Querying Data Provenance in the Internet of Things

Argyro Avgoustaki, Giorgos Flouris, Irini Fundulaki. Dimitris Plexousakis

{argiro,fgeo,fundul,dp}@ics.forth.gr

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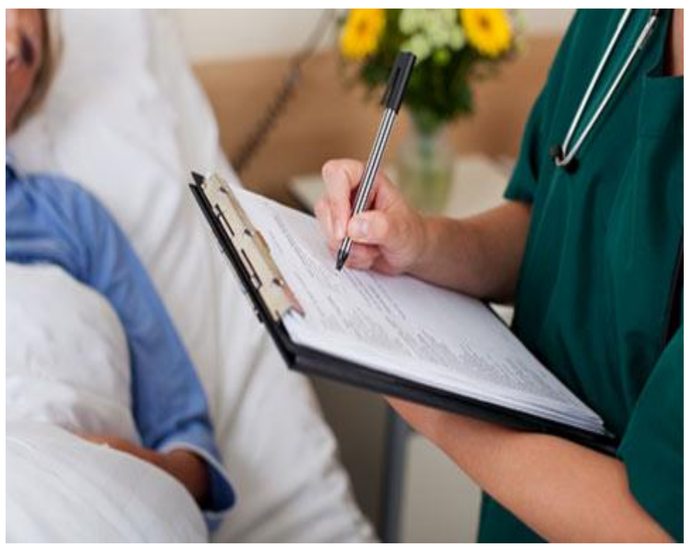
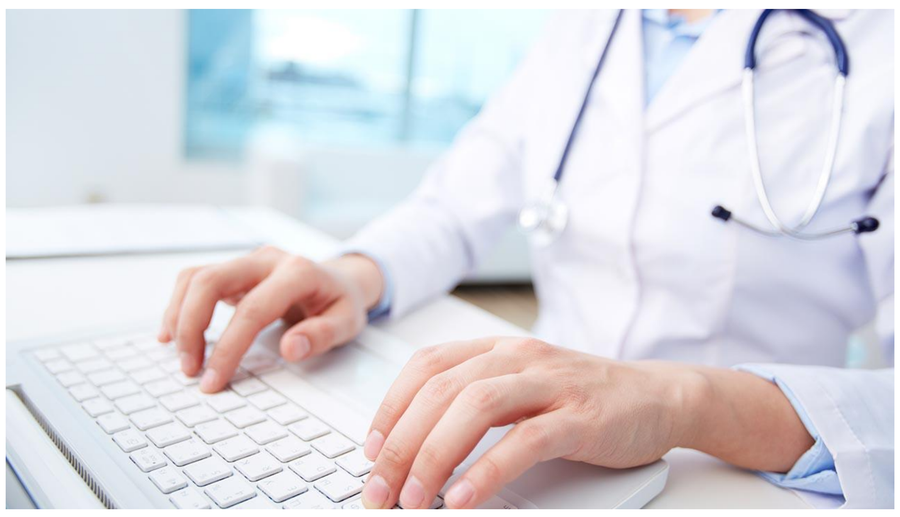
Do they look familiar to you?

Every time you "Like", "Share" or "Comment" a fake post you help a fraud to get wealthy! What if we could know about the trustworthiness of the post?

1 Recording medical history



2 Inserting medical history into the hospital database



1 million medical errors/year because of wrong data inputs due to human factor. What if we could know the reliability of people?

Why do we need "provenance"?

Nowadays, knowing from where and how data has come from is of crucial importance. Recording the *provenance* of data, i.e. their history, allows us to support applications such as:

- ✓Data Quality
- ✓Reliability
- ✓Trustworthiness
- ✓Copyrights
- ✓Access Control
- ✓Accountability

Our Work

Until now a great number of provenance models have been proposed. Thus, we are able to know from *where* and *how* each piece of information was generated. In our work, we introduce a query language (*ProvQL*) that is suitable for seeking information related to data provenance. ProvQL can answer queries like the following:

1. Which data records or sources contributed in deriving a data record?
2. Identify all data records whose provenance includes a specific data source (or data item)
3. Identify all sources referring to "Donald_Trump" that originate from a specific source
4. Assessing the trustworthiness of a data item

ProvQL Examples

- ✓ `SELECT PROV(?id) WHERE QUADS(?id) = (?a, ?b, "Donald Trump", ?n)` **(3)**
- ✓ `SELECT QUADS(?id) WHERE PROV(?id) CONTAINS ?v AND QUADS(?v) = (<a>, <b>, <c>, <d>)`**(2)**

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