Impact of the social networking applications for health information management for patients and physicians

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Impact of the social networking applications for health information management for patients and physicians

Presentation plan

- Background
- Problems
- Purpose
- Implementation
- Future work
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Background

One of the most visible trends on the Web is the emergence of Social Network Sites (SNSs), such as Facebook, LinkedIn, and Myspace, which provide **online services or platforms** that help users build social networks or social relations with others.

1. **Electronic bonds** make individuals **comfortable** with their behaviours.
2. **Multiple profiles** which are stored in different **Social Network Sites** (SNSs).
3. **Maintaining** these multiple online social network profiles is **cumbersome** and **time-consuming**.
Background

--Healthcare social networks

The social-networking revolution is coming to health care through online social networks that enable information sharing, collaboration and communication in the area of personal healthcare data (Domingo, 2010).

① Enabling healthcare information exchange (HIE)

② Simulating new social network accounts by sharing profiles

③ Facilitate updates for users by profile synchronisation

④ Maintaining healthcare sphere that can support health information management by patient-controlled integrator.
Most social network users hold more than one profile and utilise them in different ways depending on the digital context.

A user profile is a document describing an entity with details such as name, gender, avatar picture, but also things like favourite food, interests, or other attributes about one’s education, work, or health.
Problems

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Problems

- Most of the physician or patient social networks only pay attention to the user’s healthcare profiles which are stored in healthcare social networks.

- Factors, such as lifestyle, interests, exercise, interpersonal support, work environment, and job risk, can be used to gain a better understanding of a user's health background (Walker, Sechrist, & Pender, 1987)

- An Integrated Profile which contains basic, professional, and health partial profiles together, could meet current online health informatics demands.
# Problems

<table>
<thead>
<tr>
<th>Name:</th>
<th>Bob Swallow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email:</td>
<td><a href="mailto:bSwallow@example.com">bSwallow@example.com</a></td>
</tr>
<tr>
<td>Interests:</td>
<td>Mountain Climbing</td>
</tr>
<tr>
<td>Sports:</td>
<td>Basketball</td>
</tr>
<tr>
<td>Religious view:</td>
<td>Buddhism</td>
</tr>
<tr>
<td>Favorite Food</td>
<td>Burgers &amp; Coca</td>
</tr>
<tr>
<td>School name</td>
<td>Example University</td>
</tr>
<tr>
<td>Professional headline</td>
<td>Turbine Engineer</td>
</tr>
<tr>
<td>Position</td>
<td>Engineering-Gas Turbine Job</td>
</tr>
<tr>
<td>Description</td>
<td>Exposed to loud occupational noise for at least 5 months per year…</td>
</tr>
<tr>
<td>Height:</td>
<td>175 cm</td>
</tr>
<tr>
<td>Conditions:</td>
<td>Chronic Heart, Tension Headache</td>
</tr>
<tr>
<td>Allergies:</td>
<td>Nut &amp; Peanut</td>
</tr>
</tbody>
</table>

Bob’s complete profile

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Problems

However, social network sites are isolated from others.

Cannot share information between Facebook and GoogleHealth.

And......................!
High fat food may pose a big threat of heart disease, but loud noise in the workplace doubles an individual’s risk for heart disease.

### Problems (1)

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Problems (2)
--Profile residing in distributed sources (Multiple Profiles)

Maintaining these profiles is cumbersome, time consuming, inefficient, and leads to lost opportunity.

Create new profiles
Update Profiles
Delete Profiles

Social Web Profile (Iannella, 2009)

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Purpose

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Purpose

- How to obtain a more complete picture of the patients’ background so that health professionals can provide better, quality and informed health care decisions (e.g., e-Health!).
- How to simplify the management of patients/users’ multiple profiles (e.g., create, update, delete).
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We propose a framework for multiple profile management (MPM) of online social networks and showcase a demonstrator utilising an open source platform – Onesocialweb (OSW).
Social network sites are isolated from others.

Need ways to connect these islands.
• “We dream of a world where all social networks are connected and work together in a way similar to email.”

• “Our projects aims to define a language to bridge these networks and make it easy for social networks to join a bigger social web.”

JID: alice@wonderland.lit
Similar to email
Implementation

-----Multiple Profile Manager (MPM)

A framework for multiple profile management of online social networks and showcase a demonstrator utilising an open source platform – Onesocialweb (OSW).
The MPM Framework
(Simulation study)

References:

1. Liang et al., (2011). Online Multiple Profile Manager for e-Health Information sharing, IEEE, ICC Conference (eHealth), Ottawa, 10~15 June, Canada.

MPM Framework

- General Social Networks
- Professional Social Networks
- Healthcare Social Networks

- Integrated Profile (IP)
  - Basic Partial Profile
  - Social Partial Profile
  - Professional Partial Profile
  - Health Partial Profile

- Users
- Social Profiles
- Professional Profiles
- Healthcare Profiles

- SND
- MP
- MPM

- Read
- Synchronise
- Delete
MPM Framework

--IP and MP

Integrated Profile (IP)

- Basic Partial Profile
- Social Partial Profile
- Professional Partial Profile
- Health Partial Profile

Multiple Profiles (MP)

- Social Profile
- Professional Profile
- Healthcare Profile

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Prototype

Export/Print Integrated Profile

- Export the Integrated Profile (IP) including the basic, social, working, and health information data into a file in XML, Excel, or Word formats (Can be imported into other systems/applications).
- Print an IP Report which offers doctors a better picture of patients’ background.

The Integrated Profile Report makes it easier for users and their doctors to gain a more complete picture of his background. Therefore it helps health professionals provide better care for patients.
Prototype
Create HoogleHealth Account

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<table>
<thead>
<tr>
<th>Basic Information</th>
<th>Health Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Name</td>
<td>Blood Type</td>
</tr>
<tr>
<td>Birthday</td>
<td>Weight</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Conditions</td>
</tr>
<tr>
<td>Language</td>
<td>Test Result</td>
</tr>
<tr>
<td>Email</td>
<td>Allergies</td>
</tr>
<tr>
<td></td>
<td>Insurance</td>
</tr>
</tbody>
</table>

1. MPM Verification
   An authorisation token will be given to the LinkedMe Server for the access to the IP in MPM.
2. Send Request
   Extract Basic and Professional Partial Profiles form the MPM Server.

Login Dialog

Fetch the Profile from MPM Server

MPM JID: bob@mpm.com
Password: **********

OK | Cancel

Profile Details

<table>
<thead>
<tr>
<th>Blood type</th>
<th>Weight</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB+</td>
<td>80kg</td>
<td>180cm</td>
</tr>
</tbody>
</table>

Conditions: Tension Headache
Medications: Excedrin, Aspirin, Acetaminophen
Immunisation: Hepatitis B Vaccine, Adult
Allergies: Erythromycin Base
Insurance: Example Insurance
1. MPM replies with the Basic and Professional vCards.

2. MPM saves the LinkedMe Multiple Profiles Accounts (MPAs) into the database.

3. LinkedMe fills out the form automatically by matching the property names (LinkedMe profile \(\leftrightarrow\) vCards).

MPM Indicates a successful mapping of the profile item between the LinkedMe and the MPM profile. The item will be synchronised to the IP in the MPM.

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Prototype
Update Healthcare Profiles

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Prototype

Update Healthcare Profiles

Indicates the items which have already been updated or synchronised by the MPM Server.

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MPM PROTOTYPE ARCHITECTURE

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Conclusion

✓ Improve healthcare social networks which provide an active platform for storing personal healthcare data, sharing ideas, and debating treatment options (e.g, HIE).

✓ The proposed MPM can be applied in this healthcare social network platform to improve patient care (with Information Accountability).

✓ The MPM aimed and successful on simplifying the management of patients’ profiles

✓ And more importantly allow health professionals to obtain a more complete picture of patients’ backgrounds so that they can make better medical decisions.

✓ Privacy and Security: an on-going investigations and research based on BYOD and PbD {and "Semantic Profiles" [1] }
Future work

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Future work

- Security and Privacy (BYOD, PbD and Semantic Profiles)
- Individual may hold **more than one** name, contact address, phone number, etc. Thus, what is needed is the ability for a user to **control** what partial aspects of the profile they will expose to different SNSs
- **Practical and acceptable usability studies**
- "Semantic Profiles" (Iannella, 2009a)

The semantic profiles **capture the evolving changes** of a person’s social context. For example, the healthcare profile properties may capture health conditions and health risks based on a user’s actual discussion group and blog interactions on healthcare social networks such as **PatientsLikeMe** and **Disaboom**.
References