



Putra Business School

GSM 5170 Management Information System

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Lecture 5

Case Study 1: Crystal Ball, Clairvoyant, Fortune Telling... can Predictive Analytics Deliver the Future?

Case Study 2: Decision Support Is Good for Your Health

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Case Study 1: Crystal Ball, Clairvoyant, Fortune Telling... can Predictive Analytics Deliver the Future?

1. Many predictive analytic models are based on neural network technologies. What is the role of neural network in predictive analytics? How can neural networks help predict the likelihood of future events. In answering these questions, specifically reference Blue Cross Blue Shield of Tennessee.
 - a. Traditionally analysts in retail, manufacturing and many other industries use a variety of statistical methods to solve a range of problems in forecasting, data classification and pattern recognition. Some of these methods include regression analysis, logistic regression, survival and reliability analysis and Auto-Regressive Integrated Moving Average (ARIMA) modeling. However, because each of these methods uses different software algorithms with different data assumptions, forecasters must learn to use an assortment of tools to solve problems and produce best solutions (answers).
 - b. Neural networks can replace all of these methods and produce forecasts as accurate as or better than those available from other statistical methods. Advantages of neural networks are improved accuracy over traditional statistical methods, a unified approach to a wide variety of predictive analytics problems and they require fewer statistical assumptions and can manage complex predictive analytics tasks in a more automated way, which saves time for analysts and programmers.
 - c. With these it could help to foresee the patterns of failures in heart, kidney or diabetics and find the solutions.
2. What is the Richmond police began to add demographic data to its predictive analytics system to further attempt to determine the type of person (by demographic) who would in all likelihood commit a crime. Is predicting the type of person who would commit a crime by demographic data (ethnicity, gender, income level and so on) good or bad?
 - a. It can be possible for both good and bad. As in good side it will narrow down to the result with possible heads that might cause the crime. It will be able to assist to find the crime sooner. As in from bad side when people are being suspected it could also might include people who are not involved which could cause a prestige problem. They might end up in sue the police who non crime act but being suspect wrong person.

3. In the movie Gattaca, predictive analytics were used to determine the most successful career for a person. Based on DNA information, the system determined whether or not an individual was able to advance through an educational track to become something like an engineer or if the person should complete only a lower level of education and become a janitor. The government then acted on the system's recommendations and placed people in various career tracks. Is this a good or bad use of technology? How is this different from the variety of personal tests you can take that inform you of your aptitude for different careers?
 - a. Placing in various kinds of career tracks is good to identify the individual's skill and expertise. Some people may have a high educational background but when it comes to practically the implementation, they were not able to place at the right place and right time. This is where the individual requires training and hands-on activity at the field. In fact, soft skills are also valuable for the people who lined up at the technical sides.
 - b. An aptitude is a component of a competency to do a certain kind of work at a certain level, which can also be considered as talent. Aptitudes may be physical or mental. Aptitude is not knowledge, understanding, learned or acquired abilities (skills) or attitude. The innate nature of aptitude is in contrast to achievement, which represents knowledge or ability that is gained. With various types of questions, we can see where we are locating and what are our skills and expertise.

4. What role can geographic information systems (GISs) play in the use of predictive analytics? As you answer this question, specifically reference to FedEx's use of predictive analytics to (1) determine which customers will respond negatively to a price increase and (2) project additional revenues from proposed drop-box locations.
 - a. Geographic Information System (GIS) is rooted in intellectual practices, populated by data and powered by mathematical analysis. The main use of GIS is for spatial analysis, predictive modelling, cartography and visualization. GIS are computer-based tools for mapping and analyzing features and events on earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps. Thus, the use of GIS is needed to collect data, store, manage, analyse and produce useful information. In other words, the process of GIS is to input sets of raw data to produce useful output information. Despite the vast potential applications of GIS, the means of integrating the pervasive role and influence of the technology have not kept pace with the current developments and techniques. Put more simply, the use of GIS has not reached its potential because users are unaware of the possibilities for an integrated GIS in situations where spatial location is involved.

- b. FedEx uses predictive analytics to determine which customers will respond negatively to a price increase. If they incorporate GIS then they would be able to have a map of locations where people are stingier than others. They also use it to project additional revenues from proposed drop-box locations. By using GIS they can find future spots where they can make more revenue.

- 5. The Department of Defense (DoD) and the Pacific Northwest National Laboratory are combining predictive analytics with visualization technologies to predict the probability that a terrorist attack will occur. For example, suspected terrorists caught on security cameras who loiter too long in a given place might signal their intent to carry out a terrorist attack. How can this type of predictive analytics be used in an airport? At what other buildings and structures might this be used?
 - a. This could be used in airports the same way they suggested. Put up cameras around the building and if a suspected terrorist seems to be loitering or intending to carry out a terrorist attack, we can arrest them. Especially for an airport, if the system could pick up on traits such as how much luggage they may carry, what they wear and how long they stay in terminal. This could be used in museums, theaters, concerts, banks or important office buildings.

Case Study 2: Decision Support Is Good for Your Health

1. The system discussed in this case was a decision support system. However, other types of computer-aided support are utilized in medicine. Can you think of way that the medical profession could use AI system? For example, how about pattern recognition? Could that help in diagnosing illness?
 - a. Artificial Intelligence is a machine which can imitate human thinking and behavior. Yes, in medical profession AI system can be used for decision support or for the best solution for any diagnose. Based on case study Isabel is one of the AI system which assist b listing possible diagnose test list of test that can be performed and treatment options after we enter patient's symptoms.
 - b. Pattern recognition is one of AI application which is a field of research activity in which observation being made are classified and described. It is recognized pattern by clinical characteristics. It is mainly based on certain symptoms or signs being associated with certain diseases or conditions, not necessarily involving the more cognitive processing involved in a differential diagnosis.
 - c. This may be the primary method used in cases where diseases are frequently received, or the provider's experience may enable him or her to recognize the condition quickly. Theoretically, a certain pattern of signs or symptoms can be directly associated with a certain therapy, even without a definite decision regarding what is the actual disease.

2. A big worry in the collating and aggregation of medical institution is that the more access there is to person's medical information, the more exposed that personal information becomes. HIPAA (Health Insurance Portability and Accountability Act), signed into law in 1996, addresses the security and privacy of your health data. The law was enacted to try to ensure that medical records, electronically stored and transferred, would be protected. Do you think that making your medical records available to the various branches of the medical industry (doctors, therapist, insurance companies, hospital billing, etc) is, on the whole, good or bad? Why? Can you think of any instances where disclosure of medical information could cause problems for patient?
 - a. Good. Personal data of patient's which stored electronically and transferred among doctors, therapist, insurance companies and hospital billing will help the patients and people who involve to smoothly move.
 - i. Doctors: Before being diagnose doctors always wanted to know if the patient has previous history or any type of medical issues. By having the data electronically doctors will understand patient's condition and will

able to diagnose based on current illness. For example allergic to some medication, so that doctor can give alternate medication.

- ii. Therapist: follow up therapy at different branches will assist the therapist to check the last therapy so that redundant information collection not required.
 - iii. Insurance companies: Will able to see patients record to cover the bills and assist patients to cut down the steps such as for history of claims
 - iv. Hospital Bill: When a patient being send from one department or branch to another for any medical checkup or admission etc. will able to assist the employees to trace the record and transfer the billing to patients at the last branch or clinic.
 - b. When patients information being disclosure it could be problem to patients such as:
 - i. Medical study. Probably the patient being diagnose with strange cases and this could be medical study for interns but it will be uncomfortable for the patients.
 - ii. Security. Patients might think that their information is no longer secure with the hospital and many people knows about the problem and this can be end up for the patient to not get treated to the hospital again.
3. Could predictive analytics be a part of the HHC decision support system? If so, what sort of data would it analyze? What might it tell medical staff? Would it be useful only to those who are already ill or could it help healthy people? How?
 - a. Predictive analytics is an area of data mining that deals with extracting information from data and using it to predict trends and behavior patterns. It is can be part of HHC decision support. It will analyze the data which is related to clinical information from the database from different branches. It will able to tell the possible solution for the input of details we enter with the prescription. It will able to assist ill people or healthy as precautions. For the ill people it will able to tell us the possibility of the sickness and prescription that required for treatment. For healthy people it would be precaution for the individual to stay healthy.
4. A clinical study has shown that telemonitoring, discussed briefly in this case, helps in keeping down medical costs. In fact, monitored patients were hospitalized about half as often as those with the same illness who were not monitored. Emergency room visits were five times more likely among those who were unmonitored. What types of illness could be monitored this way (think chronic diseases like high blood pressure)? Would it make sense to use the system as follow-up care? How could the data be utilized to help those who might become sick in the future? Into what part of Isabel would the data fit?

- a. HHC uses telemonitoring personnel to track patients with chronic illness. Chronic illness required careful monitoring, however with thousands of patients with chronic illness unable to track in person all the time, thus telemonitoring plays vital role. Yes, it's make sense as the data which collected for certain time period will able to diagnose the conditions of the patient. Vice versa if the condition is good or bad both able to secure the patient's condition with the regular monitoring and based on the collected data.
 - b. With the collected data will able to assist doctors to identify or check the patient's current condition. With the change of result of the checkup which has done will show the doctors what is their current condition. Such as blood pressure, if it's getting increase that shows the individual is not in good condition. Same goes to diabetic patients where the reading is more than the benchmark.
 - c. Isable will able to fit at the recollection of the data of individual possible sickness and treatment or prescription based on the symptom. This is because Isable stored thousands of data from book, journal and other source together with previous cases and treatment. It will able to assist to take the next cause treatment for the existing individual.
5. Could an automated medical diagnosis system ever replace live doctors? Why or why not? Would you trust an experienced doctor over a database that you could query yourself? Why or Why not?
- a. No. Live doctors cannot be replaced by machines. This is because human is unique in way they have the experience of completing successful surgery at any cause though there is minor failures and misdiagnose. When comes to machines, there is some vulnerabilities which feels it is still not secure. Electricity supply, system corruptions, incorrect program and etc. If a surgery being operate by machine, what will happen to the patients when one of these vulnerability happens? It could end up patient's life in danger.
 - b. I would rather trust experienced doctor over database. In my opinion database is created by human. Human able to come out with the diagnose based on the research. The doctor has hands on experienced on the treatment which able to explain much better instead of database. It will only show what is the problem and possible diagnose and ways of treatment.