INSPIRE: An Ontological Approach to Augment Careers Guidance

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Semantic web and information extraction technologies are enabling the creation of vast information and knowledge repositories which form large *knowledge graphs*. As the volume of such data continues to grow (e.g. in the form of RDF Linked Data), many applications take advantage of the exploration of the knowledge encoded in the graphs to augment human practice. However, layman users may not be aware of the full structure underpinning knowledge graphs, especially when the graphs come from several heterogeneous sources.

We are addressing this challenge by assisting:

- *knowledge integration* - we are developing light-weight ontology alignment techniques for integrating multiple related knowledge bases to extend the information available for users while still retaining tractability of querying and semantic reasoning; and
- *user navigation* - we are adapting earlier work from L4All/MyPlan (JUSC) and ImREAL (EU) projects to integrate automatic approximation and relaxation of users' search queries and semantic reasoning in order to generate paths with high utility.

Our case study in INSPIRE is the domain of career guidance, particularly *career transitions*. Although many sources of careers advice exist (school and university careers advisors; websites such as jobserve, Prospects, UK National Careers service; friends, relatives, peers and colleagues), when a person is at a particular career point they usually are unaware of the possible options and may not see longitudinal paths. For example, it may be hard to gauge the relevance of available information, the diversity of information sources may create a sense of 'being lost', it may take a long time to find useful information, and it may be hard to elicit longer-term career trajectories as opposed to just immediate possible next steps.

Our aim is to develop an interactive tool that can aid users' exploration of knowledge graphs by assisting them in identifying paths that will be beneficial for expanding their awareness of career options. Such a tool would have the potential to 'inspire' users to explore short- or longer-term career paths, through a combination of personalised ontological querying and reasoning over large volumes of real careers data, stored as Linked Data graphs. So far we are using two knowledge sources: the L4All RDF/S ontology arising from the L4All and MyPlan projects, capturing the work and educational experiences of lifelong learners; and a new RDF/S ontology we have designed based on the information published on LinkedIn. For the longer-term, our tool will be scalable and extensible with multiple knowledge sources.

At the UKON meeting, we will present our two ontologies, describe how they have been semantically aligned, and demonstrate the application of our techniques in several real usage scenarios, showing how people at different career stages might be helped in finding inspirational career paths.