

THE NEXT GRAND CHALLENGE FOR SEMANTIC TECHNOLOGIES: PLANET SCALE INFORMATION INTEGRATION?

INTRODUCTION

Every book ever written; every song ever sung; every movie ever made - available to everyone, everywhere. Universal access to the entirety of humankind's knowledge from every home, every valley, all mountains and even the middle of the ocean – what once seemed like a crazy vision is now close to reality. It is an achievement that was made possible by the Internet - an information system encompassing the planet that integrates all codified knowledge as well as enables instant contact to all experts worldwide.

Here I want to propose to take heart from the achievement to tackle other information integration challenges that seem similarly impossible: integrated and interlinked models of entire enterprises, the state of the art in scientific communities and all the laws governing our societies.

ALL THE LAWS OF A STATE

When faced with a fine perceived as unfair, a citizen will usually not be able to find relevant judgments from comparable cases in court. Sadly he or she will not be able to voice frustration to the people responsible for the law he/she has gotten into conflict with. Shamefully this citizen will usually not even be able to find and read the relevant law and the relevant implementation guidelines. Shamefully and utterly unnecessary: there isn't a reason in the world that not every ticket includes a link to a page with the relevant laws that are interlinked with relevant provision, judgments and parliamentary deliberations. For that to become reality, however, states have to take the bold step to make the open access to this information and its machine readable meta-data mandatory.

AN ENTIRE SCIENTIFIC FIELD

It is now possible to build models of such size and complexity that they can (and do) reflect the state of the knowledge of an entire scientific community. In some cases these models can be so elaborated that computers can 'execute' them – e.g. enabling a drug researcher to see the effects a particular chemical component on a simulation of the heart reflecting the aggregated knowledge from thousands of scientists. Or enabling school children to walk through a virtual representation of Rome - build jointly by hundreds of scientists and enthusiasts, interlinked with provenance information, scientific articles and petabytes of scientific data. Such integrated model of scientific fields offer tremendous value in a world where the scientific community grows ever more specialized and many solutions rely on applying knowledge from many domains.

AN ENTIRE ENTERPRISE

In the world of business software systems we are already witnessing the integration of the formerly separate fields of business software (e.g. business rule management systems and business process management systems). However - taking a long view - these are but timid steps in the direction of the natural endpoint of integrated business planning supported by the Holistic Digital Enterprise, an integrated digital model of an entire enterprise. This Holistic Digital Enterprise will not stop at purely mirroring the state of an enterprise, but it will be backed by AI systems that use machine learning algorithms to permanently predict the future development of all businesses parameters, continuously learning from their actual development; informing decisions with these predictions and alerting people to sudden deviations of values from expectations.

CONCLUSION

The Internet has enabled humankind to globally integrate all knowledge into one interlinked network and thereby make it accessible everywhere to everyone. In the next decade we should use it as an example to tackle similarly challenging integration problems - creating integrated and interlinked models of entire enterprises, the state of the art in scientific communities and all the laws governing our societies.