ADOPTING HEALTHCARE BIG DATA IN SRI LANKAN HEALTHCARE SECTOR

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Outline

- Problem Definition
- Healthcare Big Data Perspectives
- Information Accountability and Measures
- Electronic Health Record (EHR)
- Methodology
- Finding and Arguments
- Research in Healthcare Context in Sri Lanka

Research Problem

Unstructured Data

- Office medical records
- Handwritten nurse and doctor notes
- Hospital admission discharge records
- Paper prescriptions
- Radiograph films
- MRI, CT images

Structured Data

- Electronic medical records
- Electronic health records
- Financial data
- Administrative data

Healthcare Big Data Perspectives

- Volume
- Complexity
- Diversity
- Timeliness

How to improve Information as a real time Decision Making Tool in Healthcare?

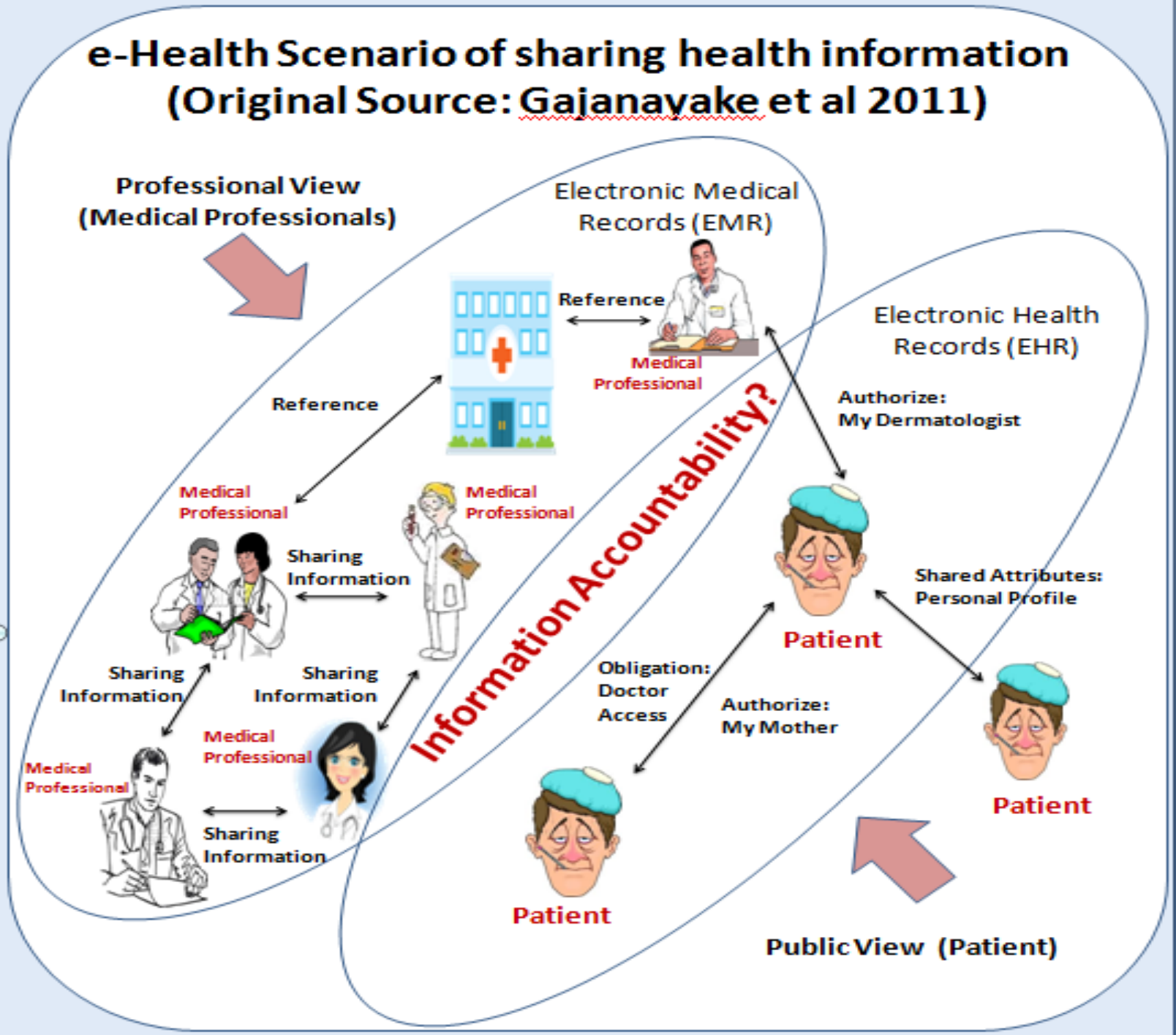
Information Accountability

- **Unstructured, narrative data provided by data sources qualify as healthcare big data**
- **Researchers argue that application of big data in healthcare might enable accountability and efficiency**

Information Accountability Measures

- Transparency
  - Demonstrate integrity
- Clarity
  - Avoid data ambiguity and controversy about interpretation
- Liability
  - Avoid danger

e-Health Scenario of sharing health information (Original Source: Gajanayake et al 2011)



Electronic Health Record (EHR)

- Key information resource for big data analysis
- Composed of varied co-created values
- Difficult to find a comprehensive set of guidelines to adopt EHR to fulfill the big data analysis requirements

Method

- Healthcare information sources and data migration will be studied for healthcare decision making
  - Conducting six to eight months' longitudinal studies with selected **private hospitals and government hospitals in Sri Lanka** to identify healthcare information sources and their transmission.
- Analysis of Information Accountability measures using
  - Predictive analysis
  - Descriptive analysis
  - Prescriptive analysis

Method

- Information Accountability Measures are implemented
  - Appropriate techniques, tools and algorithms are to be used to analyse the identified Information Accountability measures where applied to Healthcare Big Data accordingly.
  - Necessary authorisation of data usage including ethical clearance will also be sought appropriately.

Findings and Arguments

- This research would lead from the investigation of proper data extraction points from healthcare big data and application of information accountability measures to enhance the practicability of real time quality decision making in healthcare service deliveries.
- The prototype system would be tested in Sri Lankan Healthcare context.

How it will important to Sri Lanka?

- Improve quality of HC delivery
  - HC Decision making -Clinical decisions
  - Reduce cost of delivering HC services
  - Support wide range of Medical and HC functions
  - Disease surveillance

Challenges in Sri Lankan Context

- Lack of digitized and centralized data sources (EHR)
- No systematic data recordings (Scattered data)
- Hard to integrate different data sources
- Availability of co-created data
- Poor assistance for data collection

References

- Groves, P., & Knott, D. (2013). The —big data‖ revolution in healthcare, (January).
- Gajanayake, Randike, Iannella, Renato, & Sahama, Tony R. (2011). Sharing with care: an information accountability perspective. IEEE Internet Computing, 15(4), pp. 31-38.
- Grönroos, C. (2012). Conceptualising value co-creation: A journey to the 1970s and back to the future, 28 (December),1520–534.
- Hersh, W (2014). Chapter 3 Healthcare Data Analytics, 62—75pp. From: Hoyt, RE, Yoshihashi, A, Eds. (2014).
- Health Informatics: Practical Guide for Healthcare and Information Technology Professionals, Sixth Edition. Pensacola, FL, Lulu.com.

Thank You!