

Protocol of CaRR 2011 Discussion

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What is context?

The discussion of this problem already came up at RecSys 2010 conference, during the 2nd Workshop on Context-Aware Recommender Systems & Challenge on Context-Aware Movie Recommendation organized by Gediminas Adomavicius, Alexander Tuzhilin, Shlomo Berkovsky, Ernesto William De Luca and Alan Said. During the IUI 2011 Workshop on Context-awareness in Retrieval and Recommendation (CaRR2011) held in Palo Alto, California, USA, we continued this discussion finalizing this protocol to be shared in an open group on context-awareness.

In the following we finalize the results of our discussions:

The bottom line for building a system is: can we formalize context? Some years ago at the first IIX conference the question was phrased "What is not context?"

Speaking generally: everything is context. Some pieces of information are more salient, but this might differ.

Do we need context? Yes! The topic is going on.

We are not sure if a standardized formalization is important. It is better to stick to the old definitions. New definitions are not required. It is more interesting to focus on applications and domains. The question is: what kind of information can we put together to build cool stuff?!

Another way to ask it would be: what is relevant context? What pieces of information matter for the quality of a recommendation? Otherwise we will fall into a circular argumentation. However, it is also clear that pieces of information that do not change the result of a query/recommendation are not context.

Is context equal to situation? Is there only one context or do we have to distinguish between the user's context and the item's context? Tasks might be context.

Another way to „cut the cake“ might be like this: among all available pieces of information factual context (indisputable) vs. assumptions.

We can conclude, that we cannot say what is context in general. We can only answer these questions with a focus, e.g. depending on an entity, task or person. We have to put the object into question and name the entity: the context of WHAT?

Is context-awareness in retrieval and recommendation necessary?

Which benefits come from context-aware retrieval and recommendation systems?

Yes, there are definitely benefits! The more context data we have, the better! However, some questions arise:

- Can we measure the benefit of contextualization?
- Is it worth to add context?
- How do we evaluate ratings given in contexts?

One solution: evaluate multiple measures like task accomplishment (what can be measured, e.g. time, effort, usability measures), or measure of benefit (e.g. in terms of increased sales). The hardest part is – before we change something – to define WHAT we want to measure? Sometimes we can also use the users ratings. Interesting question: Can users help in evaluating? The user's speed and performance is important. Can we measure the user's satisfaction? We can also use things that the system gives back as feedback. However, we have to be aware of noise! User feedback is mostly noisy.

For instance, when we ask people how well they did a task, a star-rating is most likely biased. Another way of measuring would be, to use implicit data. The user does not need to interact, explicit rating not always needed.

How can we evaluate context-aware systems? What about data? Can we evaluate context-aware systems based on data? No general answer possible, it varies with the category of the recommended goods, e.g. for fashion the season plays a crucial role. We might tackle this problem with more meta-data.

How do we have to define content related to context? Is there a linguistic or semantic context? The linguistics of an item, e.g. a single article, does not change. As a result, are they no context? How does the linguistic context of a query relate to the linguistic context of an item, e.g. searching for "windows" during the week of the release of Windows 7 (glasses vs. windows 7). Can we incorporate twitter to analyze such short-term trends?

Could profiling of users help? Yes, e.g. user roles. This is important, but how to define? Since only Facebook is not enough, can we aggregate user profiles? What about privacy? Do social networks have some kind of inherent context (e.g. private content on Facebook, business content on LinkedIn)? Do people use social networks this differently? Maybe it is even finer grained and we have to separate groups of friends. Current social networks are more for posting activities than for asking for recommendations. Some people would only take the opinions of subset of their friends on Facebook for building up their own opinion e.g. whether to watch a certain movie or not. We might link those pieces of information available on different social networks to get a richer user profile.

How do user interfaces handle context?

The user interface is where context is applied in its essence. For instance, Google uses a lot of context information within their UI for search (esp. if you are logged in, e.g. location). Explanations on what pieces of context were used for estimating the result are important for the users' decisions.

Do we have to the differences between individuals count into context? Yes, since short term memory affects how well people perform in tasks. We should think in task orientation, and the interfaces should change according to search task (e.g. tag clouds for exploration vs. clustering of results for opinion mining). One problem rising is that people are shifting between tasks, but the interface should not change.

There are different ability levels. This refers to classic HCI problem: novice vs. experiences users, simple vs. complex. People generally don't like it when interfaces change, rational dialog models.

The underlying idea of context-awareness is, that people use the same software, but do things differently. The bottom line is, that current UIs handles context bad! Our community should collaborate with UX/HCI people. We should find a bridge to UX/HCI people.

In what ways can context improve HCI?

Exchange with UX/HCI required. We have to make our concepts easier and understandable. Example: CHI power tools (plugin for Adobe Photoshop)

One related conference: Information and Interaction with Context (IIIX), <http://www.iiix2010.org/>

How can we combine general- and user-centric context-aware technologies?

Is it like server-side (e.g. social context) vs. client-side (e.g. location)? One example: furniture chair vs. professorship chair.

We need enough data for statistical sound approaches. When we aggregate over everyone we have a general approach, when we have enough data we can be user-centric and personalized.

How should context affect the way information is presented?

Depending on the level of a menu that the user is currently in he is in different contexts.

What does happen when I want to watch a movie together with friends instead of the girl friend? How should the presentation be adapted?

The presentation of the pieces of context that were used for recommendation/retrieval can affect if people take recommendations into account or not (e.g. explaining the incorporation of the location: the city guide was recommended to you, since it is your first time in San Francisco).