Logic engine's Logic

Some important decisions and why when we make Witmate

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Abstract

This article explains some important decisions and the reasons why we made these decisions, when we design and implement Witmate Logic engine (http://www.witmate.com/).

Simple Logic language vs. GUI

Witmate offers Simple Logic language (SL), a human friendly logics definition script, to application field experts and software developers to define logics. GUI (Graphics User Interface) is a popular user interface type, and makes software look cool. It is good for beginners to start using a new tool. But at most situation, a well-designed script is more effective on a real world jobs than GUI for experienced users. Even for beginners, a script that has logical concept and structure is easier or at least is not more difficult than a GUI. Witmate Simple Logic language has very simple and easy understandable language structures, and an almost free writing style. Beginners or experts of SL can take any way they like to write SL.

Normally, logics in real world systems are very complex. Logics printed on one paper can include more information than a GUI screen, and they are more readable for people. Concerning software development management, a printed hard copy of system documents with customers' sign is the important part of contract. SL can be easily printed to be attached in the contract, but GUI does not work for this.

Even so, Witmate provides Simple Logic Markup Language (SLML), a machine friendly XML format, to keep the possibility to extend a GUI for Witmate by our team or our partners in the future.

Simple Logic language vs. Natural language scripts

Natural language script is a very hot research field from many years ago. Unfortunately, most of them are failed. We think the most important reason is that it is still a hard problem to express logics clearly enough to be understood by machines with natural language.

In the international environment today, most of developers and application experts do not speak in English, so the "natural" never make them feel good. "if a > 10 Then return 1" is much easier for them than a natural one, as "Echo value 1, when variable a is greater then value 10".

Witmate only reserves very few key words that is so simple, even for developers and

experts who do not speak in English, as IF, THEN, LET or RETURN.

WitStream vs. Object serialization

WitStream, an ASCII based logic format, is offered by Witmate to transport logics through networks and save/retrieve logics with storages. Object serialization strongly lies on the middleware implementations and is difficult to customize for different applications. Most of object serializations generate binary streams which are not compatible with all storages and network channels. For example, e-mail protocol is a typical text based channel. Even it can be used to transport binary data, but that need additional process power to encode/decode data into text. WitStream is optimized for logics definitions, and avoids all problems of binary streams.

ASCII based WitStream can be easily processed and verified by any simple text script tools, or even checked by people eyes whether mistakes happened on networks transportation.

Printed hard copy of WitStream is the last method to back up important system, and retrieve quickly by any OCR tools.

WitStream can be compressed effectively, if required. Because optimized compress algorithm for ASCII contents is included in all compress tools.

Witmate vs. Logic Programming

Logic programming is a technology field close with logic/rule engines, so peoples even look them as same thing or try to use logic programming tools to implement logic engines some time. But, from start point, they are different. Logic programming try to use attributes based, non control flow language to program computers. Logic engines do not try to do so big, they just wants to be associates of programmers to manage logic separated with other programs. So we call Witmate, mate of your wit.

Logic programming got many successes in AI and natural language processes applications. Then they go too far to replace other general program languages. That is impossible, because computers are working on flow control pattern, not logic programming pattern. To fill the gap logic programming languages, like Prolog, are plugged into many things. But more things are plugged, more difficult to use them, since those things aren't compatible with the concept of logic programming, and made languages too complex.

Another problem of logic programming is that most of logic programming languages chose very special syntax. They are unreadable for programmers or application field experts and difficult for software maintenance.

J2me platform support

Not like most of open source and business package of rule engines are heavy systems, Witmate is executable from j2me to j2se/ee to support the most multiple platforms. We believe logic/rule engines are not only to support high level business rule matches, but also a daily tool for software development in any applications. Even we just think about mobile devices, a logic/rule engine still a very effective tool for these thin devices. Because updating process logics only avoid the total application update that is much more difficult task on these devices than on standard platforms.

Through providing a shareable engine in thin devices, it is possible to more effectively use limit resources.

SL+SLML+WS logics description formats

Different with other engines, Witmate provides 3 formats to describe logics, Simple Logic language (SL), Simple Logic Markup Language (SLML) and WitStream (WS). Other engines normally only provide one language for logic definition. Some engine provide script language that work well for human to define logics, others provide XML based language that is good for logics exchange between computers. Since Witmate is designed as a daily tool and support multiple platforms, only one language can not be the best for all platforms. So Witmate not only provides SL for human using and SLML for computers exchange/process, but also provide WitStream, an ASCII based compact format, for storages and mobile/wireless network transport.

SL+SLML+WS give Witmate another very important advantage by that construct a logic/rule broadcast system. With this system, people define logics with SL, system exchange and collect data with SLML, and WS is used to send logic to devices and storages.

Logic set firing & reference

Complex logics always can be separated into sub sets or levels. The relations of these sub sets or levels are expressed by logic set firing or reference. Sub sets can be managed by separated teams to make system management easier.

Witmate can be used as work flow controller with logic set firing feature.

Only one Else in One logic set

One logic set should be a set of continuous logics for a certain topic. ELSE append on IF-THEN will break the continuity. So in Witmate, there only is one "ELSE" in one Logic set. This feature leads programmers and experts to define their logics in a continuous thought.