Group Name: **The Sherlock Application**

Business Case Name: **Changing the 911 Dispatch System with IBM Watson**

Submission Video Link:

https://www.youtube.com/watch?v=LkPBaNTiSV4

(Youtube link)

Case Prompt: **City Services**

(Higher Education or City Services)

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1. Introduction

The process of upgrading New York City's 911 dispatch system has spanned over a decade and cost taxpayers an upwards of 2 billion dollars (Hajela). In the current system, all 911 calls are sent to the NYPD where they are then transferred to the dispatchers at the NYPD, EMS, and FDNY, resulting in unnecessary delays in response times. In October 2014, the Department of Investigation released a report that discussed the various inefficiencies, such as technology and processes, that continue to affect the call takers and dispatchers of the 911 system despite the additional upgrades. (*Investigation in Significant Delay;* "NYC 911 Performance Reporting")

The Sherlock Application proposes to integrate IBM Watson into the 911 dispatch system. By empowering the call takers, IBM Watson has the potential to streamline the process in which information is received and shared amongst all relevant parties involved. IBM Watson's unique cognitive technology would allow call takers to adapt to any situation. By using IBM Watson to supply supplementary information, 911 operators and dispatchers will be able to provide a quicker response to the emergency at hand, allowing the proper authorities to arrive at the scene faster.

2. Impacts & Solving The Problem

The success of implementing this technology will be measured by the reduction in costs, the lives saved, and the improvement in response times. The introduction of IBM Watson can put an end to the costly upgrades paid by taxpayers. It has been estimated by the de Blasio administration that an additional $100 million dollars will be needed to complete the upgrades with an estimated final product launch date of 2017 (Hajela). In contrast, implementing IBM Watson would cost approximately $1 million while offering New York City taxpayers a benefit that is currently not provide through the current system (Dunford). Since this is a project that will improve a public service, it will be funded by New York City taxpayers.

Implementing IBM will solve two main issues that currently exist in the 911 system. The first issue involves the operational flow of the 911 dispatcher. After receiving a call, call takers obtain general information but will transfer the call to the appropriate departments if necessary. As they do this, they need to stay on the call to confirm details and to provide emotional support to the caller. ("My Hell as a 911 Operator") IBM Watson will provide call takers with information from all the departments to ensure that information is taken down effectively. The second issue is that dispatchers from different departments need to coordinate using multiple computer systems, such as ICAD, Starfire, and EMSCAD (*Investigation in Significant Delay*). IBM Watson would be the bridge that streamlines all three departmental processes. By making the 911 process more efficient, the service as a whole will be able to answer more calls and save more lives.

3. Use of IBM Watson

IBM Watson will be implemented internally as a supplementary tool to the 911 call takers. It will appear as a program for the call takers on their workstation screens and will

monitor calls to offer certain suggestions or follow up questions for the call takers. Since Watson uses natural language processing in order to understand on a deep contextual level, it can allow call takers to make quicker and more informed decisions when tackling emergency calls. During medical-related calls, Watson can use the symptoms and information provided by the caller to offer possible ways to deal with the situation. Furthermore, Watson allows the call taker to focus on the critical issue while it provides additional support by supplying background information such as caller's address and past history call logs. Based on the information provided by both the caller and the call taker, a report of departmental specific codes can be generated by Watson and can be forwarded to the dispatchers for immediate response. The log of the call history will also be sent to the dispatcher for reference. This will reduce the risk of error that usually results in transferring information from the call taker to the dispatchers. Due to sensitivity of the information involved, an on premise system would be more suitable for the 911 system (Dunford).

4. Data Input and Output

Given that Watson has the ability to understand natural language, it can greatly lower communication errors and improve response time. Watson would listen in to the 911 calls between the call taker and the caller, and pull the needed information. Through this process, Watson would pick up on key details from the call and continuously update the call taker in real time. Watson would also prompt the call taker on his or her screen with related questions to the situation and access information from other related current events that may provide any extra details. All of this reduces the chances of repeating questions and allows the call taker to focus on acquiring the necessary information quickly.

To train Watson, we will use past call logs, departmental guidelines, and expert dispatchers from the EMS, FDNY, and NYPD as the basis for its corpus. Watson will learn how to interpret the key terms from the call and pull data from city databases when necessary. With the data it receives, Watson can build reports from the call and customize them to different department (EMS, NYPD, FDNY) codes which can be quickly sent to the dispatcher, who can then get the appropriate aid out faster. With Watson's help, crucial information between the caller, the dispatcher, and the departments will travel more quickly and accurately. By reducing wait time for other incoming calls, there will be more time to save potential lives.

5. Conditions and Launch Timeline

In order to successfully implement IBM Watson within the 911 system, there are several conditions that need to be met.

One resource that this project requires is money. Utilizing such an advanced technology will cost the city millions. Past IBM contracts with NYC have had a range of costs; for example, in fiscal year 2012, the city engaged IBM for 20 to 24.9 million dollar contracts involving city systems (*Agency Procurement*). It is estimated that implementing IBM Watson will cost approximately one million dollars (Dunford). Additionally, there will be a yearly cost of

maintaining IBM Watson to perform as needed. While this amount sounds costly, it is still significantly less than the contracts that NYC have awarded vendors to upgrade the system, which sometimes were as high as 72.5 million dollars (Goodman).

As a result of the cost, this project will likely require public support. According to NYC's Mayor's Office of Contract Services, public hearings are needed if the contract costs over 100,000 dollars and there is no "competitive sealed bidding" ("Public Hearings"). Since IBM is the only company with IBM Watson technology, this fulfills the requirements for public hearing circumstances ("N.Y. NYC. LAW § 313). Therefore, it is especially important that the public understands and supports the idea of upgrading the 911 system to include Watson.

Third, this project requires the cooperation of the different NYC departments and IBM. An issue that plagued the current update to the 911 system was the lack of cooperation between the different departments and their systems (Hajela). Given the structure of current 911 calls, leaders of the FDNY, EMS, and NYPD need to be willing to work with one another to streamline the dispatch system ("NYC 911 Performance Reporting"). They also need to cooperate with other vital government officials and IBM employees. Without the cooperation of government officials and IBM, it would be extremely difficult to implement this project, even if there was public support and money.

The final component of this implementation is time. Since IBM already has experience from improving 911 in other states using other technology, we estimate that it will take less than two years to get IBM Watson ready for use ("Public Safety Solutions"). During this time, we expect Watson to be trained, the software to be developed, and the existing infrastructure to be updated. According to our IBM consultant, it is estimated that training Watson will take less than 6 months (Dunford). During this training, Watson will be taught from existing call logs and employees from the EMS, FDNY, and NYPD. Watson will also be taught to create the necessary reports used by the different departments from the call. After the training process, Watson will be installed across all call centers while employees will be trained to use the software. When call takers are properly trained to utilize IBM Watson, it will then be activated in all call centers at once.

There will be continuous maintenance and monitoring by government and IBM employees to ensure IBM Watson performs the best that it can. This also gives IBM Watson the opportunity to be improved. For example, as IBM teaches Watson more languages, it can be added onto the existing system. IBM Watson's ability to constantly adapt and improve truly makes it the technology New Yorkers deserves and needs. Using IBM Watson in the 911 dispatch system would allow each 911 call taker to be more equipped in assisting callers and getting New Yorkers, from all types of backgrounds, the help they need in emergencies.

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