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I-CAW: Intelligent Data Browser for Informal Learning on Cultural Variations in Interpersonal Communications

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Abstract. This demonstration will present a system, called I-CAW (Intelligent Content Assembly Workbench), which aggregates content from social spaces into a semantically-enriched data browser to promote informal learning. The work pioneers a new way to interact with social content using nudges (in the form of signposts and prompts) that exploit ontologies and semantically augmented content. The demonstration will offer explanation on the underpinning ontology, how cultural variations are handled, possible application domains and hands-on experience with I-CAW which has been populated with culturally-rich social content for learners wishing to explore variations in interpreting body language for interpersonal communications.

Keywords: Semantic Data Browser, Multicultural, Interpersonal Communications, Adult Informal Learning

1   Introduction

Trends and predictions (e.g. [1]) point out that social media will have a strong impact on learning in workplace, providing a huge resource for learning that may be unplanned and driven by circumstances – i.e. informal learning. With real life experiences frequently captured and reflected in social platforms, these user generated content can be particularly appealing as a source for informal learning of soft skills (e.g. communicating, planning, managing, advising, negotiating and so on which are highly demanded in the 21st century [2]).

  In today's increasingly global society, cultural awareness is a key factor in effective interpersonal communication and is particularly well-suited for informal learning. This demonstration presents a tool I-CAW (Intelligent Content Assembly workbench) which has been developed to use a culturally enriched and activity driven ontology to (i) semantically annotate relevant user generated content which are assembled from social media, (ii) scaffold the navigational paths for a user to explore the content in a meaningful fashion, and (iii) provide semantically-driven 'nudges' for a user to benefit from informal learning.

2   Brief Description of I-CAW

I-CAW is a semantic data browser for learning which combines key semantic technologies - semantic augmentation, semantic query, relatedness, similarity, entity summarisation, and ontology summarisation. Fig. 1 gives the main components.
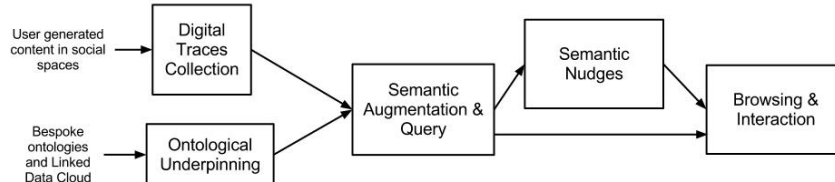

Figure 1. Main components of the Intelligent Content Assembly Workbench (I-CAW).

Digital Traces Collection. I-CAW supports users to browse user generated content including videos and comments from YouTube (linked within I-CAW) and personal stories. The digital traces are collected from the open social spaces (e.g. YouTube) and the closed social spaces (such as blog-like story telling environment).

Ontological Underpinning. An Activity Model Ontology (AMOn)[1] is developed by a multi-disciplinary team of computer scientists and social scientists [3]. The ontological underpinning for aggregation of content in I-CAW utilises AMOn, DBPedia and public ontologies. The ontologies are used by intelligent services for semantic augmentation, query and for designing semantic nudges as described below.

Semantic Augmentation and Query[2]**.** Unstructured or semi-structured user generated content is semantically tagged with ontology concepts, which is implemented using the General Architecture for Text Engineering (GATE). Semantic indexing is developed using semantic repositories converting the annotation sets to RDF triples. The mechanism for querying and browsing the semantically augmented content takes a focus concept (C_f) and outputs other concepts and content using a relatedness algorithm (deriving concepts linked via properties with C_f).

Semantic Nudges. I-CAW proactively suggests areas of exploration to learners in the form of *nudges* based on Sunstein and Thaler's choice architecture [4]. A nudge is any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options, and tries to influence choices in a way that will make choosers better off. In our analysis for mapping the choice architecture to semantic technologies, we narrow down to two elements of the choice architectures that are possible to be implemented using semantic technologies. These two elements are mapped to *signposting* and *prompts* and are the 'semantically-driven nudges' in I-CAW. **Signposting** are related to "default options" which usually most users will end up with. The semantic data browsers generally have information on a focus concept with a list of known facts from ontological knowledge bases. The presentation (signposting) of these facts influences the navigational path that learners take and facts

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[1] http://imash.leeds.ac.uk/ontology/amon/
[2] Details on services : http://imash.leeds.ac.uk/imreal/wp3/#services

they can read. "All Facts" show all the facts about a concept from the ontologies. "Key Facts" give a summary of a focus concept with fewer facts, and yet containing sufficient information for learners to quickly identify the concept. This provides immediate exploration space, generated using entity summarisation techniques [5]. **Prompts** provide non-invasive suggestions based on similar and/or contradictory learning objects. Similarity prompts use the subsumption relations, e.g. if the user explores content on 'nervousness', which is a negative emotion, a similarity prompt directs to content linked to other negative emotion like 'anxiousness'. Contradictory prompts are based on finding mutually disjoint concepts, e.g. if the user explores content on 'aggression', they can be suggested 'empathy' as positive and negative emotions are disjoint.

Browsing and interaction. I-CAW provides interface that incorporate the services and nudges and allows learners to search and browse relevant digital traces for interpersonal communications. *The demonstration[3] will offer hands on experience with I-CAW (an example screen shot is given in Fig. 2).*

Fig. 2. Sample interaction screen - exploring the concept 'nervous' using signposting nudges.

3 Key Contribution

I-CAW illustrates an original knowledge management approach that exploits semantic web technologies to meet the demands of an important domain – informal learning.

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[3] Demo screen cast available at: http://vimeo.com/user8051533/icawdemo

Semantic data browsers that combine semantically augmented data and ontological knowledge bases are being utilised in various domains (a recent review is given in [6]). Data browsers assume that the users are in charge of what they do when using the browser. This puts the cognitive onus on the user, and is particularly acute in the case of a user being a learner, i.e. who may not be familiar with the conceptual space in the domain and may be unable to decide what is the best course of action for himself/herself. Hence, directly adopting semantic web browsers in learning contexts would not be sufficient for effective learning environments – new intelligent techniques are needed to extend these browsers with features that facilitate informal learning. I-CAW presents a novel approach to extend semantic browsers with nudges in order to influence the choices users make and benefit learning.

It is acknowledged that this approach requires further consideration in terms of quality control of the content and what kind of information should be made transparent to the users (e.g. source of information).

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