CSER Meeting (Fall 2012)

Personalized Environment for Smart and Effective Decision Support Service Integration

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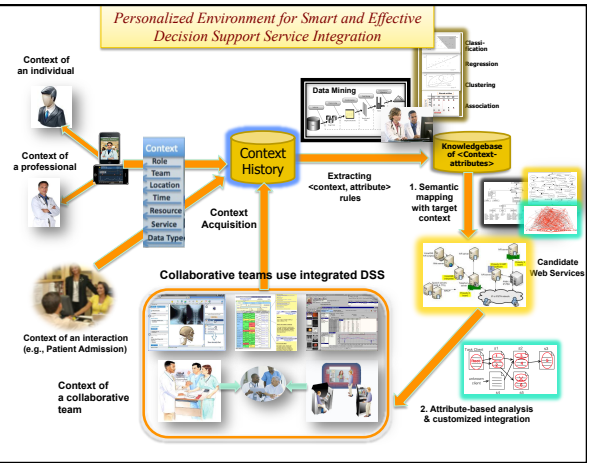
Motivation

- Enterprise web applications require extra knowledge and expertise from users to identify and use their features and services.
- On daily basis, individuals and collaborative groups make important decisions that affect their lives and professions, including: financial, education, job, health, purchase, living location, marriage, vacation, etc. They need assistance to make effective decisions.
- Time constraints and overwhelming amount of information cause users to select services that are not best fit with their tasks at hand and their contexts.
- New customizable expert agents can be utilized for different purposes in such an environment.

Effective Decision Support Environment

We present an intelligent service-based environment that provides effective decision support services for individuals and collaborative teams based on their contexts.

- Characteristics of the proposed environment:
  - Recognizes context of the users and provides suitable services.
  - Develops a context history and supports semantic mapping with the user context, as the first-stage of service selection process.
  - Performs an in-depth dynamic analysis of the candidate services for attribute matching purposes.
  - Uses customizable expert agents at client side that improve data privacy and reduce network traffic.



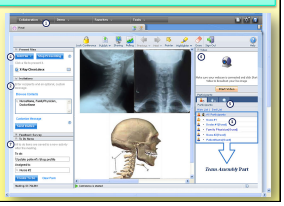
Individual & Collaborative Decision Support and Application Integration

- MedickIT system, IBM
- **Applications**: EHR; Map; Calendar; Medical search engine; SMS; Medical data analyzer.

- Addresses of doctor appointments can be pulled from the calendar and then be fed into the map for display.
- The appointments time can be retrieved from the calendar and sent as SMS reminders to phone numbers taken from the patient EHR.

- Healthcare application integration
- **Applications**: Collaboration widget; Invitation; List of team members; Document sharing; Chat; Video conferencing; List of

- Collaboration initiator sends invitation for online meeting by emailed to team members.
- Contact widget displays the list of available team members with their skill sets.
- Invitations are sent to the people with right skills.
- Online meeting or eConferencing allows the team to discuss and make collaborative decisions.



Challenges for Effective Decision Making (in clinical environment)

Clinical decision support system (CDSS) is a computer application that assists practitioners and healthcare providers in decision making through timely access to electronically stored medical knowledge in order to improve their medical practices.

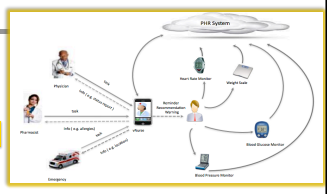
Requirements for effective decision systems:

- Assist to manage different types of overwhelming information and interrupts received at workplace.
- Save time and cost, easy to use.
- Maximal adherence with the user context.
- Provide seamless integration of services

Mobile Customizable Expert Agent

The agent receives instructions in four parts (called a task):

Task = <Schedule, Model, Knowledge, Data>



- **Customizable expert agent**: installed on client's smart phone and performs different tasks assigned by healthcare professionals.
- **Task**: an operation on the patient's health information to generate reports for both patient and healthcare practitioners (e.g., health reports, warnings).
- **Decision makers**: healthcare practitioners, no decisions are made by the vNurse.
- **Usability**: any healthcare practitioner with a basic level of computer knowledge can define tasks for the vNurse.

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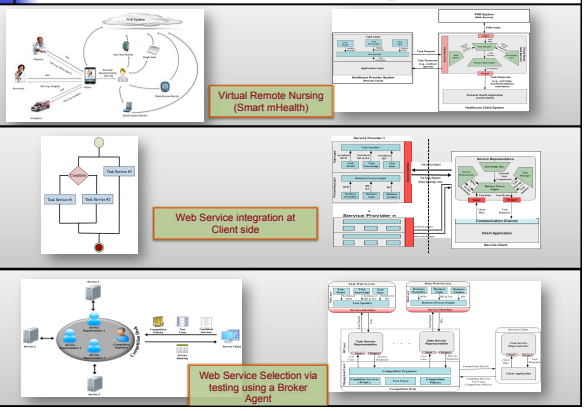
Applications of Client-side Customizable Service Agents



Conclusion

- We view "Personal Web" as an intelligent service-based environment that provides effective decision support services for individuals and collaborative teams based on their contexts.
- This approach requires facilities and infrastructure that are not yet available in large scales and for public use.
- A practical approach would be to develop a simulation lab to synthesize a small scale model of this environment to examine the effectiveness of the approach.
- The proposed approach requires close collaborations among service providers and service clients, as the services must be instrumented for dynamic analysis stage.
- As the number of the services and providers is fast growing, such analytical approaches will be required to control the non-functional qualities of the web service computing.

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