

Data Analytics in Healthcare

Graduate Student Seminar (MSc Coop)



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Agenda

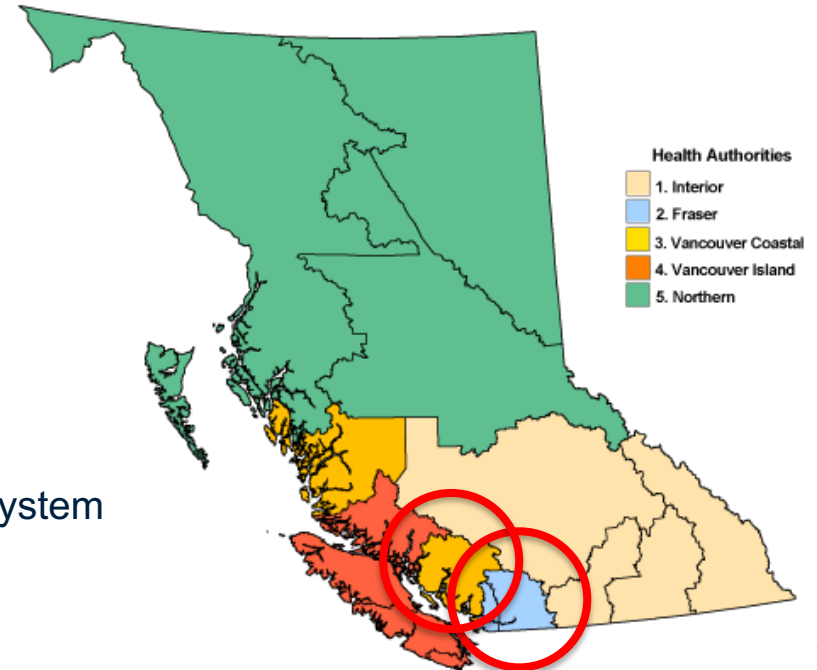


- **Coop Placement and Job Responsibilities**
- **Overview of Healthcare Data**
- **Type of Health Care Analytics**
- **Example Project**
- **Skills required for Healthcare Analyst**

Coop Placement and Role Responsibilities



- **Placement:** Fraser Health Authority
- **Team:** eSafety and Quality
- **Title:** Business Analyst
- **Duties:**
 - Analyze health data
 - Design and develop BI reporting solutions
 - Automate data entry into electronic health system



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Data Analytics in Healthcare



- **Descriptive Analytics**
 - Discover patterns or draw comparisons
- **Predictive Analytics**
 - Make predictions about the future
- **Prescriptive Analytics**
 - Identify specific actions an organization can take to reach future goals

Data Analytics in Healthcare – Example



Analysis of Length of Hospital Stay

Descriptive Analysis

Report on patients' LOS per service class

Predictive Analysis

Predict future performance on LOS to inform service planning

Prescriptive Analysis

Service planning on bed mapping and bed allocation

*LOS: Length of Stay

Example Project: Analysis of Clinical Course Completion



Background:

- New users of the health system need to take training course(s)
- Upon completion, supervisor will request module access for them

That isn't always the case!!!

Inquires from Clinical Specialists

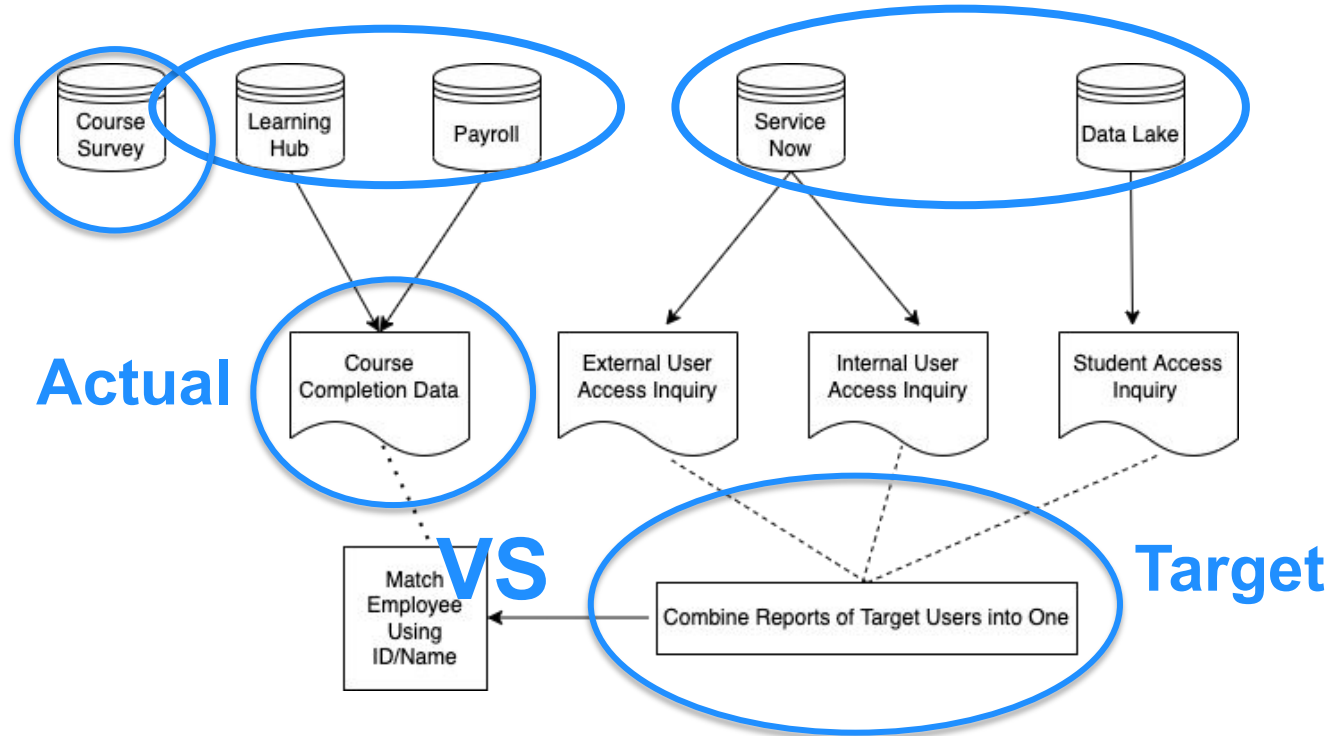


What happened?

- Evaluate the clinical course completion
- Investigate the discrepancies
- Suggest improvements



Acquisition of Data



Cleaning Healthcare Data



Challenges

- Complicated sourcing of raw datasets
- Inconsistent formats and data types
- Ambiguous data entry, especially **free-text** data

Solutions

- Regular data cleaning
- Techniques from NLP
 - Fuzzy matching, regular expression, sentiment analysis...
- Recognize the assumption and limitations

Develop BI Solutions

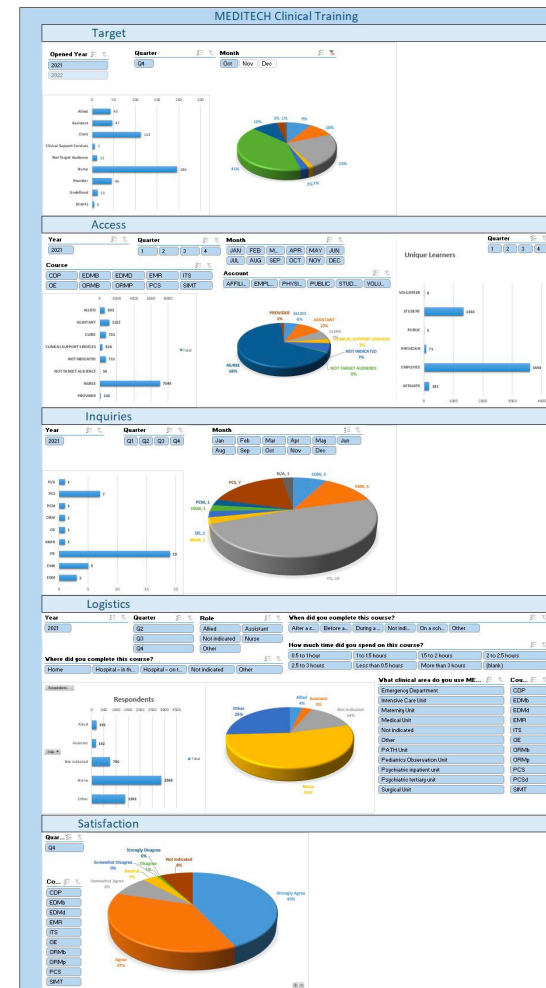


Course completion and access request:

- Course Type
 - Time of Course Completion
 - Clinical Role of User
- What
 - When
 - Who
 - How many

Post-training survey response:

- Course Satisfaction
- Training Location
- Training Duration
- Suggestion



Impact of Analysis



- Quantify the discrepancies between **target users** and **actual course completions**
- Discover the existence of **specific patterns** in terms of
 - Certain course
 - Certain clinical roles
 - Certain time
- Identify areas of **improvement** for training materials

Skills Required for Data Analyst in Healthcare

Technical Skills

- Database programming
- Data manipulation programming
- Reporting software
- Scripting language (optional)

Soft Skills

- Communication
- Research
- Attention to details
- Teamwork

Many thanks



- Fraser Health and the eSafety and Quality Team
- Professor Wu, Professor Chen, Professor Iqbal (Science Coop)
- Professor McDonald, Professor Coia (UBC stat)
- UBC and the BEST STAT DEPARTMENT!





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