The Impact on Minority Backgrounds With the Use of Databases in the Hospital Setting

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CIS 105: Survey of Computer Information Systems
Introduction

• In almost every single business, institution, and organization, they utilize a database

• In a hospital, basic information is gathered about us in order to provide us aid and treatment, right?

• Well this is only ½ true. There have been occasions in which a healthcare provider has sold major corporations patient data, which lead to:
  • Data breaches by hackers and getting their hands on the data
  • Biased Algorithms
  • Discrimination

• How, then, could a database impact minority backgrounds in the hospital setting?
What Shall be Discussed?

• Databases
  • Basic Definitions
  • Organization of a Database
  • Structure of a Database
  • Planning and Developing a Database
  • Issues

• Ethics
  • Ethics in Computing
  • Ethics in Healthcare

• Hospitals
  • Existing issues

• Conclusion
Let’s start off with... Databases!
Basic Definitions

- Data can be organized in 5 different ways:
  - Bits
    - Smallest unit of data representation
    - 8 bits make up 1 byte, which can be used to represent a letter or special symbol
  - Fields
    - Grouping of letters and/or special symbols
    - Represent a characteristic or quality of some object, person, or place
  - Records
    - Represents a collection of characteristics that describe a real-world entity
    - Think of a record as multiple fields
  - Files
    - A group of related records
Organization of a Database

- **Sequential Organization**
  - Records are physically stored in a specific order according to attribute they contain
  - Time Consuming in Hospital Setting

- **Indexed- Sequential Organization**
  - All files and records are physically stored on a magnetic disk or storage device.
  - Each record or file has an index for reference
  - Runs the risk of the storage device failing

- **Direct Organization**
  - Direct access to records
  - Do not have to be arranged in any order
  - **Ideal Organization** in Hospital Setting
Structures of a Database

• Hierarchical Structure
  • Data is dependent on each other and can lead back to a root data

• Network Structure
  • Data can be connected to almost any single data value in some way
  • No root data

• Relational Structure
  • Data is stored in the form and represented as tables.
  • Tables are related if they contain a certain trait
  • Used for databases in Hospitals!
Relational Databases

- Relational Databases store data that can be related to one another
- Structured like a table of values; each row contains a unique ID called a key; each column holds characteristics of a data
- If each row and column have a value, then it is easy to establish a relationship between similar tables
- In a hospital setting, relational databases can be used to track patient information like treatments, results of treatments, and critical indicators of patient’s health (Campbell, 2004)
Planning and Developing a Database

• A database can be developed by using the Software Development Life Cycle.
  • A cycle used by software developers and computer programmers
  • This includes
    • Planning or Mapping out what should be in a database along with values and relationships
    • Analyzing and digging deeper of what is required
    • Implementation is when the design is set and has passed multiple test cases and is ready to be used
    • Maintenance is where bugs or errors are fixed every now and then and updates are sent out.

• The ones responsible for this come from the organization side (Data Administrator) and on the technological side (Database Administrator)
Issues

• Issues could arise in the Planning and Implementation part of the life cycle
  • Biased or Discriminatory intent towards a group when planning
  • An example would be a biased algorithm towards a specific group based on patient’s data
  • In Implementation and Maintenance, there are not enough qualified workers who understand how to work with the complexity of a hospital database.

• Essentially, it boils down to two issues which are human error/flaw
  • This leads to patients not receiving the proper care that they need along with not being treated equally due to a person’s perception of the patient’s data.
Let Us Move On to Ethics In both Computing and Healthcare...
Ethics

- Ethics involve the moral principles or values that take charge of our own behavior or when we do a certain activity.

Classical Dilemma
- Railroad track splits into 2 tracks. On one track there are 5 people tied down and on the other one there is only 1 person tied down. If you save group, the other will die.
  - Who will you save?

- There are ethics that we follow in almost every single activity or situation.
Ethics in Computing

• Data ethics encompasses the moral obligations of gathering, protecting, and using a person’s information and how it impacts individuals.

• Patients have the right to know how data is being used, stored, and/or how it is collected

• Software developers and computer programmers must provide data security and reliability

• Overall, being transparent!
Ethics in Healthcare

- Ethical issues arise when sharing sensitive patient information outside of the scope of the provider and the patient
  - This includes
    - Stigmatization
    - Discrimination in vulnerable populations
    - Law Enforcement Involvement

Example:
- In 2019, Avanir Pharmaceuticals was found guilty of bribing physicians to promote the use of the drug called Neudexta to older patients to help with their Dementia, but never actually helped.

Example:
- Again in 2019, the State of Pennsylvania sued the company of Purdue Pharma, who were alleged to have told certain physicians to promote the use of a deadly opioid, OxyContin, on the older population and military veterans.
How can Ethics be Held in the Healthcare Setting when It seems like no Ethics are being followed?

• Healthcare administrators are the ones who are responsible for recruiting, training, and supervising a facility’s staff members and creating a positive work environment

• All doctors and Pre-Med students must take Ethical course
  • Gain first hand experience when working in the field when interacting with different patients

• All the healthcare ethics revolve around the Hippocratic Oath
Let Us Finish with Current Issues in the Hospital Setting...
For those of minority backgrounds, they may have experienced these types of situations in the hospital:

- Noticing that the doctor or nurse behave differently around you such as being ruder
- Doctor not listening to your concerns and not giving optimal treatment plan
- Essentially, being treated differently than others
- And in general, the lack of interconnectedness between healthcare databases leads to a loss of time and leads to ineffectiveness
Issues with Interconnecting Healthcare Databases

- Issues/Challenges include:
  - Cost
  - Complexity of maintaining the patient’s data
  - Time required to compile all of the patient’s data when the patient has to receive different types of services in different locations where a different database is used
Issues with Bias and Discrimination in the Hospital Setting

• Issues:
  • Lack of diversity in most healthcare centers
  • Discrimination still persisted from ideologies that stem all the way to the 1800s
    • This includes biological differences between Whites and Blacks
  • Despite over 89% of hospitals collect race, ethnicity, and primary language, only 1 out of 5 hospitals use that information for quality improvement
  • Could patient data be protected and be given privacy?
Conclusion
So, now what?

• Actions Speak Louder Than Words

• Human bias and discrimination will never eradicated

• The problem must become transparent!

• Necessary Changes:
  • Allowing patient to be involved with their data, where it goes, and how it is used
  • HIPPA Laws should be changed to also protect patient digital data
  • Having guidelines in all educational institutions of how to deal with software development and database development in businesses and organizations
  • Make it a part of the curriculum that each college student must take a ethics course or a philosophy course
  • Encourage and offer opportunities minority backgrounds to be employed in Hospital or Healthcare Settings
To answer the question: How could a database impact minority backgrounds in the hospital settings?

It could impact them by making them believe that the value of their own life is lower than those around them...
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