

May 27, 2018

Course: CIS570 – Business Intelligence
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Assignment: Reading Discussions – Week1-Session2
Due Date: Sunday, May 27@ 11:59pm

Question 1. Discuss one or more examples of how organizations in the healthcare industry are using analytics.

Now that the organizations such as in the healthcare industry are beginning to get a handle around big data with respect to how to manage and use it, they are also making great strides in perfecting algorithms that can be used to improve extend our quality of life.

One application of this is the ability to use this new technology to detect early signs of *sepsis*, especially with ICU patients. Sepsis is a blood-born infection which is characterized by symptoms such as a drop-in blood pressure, high fever, elevated heart rate, and other metabolic changes that. There are many causes for sepsis, such as pneumonia, abdominal infections, E.coli, and others. If left untreated, sepsis can progress to a severe state leading to possible organ failure, septic, and possible death. Sepsis itself is difficult to detect with a 40% mortality rate at the present time.

With patients in an ICU recovering from various surgeries, especially with oncology and transplant patients, their immune systems are already immuno-compromised from medications they are given, and as such in a more vulnerable state and at a higher risk for sepsis. With these patients it is extremely important to detect and treat sepsis as early as possible.

Researchers and engineers have worked on creating sophisticated algorithms and new medical devices that can be connected to these types of patients immediately after surgery. These algorithms are very highly tuned to detecting changes in vital signs that would indicate the possible onset of sepsis many times hours before the physicians are even aware. Further, the data collected from patients that do in fact develop sepsis is collected and used to identify or predict future patients that should be targeted as likely to develop sepsis which would give clinicians a heads up during post-op treatment.

<https://www.sepsis.org>

<https://www.predictiveanalyticsworld.com/patimes/four-use-cases-for-healthcare-predictive-analytics-big-data-0422153/5218/>

Another area in which analytics are being applied within the healthcare industry is what is termed '*Population Health Management.*' The idea behind PHM is that it attempts to improve the

medical treatment of a related group of patients by monitoring the outcome of individual patients within the group.

As part of PHM, data from multiple sources (clinical, financial, operational) is collected for each patient. From this data, BI tools are employed to aggregate that data into a “*comprehensive clinical picture of each patient.*” Using this data, the goal is to then use predictive analytics to be able to use past patient history to predict future events.

For example, suicides among those in the military can be characterized as an epidemic. By studying the past behaviors of those that fall into this particular group it will become *easier* to identify those patients that are highly likely to commit suicide or harm themselves (or others) and to provide proactive treatment as soon as possible.

Further, with the use of the aggregated patient data, PHM can be used to improve the quality, efficiency, and financial aspects of patient care not only individually but for the groups(s) as a whole including care gaps that are identified within the population.

<https://www.wellcentive.com/what-is-population-health-management/>

<https://www.predictiveanalyticsworld.com/patimes/four-use-cases-for-healthcare-predictive-analytics-big-data-0422153/5218/>

Question 2. Do you see an opportunity to use cognitive analytics within your organization? Elaborate.

With respect to the question at hand I am going to answer as it relates to cognitive analytics that is *slightly* orthogonal than the traditional view.

I work for the State of Colorado Judicial Branch of government which includes the State Court Administrator’s Office and Probation Services. These entities provide services to all trial and appellate courts throughout the state include probation services for offender rehabilitation and public protection.

The court system maintains massive amounts of criminal related data for those individuals that have run afoul of the rule of law. These transgressions can be charges related to simple misdemeanors to the most extreme case of felonious murder. Violent criminals undergo psych evaluations and that data is captured and maintained by other state agencies. All of this data is available thru the Judicial Branch but it is not the charter of the branch to perform cognitive analytics of the data.

I believe that Probation Services, which does not have an analytics division, could and should create a division for cognitive analytics. Probation services is responsible for monitoring

individuals that have served time for crimes committed and have been deemed worthy of being released back into society.

A major factor in consideration for the release of an inmate is whether or not they will become a repeat offender, i.e. commission of another crime after being released. While the mental health and state of these individual is certainly monitored by associated health and human service agencies, I believe it would be of great value to Probation Services to perform their own cognitive analysis on those being considered for release prior to the actual decision being made.

What I would like to see is a study that analyzes those under supervision of probation services (currently released) that do commit another offense to try to determine what factors might have contributed to or caused to their inability to not engage in criminal activity. In a cognitive sense I believe these individuals likely shared a common set of traits or behaviors that can be used to identify or target other current inmates with similar tendencies. Additional or more detailed examination of these targeted individuals can then be employed to gain additional insights as to whether it is appropriate to release them back into society or there is very high chance they will commit another criminal act.

Individuals that have a high propensity for committing multiple criminal acts need to be identified and held in confinement until treatment or effective measure can be employed to prevent future criminal acts once released. I believe having Probation Services, which has a first-hand accounting of these individual's behaviors and actions, can add an additional layer of analysis in the process of inmate assimilation back into society.