Business success: knowing the rules and making them work

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Businesses may be run by people, but they have to follow rules. An EU-funded project is using semantic techniques to help businesses identify and adapt more easily the rules behind their operations.

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If there was ever a single 'secret' to business success, it was probably stated by Socrates some 2500 years ago: 'know thyself'. To maintain its success and improve its competitive advantage, every business must understand the details of 'what makes it tick', from how new products or services are developed to gathering and using customer feedback.

Thanks to powerful software systems, organisations can churn through data, analyse business processes and document the rules people must follow to comply with legislation, improve customer satisfaction and generally ensure that the organisation performs well.

Businesses use knowledge management systems to record all the rules that govern the work people have to do; often the rules are so complex that it would be impossible for individuals to be able to do their job properly without the guidance of the knowledge management system.

But most knowledge-based systems deployed in organisations today are tricky to set up and use; it is difficult to maintain the rules, adjust and tweak them as legislation changes or the business responds to competition or develops new working methods.

A complicated business

'The problem with knowledge-based systems at the moment is that they are encoded by knowledge systems experts,' explains Christian de Sainte Marie from IBM, France. 'It can be extremely complicated to identify and document rules in the first place; then you have to actually write the computer code which will implement these rules through the business.'

'Knowledge-based systems are difficult to manage and maintain because they require the expertise of

statisticians and data analysts, people involved in operations and customer-facing roles and technical computer programmers,' Mr de Sainte Marie continues. 'There are lots of different people, each with their own specialist expertise and knowledge.'

Mr de Sainte Marie coordinates the EU-funded 'Ontologies meet business rules' (Ontorule) project which was set up to give business experts more ownership of the rules, helping them to capture and implement them across the business, without requiring the expertise of software programmers, for example, to turn rules into computer code.

'The idea of the Ontorule project is to separate out knowledge from its implementation,' Mr de Sainte Marie explains. 'At the moment the business experts, who are most aware of how the business operates and the constraints on its activities, have to somehow communicate this knowledge to IT experts, who then have to work out how the rules are expressed within software systems. We believe that by using highly defined vocabulary with agreed meanings, known as ontologies, we can separate out knowledge from rules, and the representation of the knowledge from its IT implementation.'

The Ontorule project is helping the relevant people in the organisation to manage and maintain ontologies, business rules and data models separately, without having to worry about how to communicate their work to others.

Make up rules... like a natural

One of the biggest challenges is to translate policies, legislation, statistical analyses and the strategic planning of a company's executive board, for example, into concrete, unambiguous, rules. The knowledge is often expressed in documents (legal texts, minutes of board meetings, etc.) written in prose.

Ontorule has applied natural-language processing technology to help business-knowledge experts formulate ontologies and express rules based on the text in documents. The natural-language processing software analyses texts, looking for key phrases, grammatical constructions and other features of a document to identify candidate rules; a business expert can then pick appropriate rules from the candidates and refine them, still using natural language and not having to worry about how they will be implemented in code.

'With this natural language processing, we have been able to suggest rules which are specified sufficiently precisely that there is little or no room for interpretation by the specialist who has to translate rules into computer-executable rules. This is quite a step forward, although the full automation of rule extraction from natural language is still a long way off,' Mr de Sainte Marie remarks.

The Ontorule business knowledge ontology brings together abstract business knowledge and concrete operational rules into a single domain. Experts in rule implementation and business strategy and compliance can effectively work from the same knowledge bank, thanks to the way an ontology organises knowledge in a highly structured and unambiguous way.

The Ontorule platform makes use of 'Semantics of business vocabulary and business rules' (SBVR) which is an internationally agreed standard for the high-level formalisation of business vocabulary and rules. It is close to natural language (making it understandable for business knowledge experts) but also close to 'Web ontology language' (OWL) which is understood by experts in formulating and implementing business rules.

'Ontorule builds on the SBVR bridging format,' says Mr de Sainte Marie, 'that goes from the natural language description of a business and what it does to the highly structured and defined version of this description in an ontology. From this ontology you can then develop specific, useable business rules.'

Rules for the real world

The Ontorule technology and methodology has been tested in two prototype systems, one in Audi's design department in Germany and another in a steel galvanisation plant belonging to ArcelorMittal.

ArcelorMittal use an expert software system to analyse the quality of its galvanised steel coils and assign which coils can be shipped to specific customers or whether they need repairing or recycling. The Ontorule system will be used to capture all the rules involved in this process - not just those ones programmed into the expert system, but all the other constraints, policies and contexts affecting the final shipping decision. Once the rules have been captured they can be implemented and adapted by other ArcelorMittal plants around Europe.

Peter Rosina has helped to test the Ontorule system in Audi's R&D department. 'We are using ontologies and business rules to capture and analyse some of the knowledge in our department,' he explains. 'During the project we were able to model business knowledge that we had never managed before using other systems. I can say for sure that using Ontorule technology to maintain our business knowledge is saving us time and reducing "digital waste". We do not maintain our business knowledge in a spreadsheet anymore, but in one centralised place where it is easier to store, monitor and update this knowledge to improve the processes within our design labs.'

The Ontorule project received EUR 6.1 million (out of a total EUR 10.2 million project budget) in research funding under the EU's Seventh Framework Programme (FP7), 'Information and communication technologies' (ICT) theme.

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