analysis provided insight into the social construction of facts:

Support is built up by constructing the facts, the record, the evidence, as having its own agency. . . Such constructions obscure the work of interpretation and construction done by the descriptions producer: ‘the facts’ are, first, not being constructed as facts and, second, their significance is not being generated by their producer, it is provided by the facts themselves (Potter, 1996: 158).

To assess how different actors within the network attempt to construct facticity, I adopted Jonathan Potter’s (1996) method of discourse analysis.

Potter (1996) explains how descriptions or metaphors can build their own status as a factual version. He goes further to demonstrate how the acts of using categories (that formulate objects as things possessing specific qualities), interest management, and category entitlements (that demonstrate how certain categories of actors, such as doctors, are privileged as knowing particular sorts of things, thus their accounts are given special credence) all aid in developing factual accounts. Engaging these various description qualities demonstrates how different people across the EPS network constructed facticity in their claims. Metaphors, descriptions and justifications highlight the varying

conceptual and cultural interests among the different players within Adacan's EPS network. Metaphors not only create action and justifications for peoples' acts, but they also structure the collective and individual actions while maintaining the ability to unite people (Maffesoli, 1996).

Developing the list of highlights and metaphors identified three disruptions to the standardized processes of emergency call-taking: locating emergency call(er)s; classifying call(er)s; and, the labour and identity of call-takers. Once these three disruptions were identified, I read through my materials for each tension from the perspectives of the organization, other emergency agencies, technology, call-taker / dispatcher, and emergency worker (see Figure 3). Dividing the data into the different actors present in the EPS network allowed me to develop a better understanding of the metaphors and descriptions used by each.

Data collection and analysis were ongoing processes. Every tension examined repeated the aforementioned steps of analysis and follow-up interviews were conducted to answer any remaining questions. The exhaustive data analysis process exposed how the three disruptions resulted from the process of standardization and centralization within the emergency communication centre. The analysis further illustrated how each disruption, although arising from standardization, revealed its own theoretical interests.

Figure 3**Photographs A: Cellular Phones** **Photograph B: Classifying The Call(er)**

Utilizing the network analysis for writing-up the research findings developed a clear and descriptive picture of how each player defined, acted towards and perceived their place within the network. Thus, an opportunity to uncover the hidden labour involved in call-taking while further revealing the differing perspectives and actions across the network was created. However, it was during the write-up phase that I faced the final struggle in maintaining the anonymity of participants without removing valuable insight from my analysis.

I felt it important to keep each emergency agency clearly defined, as well as highlighting the hierarchical structure prevalent within them. Maintaining the hierarchical structure became difficult when identifying interview quotes, because many positions were occupied by a single person. After struggling with this ethical dilemma, it became apparent that the city must be anonymized. Anonymizing the city would not weaken my analysis, as there are many Canadian cities that are taking steps at centralizing and standardizing their EPS.

Now that my methodological approach has been thoroughly explained, I will begin my analysis with a description of Adacan's EPS network and standardized emergency communication.

Chapter Three: Emergency And Protective Services

3.0 The Web Within EPS

The purpose of this chapter is to develop an organizational map of Adacan's EPS network. The chapter begins with detailed descriptions of 9-1-1, police, fire and EMS communication centres. Following the flow of an emergency call(er) through the communication centres of 9-1-1 / police, fire and EMS, a description is constructed of the roles and responsibilities of call-takers and dispatchers. These descriptions illuminate the differing labour required for emergency response. The chapter concludes with an analysis of the networks' interdependencies and linkages through an examination of tiered-response and multi-agency incidents.

Adacan's 9-1-1 bureau is an acting agency within EPS. Adacan's EPS has been undergoing major organizational and technological changes and will continue to expand and grow throughout the next few years. As Adacan's EPS is situated within a large urban area, it is very complex and integrated. The following is a straightforward and simplistic description of the network, however the complexity of the network, and the players within it, will become evident throughout the following chapters.

3.1 9-1-1 and Police Communication Centre

Since the implementation of EPS Adacan has undergone an amalgamation with neighbouring communities. This amalgamation has thus resulted in a centralization of emergency organizations. 9-1-1 is presently operated, staffed, and trained by the police department. 9-1-1 came into operation in 1988 and since its implementation calls have had a 51% increase from 457 to 689 calls per day (Emergency and Protective Services Committee, 2002: 2). 9-1-1 is staffed within the police departments communication

centre “comprised of police call-taking, dispatching and 9-1-1 operators” (Emergency and Protective Services Committee, 2002: 1). Combining 9-1-1 and police communications makes it possible for 9-1-1 call-takers to be moved to police call-taking in times of high demand. Therefore a 9-1-1 and police call-taker is the same person wearing two different hats.

Both 9-1-1 and police call-takers / dispatchers operate on a CAD system. The CAD system works in conjunction with Bell Canada to provide call-takers with a Public Emergency Reporting System (PERS), which “uses digital mapping technology to link telephone numbers to specific street addresses thereby enhancing the dispatch of calls” (Emergency and Protective Services Committee, 2002: 2). When a call(er) is received by a 9-1-1 call-taker, it is automatically placed into the police CAD, and the phone number and address of the caller is displayed on the call-taker’s console (for example 1234 Main Street, 555-1282 would be displayed in the upper left hand corner of the computer screen).

Addresses and phone numbers are provided only for landline phones, thus any calls that are received from cellular phones do not elicit an Automatic Number Identifier or an Automatic Location Identifier (ANI/ALI). Without caller information the call-taker and emergency caller must determine the location and phone number together. At first glance this may appear to be a simple task, but unfortunately most cellular phone callers are on the move and are often unaware of their exact location. Call-takers may not begin to classify the call(er) or dispatch help until the exact street location is entered into the CAD. The anomalous event created by wireless communications is examined more

closely in Chapter Five, but this short description signals the many challenges and negotiations that 9-1-1 call-takers must make.

Returning to the example of 9-1-1 landline phone calls, the accompanying address and phone number (ANI / ALI) are provided by Bell Canada and are based on the billing address of the caller⁸. The ANI/ALI is used by the call-taker to verify the address and the incident's location. Once the location information has been confirmed, the 9-1-1 call-taker then re-routes the call to the appropriate emergency agency (fire, police, or ambulance). Thus a 9-1-1 call-taker is the first contact person, and first to locate and classify the call(er). Figure 4 (page 29) maps out the flow of an emergency call, illustrating the players involved in emergency response.

If the call(er) is a police matter, the 9-1-1 call-taker can stay on the line and take the role of a police call-taker, or depending on the time and office situation, they may re-route the call(er) to a colleague. At this point, the 9-1-1 call-taker deals with the call(er) by asking the 5W's (who, what, when, where and weapons) in order to classify and prioritize the call(er). If the 9-1-1 bureau has a high call density, they will then re-route the call to a police call-taker. What follows is a brief description of the 9-1-1 and police communication centre.

The communication centre is divided into three divisions: East, West and Central. Each division is then broken into districts, which are then divided into car zones. Organizing Adacan by divisions and districts enables the call-taker to send the information to the appropriate dispatcher. A Police call-taker (also called a clerk) is the

⁸ If a caller has a billing address that does not match their home address, for example a person may have their bills mailed to their office instead of their home, then the information received by the 9-1-1 call – taker is incorrect and can create difficulties for emergency response.

person who speaks directly to the caller and finds out the 5W's (who, what, when, where and weapons) of the situation, which they type directly into the CAD.

Figure 4
Emergency Call Path Chart

1. 9-1-1 call-taker deems if the call is an emergency
2. 9-1-1 call-taker transfers the call to the appropriate angency
3. Appropriate agency's call-taker receives call(er) information
- 4A. Call-taker sends ifnformation to their dispatcher
- 4B. If the call-taker recognizes that another emergency agency is required, the call-taker must call the other agency and verbally relay information
5. The dispatchers dispatch information to emergency workers

This diagram demonstrates how:

- **9-1-1 call - taker is the first to respond, classify and direct the call(er)
- **Caller is able to communicate with every agency's call-takers
- **Emergency workers only communicate with their dispatchers
- **If incident requires another agency to respond than a 5th line of communication must occur by the call-taker verbally relaying the information to the appropriate agency over the telephone line.

The police dispatcher sends the information received from the call-taker to a police officer through mobile workstations or voice radio. The form that the call(er)s information is transmitted by depends upon the decision made by the dispatcher, level of priority and situation of the officer. Thus, a call-taker and a dispatcher have two different responsibilities. A call-taker has direct contact with the caller and acts as the dispatcher's ears, while a dispatcher never speaks with a caller instead dealing directly with mapping the call(er), finding the appropriate vehicle to respond and transmitting the call(er)'s information to the emergency workers in transit.

3.2 Fire Communication Centres

If the 9-1-1 call(er) does not constitute a police matter, the 9-1-1 call-taker is responsible for re-routing the call(er) to the appropriate agency such as, fire or EMS. Presently, Adacan has a number of fire dispatcher centres, which means that a 9-1-1 call-taker must, using their judgment and knowledge of the city, determine which fire station is appropriately located to respond to the call(er).

Fire dispatchers work on a DOS program that does not have a mapping system or prompting questions. Instead, the system involves a flip card algorithm that the dispatcher can use to guide themselves through a process of classifying the call(er) and organizing the level of response and the equipment needed. Figure 5 illustrates the flip card algorithm present in fire communications.

Figure 5
Fire Communication Flip Card Algorithm

This photograph depicts how the flip cards are divided alphabetically and subdivided into different categories that are highlighted by index markers. The flip card algorithm demonstrates how the labour of fire call-takers differs dramatically from that of 9-1-1 and police.

Fire dispatching is different than police, because fire involves a significant amount of equipment and personnel management:

Fire dispatchers are less intensive on the phone than police, but more intensive on radio. We are part of incident command, meaning that the dispatcher and incident commander on the scene communicate continually with status updates on how the fire is going and asking for help to get things (Division Chief Of Fire Communication Centre).

Currently police and 9-1-1 can share information, but fire, police and EMS can only communicate through a direct line on the telephone. Adacan is taking many steps to increase the sharing of information and communication, by installing a new CAD system in fire⁹ services and an interoperable radio system for all emergency agencies.

3.3 EMS Communication Centre

While police and 9-1-1 communications are centralized and fire services are working towards centralization, EMS is also undergoing changes. Throughout the past EMS has been privately owned and operated, however, as of 2002 they were under the jurisdiction of Adacan. EMS perceives their role in emergency work as being completely different to both police and fire:

In construction you have plumbers and electricians and they all work on the house but have different jobs, so does police, fire, and ambulance, they are completely different (Director Of EMS).

Dispatching technology for EMS is different than other emergency agencies and contains different functions. Each call-taker is provided with primary assessment cards, (see Figure 6, page 33) which instructs them on classifying the call(er). The primary assessment cards also provide call-takers with pre-arrival medical instructions. Figure 6 is one of the many flip card algorithms EMS call-takers have at their disposal.

⁹ In the upcoming year, fire services will be installing and operating on the same CAD system that police use. This centralization of emergency communications is extremely fascinating and an area I hope to analyze in more depth at another time. The police CAD Coordinator will be installing the fire CAD system. The CAD is to ensure that all steps are being completed during an emergency call because the computer does not allow the call-taker to move on to different questions until they have entered the appropriate answers into the system. Not only will the CAD provide prompting for dispatchers, but it will also enable information to be sent from police to fire (and vice versa) by the push of a button. Of interest here is the form and content of information that will be shared between agencies. To date this has not been determined.

Figure 6

EMS Primary Assessment Card

1.(a)	Ambulance for what city (location)?	➡	Inter-hospital transfer?	➡	SEE SECTION 8.8 P&P MANUAL
(b)	Ambulance for what city (location)/quelle ville?*	➡	Inter-hospital transfer?	➡	SEE SECTION 8.8 P&P MANUAL
2.	Where is patient (address)?	➡	Obtain city, rural route, address; avoid directions		
3.	Caller's phone number?				
4.	Unconscious?				CARD 29
5.	Difficulty breathing?	➡	Yes/unknown	➡	CODE 4 ➡ CARD 7
6.	Uncontrolled bleeding?				CARD 6
7.	What is the problem/complaint?	➡	Specific ➡ Problem Card Non-specific ➡ Obtain History		
8.	Obtain directions if required	➡	Geographical Assistance	➡	CARD 30

*to be used by any dispatcher capable of communicating in both English and French

PRIMARY ASSESSMENT

CARD 1

The flip card instructs call-takers on the questions to ask and the actions to be taken when answered.

We have different problems and we select the call number according to the answers and all the call-taker has to do is commit a 'yes/no' answer and add narrative to the call (Assistant Manager Of EMS Communication Centre).

For example, a call(er) is received and the EMS call-taker discovers that the victim is unconscious. The call-taker designates the call(er) as a Code 4, which has the highest priority and response must be dispatched immediately. Once the call(er) has been classified as Code 4, the call-taker assesses if the victim is vital signs absent (VSA). If the victim is unconscious and breathing, EMS dispatches the closest ambulance, however, if the victim is unconscious and non-breathing, EMS will dispatch an ambulance as well as a fire truck. The extra step of dispatching fire and EMS is added to ensure the quickest response time, as both fire and police are trained to resuscitate.

For another example, a call(er) is received in EMS and the call-taker discovers that the victim is conscious but has a severe cut on their arm. The call-taker will first categorizes the call(er) and dispatch a paramedic. Upon dispatching help, the call-taker provides first aid advice over the phone to the caller (e.g. rest, elevate and apply direct pressure to the wound). Therefore, EMS call-takers not only obtain the caller's address and information, but they also provide pre-arrival first aid instructions.

EMS is governed by '*performance-based standards*', which incorporate aspects of staffing so they are adjusted to meet call(er) demand patterns. Therefore, if there are more call(er)s at noon, then there will be more staff and vehicles available:

The theory behind performance-based is that if the data shows you get 5 calls in this hour you will want 5 vehicles

to do the calls plus a number of extra vehicles to cover the area (Manager Of EMS).

Like the police communication centre, EMS has call-takers who deal directly with the call(er) and obtain relevant call(er) information, but they also have dispatchers who are responsible for dispatching vehicles and equipment.

The role and labour of the EMS dispatchers differentiates EMS from other emergency agencies, because an EMS dispatcher is responsible for the deployment of vehicles:

EMS departs from the other emergency agencies by the deployment of the vehicles. We use historical data to deploy our vehicles geographically and to prioritize post locations. This gives us the best information as to where the next call will come from. . . . The dispatcher must make a decision as to where he gets that coverage from, and that is also a situational decision. So the dispatcher picks a vehicle, in his best judgment that would be the next best vehicle to cover that spot. So the initial vehicle goes to area number 5 and then to the hospital and he is most likely not going back to number 5 and then when he is available the dispatcher looks at what the posts are to see where he would be best placed. . . so this is where the judgment and experience of the dispatcher comes into play (Manager of EMS).

EMS, fire, police and 9-1-1 call-takers and dispatchers work within EPS, however, each agency has different roles and responsibilities for answering an emergency call(er). The varying roles and responsibilities of emergency communication workers have produced different technologies and information accessible to them. Figure 7 better illustrates the differing roles and technologies incorporated in emergency call-taking / dispatching within each agency.

Figure 7
Organization and Technology Flow Chart

The above diagram shows how 9-1-1 / police and EMS communication systems have both call-takers and dispatchers, whereas fire has only a dispatcher. It further demonstrates the technology available in each agency.

Now that the roles and responsibilities of each emergency communication centre have been outlined, the following analysis identifies the agency's interdependencies and linkages. In the past, there was little integration of 9-1-1, police, fire and EMS, but now there is an increased need and importance placed on the integration and centralization of the emergency communications. Adacan is a member of the Advanced Life Support System, which provides each agency with advanced first-aid training (e.g. both fire and police are trained to use defibrillators and most emergency vehicles carry a defibrillator). With advanced training Adacan has implemented a "tiered-response system".

3.4 Tiered-response & Multi-agency Incidents

Tiered-response is a pre-prioritized system that decides which agency will be sent to an emergency, in order to ensure the fastest response possible for the call(er). Tiered-response increases dependence and cooperation among the emergency agencies.

Increased dependence and cooperation requires effective emergency communication and information sharing.

Should EMS become overwhelmed to the point that an ambulance cannot be activated within 4 minutes of the receipt of a life threatening call, Fire Services and Police Services will be requested to assist (as appropriate) until an ambulance becomes available (Tiered Response Agreement, 2002).

Tiered-response begins with the 9-1-1 call-taker. For example, 9-1-1 receives a call(er) about a heart attack:

they will relay the call to the ambulance dispatcher, but an ambulance takes longer to get there than the fire department, so they will also call the fire dispatch and give them the information. Then fire will dispatch from the closest station to that address and response time will be just under 6 minutes to get there (General Manager of EPS).

The tiered-response system is a:

‘chain of survival’- being that we send the closest vehicle with the specialists at toe. It is all about stopping the clock, so if you had a heart attack, the sooner we can get someone there the better in terms of trying to resuscitate the heart attack victim (General Manager of EPS).

Not only does tiered-response lead to a faster arrival time for emergency workers, but it also increases interaction and interoperability between 9-1-1, police, fire and EMS.

This chapter has illustrated the complexity and interdependencies of Adacan’s EPS. The chapter has further outlined and described each agency’s roles and responsibilities within the network. Since each agency is different and has different responsibilities, various technologies have been installed to help call-takers and dispatchers perform their activities effortlessly.

9-1-1, police and EMS have their own CAD systems. Although different from each other, these technologies have been implemented to standardize the ‘scientific’ procedures for classifying and prioritizing emergency call(er)s. These technologies are organizational attempts to remove the ‘social’ from emergency response. The following chapter takes an in-depth look at the role of information technology in 9-1-1 and police call-taking.

Chapter Four: The Computer Dispatcher

4.0 Introduction

The purpose of this chapter is to present the organizational and technological foundation for knowledge management (KM) and information technologies in 9-1-1 / police call-taking. Beginning with a description of the present state of emergency communications, the chapter outlines the police organization's move towards 'knowledge management' through its implementation of the CAD system. To better illustrate the capabilities of the CAD, the chapter discusses the goals of KM and the differences between information, process knowledge and tacit knowledge. Following this discussion, the chapter illustrates the capabilities of the CAD and how it has been installed, by the police organization, to aid call-takers in making informed decisions about classifying and prioritizing emergency call(er)s.

Throughout the chapter, I argue that the CAD does not store 'knowledge', but instead isolated pieces of information that only become knowledge as call-takers actively engage with them in their everyday work activities.

4.1 The CAD System

In order to increase communication between call-takers, dispatchers and emergency workers, Adacan's police department has installed a CAD System. The CAD system is only operable for police and 9-1-1 call-takers and dispatchers¹⁰. Vignette 1 is a short illustration of the present organization of emergency communications¹¹.

¹⁰ In 2003, Adacan's fire department will also be operating on the same CAD as police, thus allowing information to be shared by the push of a button from one agency call-taker to another. The shared CAD will eliminate the duplication of efforts and information compilation between the emergency call-takers.

¹¹ 'The Stabbing Vignette' is not an actual situation, but instead a compilation of examples provided during 9-1-1/police call-taker interviews.

Vignette 1

The Stabbing Vignette

A call is received in 9-1-1 and the call-taker asks for the caller's location and phone number. After eliciting such information the call-taker asks what agency the caller needs (i.e. police, fire, or ambulance). The caller asks for ambulance and the 9-1-1 call-taker immediately routes the call to EMS. Once an EMS call-taker answers he / she re-verifies the caller's address and phone number and begins to take information on the incident. The caller explains that their friend is bleeding and needs an ambulance. Moments later, the call-taker finds out that the friend was stabbed and the assailant is still on the premises.

Once the EMS call-taker hears this, he/she sends the information to their affiliated dispatcher, who dispatches the closest ambulance. The EMS call-taker provides pre-arrival first aid advice to the caller and lets them know an ambulance is on the way. Once the call-taker is disconnected from the caller, they recall the police communication centre, through the direct line on their ordinary phone, as the call involves a criminal offence as well as persistent danger for the victim and possibly the on-site paramedic. Once the call is sent to police, the EMS call-taker re-iterates the information they have attained and entered into their computer so the police call-taker may enter the same information into theirs. After all the information has been passed to the police call-taker they immediately dispatch an officer.

The above vignette demonstrates how the EMS call-taker must take an extra step by calling the police and verbally reiterating the incident information. This process does not only involve a duplication of efforts, but it also places extra minutes on the emergency response time. These extra steps have created great concerns about the communication between emergency agencies within EPS. Identifying the interoperable communication concerns has led Adacan to centralize their emergency communications.

4.2 Centralizing EPS

One of Adacan's first steps at centralization was to install the CAD system in the 9-1-1 / police communication centre. The CAD is a technology of 'information management' that has been installed to provide call-takers with enough guidance and information to make 'informed decisions' when classifying call(er)s. The CAD is an organizational attempt to render the call, and not the caller, classified. The CAD further enables emergency workers (i.e. police officers) to be *mobile knowledge workers*, who are capable of performing their duties without having to come into the office or speak directly with dispatchers. All the information a police officer needs is electronically dispatched to their mobile computer in their patrol car. Such organizational features and information technologies are components of "KM").

4.3 Emergency Services and KM

Canada is among many of the countries that are embracing KM with open arms:

the knowledge - based sectors of our economy, since 1995, expanded at almost four times the rate of the economy as a whole and contributed about 40% of Canada's growth last year. . . We enhanced investments in Science and Technology in Canada's Far North, in our Health Information Highway, in aerospace and aviation, in wireless communications and telecommunications, in our arts and entertainment, cultural industries, in transportation

and in life sciences, among others (Nicholson -O'Brien, 2001: 2).

The KM literature holds that knowledge is embedded in people. “Knowledge and creativity are now the driving force in a new economy – our human talent, values and our commitment to working together will secure Canada’s leadership in the knowledge – based economy (Throne Speech: 1999)” (Shields and Taborsky, 2002: 142).

KM attempts to connect people who need to know with information from people who know. Many information technologies, from computers to cellular phones to the internet, have been created to connect people with different forms of information. KM involves a claim that the “reach of know-how and experience possessed by individuals can be greatly extended once it is captured and explicated so that others can easily find it and understand it and use it” (World Bank, 1998,1).

4.4 Information and Knowledge

Emphasis upon connecting employees with knowledge and ‘know how’ has increased the popularity of information technologies, such as the CAD. KM assumes that knowledge can be captured, coded and transferred from one person to the next. Before assessing the capabilities of KM and information technology, it is important to develop a clear understanding and definition for both knowledge and information.

It is “people, and people represented by their content, [that] inform processes”(Rasmus, 1999: 2). Knowledge is embodied and fluid: “information becomes knowledge as it is interpreted and made concrete in the light of the individuals’ understandings of the particular context” (World Bank, 1998: 9). For the present research, *information* is defined as pieces of ‘data’ placed within a context, or stated

differently, information is data that is placed ‘in a formation’. “Information is both locally contextual and relational and we can assign a definite quantitative and qualitative description to this data” (Shields and Taborsky, 2001: 144).

Information only becomes *knowledge* when it is translated and integrated with other information into a person’s everyday activities. Knowledge is never static, but is fluid; it develops out of action. “This can be summed up by stating that knowledge is a social or collective operation of generalization and the development of normative habits, while information is the property of an isolated context” (Shields and Taborsky, 2001: 145). Therefore, knowledge emerges as a person actively engages with a situation.

Defining knowledge as a social and collective process recognizes the CAD as a tool of ‘information management’ that stores pieces of isolated contextual information and instructions for call-takers to apply to their situations. This information however only becomes knowledge as the call-taker begins to incorporate it into their daily activity for classifying and prioritizing call(er)s. The police organization perceives the CAD and its information as a standardized tool for classifying call(er)s, however the importance of call-takers’ knowledge exemplifies the impossibility of standardizing the classification process. The CAD does not render the social obsolete from classifying, but instead makes it invisible.

4.5 Process & Tacit Knowledge

KM identifies different forms of knowledge, such as process and tacit. Both forms are extremely valuable for the present research and warrant closer attention. *Process knowledge* is a form of organizational knowledge that a company wants to accumulate, capture and replicate in their employees. It is the ‘how’ of the organization that enables

workers to do the same actions continually. “Organizations must capture process knowledge, and refine it, or they will have no place for their staffs to apply any knowledge learned through practice or experience” (Rasmus, 1999: 11). Thus, process knowledge is the guidelines or standard operating procedures for organizations. For EPS, process knowledge is the call-taker’s training manuals. These manuals explain how to take call(er)s and use the CAD. It is the information that a call-taker must possess before they are able to perform their job in a consistent and standardized manner.

While there is process knowledge there is also *tacit knowledge*. Tacit knowledge incorporates aspects of an individual’s culture and background. “Tacit knowledge is seen as personal knowledge, based on individual experience and values and therefore is not as easily transmitted” (National Research Council of Canadians, 2000: 1). Michael Polanyi was one of the first to argue that science depends on tacit knowledge. Polanyi (1958 / 62) describes tacit knowledge as embodied knowledge that consists of things one cannot speak of. Expert scientists who perform their studies without complete articulation of all the decisions they make. Without these specific instructions no one else can replicate the findings (Polanyi, 1958 / 62).

Tacit knowledge involves “knowledge or abilities that can be passed between scientists by personal contact but cannot be, or have not been, set out or passed on in formulae, diagrams, or verbal descriptions and instructions for action” (Collins, 2001, 72; see also Ashmore, 1993; Pickering, 1995). As Collins’ explains, meanings and symbols change as the content and context of the situation continually emerge (1990). Tacit knowledge, therefore, is something that is embodied and fluid and extremely difficult, if not impossible, to transfer.

KM assumes an individual's knowledge can be captured and placed in a digital format to pass on to other employees. Presently, there will be no critique of whether such activity is plausible, but instead a discussion of the organizational and technological foundation for KM and the use of information technologies will be outlined. The subsequent three chapters spend more time thoroughly assessing such capabilities and the implications that arise from them.

4.6 Information Technology

The CAD is an information technology that codes, stores and retrieves information for call-takers. The CAD does not store knowledge, instead storing information that only becomes knowledge as the call-taker engages with it and places it into their everyday activities. KM is seen to aid in 'informed decision making' by increasing the collective pool of information and knowledge among all of an organization's employees through the use of information technology (National Research Council of Canada, 2000).

The goal of KM is to develop information technologies that create interoperability between organizations and employees as well as to create the mobile knowledge worker. The police communication centre uses the CAD system in hopes to bring "the *knowledge* of an entire police force to each other" (www.versaterm.com). The CAD attempts to create standardized questions and responses that enable call-takers to classify call(er)s and prioritize the response times.

Attempting to create a standardized process for classifying call(er)s is the organization's approach to removing the responsibility from call-takers. When a call(er) is entered into the CAD system, it will stay active until an emergency worker has reported responding to the scene. If the call(er) is a high priority the CAD will

continually remind all emergency personnel that it is present. The reminders provided by the CAD removes the accountability from call-takers to remember. By standardizing the call-takers questions and process of classifying a call(er), the organization attempts to capture the call-takers 'process knowledge' and pass it on to other employees. For example, Figure 8 is a call-takers call path chart for call(er)s classified as 'Accidents'.

This call path chart is to provide call-takers with important questions needed for classifying and prioritizing call(er)s. The chart also provides prompts, which are seen at the bottom of the page, that remind the call-taker of follow-up questions. Technology, such as the CAD, is perceived as the key to disseminating information to call-takers.

Figure 8

Call(er) Path Chart

<p>ACCID</p> <p>02</p> <p>Is the incident in progress or just occurred?</p> <p>Is suspect still in area?</p> <p>Is the victim under 16?</p> <p>Are there any special circumstances?</p>	<p>—</p> <p>—</p> <p>.</p> <p>.</p> <p>.</p>
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Indecent exposure, Pornography, Pornography involving

The CAD provides police officers with the opportunity to receive information in their vehicle over their mobile computers. This allows officers to perform paperless transactions without having to go into the police station (see Figure 9).

Figure 9

Photograph of Mobile Knowledge Worker

www.versaterm.ca

Interoperability is the driving force behind the organizational changes in Adacan's EPS, particularly with regards to the importance placed on information sharing. Presently, the CAD is the main technology in place to increase information sharing among 9-1-1 and police emergency communication.

4.7 CAD Capabilities

The CAD offers many functions for call-takers such as: incident status updates, dispatch updates, busy updates, recalls, other unit status, address information, contacts, alarm information, prior history, hazards, and itinerary (www.versaterm.com). The CAD further allows call-takers to check the name and previous criminal activity of the caller as well as check their, vehicle, property and address information in the Report Management System (RMS) and Canadian Police Information Centre (www.versaterm.com).

Information that is perceived as being important for ensuring the safety of emergency workers is shared between police, fire and ambulance. This information is shared over the phone to each other, however once these agencies work on the same CAD, information will be made more readily available to them all (General Manager of EPS).

The CAD also offers 9-1-1 and police call-takers tight integration with police officers' mobile workstations and report management system (RMS). The police organization perceives the CAD as emphasizing call-taker productivity by enabling emergency workers to perform paperless operations while simultaneously managing multiple calls (www.versaterm.com). The CAD also creates weekday statistics on the number of call(er)s and actions taken, thus enabling communication supervisors to assess the performance of call-takers as well as determine the number and types of call(er)s (e.g. cellular phone calls, abandoned calls, fire calls etc.).

Not only can the CAD system track different call(er)s, it can also perform call(er) traces on numbers that were not displayed, such as private lines. The capabilities of the CAD system is perceived to "make increased collaboration possible and offer strategic choices and opportunities" (National Research Council of Canada, 2000: 2). Vignette 2 illustrates the information presented on the CAD to call-takers¹².

Vignette 2

Domestic Abuse vignette

The 9-1-1 call-taker receives a call. Once the call is answered, the caller's ANI/ALI is displayed at the top, left hand corner of their computer screen. The dispatcher first identifies the caller's name and that the information

¹² Vignette 2 is an actual situation provided as an example during a 9-1-1 call-taker's interview.

displayed on their screen is the correct address of the incident.

Once the address and phone number have been verified, the call-taker asks about the type of emergency. The caller explains that she has been beaten by her husband and is scared about what he is going to do to her. The call-taker classifies the call as a 'domestic assault' into the CAD.

Once this is placed in the system, a call path chart is displayed that has prompting questions that the call-taker may choose to use. An example of such a question is: are there any weapons involved? The woman on the phone explains that he does not have a weapon and that she does not need any medical attention.

In a case of domestic assault the call-taker will attempt to reassure the caller and stay on the line with them until the police officers arrive on the scene. While the call-taker types incident information into the computer, they see a red 'hazard' sign flashing on the right hand corner of the computer console. The call-taker sees this information and realizes that this house has reported domestic assaults five times before. It further states that the husband has been verbally abusive to emergency workers in the past and keeps a gun behind the door.

The dispatcher immediately sends this information to warn the emergency workers heading to the scene. While dispatching the call out, both the dispatcher and the police officers are able to pull up a map of the city that marks

where the location of the caller is as well as where emergency vehicles are. This permits the dispatcher to find the closest police officer to dispatch. The map also allows the police officer to see how to get to the incident.

The police officer: “can follow this map and zoom in and out and actually read the street signs to find it. It’s like map quest on the internet, only it is live on your screen with the dot that you have to get to and where you are” (CAD Coordinator).

Once the officers arrive at the scene they punch into the computer to show the dispatcher that they are there and the call-taker then gets off the phone with the woman while the officers take over the job. Once the officers have left the scene they complete their report on the call from their vehicle. Once the officers have filled out the information and sent it back to the office, the computer will automatically screen the report to ensure that all required information has been provided.

The ‘Domestic Abuse Vignette’ demonstrates the capabilities the CAD offers to both call workers and police officers. As described above, the CAD offers a mapping device that visually displays the ANI/ALI of the call(er). These maps are extremely complex and are updated regularly by the city regarding road or street changes, construction sites, fire hydrants, etc.

There are all kinds of intelligence built into the CAD systems, but the biggest thing for us is the mapping capability . . . it can build in the massive amounts of information the city has, and then the dispatcher can send

the best possible information to the responder, but the responder also has options when they get there in terms of the scene by zooming down and getting more information from the map (General Manager of EPS).

The CAD offers call-takers information to make ‘informed decisions’ about the classification and priority of a call(er). While it provides prompting questions it also supplies queues to remind the dispatcher of urgent high priority call(er)s. These queues represent the level of importance for response, thus the higher the priority the higher the position in the queue and the faster the response time.

4.8 Call(er) Priority Level

Police have three levels of priority when dealing with call(er)s. A Priority 3 includes no physical evidence to collect, no injuries or potential injuries and the suspect is not a threat (OCRPS, Call Response Protocol). Priority 3 call(er)s are recorded, however the priority is quite low and an officer will respond within 24 hours. “When a call is received and determined to be a Priority 3 requiring a mobile response, the Call-taker shall enter the call causing it to default to the District queue” (Call Response Protocol: 5). Placing the call(er) in the district queue alerts the officer that there is no threat to the victims.

A Priority 2 call(er) represents an increased threat and response time. Priority 2’s include situations where a crime is no longer occurring but there may be witnesses on the scene that could fill out reports.

When a call is received and determined to be a Priority 2, the call-taker shall enter the call ensuring the call defaults to the Regular Dispatch queue for mobile response by patrol officers. . . .If information is received which warrants a re-evaluation of the assigned priority, it is incumbent upon the Communication Centre member receiving the information to take the necessary action to modify the original priority. When a Priority 2 call is upgraded to a

Priority 1, the response protocol for Priority 1 shall be adhered to (Call Response Protocol: 3).

Priority 1's are situations that have an "actual or potential danger for bodily injury or death, or an officer requires immediate assistance, or crimes in progress or imminent, or the suspect is at the scene and likely to repeat the offence or flee to avoid apprehension" (Call Response Protocol: 1). Domestic assault is an example of a Priority 1, because there is present danger for the victim. The goal for Priority 1 call(er)s is to have two officers respond as quickly as possible. When a call(er) is queued into the CAD system as a Priority 1, an alert is posted on all communication workers consoles as well as in the supervisors' office. The alert is widely posted to ensure that the call(er) is dispatched immediately and not forgotten about. Thus, the CAD acts as a reminder for all emergency employees that an urgent situation is occurring and that actions must be taken immediately.

While an incident is in the CAD it can be continually re-prioritized by either the dispatcher, call-taker or onsite emergency workers. For example, a Priority 3 call(er) can be quickly changed to a Priority 1 or 2 as the call progresses, or vice versa. The CAD is promoted as enhancing call-taker productivity by storing important information that can be used for classifying and prioritizing call(er)s. The CAD further offers tight integration with other third party report management systems (RMS) (such as: Canadian Police Information Centre, Canadian Centre for Justice Statistics, Royal Canadian Mounted Police) that is to enable "effective direct entry and paperless operations" (www.versaterm.com). Direct paperless entries and mobile workstations are the key

features to the RMS. Therefore the CAD creates the *mobile knowledge worker* who is no longer strapped to a desk, but instead free to roam.

4.9 Conclusion

The CAD has been installed to standardize call-takers process of classifying and prioritizing call(er)s. Protocol has been created to standardize types of emergencies and elicit responses to these emergencies. The foundation of KM and its presence within Adacan's EPS have been laid out in this chapter.

The present chapter illustrates how the CAD has been installed as a technology of 'information management' that is to aid call-takers in making 'informed decisions' absent of social influences such as race, social class, age, gender, sexual orientation, etc. This chapter demonstrates the difference between information and knowledge, while further illustrating how the CAD does not store 'knowledge' but instead pieces of 'information' that only become knowledge as call-takers actively engage with it. Knowledge, such as tacit knowledge, is developed through a social and collective process.

Tacit knowledge has become so natural and ingrained in one's actions that it cannot be captured and stored. Instead can only be passed on between people as they interact together. Defining knowledge as fluid and collective uncovers the inherent problems in information technologies, such as the CAD system.

It is also important to note that knowledge management could be a powerful weapon in the wrong hands. Within the community, there is a risk of the capture of knowledge by those with a strong voice to the exclusion of those without a voice (e.g. through the digital divide). . . Finally, there is also a risk that some might use the new knowledge management capacity for illegitimate political influence or for invading people's privacy (HRM, 2001: 6).

Chapters 5, 6 and 7 examine disruptions in the processes of 9-1-1 call-taking. Through an analysis of the disruptions created by the labour of call-takers and their processes for locating wireless call(er)s and classifying call(er)s, the problems inherent in the CAD and its standardized processes are identified. Each of these disruptions illustrates how the social refuses to be standardized.

Chapter Five: Locating The Wireless Call(er)

5.0 Introduction

The previous chapter provided a description of the CAD and its place within 9-1-1 and police communications. While this earlier discussion focused on KM claims made for the CAD and its capabilities within call-taking, this chapter assesses the technological impacts on standardization by analyzing the effect that cellular phones have on emergency communications technologies. Examining the processes involved in locating landline call(er)s and wireless call(er)s, uncovers the disruptions cellular phones pose for the standardized processes in call-taking. I argue that new technologies, such as cellular phones, create disruptions and increase the number of abandoned call(er)s received in 9-1-1 call-taking. I further argue that the process of locating wireless call(er)s requires skillful and negotiated labour by call-takers.

5.1 Mapping The Wireless Call(er)

Before any emergency call(er) can be classified in the 9-1-1 communications database, it must first be located with an exact street address. If the call-taker does not receive an exact street address, they are unable to enter any classification information into their computer. Bell Canada, in conjunction with the associated municipality, has created a standardized process for locating emergency call(er)s. All 9-1-1 calls are routed directly from Bell Canada's Public Emergency Reporting System (PERS). PERS provides 9-1-1 call-takers with the ANI/ALI of call(er)s.

Between 1968 – 1993, Bell routed all 9-1-1 calls based on their telephone number regardless of the address associated with that number (www.bell.ca/9-1-1). Many difficulties arose from routing calls this way. For example, an organization that has many

different locations throughout a city may have a generic phone number placed in Bell Canada's 9-1-1 system. This generic number provides only the location of the main headquarters, thus leaving the other buildings unidentified within 9-1-1 and unable to receive the appropriate emergency response.

Call(er)s from cellular phones also posed many locating difficulties for 9-1-1 call-takers. For example, an incident occurred in North Bay, Ontario, but the cellular caller had a phone with an area code for Kitchener, Ontario, so the call(er) was automatically routed to the Kitchener 9-1-1 communication centre. Although the caller did get in touch with emergency services, it was a service that couldn't immediately help.

Since 1994, Bell Canada has routed all 9-1-1 call(er)s by their address and telephone number:

In the Bell Canada 9-1-1 system, every telephone number is cross-referenced with its respective address location. That address is then cross-referenced to the police, fire, and ambulance dispatch call centres responsible for that address. This information is mapped into the 9-1-1 routing system so that every 9-1-1 call from any telephone number can be sent to the appropriate set of emergency dispatch centres making seconds count and removing any uncertainty from emergency call-takers (www.bell.ca/9-1-1).

With the changes in routing emergency call(er)s, also came changes to street addressing and mapping. In order for Bell to create a standard map for each city, there had to be a standardized process developed for providing street addresses and house numbers. "When a municipality decides to introduce 9-1-1 PERS, the municipality must ensure that each household or business in the municipality is assigned an unique civic address, in other words, a number, a street name, a street suffix, and in some cases, a directional indicator, e.g. '345 Elm Street West'" (www.bell.ca/9-1-1).

Bell created a Master Street Addressing Guide (MSAG) for the municipalities to complete the task. “Once the municipality finalizes the addressing scheme, it provides Bell Canada with a complete set of maps identifying all street names and numbering ranges within each municipal entity. The municipality will also plot onto the maps the coverage area for each police, fire, and ambulance dispatch centre” (www.bell.ca/9-1-1). The location information is then entered into Bell Canada’s PERS.

Providing an ANI/ALI for call-takers removes the guesswork from 9-1-1 call-takers and callers on deciding which police, fire, or ambulance service is the closest and most appropriate choice for the emergency. Figure 10 illustrates the 9-1-1 locating process for landline call(er)s.

Figure 10

Landline Location Chart

Figure 10 demonstrates the three straightforward steps required for landline call(er)s to be located. The 9-1-1 standardized locating process works nicely for most landline phones, however cellular phones are a different story (see Figure 11).

Wireless communications affords people the ability to be mobile and still stay connected to one another. While there are many benefits of cellular phones, there are many consequences that arise from this technology, particularly for EPS communication. “The continuing challenge to call identifier technology and automatic routing is cellular telephone technology”; cellular phones do not have an ANI/ALI in PERS, instead they are provided with the wireless carriers name and generic phone number, which is of no help when attempting to locate the call(er) (9-1-1 Report, 2001: 4).

5.2 Locating Cellular Phones

Cellular phones create an ‘anomalous event’ for 9-1-1 call-takers to locate emergency call(er)s because they do not provide ANI/ALI information. An anomaly is defined as an interruption to a routine and this interruption becomes more defined as work proceeds (Star and Gerson, 1987). According to Bowker and Star, “anomalies or interruptions, the cause of contingency, come when some person or object from outside the world at hand interrupts the flow of expectations” (1999: 311). In the case of locating the call(er)s, an anomaly arises because cellular phones do not elicit call(er) identification, location or a phone number.

There are two types of wireless 9-1-1 available in Canada. The first is the old version of 9-1-1. This form of 9-1-1 only elicits the wireless carrier’s name and generic phone number with absolutely no caller identification. The second type has been called Enhanced 9-1-1 (E9-1-1). E9-1-1 provides emergency workers with a cellular call back

number, cellular provider and communication tower location. E9-1-1 is only available as a commercial tariff in Ontario, Alberta and British Columbia, and its implementation is dependant upon the decision of the wireless carrier. Implementing E9-1-1 takes time and money from the carriers, which has made it a slow process. There are four major cellular providers in Canada: Bell Mobility, Microcell, Telus Mobility and Rogers Wireless. All, but Rogers Wireless, have been implementing E9-1-1:

It is voluntary for providers to give police this information but were they to ignore, CRTC is giving a push. . . The additional feature to this is that Microcell has provided us with a police access number only to their security system and we phone and explain to them the circumstances of the call and ask for the subscribers name and address, which they will do, but again it isn't something that comes up with the ANI/ALI (Inspector of 9-1-1 / police communication centre).

Figure 11 better illustrates the location flow chart of cellular phones.

Figure 11

1. Call goes through Communication Tower
2. Communication Tower Routes it to the Wireless Provider (e.g. Bell Mobility)
3. Wireless Provider then routes into the PERS system:
4. Bell (PERS) routes it to the appropriate 9-1-1 agency
5. Depending on the information provided by the wireless provider the 9-1-1 call taker may have to talk with the caller to assess the location
6. If the caller is disconnected from the 9-1-1 call taker, than the call-taker may call and trace the call through the wireless provided and communication towers location
7. The 'call graveyard' represents the multiple locations that cellular calls can be abandoned within the communication system

The above flowchart demonstrates the many steps and places that a wireless call(er) must go through before it can be located. It further illustrates the many problems and increased abandoned call(er)s cellular phones create for the standardized information technologies present in 9-1-1 / police communications. Once the call(er) is connected to a 9-1-1 call-taker, problems appear because many people do not know where they are and the call(er) cannot begin to be classified without an exact street address.

A lot of people have no idea where they are and they don't know the street number and we can't know all the stores or post offices throughout the city. We always try to give them a major street intersection and work our way from there. All we can go by is street intersections, we must have the street name in order to enter it into the computer system, otherwise we can't enter anything at all. We have been given no training for handling cellular phones (9-1-1 Call-taker).

When a caller utilizes the police emergency number or calls from a cellular telephone, no personal address information is displayed at the Call Centre and the call-taker must identify the location of the emergency by questioning the caller. Callers do not always know where they are. Understanding that many callers are under considerable stress when making an emergency call, identifying their exact location in a timely manner can become challenging. Cell phone callers and non-residents in such a predicament often resort to locating the nearest street sign and provide this information to the call-taker. . . .The caller must describe their specific location using the only indicators

available to them at the scene of the emergency (General Manager Development Services Department, 2001: 4).

Without receiving the location and call back number of the call(er)s, the call-taker is forced to rely on their own knowledge of the city and interaction with the caller, in order to acquire an exact street address. This is not an easy task because people calling during an emergency are typically emotional, confused or even worse, lost. The call-taker and the caller have to work together to develop an agreed upon location. Locating wireless call(er)s, requires 9-1-1 call-takers to trust the caller and the information they provide.

Cell phones do not elicit automatic locations when dispatchers look at the call, therefore they have to use word of mouth and must trust that the caller is 100% accurate, but most times they don't know the roads or area and have no idea where they are and they spend a lot of time trying to give landmarks (County Coordinator).

The above quote reinforces the importance and influence of intangibles, such as trust, within the classification process. Trusting call(er)s requires a lot of work and skill by call-takers. It is when anomalous situations arise that one can begin to see the hidden and invisible labour required for standards to operate (Star, 1999). Much of the negotiated and skillful labour of 9-1-1 call-takers has become hidden by the information technology in place. Chapter Seven takes an in-depth look at the hidden and skillful labour involved in call-taking, while the present analysis focuses on the *technological breakdown* that occurs from cellular phones.

5.3 Standardized Map and Number Identifiers

Initially, cellular phones did not create as large a problem for emergency workers as they presently do because very few people possessed them. Now that cell phones are more

prominent, their inherent difficulties with emergency communication technologies have become amplified. “The gap between an anomaly’s existence and its significance can be closed by looking at the conditions of work in which it arises and gets negotiated. . . Once people recognize an anomaly, however, it begins to create more interruptions” (Star and Gerson, 1987: 148/9). Wireless communication not only renders the call(er) un-located, but it creates further technological and organizational problems for 9-1-1 call-takers.

When Bell Canada developed their new MSAG, they required cities to implement rural house numbers, vacant property numbers and unique street names. These new mapping standards were created in reference to the increased number of cellular phones.

Of significant concern is the proportion of incoming emergency calls received from cell phones and the fact that the use of cell phones to obtain emergency assistance is increasing at an alarming rate. Currently, cell phone calls equate to 38% of all calls to the 911 Call Centre or 90, 412 calls in the past year, up from 34% or 69, 364 calls in 1999. Currently 25% of Canadians have cell phones compared to 17% in 1999. All emergency services and the 911 operators must deal with the issue of duplicate streets on a daily basis (General Manager Development Services Department, 2001: 4).

One of the main reasons for changing duplicate street names was to help 9-1-1 operators so that if someone was calling from their cell phone, which created the whole issue - because if you have duplicate street names, eg. two Mark Streets in the city, and you call by cell phone and the caller gives Mark Street and dispatcher asks what Mark Street, and the caller says I don’t know. Then the dispatcher says, can you give me some landmarks? This is when you get into ¾ versions of the same street. Therefore I have to rely on you to tell the dispatcher where you are and if you have 2 or 3 streets with the same name, we can end up sending the resources to the complete wrong address, because you have described it incorrectly and the dispatchers took their best guess at where you are located. Housing numbers were another problem. Worst - case scenario was the same

house number on a duplicate street, so two people have the same (General Manager Of EPS).

The 9-1-1 system is designed to work in a consistent manner for all residents within Ontario and Quebec, for all municipalities and for all emergency service providers. The 9-1-1 system was designed following extensive fact-finding and collaboration with municipalities and emergency service providers to provide features and functionality that had not been available in earlier versions of 9-1-1 (www.bell.ca/9-1-1).

The last quote demonstrates Bell Canada's 'scientific' and 'mathematical' process for developing standards because the system "*was designed following extensive fact-finding and collaboration*" (www.bell.ca/9-1-1). Using empiricist discourse lends a 'scientific' aura and thus facticity for the implementation of the new MSAG standards (Potter, 1996). Empiricist discourse diverts attention away from Bell Canada and onto the issue itself, providing great primacy and importance for the new street naming, numbering and mapping process. This creates data primacy and universal procedural rules, providing descriptions for Bell Canada's actions while simultaneously minimizing their involvement in the construction and implementation of the new standardized mapping system.

Not only are municipalities changing duplicate street names to accommodate for cellular phone use, but they are also creating rural housing numbers for fields and open land.

There are a lot of instances where a farmer has called 9-1-1 and when the emergency workers arrive at the house they find that they are having to be redirected to the back of the field or the adjacent farm. So, we have developed a new number system that will allow the farmer or homeowner to give the lot number that is closest to where they are. This ensures that emergency workers can arrive at faster times. We are unique for this form of house numbering. Our

numbering system was largely influenced by the number of farmers who owned cell phones and would be calling from the field for help (County Representative).

The County Representative highlights the value of standardizing land numbers in order to ensure public safety. Emphasizing public safety provides value to the new standardized procedure and ultimately reinforces its factual importance. The process of constructing “agential facts” (for example land numbers guiding emergency workers), removes the identity of the descriptions producer. Therefore, “the ‘facts’ are, first, not being constructed as facts and, second, their significance is not being generated by their producer, it is provided by the facts themselves” (Potter, 1996). Thus, the facts demonstrate how new standardized land numbers need to be created in order to accommodate cellular phone users. Standardizing house numbers ensures that help can immediately locate call(er)s, in the event of an emergency.

The changes in EPS standards demonstrate how cell phones have created anomalous events for emergency workers, while further reinforcing the factual validity of the new standards in place. The anomalous events created by wireless communications have resulted in the changing of old standards. Even with these changes, wireless communications pose other problems for emergency workers.

5.4 Increased Number Abandoned Call(er)s

With the increasing use of cellular phones, there has been a drastic increase in both the call(er) volume and number of abandoned call(er)s that 9-1-1 call-takers receive in a day.

One reason for the increase in call(er) volume is the ‘Good Samaritan’.

Most of our calls are coming from cellular phones and they are such a pain, but at the same time I think that they have helped people out of trouble situations. When there’s a lot

of calls for an accident on the highway or a bar fight then sometimes our lines will get blocked because too many people are calling at once. This happened in New York as well, the communication towers over flowed and the network shut down because too many people were calling at once (9-1-1 Call-taker).

You cannot believe the problems that cellular phones are creating for us. First of all, the volume of calls coming in has increased drastically due to cellular phones. Two reasons: if there is an accident everyone wants to be a Good Samaritan and call it in, or they don't lock their keypad and they are accidentally ringing in. Every call coming into 9-1-1 has to be justified and we have a feature on our system that forces us to show what we have done with it (therefore, did we transfer to ambulance, dispatch someone, etc?). We are just dealing with it as best as we can right now. We are at a stage right now that we can do nothing about it (9-1-1 / police Communications Training Coordinator).

While call(er) volume is increasing, so are the numbers of dislocated or abandoned call(er)s. There are many explanations for these abandoned call(er)s, such as the cellular batteries die out or the call has been accidentally dialed and purposefully disconnected.

A lot of time people don't put a lock on the cell phone and they hit 9-1-1 without knowing it and we hear conversations or even people singing to the music in their car. Goodness, some of the things that I have heard [the call-taker laughs]. A lot of time you will attempt to do a call back on it and the person won't answer or it has been turned off and it ends up taking a lot of time and this job can't waste time. For every cell phone that you track and attempt to call back you are left unable to answer other emergency calls (9-1-1 Call-taker).

Some people program 9-1-1 into their cell phone, so it is not surprising for people to hit it by accident. If this call is put in our trunk system then we will have the call back number and this allows us to call them back, but if they have realized that they hit 9-1-1 by mistake they sometimes hang up and then we can't reach them. It becomes a little

bit of a dilemma to know the process to follow (Inspector of 9-1-1 / police Communication Centre).

Usually people with cell phones who require assistance don't get the location out, for example there was a woman who was shouting into the cell phone that her husband was beating her and was going to kill her but she was disconnected before she got her address out. So we had all this information but we were unable to locate her (9-1-1 Call-taker).

The above quotes demonstrate the many disruptions and anomalous events created by cellular phones and how each of these disruptions increases the length of time for emergency response to be received.

The above quotes from communication workers show how standards have changed in recognition of the problems, while further demonstrating how the facticity for these changes have been constructed through the descriptions of the impacts of cellular phones. While some cellular providers are issuing more information with E9-1-1, such as providing emergency workers with call back numbers and communication tower locations, there are still areas of concern. A final example is communication towers.

Every wireless provider has their own communications towers and there are multiple towers that face in different directions across all of Canada. These towers and their locations have created problems by abandoning call(er)s or routing them to the inappropriate emergency system:

There are different cellular providers and each provider has their own tower, so there are multiple towers. Depending on the provider their towers are not located in the same place and this can cause problems for routing calls. For example we had a caller from a church on a particular road and their call was routed, because of the tower system, to another city. I have spoken to Bell mobility, who is the

supplier, and they are saying that they don't have much control of that stretch of the tower. We have also had Microcell be the first on board to turn onto a new system that allows us to get a call back number. So basically the number of the cell phone, which we didn't get before and what the other additional information we receive is the address of the tower and they are actually including a map that includes the direction that the tower is facing. Certainly it doesn't give us an exact location, but it is an improvement from what we had gotten (Inspector of 9-1-1 / police communication centre).

Providing the location of communication towers enables emergency workers to narrow down the location of call(er)s within 7km of the tower. Even with the added tower location information, most call-takers and dispatchers do not find it useful.

The cellular towers are no good because they don't help us find the caller. They don't tell you exactly where they are and they could be in any house or apartment and there is no way for us to find that information out. There is really nothing we can do, our hands are tied (9-1-1 Call-taker).

Without an exact location, the emergency cannot be classified and help cannot be dispatched out.

5.5 Conclusions

During my field observations in 9-1-1 call-taking, the number of cellular phone call(er)s amazed me. Approximately 2/3 of the call(er)s received were from cell phones. Many of these call(er)s were disconnected or unanswered and each time a cell phone call(er) appeared the call-takers looked frustrated by the situation they faced. Every player within the EPS network discussed the concern and difficulty they faced with cellular phones, however each of these players focused on different areas of difficulty. These varying views demonstrate how anomalies come to be defined by their occupational context: “. . . a mistake or any anomaly in scientific work never exists in some absolute

sense; rather, it always is defined relative to a local or institutional context” (Star and Gerson, 1987: 148).

While cell phones have aided some people in emergency situations, they have also created many unanswered and uncontrollable situations for the standardized work procedures in 9-1-1 call-taking. Wireless communication illustrates how standards “do not remain standard for very long, and that one person’s standard is another’s confusion and mess” (Bowker and Star, 1999: 293). Even though the present analysis has demonstrated how standards are ever-evolving and incorporate hidden and creative labour, it also shows a fascinating social phenomenon. Throughout these interviews, and the texts provided, there was no attempt made to change the call-takers routine to accommodate wireless communication, instead there was an emphasis placed on the need for new technology and new standardized technological processes.

Many of the above quotes from 9-1-1 call-takers emphasized the frustrating and impossible situation that cellular phones created. Some call-takers went as far as to say that there is “nothing we can do” or “it feels as if my hands are tied”. Such descriptive quotes attempted to build category entitlement which “obviates the need to ask how the person knows; instead, simply being a member of some category . . . is treated as sufficient to account for and warrant, their knowledge of a specific domain” (Potter, 1996: 133). Describing the present cell phone situation as hopeless attempted to remove responsibility from call-takers for locating call(er)s, instead emphasizing the need for new technology and standardized processes to be created. Emphasis was placed on the need for technology to elicit exact locations of cellular phone call(er)s.

We have not created any changes to training to accommodate for cellular phones. We are just not there yet

because we are not getting the information from the cellular providers so there is absolutely nothing we can do about it (Trainer of 9-1-1 / police).

9-1-1 system technology advances will be required to identify caller numbers and location identification, which may be limited to tower locations to which cellular phones are transmitting. Suggestions around Global Positioning System incorporation into cellular telephone hardware is an item enjoying spirited debate around invasion of privacy, in the United States (9-1-1 Report, 2001: 4).

The above descriptive quotes attempt to build facticity for rendering the social aspects of call-taking unchangeable. The texts and interviewees attempted to construct facticity for the development of new location technology, however descriptions have been socially constructed to pick out phenomena that are relevant while ignoring other possible explanations (Potter, 1996).

Analyzing anomalies draws attention to the link between problem structures and work practices, while further uncovering the negotiated labour involved in standardized work processes and information technology (Star and Gerson, 1986). As no changes to the work process of call-takers are being made to cope with the lack of location information, it makes one question if the location is only a small portion of a larger problem. Is it the street location that call-takers need or is it the additional information that is supplied by a caller's ANI / ALI, such as their premise history and previous criminal records, that is needed? Cellular phones do not provide call(er) identification, thereby leaving the call-taker to determine a call(er)'s reliability on their own. The following chapter analyzes the process involved in classifying and prioritizing emergency call(er)s.

Chapter Six: Classifying The Call(er)

6.0: Introduction

Once the location of a call(er) has been determined, the call-taker can begin the classification process. The 9-1-1 / police communications centre has implemented a standardized process for classifying and prioritizing emergency call(er)s. The present chapter provides a detailed analysis of the disruptions created by these standard processes. In order to understand the complexity of emergency classification, I will first demonstrate the police organization's interpretation of the standard procedures. After describing the organization's perspective, an exploratory look at emergency classification is conducted to assess the tangible and intangible components involved. Identifying these components highlights the call-taker's hidden boundary work, while simultaneously uncovering the importance of the identity of the caller within emergency classification.

From this analysis I argue that the CAD is not an acting agent, but instead provides call-takers with information to socially construct a call(er)'s emergency classification. I further argue that the boundary work and skill required for constructing emergency classifications makes standardizing the labour of call-takers impossible.

6.1 The Standardized Emergency Classification

Before assessing the processes involved in classifying emergency call(er)s, a description of the police organization's interpretation of the classification process will be provided. Vignette 3 illustrates the standardized procedure for classifying and prioritizing emergency call(er)s¹³.

¹³ The 'Standardized Classification Vignette', is not an actual incident. The classification description was provided from police organization interviews.

Vignette 3

Standardized Classification Vignette

A call is received in 9-1-1. The call – taker answers the call and is instantly presented with the call(er)s name and location. The call – taker asks: “do you require police, fire or EMS”. Caller responds “police”.

Once identified as a police matter, the call – taker is presented with a call path chart. This chart provides standardized questions and reminding prompts. The call – taker proceeds classifying the call(er) by asking the questions presented on their CAD. As the caller answers the standardized questions, the call – taker enters the information into the CAD.

Once all the answers have been entered, the CAD provides the call(er) with an emergency classification. The call(er)s classification is based on the information provided. From this classification the CAD automatically provides a call(er) Priority level.

The above vignette presents a straightforward picture of the classification process. The above description illustrates the technological and ‘objective’ processes incorporated in classifying an emergency. The standardized classification process has been implemented in 9-1-1 / police call-taking to ensure that an emergency classification is based on ‘relevant information’ and not social influences, such as age, race and socioeconomic status. The above vignette creates a simplistic image of the classification

process that removes the actions of call-takers, while simultaneously placing the CAD as the central player in classifying an emergency.

6.2 The Classification Process

Having illustrated the police organization's interpretation of emergency classification, an examination of the actual processes involved in constructing emergency classifications is conducted. There are multiple classifications present during 9-1-1 calls. For instance, the call(er) must first be classified as a particular criminal incident (i.e. domestic assault, assault, assault with a weapon, sexual assault, robbery, etc.). From this classification it is then assigned a Priority 1, 2 or 3 classification. The call(er) priority, as described in Chapter Four, is determined by the circumstances and information obtained from the caller.

After receiving a Priority 1, 2, or 3 classification, the call(er) is automatically queued into the appropriate district dispatch system. While the call(er) is queued in the system it can be continually reprioritized and reclassified at any time by any of the call-takers, dispatchers or emergency workers. Therefore, classification is an ongoing process. The accompanying quote demonstrates how the call(er)'s classification and priority are continually juggled.

Priority 1 clearly states that there is an emergency that a police officer must be immediately dispatched, but it is quite plausible that there could be a number of emergency Priority 1's at the same time and stacked in the dispatcher's queue. The dispatcher's job is to find officers to fill those and answer them and to pull in cars from the different districts if they need to. We can reprioritize what we have, for example a Priority 1 of someone smashing my car out front in comparison to someone currently being stabbed, although both are Priority 1's we would go to the stabbing first. Priority 2 calls are where there is a need to dispatch a police officer but there is no emergency, so for example

accidents that need a police officer but they don't need it right away. It is a constant juggling game to prioritize Priority 2's, the less severe could sit there for quite a while so there is constant reclassification in that category being done! It is not a first come first serve (Trainer Of 9-1-1 / Police Communication Centre).

As a call(er) progresses, the classification can move the Priority from a 2 to a 1 or vice versa. Not only can the priority be changed, but also the priority for dispatching call(er)s for service can be continually juggled based on the classification of other call(er)s in the system. This ongoing classification and prioritization illustrates the complexity of the emergency classification process.

As described at the beginning of the chapter, the police organization has installed the CAD to help call-takers and dispatchers perform this classification process quickly and efficiently. The developers of the CAD describe it as a “proven and highly advanced information management system designed to address the needs of the efficient, automated Police department” (www.versaterm.com). Since Chapter Four was directed specifically to the technological capabilities of the CAD, this chapter will not spend time reiterating these points, but will instead uncover how the CAD utilizes the identity of the call(er) throughout the classification process.

6.3 The CAD & The Classification

The preceding chapters have illustrated the importance and emphasis Adacan's EPS places on information technologies. Particular attention has been given to the CAD and its ability to “enhance dispatcher productivity” by providing call-takers / dispatchers with the information and guidance required to elicit emergency response (www.versaterm.com).

Information on CAD, is basically structured to provide a format for gathering information that is *relevant* to the call for service and transmitting that information out to the officers on the road (Inspector of 9-1-1 / police communication centre).

Providing call-takers with a structured format for collecting ‘relevant’ information is an attempt to remove the possibility of collecting information that is unnecessary or irrelevant for classifying a call(er). The above description by the Inspector illustrates how the CAD has been provided with its own agency that is ‘structured’ and ‘relevant’ in the classification process. This description, as with those provided in Chapter Four, attempt to construct a factual account of the classification and prioritization process, which removes the presence and agency of call-takers.

The CAD is equipped with suggested questions and prompts (as illustrated in Figure 4, page 47) that are to help call-takers collect relevant information, however these prompts can be easily bypassed.

There is a set of scripted questions built into our CAD system so a situation such as an assault, depending on the response to the question, will *automatically screen the priority for the call-taker*. The CAD automatically queues the call into the dispatcher’s console based through default that is based on the questions asked. The *different questions establish the priority* of the call. Every time something is added to the call, the queue can change the priority automatically (Inspector of 9-1-1 / Police Communication Centre).

In the above quote, the Inspector places a lot of emphasis on the CAD providing the call(er)s priority level. For example he states that the CAD will “automatically screen the priority for the call--taker”, thus removing the agency of the call-taker from this process. The Inspector places the CAD as an active and present agent during the prioritization process. He further emphasizes how the CAD is based on the specific

questions asked and that it is these standard questions that ‘establish the priority of the call’. The use of the CAD and its questions attempt to build an objective process to prioritizing call(er)s. The questions presented on the CAD can be easily overwritten by a call-taker.

A call path chart is provided to help us classify or to help guide us or support us. But the dispatchers can bypass it naturally because it *does become second nature to them!* (Trainer Of 9-1-1 / Police Communication Centre).

The Trainer’s quote, contrary to the Inspector’s, places the agency of the call-taker and dispatcher as central for determining the priority of the call(er). The Trainer, previously a veteran call-taker, illustrates how the emergency classification and priority are left to the *knowledge* and *actions* of call-takers and not the actions of the CAD.

Generally, the circumstances surrounding the incident will determine the priority level, not the type of call. In determining the proper level of priority to be assigned, Communication Centre personnel must evaluate all the information being gathered pertaining to an incident and ***apply their knowledge, experience and common sense*** in assigning the appropriate priority level (Police Services Call Response Protocol).

Many interesting things arise from this quote, such as the emphasis placed on the call-taker’s performative role in prioritizing call(er)s and the importance of ‘applying’ their ‘knowledge, experience and common sense’. At first this appears straightforward, but after hearing the Inspector’s and Trainer’s quotes on the classification process, it becomes evident that a call(er)’s classification and priority cannot be separated. One cannot separate a classification from a priority because certain classifications have particular priorities attached. A call(er)’s classification and priority come hand – in –

hand, the classification determines the priority. Therefore, a call-taker is aware of the priorities associated with the classifications they provide. This illuminates the pivotal role call-takers have in constructing classifications and priorities for determining the appropriate emergency response.

Before a priority can be assigned to a call(er), the call-taker must construct a classification. This classification is constructed from the call-taker's "knowledge, experience and common sense" (Police Services Call Response Protocol). Therefore, the CAD does not classify the call(er), as the police organization and technology claim, but instead provides information and an automatic prioritization based on the information placed in the CAD by call-takers. Analyzing the classification process draws attention to the call-takers active engagement in socially constructing an emergency classification. Recognizing the knowledge and activity required for call-takers to construct an emergency classification, demonstrates how the classification process cannot be standardized.

6.4 Classifications and Representations

Every successful standard, such as the CAD, imposes a classification process; however "the arguments, decisions, uncertainties, and processual nature of decision making are hidden away inside a piece of technology or in a complex representation. Thus values, opinions and rhetoric are frozen into codes, electronic thresholds, and computer applications" (Bowker and Star, 1999: 134). The heterogeneity of standards sheds light on the political components present in information technologies, such as the CAD, which enforce a standardized classification process. However, "the more naturalized an object becomes, the more unquestioning the relationship of the community to it; the more

invisible the contingent and historical circumstances of its birth, the more it sinks into the communities routinely forgotten memory” (Bowker and Star, 1999: 299). The following discussion illuminates the processes and factors involved in classification, while further illustrating how this virtual image is socially constructed by call-takers.

The classification process begins as soon as the call(er) is answered. The CAD provides the call-taker with information on both the location and caller as soon as the call(er) is received. As the previous chapter demonstrated, every landline call(er) is provided with an ANI /ALI , this information provides the call-takers with a geographical understanding of the incident as well as the caller’s identity¹⁴. In order to make sense of the disorder in the call centre and fit the information from different places into existing information bases, standardized formal representations have been implemented by the police organization.

Formal representations including especially those used in creating and using information technologies, are changing the space of our world in ways we are only beginning to intuit. While priorities have always been arranged and rearranged politically, certain aspects of information technologies change the politics. These aspects include the fact that highly formalized representations seem neutral or objective to many, if not most, people – and the political decisions made in creating them invisible; that there is an illusion of completeness of information because of information technologies, whereas in fact information is highly decentralized and always incomplete; that we may delegate moral decisions or responsibilities to technology in ways that are blind” (Star, 1995: 112).

¹⁴ As explained in the previous chapter, cellular phones do not elicit location or call(er) identification information. Without this information the call – taker is left to construct the call(er)’s classification and reliability from the phone interaction only. This chapter illustrates the many tangible and intangible factors present during an emergency classification, thus demonstrating the increased difficulty cellular phones pose to communication information technologies.

The CAD comes equipped with formal representations, such as caller's location, premise history and criminal record. These representations are flashed onto the call-takers computer under a red flashing '*hazard*' sign that is easily noticed and identifiable. Hazard information is immediately passed on to police officers, and if the call-taker deems the information relevant it is also passed on to other emergency agencies.

We typically, and often do, put in *cautions around certain addresses* because of the activity that we have had at those addresses before. So if there is a fire call at an address and we know that to be the 'Outlaws Clubhouse' then we will let them know about that *as a matter of safety* for those people. Our expectation is that they will keep information around hazardous materials kept in certain places, so if we are sending somebody out then we can have that available to our officers as something to keep in the back of their minds as they enter into the place (Inspector Of 91-1- / Police Communication Centre).

CPIC checks are done as well as internal queries, which tell us how many times we have been there in the past, who was involved, and *we have flags on different addresses*, for example this guy normally hits officers or he has a gun behind the front door, so the dispatcher ensures that all this information is relayed to the officer (9-1-1 / Police Trainer).

Some *addresses will be flagged* with a red sign that flashes in the corner that says "hazard"- that gives emergency workers information about the situation or people they are approaching (9-1-1 call-taker).

These 'hazard' representations are implemented in order to provide 'safety' to all emergency workers prior to entering the scene. Placing information under the title 'hazard' provides urgency and relevancy to it. The word 'hazard' is defined as "a risk or chance associated with danger", thus providing factual relevancy for the use of 'hazard' information during the classification process (Webster, 1988: 445).

Each of the above quotes emphasizes the use of ‘hazard’ information for safety purposes only, thereby attempting to remove the presence of call-takers during the classification process. While ‘hazard’ data is to be used for safety only, I argue that it is impossible to separate this information from that used in constructing the emergency classification. The representations presented on the CAD are both abstract and static pieces of information that impact a call-taker’s perception of the call, the caller and their reliability. Although these formal representations were hidden in the description of the classification process, I argue that they are present and actively engaged with when constructing a virtual image of the incident.

6.5 The Virtual Image & Concrete Response

It is during the classification process that a call-taker socially constructs a virtual image of the incident. The socially constructed virtual image incorporates both tangible (e.g. location) and intangible (e.g. trust) components. For the purpose of this chapter I am not attempting to provide a theoretical debate on how to conceptualize and define the ‘virtual’, but instead am demonstrating how call-takers use the telephone interaction, static representations and their own knowledge to performatively construct a virtual image of the incident.

Virtualities, unlike representations, are not static as they capture activities and objects that are present but not tangible or concrete (Shields, 2003). When a call-taker is faced with classifying a call(er), they have to take the information they receive on the phone and the CAD to construct an image of the incident. “Virtual worlds are simulations. Like a map they usually start out as reproducing actual worlds, real bodies

and situations; but, like simulations they end up taking on a life of their own” (Shields, 2003: 4).

The CAD provides call-takers with a map of the city, but the additional information that it provides, such as hazards and premise history, along with the information from the caller and the call-taker’s own knowledge, creates a map that diverges from the concrete. This new map, which socially constructs space and time, becomes more ‘real than real’. Call-takers use these socially constructed virtual images to solve problems and manage risk.

Recognizing the virtual allows us to see more clearly how it enters into categories of thought and into descriptions of the world and embellished narratives which cast the world in a given light or frame problems. Moving away from the simple actual – ideal binary of (concrete-abstract) to recognize how the virtual fits in relation to these terms and with probability has important implications for the way in which risk is understood and managed at a society level (Shields, 2003: 38).

The virtual is performed by call-takers and is used to establish the type and level of risk, caller reliability and incident urgency. Decisions about risks involve components of the virtual and the abstract (Shields, 2003). Call-takers socially construct a virtual image of the incident that is then used to classify and prioritize the emergency and elicit a concrete response.

A virtual image is dependent upon call-takers and their technology, because it arises from translations across the virtual, abstract and material. Call-takers are like fluid boundary workers who not only cross the many borders present in the EPS network but also the border between the virtual and concrete worlds. It is the call-takers who perform this hidden boundary work, where they move between the concrete and abstract in order

to create an image of the incident, classify it and dispatch emergency response. Chapter Seven looks specifically at the hidden boundary work of call-takers, while the present chapter focuses on the factors involved in classifying call(er)s.

6.6 The Tangibles and Intangibles Involved In Classifying

Many things come into play when classifying an emergency call(er), such as the location and identity of the caller. Premise history and past police contact become available to call-takers once a call(er) is received. This information becomes extremely important throughout the classification process. Many times the address and identity of the caller are used to construct their reliability. The following quote illustrates the importance placed on the address of a caller.

If there is a call from a public telephone in a shopping mall, and kids hang out there as you know and they are being smart, well the ANI/ALI will show us that it is the public payphone at the mall. So prior to dispatching, *because it is labour intensive to do that*, we will phone the mall security and tell them what we got and ask them to do a walk by to see what they find. So there are protocols in place to deal with different types of callers, there is no question (Trainer Of 9-1-1 / Police Communications Centre).

In the above example, the caller was deemed ‘unreliable’ because they were calling from the mall and sounded young. Although no information had been provided to say that the caller was young, it was assumed that since the call came from the mall it was not serious and did not require emergency assistance.

Of more importance was the lack of emergency response, which was dismissed as being ‘labour intensive’ and therefore a waste of resources. This removes the attention from the call-taker’s process of constructing ‘victim reliability’ (an abstract process) to a problem concerning resources and time (a concrete object) for the organization, thereby

removing the responsibility of the call-taker. ‘Labour intensive’ discourse is being used to construct a version of emergency dispatching that is solid and factual, as it turns an abstract classification into a material object. Vignette 4 illustrates how the identity of a caller impacts and changes the emergency classification, caller’s reliability and emergency response¹⁵.

Vignette 4

Classification Vignette

The 9-1-1 call-taker receives a call from a man. When the call-taker receives the call, there is an odd bumping sound in the background. The call-taker asks if he needs fire, police or ambulance. He states that he didn’t mean to call 9-1-1 and attempts to hang up. The call-taker (in a strong and assertive voice) reads the address that is displayed on her computer screen and asks him to verify if this is his address. He states, “yes” and explains that he didn’t mean to call, that: “it must have been hit by accident”. The call-taker then asks if he is alone, and the caller affirms that he is. Again he tries to hang up, but the call-taker asks what the number is that he was trying to call. The caller replies that he must have bumped the phone because he didn’t mean to call 9-1-1. The call-taker pauses and looks at her screen and then hangs up. The call-taker then turns to me and says: “that was a different call, I believed him because I heard the banging noise at the beginning that sounded as if he had bumped the phone”.

¹⁵ This short vignette is an actual situation which took place during my participant-observations in 9-1-1 call-taking.

Minutes later she receives another call, this time from a female and when asked “9-1-1 do you require police, fire, or ambulance”, the caller gives a loud and high-pitch gasp: “oh goodness, I am sorry I didn’t mean to call this number” and she begins to laugh. The call-taker (in a friendly tone) asks if she is alone, and the woman says yes. The call-taker then asks her what number she was trying to call, and the caller tells her. Once the call-taker has received this information she nods and says “goodbye and have a nice day” to the woman. After hanging up the phone the call-taker laughs and does an imitation of the lady’s gasp at the beginning of the call.

After the call, the call-taker turns to me and explains the reason why she didn’t continue to question this woman the way she had with the man moments before. “I could tell that lady hadn’t meant to call us because her voice indicated that it was an accident and as soon as she made that funny sound I knew she didn’t mean to. Plus she is from a good part of town. It was a lot different than that other call with the man because he sounded suspicious. He was also from _____ St. and I know that street it is a bad part of town. I used to rent an apartment around there and it is a bad neighbourhood. His name even came up on the computer as having had trouble before, so I didn’t believe him as much” (9-1-1 call-taker).

During the classification vignette, it becomes obvious how there are a number of tangible and intangible factors that come into play when classifying a call(er). In order to better understand Vignette 4, time will be spent examining the factors that impacted the

call-taker's construction of the reliability of the two callers. These factors include: location, premise history / caller's identity and mental health, tone of voice and background noises, and the call-taker's knowledge and memories.

6.7 Location

The first factor involved in classifying call(er)s is the caller / incident location. During the above vignette, the location of the callers came to play on the call-taker's image of the call(er). For example, during the first call, the man's location was in a lower rental and higher crime rate area than that of the woman's. The call-taker was extremely persistent in questioning the man about being alone and whom he was trying to call. The location of a caller does not only impact their reliability, but it can also impede on the emergency response dispatched.

This man has been charged with assault and is known to be violent to police officers, he also has a gun behind his door, and so we would give this information to the emergency workers. But if we had transferred the call to ambulance we would say, "hold on there" and call them back to tell them we were sending a police officer before ambulance. So, if the ambulance arrived first, it would just sit out front and wait for an officer to arrive (9-1-1 Call-taker).

The above quote illustrates how the location and past history of an individual impacts the response they receive. It also demonstrates how these classifications are embedded in a discourse of 'risk management'. The 9-1-1 call-taker will not allow paramedics to enter the scene because of the danger they may face, instead dispatching a police officer first, even when there has been no evidence of criminal activity. Placing the call-taker's actions and their descriptions into categories, such as 'risk management', "is a technique for categorizing actions and processes that allows the speaker . . . to avoid endorsing a particular story about accountability" (Potter, 1996: 182). This discourse

removes the accountability of the call-taker's social construction of the reliability of the caller and places it into a category of risk management. The location of many call(er)s is bound up with the premise history and identity of the caller.

6.8 Premise History, Caller's Identity & Mental Health

The above examples have demonstrated how the history of a person's home or location can impact the call-taker's impression of the reliability of a caller. This was evident during Vignette 4, when the call-taker would not allow the male caller to hang up and insisted on questioning him about his 'accidental call'. The call-taker saw that this caller had been in contact with the police for other reasons and used this information to construct an image of his reliability.

Other factors of a person's identity, such as their age, mental health and occupation also come into play.

There are different things that play on the priority of a call, such as age of the caller, mental health, etc. For each classification there are different defining characteristics. The easiest way to know if they are telling the truth is to check mental health and you can usually know that. You just keep asking questions and if they are getting irritated or anxious than you can usually tell something is going on (Police Call-taker).

When you receive a call, the in-house information will be displayed and it will show past records of people, for example (calls up a person) this women is a prostitute who has been charged, her alias is _____, she lives in a bad neighbourhood, etc. All this information is provided to us (9-1-1 Call-taker).

Each of the above quotes illustrates how the identity of the caller, whether it be their age, mental state or occupation, can be used for constructing a virtual image, and most importantly, in constructing the reliability of the caller. What is most striking in the

second quote is that the occupation of a prostitute, is used to assess the reliability of a caller or the need for emergency response. What 'risk' or 'danger' does prostitution pose to emergency workers?

While the police organization, other emergency organizations, and call-takers / dispatchers, discussed the value of hazard information during their interviews, they also emphasized the importance of not being complacent.

We can't judge a caller just based on the information they are giving us. For example, when we think that a *drunk* has called and they have phoned us and are rambling on, the 9-1-1 operator could hang up, but this person could be a diabetic entering into diabetic shock. We always tell our dispatchers to question, question, question and when you are not sure to err on the side of precaution and dispatch. This is what I was talking about with liability issues and if they just sloughed off what they thought was a drunk caller and they see that the person has called 2/3 times in the past, (because we can check how many times they have called us before) and they didn't send out emergency workers and the guy ended up dying, the blame will fall on the 9-1-1 dispatcher who was too quick to hang up. So you go by your gut a lot. We also have a handful of people who do become chronic callers, but we cannot become complacent, and this is something that we talk about in training as well. So you can't judge because they have called many times or it is a low rental area, or based on sexual orientation, racial discrimination or because of where they happen to live. There have been circumstances where this has happened, for example the Philadelphia case where they lowered the priority of the call and there were people hitting them with the baseball bat. So you can't become complacent (Trainer Of 9-1-1 / Police Communications Centre).

We have to be careful with the signs that we pick up from calls because we can never assume! (Police Call-taker).

These quotes stress how a call-taker must not assume or become complacent when classifying a call(er). The Communications Trainer discussed the legal

repercussions of call-takers becoming complacent and constructing the reliability of a caller based on their location or identity. However, the Trainer also provided an earlier example about not dispatching emergency response to a mall because of teenagers joking around. While the Trainer emphasizes the need to err on the side of caution, she further describes call-taking as a ‘gut thing’. Describing call-taking as a ‘gut thing’ emphasized the importance of the knowledge and actions of call-takers for constructing emergency classifications.

Measures have been taken to govern the construction of emergency classifications by placing legal liability onto the call-taker. These legal liabilities are of greater focus and attention in the next chapter, but are still of interest here. When a call(er) is misclassified the blame is placed onto the call-taker and dispatcher. Each of these workers is held legally liable for their actions, which, as Bowker and Star (1999) state is not uncommon for standardized work processes. The legal contract binding call-takers to their actions reinforces their importance in the classification process.

6.9 Interactional Cues

Other factors, such as a caller’s tone of voice or background noise, also play an important role in constructing the emergency classification. Vignette 4 illustrates how the background noise of the phone ‘bumping’ something or the tone of the woman’s voice, impacted the call-taker’s construction of the reliability of the caller.

That was a different call, I believed him because I heard the banging noise at the beginning that sounded as if he had bumped the phone . . . I could tell that lady hadn’t meant to call us because her voice indicated that it was an accident and as soon as she made that funny sound I knew she didn’t mean to (9-1-1 call-taker).

There are other examples where the background noise or tone of the caller impacts the classification and ultimately the emergency response.

You can always tell when someone is lying to you on the phone, for instance you will get a call and the person will tell you that they are being robbed or something, but you can tell that they have been drinking (she states in a voice that stresses the slurring) and you just know, ***it is a gut thing*** (9-1-1 Call-taker).

Sometimes if a call has come in and it is a Priority 2 but the guy has been rude, I will usually dispatch it with a note to tell the officer to check on the complainant because he was rude (Police Call-taker).

The above shows how the tone of a voice, whether it's happy, laughing, slurred etc., impact the classification as well as the response. The above quotes also demonstrate how the call-taker and their knowledge (e.g. the 'gut thing') are absorbed in this process.

It is during the telephone interaction that call-takers receive information about the incident. For a call(er) to be classified as a 'Priority 1' and to receive immediate assistance, there must be "actual or potential danger for bodily injury or death or an officer must require immediate assistance or the crime is in progress or imminent and the suspect is at the scene and likely to repeat the offence or flee to avoid apprehension" (Police Services Call Response Protocol, 2002: 1). Therefore, the presence of weapons and physical state of the caller are important for the classification of the emergency. It is only during the interaction between the call-taker and caller that incident information can be received.

6.10 Call-taker's Knowledge & Memories

Many of the quotes provided throughout this chapter have stated how call-takers know if a call(er) is reliable. It is because of the call-takers own knowledge and instinct.

Throughout my interviews, I inquired into caller reliability and continually heard that “you just know if someone is telling the truth, it is a gut thing”. None of these interviewees could provide specific examples of how they knew.

When I am trying to see if the *caller* is reliable, it is just a gut instinct or a sixth sense (Police Call-taker).

The unarticulated tacit knowledge of call-takers is what makes the emergency classification process fascinating. Call-takers engage with abstract social codes and nuances and guard them by saying “it is a gut thing”. People outside of this work cannot capture this knowledge, nor can they code it or place it within information technologies.

Human creativity and ability to find ad hoc solutions to ill - structured problems simply go to a different part of the work process when domains become formalized. . . .The danger with attempting to capture tacit knowledge, especially in attempts to automate critical systems, is that the flexibility and smartness that comes from situated action may be lost, in exactly the position where it is most needed” (Star, 1995: 103/9).

Tacit knowledge makes the work and labour of call-takers valuable for the police organization (see next chapter for a more in-depth look at their labour). While the interviewees could not deduce how they knew if a caller was reliable, the analysis identified factors, such as personal knowledge and memories.

In Vignette 4, the call-taker mentioned that she had rented an apartment in the caller’s area and that it was a bad neighbourhood. These memories were used to construct his reliability. It is the call-taker’s knowledge of different areas of the city or even their knowledge of the different tones of voice that make them a critical part of the classification process. Memories and tacit knowledge are not accessible to information technology designers. It is the call-taker’s ability to be creative that makes their labour

an essential component of the classification and prioritization process. Many call-takers guarded this knowledge by referring to it as a 'gut thing', however this knowledge arises from their experiences and interactions with their co-workers. Thus, the official representations of abstract and valued things that call-takers use to construct the virtual image are learned from their own experiences and from those around them.

6.11 Conclusion

By uncovering the tangible and intangible components of emergency classification, the hidden and complex boundary work of call-takers is identified. This 'boundary' work has illuminated the disruptions and limitations present in the standardized classification process. Examining the classification process, has illustrated how the call-taker socially constructs the emergency classification.

Figure 12 illustrates the many tangible and intangible components present in constructing caller reliability and emergency classification. This analysis has demonstrated the impossibility of separating the identity and reliability of callers from the emergency classification because reliability, which is determined through such things as their identity, location and past record, is incorporated in their classification.

Figure 12
Call(er) Classification

Call – takers socially construct a virtual image of the incident that they use to direct a concrete response. This virtual map diverges from the concrete to incorporate the tangible and intangible components of classification. Thus, the map socially constructs new spaces that are represented as ‘hazard’ spaces. These new spaces elicit different emergency response times, thereby constructing space and time as social commodities.

Just as space and time are both physical and social phenomena, the production of space and time may have both physical and social implications as well, with space arranged specifically to exclude certain disempowered persons, or time arranged specifically to accommodate certain powerful persons (Downey, 2001: 218).

In the case of emergency classification, socially constructed space and time empowers some by providing them with increased ‘reliability’, while disempowering others as ‘unreliable’.

The present chapter has argued that classifications are not static representations, but actively constructed virtual images performed in real space and time by the call-taker. Both the virtual image and the socially constructed classification are centred around the identity of the caller. The 'trust' and 'reliability' that a call-taker constructs with the caller influences the emergency classification and priority. Trust and reliability are both intangible and abstract components of the classification process. Call-takers are able to construct virtual images and classifications because they have the ability to image abstractly and non-virtually, as well as maintain the ability to remember. For an emergency to be classified, a call-taker must be capable of working across the boundaries of the virtual, abstract and material. The boundary labour of call-takers and the tangible and intangible components incorporated in constructing virtualities make standardizing emergency classification impossible.

Chapter Seven: Call – Takers’ Hidden Boundary Work

7.0 Introduction

Chapters Four and Five describe in detail the activity involved in locating and classifying call(er)s. They demonstrate how the CAD cannot standardize these processes or remove the social from call-taking. Instead the CAD emphasizes the social as a resource for classifying call(er)s, thereby rendering the caller, and not the call, classified. This chapter challenges EPS’ interpretation of the labour and importance of 9-1-1 / police call-takers in emergency response. Paying attention to the activity of call-takers and their interactions with the CAD and other emergency agencies uncovers the hidden boundary work incorporated in 9-1-1 / police communications.

Beginning with a detailed account of the communication centre, the analysis moves to illustrate how the labour of call-takers is ‘downgraded’ by the organization, technology and other emergency agencies. Examining the 9-1-1 / police communication centre; demographics, job titles and descriptions, occupational clothing, and office layout and technology, illustrates how the police organization ‘downgrades’ the labour of emergency call-takers. Throughout the analysis, I argue that the identity of call-takers is incorporated in the CAD, work protocols and organizational layout of the communication centre. I further argue that the organizational and technological actions are implemented to govern and standardize the labour of call-takers.

7.1 9-1-1 And Police Communication Centre

The 9-1-1 / police communication centre employs an Inspector, a Staff Sergeant, a Training Coordinator, Managers, Supervisors and a number of communications clerks. The Training Coordinator, Managers, Supervisors and Communication Clerks are all

civilian positions. The average age of 9-1-1 / police communication workers is older than both fire and EMS. The youngest 9-1-1 / police call-taker is in their early 20's and the oldest is in their 50's, with the rest being between 32-35 years of age.

We are seeing a trend that more mature and older people are applying for the position and only the more mature and experienced people will successfully complete our training process. So that is not to say that we don't have younger ones apply such as 19, 20, or 21 year olds, but as a general rule they don't make the process because they don't have the life skills we are looking for and that really comes through in the board interview. They may have passed the written test and they may be qualified on keyboarding but once we bring them into the board interview (usually consists of 3 people on the panel) they don't have the skills we are looking for and we find that they don't tend to take things as seriously or to recognize the severity of this position. So we find that those who are successful are an older age group (Training Coordinator).

Call-takers are non-uniform wearing civilian positions represented by the Police Association. The Police Association represents all employees and their rights within the police organization. Therefore, communications employees do not have an independent union to represent them. Instead the organization provides them with representation. Dispatchers and call-takers are divided into platoons and these platoons are broken into districts (East, West and Central).

Working in platoons within specified districts allows call-takers and dispatchers to know the officers that work on their shift, and in their district. The shifts are based on a 42 - day rotation, with one day of training every six weeks. The shifts are 10/11 hours per day with two breaks and a 30- minute lunch. The average pay is \$20-\$25 per hour with a maximum pay of \$48, 000 a year.

New recruits in the communication centre must complete a training phase that consists of five weeks of classroom training and seven weeks of practical training.

It is five weeks of class that are broken down into two different sets. We start with two weeks at the beginning with classroom training and then we cover the operating systems and policies and procedures. . . . Then we assign them a coach officer, so it is one-on-one coaching. And the coach officer has had a two-day workshop on coaching and they are just veteran dispatchers. The new recruit is assigned a platoon rotation as well as a coach officer and then they do some practical training for approximately 7 weeks. Once that practical training is over I pull them back into class for the remaining 3 weeks and introduce them to the specialized sections of the institution. I have brought all the specialized groups from the Ottawa police in to talk with the dispatchers to show them what it is the specialized groups do. So they come out at the end seeing what the entire picture is (Trainer of 9-1-1 / police Communication Centre).

Once the training has been completed they are placed on a platoon and begin their shift work. Each new call-taker begins in 9-1-1, moves to police call-taking and lastly into dispatching. Call-takers in 9-1-1 respond to emergency call(er)s (those deemed to be an immediate threat), whereas police call-takers deal with both emergency and non-emergency call(er)s. Although both 9-1-1 and police call-takers work out of the same building; they are spatially separated. The overall design and layout of the communication centre is similar to other telemarketing or call-centres. Figure 13 illustrates the 9-1-1 / police communication centre on a weekday morning during a 'low calling' period; there are more workers present during 'high calling periods', such as weekends and evenings.

Figure 12

Picture A: 9-1-1 Communication Centre

Picture B: 9-1-1 / Police Communication Centre

Picture A illustrates the 9-1-1 call centre. While 9-1-1 call-takers work in the police communication centre, their desks are located at the far left-hand side of the room. This office layout keeps 9-1-1 separate and isolated from the police communication workers. The spatial separation is better illustrated in Picture B.

In Picture B, the 9-1-1 sign is to the far left of the room and the police call-takers are seated in a semi-circle at the centre of the photograph. The desks are strategically positioned to isolate the workers from each other, according to their districts. Each district has two call-takers and one dispatcher at each desk, with the dispatcher seated between the two call-takers. This arrangement allows each district to work closely together, while preventing them from socializing, or being distracted by others. Only the manager and supervisor's desk face out; this desk is situated at the back of the room overlooking the call-takers' cubicles. The office layout provides supervisors and managers with the capacity to observe all the action occurring in the communication centre.

Figure 14, illustrates the small desk space that each call-taker has. There are very few personal items present on the desks, however a few people did have reading materials, such as books and magazines. Each district has a large map of their geographical area hanging above their desks and each desk is to have a separate book of maps, however no maps were present during both observations. Many call-takers chat with their work partners and frequently send 'hot messages' across the room to each other. These 'hot' messages can be sent to all colleagues or privately. Each call-taker and dispatcher has their own computer that allows them to see information about their call(er)s as well as what call(er)s have been dispatched and which ones are waiting.

Figure 14**Picture C: Call-taker's and Dispatcher's Desk**

The manager and supervisor's computers are connected to all computers in the communication centre, thus enabling them to see what call(er) activity is happening and what actions are being taken. All call(er)s are recorded and supervisors can listen in at any time to see how the call(er)s are being handled.

The 9-1-1 / police communication centre is larger in both office size and the number of employees in comparison to fire and EMS. Not only is it larger but the 9-1-1 / police call-taker's labour and identity are also viewed differently than they are in the other communication centres. An analysis of the 9-1-1 / police call – taker; demographics, job title, job description, occupational clothing, and office layout and

technology better illustrates the organizational and technological 'downgraded' perception of call-takers' labour.

7.2 The Female Call-taker

Police call-takers, like phone operators and administrative and clerical workers are overwhelmingly female. For example 78% of communication workers are female while 22% are male. Half of the supervisory positions are held by 30% of the men employed in comparison to the 9 % of women who are in a supervisory role. Very few explanations were provided for this gender differentiation.

This field is definitely primarily women and there has never been a study done to explain this gender difference, but my experience has taught me that men can't multitask like women can and if there is one thing you must be able to do at this job it is definitely multitasking. . . . Even before men didn't have typing skills and they had a difficult time multitasking. What we did find at one time was that men who were trying to be a dispatcher were using it as a stepping-stone to pursue a career as a police officer. There are also a large number of dispatchers that have husbands who are police officers. . . To this day our work is referred to as the female dispatcher, but certainly now there is a lot more female police officers on the road, but when the officers would hear a female voice on the radio they would tune into it right away because they knew it was their dispatcher, but if a man came on the radio as a dispatcher they wouldn't pick up on it. The officers also didn't relate to the male dispatchers, maybe they were giving them a hard time, but certainly we have developed quite a lot over the past years (Trainer of 9-1-1/ Police Communication Centre).

Throughout the interviews and field observations there was little recognition for the work 9-1-1 / police call-takers do, particularly in comparison to the status awarded to EMS and fire call-takers. To explain this situation there are a number of differences

between these call-takers and their organizations, such as: most of the 9-1-1 / police call-takers are female; it is viewed as a reporting system; their job title and description are ambiguous; and, they are non-uniform wearing civilians.

The organization, technology and other emergency agencies frequently made reference to the predominantly female staff at the 9-1-1 / police call centre. Many of the interviewees referred to 9-1-1 call-takers as ‘operator’ and some went as far as to call it ‘girls work’.

There is always an officer on duty supervising the *girls* because according to the provincial act in some situations there must be the approval of a licensed officer, so there is a police officer always on duty in the communications center, but there are no police officers who dispatch (CAD coordinator).

Our *girls* are just the best, they have things coming at them and they are unbelievable. The *chatter* never stops, the *girls* are always dispatching all the time. I would be amazed when I would get to a scene and you could hear the radio and the amount of chatter those *girls* were doing and being so level-headed about it (Police Officer).

Referencing this labour as ‘girls work’ removes credibility from call-taking as adult labour, instead creating an image of children’s work. Not only did the police organization and technology reference this work as a female occupation, but the other emergency agencies also drew attention to the gender difference. Both fire and EMS had proportionately more males than females call-taking and dispatching. In the past these agencies have been primarily more male and only recently have women entered their field.

Ambulance dispatchers are not seen the same as police. When I started we were all male and this was because it

used to be ex-ambulance officers so it used to be a males world, just like fire (Assistant Division Chief Of EMS).

Historically it was all men, but in police stations there are no men. It is very rare that men work in police. We have noticed that there is a huge shift towards women on the radio and a lot of men have a low bass voice and it doesn't translate through, women, I hate to categorize like this, but women are much more analytical and much calmer and much more directed during an emergency (Division Chief Of Fire).

Not only was there a large differentiation between the genders in police, fire and EMS, but there was also a large emphasis placed on the different labour required for dispatching among them. As fire and EMS explained above, much of their work had previously been completed by retired, injured or ex-officers. Presently all three agencies are dispatched by civilians, however their labour is defined differently. For example, fire and EMS provide extensive pre-arrival and on the scene advice, whereas 9-1-1 call-takers lose contact with the call(er) once it has been classified, prioritized and dispatched.

Police and 9-1-1 call-takers take the information that would typically be gathered from the CAD system and then stream it off to one of the dispatch consoles and then they are ready for another call. So what happens there is that it typically requires 30 seconds from call to sending the information to fire and ambulance because all we are doing is 'downstreaming' the information (Inspector Of Police Communication Centre).

Fire dispatch is very different from police, they will dispatch a call for fire or a medical emergency and they will send out a vehicle and from there on in it is very personnel and vehicle management depending on the incident. They will have to manage the equipment that goes in and out and will have to know which pumpers are there and aren't there and which ones are available in the city and which will be reallocated and which ones are available for follow-up. . . So fire handles the incident on an ongoing basis, whereas police dispatching is all about dispatch and go, bump, bump, bump (CAD Coordinator).

Referring to police and 9-1-1 call-taking as ‘downstreaming’ or ‘dispatch and go’, removes action and accountability from the labour. Instead of representing this work as a form of *decision - making*, it refers to it as a ‘*reporting system*’ that requires a call-taker to passively receive information. In the *9-1-1 Annual Report 2001*, submitted by the General Manager of EPS, the 9-1-1 communication centre was referred to as an “Emergency Services reporting system” and not a dispatch or emergency call centre (2002: 9). The CAD coordinator further explained how:

9-1-1 answers the phone for fire, police, and ambulance and then automatically downloads the call, they don’t talk to the person necessarily, they just transfer the call (CAD Coordinator).

Describing a 9-1-1 call-taker as a person who merely answers the phone, reinforces the conception of 9-1-1 as a reporting system and not a dispatching centre. Because 9-1-1 / police call-taking is performed mostly by women, and not retired officers, the image of a passive telephone operator, instead of an active, knowledgeable and skillful call-taker has been constructed.

Addressing the communication centre as a ‘reporting system’ removes the importance of 9-1-1 call-taking, and renders the workers as passive listeners and receivers of information. However, the previous chapters have highlighted the many steps 9-1-1 call-takers perform when receiving an emergency call(er), such as locating, classifying, prioritizing and dispatching. These steps illustrate how 9-1-1 call-takers are more than passive listeners, but instead active participants in the emergency response.

7.3 *The ‘Downgraded’ Call-taker*

Describing 9-1-1 and police call-taking as a ‘female answering service’ downgrades the knowledge and activity that these individuals do. Downgrading 9-1-1 call-taking is further amplified and reinforced by the job title and description, occupational clothing and office layout. Reimer (1995) did a fascinating analysis on clerical work and how it has been ‘downgraded’ to appear as if the clerical worker is unknowledgeable and unskilled. Reimer (1995: 207) writes that “clerical work is documented in such a way that the specialized knowledge and contributions of women in advanced clerical positions are drawn upon while not being made accountable as performance in a position”. There are many similarities between Reimer’s findings on clerical workers and the recognition and perceptions of 9-1-1 / police call-takers.

Throughout the EPS interviews and texts the 9-1-1 / police communication workers were referred to as: call-takers, clerks, dispatchers, and operators (although this title was used the least). These terms were used interchangeably and yet represented the same labour. The naming of this position is ambiguous, but used to differentiate the workers. After analyzing the interviews and texts, it became apparent that this ambiguous position was extremely important because it is tied into the perception and representation of these workers.

The Webster’s Encyclopedic Dictionary Of The English Language (1988), defines a clerk as an office worker who has minor responsibility, while an operator is someone who operates machinery or instruments such as the telephone and a dispatcher ensures that vehicles are sent out according to a schedule. All of these job titles have an inherent hierarchical structure embedded in them. In the case of these titles, it refers to a person

with minor responsibility that must follow procedures and answer the phone. These job titles coincide nicely with their official job description, which emphasizes the importance of good customer service and communication skills.

Throughout the *Ministry Of The Solicitor General Core Competencies For Communication Communicators / Dispatchers* the position is described as requiring the ‘ability to’ or for a person ‘to know of’ a variety of skills, for example a dispatcher is to “know police service boundaries. . . understand appropriate appearance and conduct in court” (2000: 1). Throughout this job description, it never describes call-takers as possessing ‘knowledge’, but instead suggests call-takers are to be ‘able to know’, ‘understand’, and ‘able to perform’ their duties.

At first sight this may appear trivial, but after reviewing other police civilian job descriptions the job description for call-takers and dispatchers became fascinating. For example, the communication supervisor must possess ‘knowledge of’ and be capable of ‘demonstrating’ a variety of skills, such as “knowledge of labour relations, knowledge of disciplinary procedures. . . knowledge of police service goals and objectives” (Ministry Of The Solicitor General, 2000: 2/3). The official job description that the police organization posts when looking for new recruits, further reinforces the hierarchical downgraded position of call workers.

Under the supervision of the Communications Centre Supervisor, the Communications Clerk is responsible for dispatching calls for service to police officers, ensuring adequate police coverage and supporting police officers and public safety, ***answering and responding to incoming emergency and non-emergency calls as well as calls received from the 9-1-1 telephone system in a calm and efficient manner, reporting all situations in the Computer Aided Dispatch (CAD) system,*** querying the CPIC system for information and ensuring all requests by field units are

completed. *The procedures and requirements for handling incoming calls and police officer requests are clearly established.* . . The Communications Clerk *has no supervisory* responsibilities but will be required to assist in training new Communications Clerks (OPS Job Description, 2002).

The highlighted sections are areas that reinforce the hierarchical supervised placement of call-takers, while further illustrating how their work is to follow established rules and support those around them.

In Reimer's study on clerical work she notes:

the fundamental difference between the positions classified in higher- level administration and those identified as advanced clerical is the absence of recognition of that kind of program knowledge required to perform the job. Because the job description does not reference program objectives nor the kind of knowledge, judgments and decision making involved in achieving them, the grounding of clerical activities in organizational processes and programs is not established for evaluation (1995: 206).

The knowledge required for 9-1-1 and police call-takers is unrecognized as both the job titles and descriptions remove the knowledge required for call-takers to perform their everyday activities. The job description reinforces the organization's, technologies' and other emergency agencies' perception of 9-1-1 / police call-takers' labour. The image of an unknowledgeable and unskilled call-taker is further illustrated by their occupational clothing and office layout and is scripted into the technology that they use.

7.4 Uniforms, Office Space & Technology

9-1-1 and police call-takers are the only emergency communication workers that do not wear a uniform. Both fire and EMS are uniform-wearing, civilian positions. During both fire and EMS interviews, the importance of the uniform was stressed.

This is a civilianized position, but I hate that word, they wear uniforms and at police they don't and they are civilian, but our folks here wear uniforms. That tends to bear that we are not civilians, despite what other people tend to call them, they are in the firefighter union (Division Chief of Communications For Fire).

A uniform can represent many things to people within an organization, in addition to people outside of the organization: “the uniform is the legitimating emblem of membership within an organization” (Nathan, 1986: 2). It is fascinating that 9-1-1 and police are the only emergency agencies that do not require their call-takers to wear uniforms, yet the police officer uniform bears extreme significance. It is the decision of the individual agency if they wish their staff to wear uniforms. The police choose not to because:

our idea with uniforms is that they are used to be identifiable by the public and well these people don't need to be identified because they don't work with the public, so again it is the individual agencies decision (Inspector of Police Communication Centre).

The Inspector is the only communications worker who wears a uniform in the police organization. The uniform works as a symbol to demonstrate an individual's rank within the organization: “uniforms therefore simultaneously express the separation and integration of hierarchy. . . uniforms indicate and accentuate differences in rank in the hierarchical structure of organizations” (Nathan, 1986,77). By not wearing a uniform, the call-takers and dispatchers are effectively assigned a low rank within the police organization.

The layout of the communication centre also displays and reinforces the call-takers' inferior rank within the organization. Looking back at Figure 13 Picture B, the layout of the communication centre places the call-takers' and dispatchers' backs to each

other. The supervisor's desk, on the other hand, is strategically placed at the back of the room. Arranging the desks this way places the workers under constant supervision and works to control their behavior.

Attempts to govern the activity and hierarchical status of call-takers have also been written into the information technology they use. When a call(er) is received, it is automatically recorded and any actions that have been made are logged into the computer system. At the end of each weekday, the managers perform a statistical analysis on the call(er) activity. The statistical analysis reports the numbers of call(er)s received and the actions taken. "Police communications technology have been adopted also as a means of organizational surveillance, guidance and control. . . They have become increasingly acceptable, viewed as "modern" and progressive techniques, scientific means to increase policing effectiveness" (Manning, 1988: 7).

As explained in Chapter 6, the CAD is equipped with a prescribed-script that call-takers can follow when answering a call(er). The policies, procedures and technologies incorporated in call-taking are organizational attempts to standardize the procedure of classifying and prioritizing call(er)s. As previously discussed, this standardized process is to remove any social influences, such as gender, location, age, etc., from interfering with the call-taker's process for classifying call(er)s.

Not only does the CAD attempt to govern the activity of call-takers by prescribing what should be classified as information and what should not, it also reinforces the hierarchical structure of the organization: "the scripts of decision tools inevitably embed prescriptions as to who is in charge, and who gets to use which technologies (and thus gets the status that goes with them)" (Berg, 1997: 120). Although Berg (1997) was

referring to medical testing technologies the conclusion is the same. The CAD keeps call-takers and dispatchers under continual surveillance of their peers by recording their call(er)s, informing the managers of priority call(er)s, and scripting the call process, while further enforcing the call-taker's hierarchical status. These organizational attempts to standardize and govern the actions of call-takers have created a 'downgraded' perception of their labour to other players within the EPS network. However, by examining the labour of 9-1-1 / police call-takers the skill and knowledge required to perform their duties is uncovered.

In emergency response, 9-1-1 / police call-takers occupy the space between the known and the unknown, they are the first to receive information and process it, thereby making their position one of extreme importance. "No matter what automated protocols are in place at any given moment, they will be imperfect and incomplete; disparate information networks can only work together through the efforts of specific workers who maintain the links, transform the content and police the boundaries between those networks" (Downey, 2001: 225). For EPS, these workers are 9-1-1/ police call-takers, however their actions can only be uncovered by close examination of their everyday activity.

9-1-1 / police call-takers are faced with high stress, emotionally charged labour on a daily bases. They are not passive listeners but active participants, who act as boundary workers through activities of 'sensemaking' and 'negotiated labour'. By examining each of these skills, it becomes evident that information technologies and standardizations do not remove action from call-takers but require negotiated labour, thereby creating an intermingling of human and machine to elicit an emergency response.

7.5 *Emotional Labour*

Many call-takers describe their environment as a 'world of its own' that involves different emotions and situations.

This is a life in itself, you have to get into a mindset to come in and get work done and then go home. When you are on the phone you just learn to do your job, you can't break down or get frightened. . . You learn to separate yourself from the situation, there are different ways that we each cope with the information that we receive. . . It is hard to not have emotions, I find that I cry a lot after a shift because everything was just so intense (9-1-1 Call-taker).

Throughout the interviews and observations it became apparent that there were a variety of approaches used when handling call(er)s.

The policies and procedures that you are given leave a little to be desired. You spend a lot of the time listening to each other and helping each other, but you can always ask when you are having trouble (9-1-1 Call-taker).

When a call comes in there is no set way to answer the phone, some will say "9-1-1 do you want fire, ambulance or police", while others will answer "9-1-1". When a 9-1-1 call-taker receives the call and are requested to go to fire or ambulance they can handle the call in different ways. For instance they can immediately transfer the call and then stay on the line to hear what information is given or they can take down information and then transfer the line. The protocol tells the dispatcher that they are to receive caller information and immediately transfer the call, but everyone has their own way of dealing with it, there is no right way to handle a call and you can stay on the line as long as you want to (9-1-1 Call-taker).

The above quotes shed light on the coping methods developed and used by call-takers, whether it be a support group at work / home or the use of black humour. Not only was the information received on the phone difficult to hear at times, but also the lack

of call(er) closure was troubling. Many of the 9-1-1 and police call-takers emphasized the difficulty created from not receiving closure on their call(er)s.

What is most difficult to dispatchers is that they don't get closure to the call that they handle, because the officer will respond to the scene and follow it through to the end. So for example, someone was arrested and went to the hospital and he is going to live, or a little child is okay and going to a foster home, so police officers can receive the closure, whereas dispatchers cannot, unless they make a special effort to follow-up with the officer. It is very difficult! (Trainer of 9-1-1 / Police Communication Centre).

Lack of closure was not the only difficulty call-takers face, they also expressed the difficulty in receiving a call(er) that 'hits home'. Many references were made to call(er)s that reminded them of situations from their own life.

Most of the dispatchers are women and I think that there is an image of this job as being a secretary or an operator, but it is really serious. There is still that image of police work as "boys in blue". Some people call 9-1-1 and forget that we are real people and not just a disembodied voice. . . Everyone is affected by the information that they learn from this job, but many of us hide it. You have to learn to handle each call as it comes on a one-to-one basis. . . There are many times that you receive a call that reminds you of your own personal life and it makes it even harder to handle the situation. For instance when I received a suicide call a few months ago I had a cousin who had just hung himself and that was all I could think of and it made it really hard to handle the situation (9-1-1 Call-taker).

The job is really nerve racking when you first begin, but you get used to it. Now you just deal with the call and move on. You can't get all emotionally involved. Some calls hit home, but you use a lot of black humour to get over things (Police Call-taker).

Call-takers and dispatchers have to deal with many emotions during every phone call, from the emotions of the callers to their own during the interaction, as well as those they

experience after the call. Dealing with emotions is not an easy task, nor something that technology can remove from the work environment.

Weick (1995) conducted a study on the activity of sensemaking. In this research, he recognized the difference between the act of sensemaking and that of interpreting and concluded that sensemaking involves and incorporates emotion. It is a process that people actively engage in “to construct, filter, frame, create facticity, and render the subjective into something more tangible. . . [it] involves a higher level of engagement by the actor. . . A failure in sensemaking is consequential as well as existential” (Weick, 1995: 14). Perceiving the labour of call-takers and dispatchers as an activity of sensemaking highlights the skill and difficulty present in this occupation.

7.6 Sensemaker & Boundary Worker

The 9-1-1 call-taker, is the first person contacted and connected with the emergency scene. There are only a few seconds available for call-takers to determine the extent of the emergency. Because of the short telephone interaction, there are times that call(er)s have been deemed non-emergencies but were actually emergency situations.

9-1-1 call taking is more emergency intensive, however there are still emergencies that we deal with when a 9-1-1 call-taker doesn't define the call as an emergency, but when we begin talking to them we realize that it is an emergency (Police Call-taker).

The above quote illustrates the varying understandings that people can have when classifying an emergency. Varying definitions increase the difficulty required in classifying a call(er). Each person has their own vocabulary and interaction style and it is the job of the call-taker to quickly recognize what is of value and importance throughout their brief interaction.

Although the communication centre has created procedures for handling call(er)s, it is impossible to have a set script, as every situation and call(er) is different and there can be no pre-planning.

There are different things that play on the priority of a call, such as age of the caller, mental health, etc. For each classification there are different defining characteristics. . . I used to keep an extra book, and I actually gave one to the woman that I just trained, and I used it to keep little helpful hints and reminders throughout it. No call has the same situation. When I am trying to see if the caller is reliable, it is just a gut instinct or a sixth sense. The easiest way to know if they are telling the truth is to check mental health and you can usually know that. You just keep asking questions and if they are getting irritated or anxious than you can usually tell something is going on (Police Call-taker).

It is the questions that call-takers ask that allows them to create caller reliability, this shows that technology cannot classify an emergency, but instead requires a call-taker to interact and question the caller. “Some calls are refused as not being emergency calls without a reason being given, suggesting that some tacit sense of emergency is being employed” (Manning, 1998: 80). It is ‘tacit knowledge’ that information technologies, such as the CAD, cannot capture.

Since each situation is different and unique, the call-takers must learn to listen for cues that would lead them to appropriately define and classify the call(er). They have to establish what is important in the call(er) and continue to ask questions to obtain all the information necessary for classifying it. This is not an easy task and demonstrates how the call-takers must engage in the act of ‘sensemaking’ (Weick, 1995). Call-takers do not merely interpret call(er)s or retrieve information, but they also, as described in the

previous chapter, attempt to construct a virtual image of the situation in order to make sense of its urgency.

Sensemaking incorporates talk, discourse and conversations (Weick, 1995). In the case of call-takers, it also involves the words chosen to describe the incident, the tone of the callers voice, the information presented on the CAD and background noises. 9-1-1 and police call-takers do not want to ignore any of the sounds and cues occurring throughout the call because it is *their responsibility* to get help.

When we train our call-takers we stress the liability issues. They can definitely be held liable such as: failure to follow policies, failure to respond to a call that was a call for service, but they deemed it unnecessary, not gathering the required information that could have led to an injury or death, not notifying the appropriate secondary or third agencies (such as the ambulance). The line that we tell them, is that as long as you have done the best that you can with the information that was provided to you then you are okay, so long as there was no intent (Trainer of 9-1-1 / Police Communication Centre).

When you work here you are damned if you do and damned if you don't, because we are on taped lines. Anything that we do can come back on us. We are legally liable for our decisions, so you really watch your back. You never assume, because when you assume you only make an ass out of yourself. We have to be careful with the signs that we pick up from calls because we can never assume (Police Call-taker).

One thing that is important in this job is that you must log everything, you always want to cover your ass because you can be taken to court. I have to go to court this week because of a call I received from a woman who was being assaulted by her husband. During the call she kept repeating "my husband will kill me if he knows it was me who called, don't tell him it was me", and well now she is saying that the phone call never took place and I have to go to court to show my logging and it says right in there exactly what the woman had told me on the phone. Comments that come from your supervisors or other

emergency workers I always log as well because you never want to get blamed for anything. There are major repercussions from your decisions here (9-1-1 Call-taker).

These three quotes illustrate the pressure and severity of call-takers and dispatchers actions during calls. Not only are these workers liable for their actions within the organization, but they are also responsible for their actions when dealing with other emergency agencies, such as fire and EMS.

When 9-1-1 receive a call and fill out the information and dispatch it to the officers, they are also responsible for contacting any secondary agencies required for the call(er). It is during multi-agency incidents that 9-1-1 call-takers become boundary workers. They take the information received and cross the network to inform the other players and provide information that is pertinent to the call(er). During a 'Priority 1', call-takers are responsible for dispatching help, contacting secondary agencies, as well as maintaining continual contact with the caller to provide reassurance and help. 9-1-1 call-takers produce information and maintain the flow of information across the network by rendering spatial and temporal boundaries irrelevant. The maintenance of information is aided by the CAD system, however the technology does not act independently of the call-taker rather they work in conjunction with each other.

7.7 Negotiated Labour

The CAD has been implemented as a technology of information management, however this thesis has revealed the hidden negotiated labour between the call-takers and their technology: "technology may increase access, reduce processing time within organizations, and provide more accessible and immediately extant records, but it also produces its own unresolved or heightened difficulties" (Manning, 1998: 7). When

difficulties or deficiencies occur it is the call-takers who work to make adjustments and correct the situation, not the technology. “This ability to repair is learned as one becomes socialized- it is a skill that cannot be fully explicated because it rests on an understanding of what is culturally acceptable” (Collins, 1990: 196). It is the call-takers tacit knowledge or ‘gut instinct’ that enables them to classify a call(er) by eliciting more questions.

The computer is just a small part of our job, our work involves a lot more than what the computer has to offer. I never use the questions or reminders. All of the questions are based on commonsense. You use what you have learned and what others have told you. I used to keep a little book to remind me of important things to ask or situations to look for (Police Call-taker).

We use the CAD to enter calls and also for the RMS for the police, but it really is a small part of what we do. The CAD is great for us to run vehicles, check the caller and call history and premise history. It is really good for the officers’ safety as well. We can run things on In-house information and Canadian Police Information Centre (Police Dispatcher).

The CAD is used as a tool to accumulate and coordinate information and not a technology that informs call-takers and dispatchers on how to perform their duties.

“Decision-support-techniques are not in control either. They are wholly dependent on the way other entities produce their input (if any) and act upon its output (if at all); they articulate some relations, but leave it to other entities to articulate the rest” (Berg, 1997: 139). It is the call-takers and dispatchers who are active agents in the emergency response process. The CAD does not capture the call-takers’ knowledge, but instead stores data that the call-takers and dispatchers use when establishing caller reliability, incident classification and prioritization. There are many functions that the CAD has

developed for dispatchers that are valuable for their work but not functional during actual labour:

The CAD shows a map of the city, however a down point is that this cannot be printed out so a police officer could be needing our help with directions but we are typing in the case information and we can't be looking at the screens at the same time, it would be very helpful if we could print off the maps and look at them while we speak (9-1-1 Call-taker).

This illustrates the negotiated labour that occurs within the communication centre. It is the active work of the call-takers that renders the CAD functional, while it is the CAD that allows the call-takers to function effectively and speedily.

7.8 Conclusion

9-1-1 and police call-takers are perceived as 'unskilled' operators whose main responsibilities include answering the phone and entering information into the CAD. The present analysis has highlighted the central role that these call-takers play in emergency response. The organization's attempts at standardizing the call – takers' actions through continual surveillance and technological control have not only reinforced their low hierarchical position within the organization, but have also facilitated the perceptions held by other agencies of these workers.

The communication centre is largely staffed with female communication workers but only 9% of these female employees hold supervisory positions. The demographics of communication workers have created an image of 'girls work' by other players in the EPS network as well as regarding call-takers as passive agents in the emergency response process. The police organization has maintained, and even reinforced, this image through its job title and description, organizational clothing and office layout. These

organizational policies have reinforced organization hierarchy and attempted to standardize and control the actions of call-takers and dispatchers. The perceptions of 9-1-1 call-takers and their low hierarchical status has been entrenched in the technology they use everyday. The CAD continually informs supervisors of the activity that is occurring throughout the communication centre while simultaneously creating a scripted path that call-takers are supposed to use when classifying and prioritizing call(er)s.

It is only by immersing oneself into the everyday activities of these workers that their true labour comes to light. After closer examination, it becomes evident that 9-1-1 call-takers hold a key place in emergency response. They are the point of first contact during the emergency request, and occupy the space between the known and the unknown. Call-takers act as 'boundary workers' who cross the many borders within the emergency response network. Many things occur when a 9-1-1 / police call-taker is dealing with an emergency call(er) and it is these qualities that truly demonstrate the skill and knowledge required to perform their labour. There are many definitions and emotions evident throughout a 9-1-1 phone call and the call-takers have to learn to deal with emotional work and to communicate effectively.

The CAD does not remove the ambiguities presented by varying definitions or emotions, nor does it function independent of the call-taker. By examining the call-taker's interaction with the caller and the technology, it becomes clear that call-takers participate in a continual process of negotiated labour. They repair the deficiencies prevalent in the CAD, as well as maneuver the conversation with the callers to evoke the necessary responses for the CAD to operate. Call-takers engage with the CAD to

uncover premise and caller history using the information on the CAD in conjunction with the information acquired during the call, to create a virtual image of the incident.

The present analysis has drawn attention to the importance of call-takers' tacit knowledge. Tacit knowledge, as presented above, has not been, and cannot be, captured by information technologies. It is left unarticulated but still present during call(er) interactions. From this analysis it is clear that the organization's attempts to standardize procedures and policies have resulted in a *downgraded* perception of 9-1-1 / police call-takers. The police organization has used this downgraded perception to govern the actions of call-takers.

Chapter Eight: Conclusion

8.0 Are You Identified?

With the terrorist attack behind us, and the threat of a war upon us, we find ourselves living in a society filled with fear and uncertainty for our future. These concerns and risks have led many cities to improve their emergency preparedness. As our fears escalate, so do our measures of risk management. The need for improved emergency communication and interoperability between emergency agencies are only a few examples of the changes occurring around the world. This thesis illustrates how the discourse of ‘risk management’ has led EPS to standardize emergency call-taking through the implementation of information technology, such as the CAD.

While this thesis focused primarily on the 9-1-1 / police communications, it also highlighted the future organizational and technological changes occurring within Adacan’s EPS. Interoperable radio systems and a shared CAD system for 9-1-1, police and fire are two examples of the upcoming changes. These changes have been emphasized by EPS as essential for increasing the efficiency and effectiveness of emergency response, by enabling all emergency call-takers to share information by the push of a button. Centralizing emergency communications is a fascinating area for future research, particularly with regards to the content of information being shared.

8.1 Information Technology & Knowledge Management

Throughout this research many players within Adacan’s EPS network emphasize the need for information technology, such as the CAD. Value and importance were placed on the standardized work processes and information capabilities of the CAD. This

information was described as vital for aiding call-takers in making ‘informed decisions’, as well as essential for ensuring the safety of onsite emergency workers.

The police organization, technology and other emergency agencies emphasized the importance of the CAD for emergency call-taking. Adacan’s EPS perceived the CAD as the ‘black box’ for emergency communication: never questioning the technological or social impacts the CAD has on the labour of call-takers. The standardized processes imposed by the CAD are highlighted as a means to remove the social from classifying and prioritizing call(er)s. It is regarded by the organization and other emergency agencies, as the active agent involved in eliciting emergency response.

Making the CAD an active participant in the emergency classification process removes the knowledge, skill and activity of call-takers. Thus, the labour of call-takers is ‘downgraded’ as passive listeners and recorders of information, while the CAD becomes a ‘standardized and objective’ agent in classifying the call(er). Information technology, such as the CAD, is assumed to capture, code and transfer knowledge to people across an organization. Throughout this thesis, I argue that the CAD does not store knowledge, but instead only information.

Information is pieces of data placed in a context that are both locally contextual and relational and can assign a definite quantitative or qualitative description (Shields and Taborsky, 2002). Knowledge, on the other hand, is fluid and emerges as people actively engage with situations. Therefore, I argue that the CAD does not capture knowledge but stores isolated and contextual information and instructions for call-takers. This information only becomes knowledge as call-takers incorporate it into the classification process.

Not only have the differences between information and knowledge been identified, but the research has also argued that knowledge, and particularly the call-taker's *tacit knowledge*, cannot be captured by information technologies. Tacit knowledge incorporates aspects of an individual's culture, creativity and background.

This thesis demonstrates how the tacit knowledge of call-takers is incorporated in their processes for locating, classifying and prioritizing emergency call(er)s. These processes, along with the call-taker's labour, have illustrated the limitations and inherent difficulties present in information technologies, such as the CAD, and the standardized work processes of call-takers.

To better assess the limitations and impacts of standardization on 9-1-1 / police call-taking, I analyzed three tensions prevalent in call-taking: locating wireless call(er)s, classifying the call(er), and the labour and identity of call-takers. The analysis of these three tensions uncovers the social and technological aspects incorporated in classifying and prioritizing call(er)s. From analyzing the processes involved in locating and classifying call(er)s, I argue that the CAD is *not* an active agent in constructing emergency classification, but instead a technology that accumulates and coordinates information.

8.2 *Locating Wireless Call(er)s*

When a call(er) is received at the 9-1-1 call centre, the call-taker must first locate it before an emergency classification can be identified. Bell Canada, in conjunction with Adacan and municipalities, has implanted PERS into emergency call-taking. PERS provides call-takers with an automatic number and location for all landline call(er)s. Cellular phone call(er)s, on the other hand, are not accompanied with ANI / ALI

information, thereby creating extra time and work to locate. Cellular phones have resulted in a ‘technological breakdown’ in emergency call-taking. New standardized procedures for street addresses and rural house numbers have resulted from the effects of wireless communications on information technologies. These new standards were created in reference to the increased number of, and difficulties posed by, cellular phones.

Even with the new standardized map, cellular phones pose other problems for call-takers. Wireless communications has created a drastic increase in the number of *abandoned call(er)s*. There are many explanations for this, such as battery failure, disconnection, and inappropriate routing from communication towers, however, they each result in a lack of emergency response. Thus, cellular phones have created many unanswered and uncontrollable situations for the standardized work procedures in 9-1-1 call-taking. By examining the anomalous situation created by cellular phones, the ever-evolving nature of standards and the hidden labour of call-takers have been uncovered.

8.3 Classifying The Call(er)

Once a call(er) has been located the classification process can begin. There are multiple classifications present in emergency response. While the EPS organization perceives the CAD as an information technology that standardizes the classification process, this thesis identified the tangible and intangible components present in emergency classification. Uncovering these components, such as a caller’s location, identity, premise history, previous criminal history and occupation, illustrates the active boundary work of call-takers. The ‘boundary work’ of call-takers exemplifies the importance of the ‘social’ in emergency classification.

This thesis demonstrates how the technology, and its stored information, places the *identity of the caller* as a central component in the construction of the emergency classification. In order to construct an emergency classification, the call-taker must first create a virtual image of the call(er). This virtual image captures activities and objects that are present but not tangible or concrete. Virtualities incorporate components of the virtual, abstract and material worlds.

The CAD provides call-takers with a map of the city, but the information that it further provides, such as hazards and caller identification, along with the information from the caller and the knowledge of the call-taker, creates a virtual image that diverges from the concrete. This virtual image is then used to manage risks, establish caller reliability and incident urgency. Virtualities, and the tangible and intangible components incorporated in them, illuminate the ongoing construction of emergency classifications. Thus demonstrating the impossibility of separating a caller's identity and reliability from the emergency classification. This research illustrates how emergency classification is not a standardized process, but instead an actively constructed virtual image performed in real space and time by call-takers.

8.4 Call-taker's Identity & Boundary Work

Throughout the research analysis, it became evident that the knowledge and labour of call-takers makes emergency classification possible. This thesis demonstrates how the police organization's standardized work processes attempt to maintain surveillance and control over the communication workers' labour. The job titles and descriptions, demographics, occupational clothing, office design and information technologies in the 9-1-1 / police communication centre, reinforce the downgraded labour and low hierarchical

status of call-takers. While the police organization interpreted the labour of call-takers to be 'unskilled' and 'unknowledgeable', this thesis identifies the complexity, knowledge and skill required for emergency classification.

Engaging an ethnography of actors, networks, and fluidity within the standardized procedures of 9-1-1 / police call-taking, illuminates the hidden boundary work of call-takers. It is the call-takers' tacit knowledge and their ability to work across the virtual, abstract and material worlds that makes them essential for emergency classification. It is also this labour that demonstrates the third, and final, tension present in emergency communications standardized processes.

Throughout this thesis I argue that the CAD does not remove the difficulties or social influences present in emergency classification, but instead emphasizes the use of the social as a resource for constructing emergency classifications. This thesis further argues that the knowledge, and particularly tacit knowledge, of call-takers are essential to their labour, while simultaneously demonstrating the impossibility of standardizing the social.

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