A Domain Specific Language for Usage Management

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ABSTRACT

In the course of this paper we will develop a domain specific language (DSL) for expressing usage management policies and associating those policies with managed artifacts. We begin by framing a use model for the language, including generalized use cases, a loose ontology, an general supported lifecycle, and specific extension requirements. We then develop the language from that model, demonstrating key syntactic elements and highlighting the technology behind the language while tracing features back to the initial model. We also compare and contrast this DSL with others developed for rights management (e.g. Ponder). We then demonstrate how the DSL supports common usage management and DRM-centric environments, including creative commons, the extensible rights markup language (XRML), and the open digital rights language (ODRL).

Categories and Subject Descriptors

H.4 [**Information Systems Applications**]: Miscellaneous; D.2.8 [**Software Engineering**]: Metrics—*complexity measures, performance measures*

General Terms

Theory

Keywords

DRM, usage management, software architecture

1. INTRODUCTION

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1.1 Previous Work

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2. LANGUAGE MODEL

Language model

2.1 Expected Use

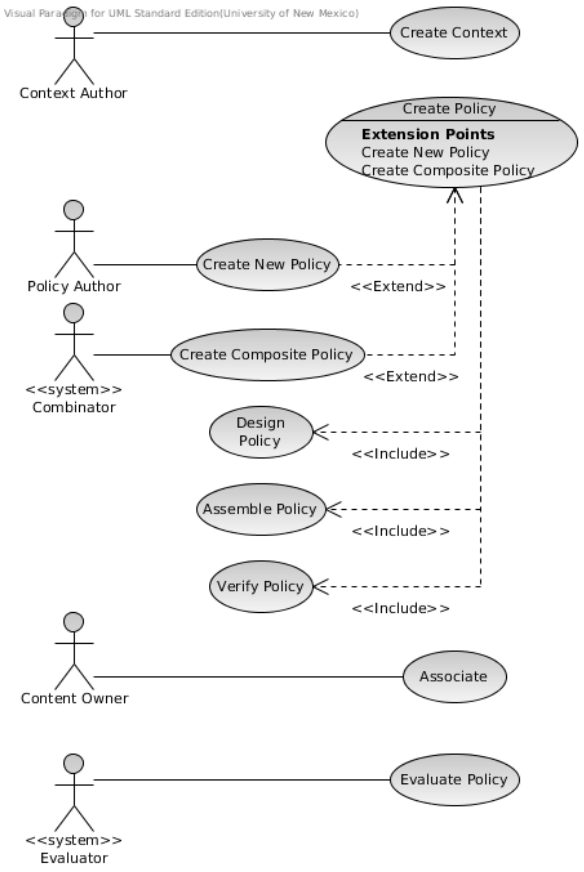

Figure 1: General DSL Use Cases

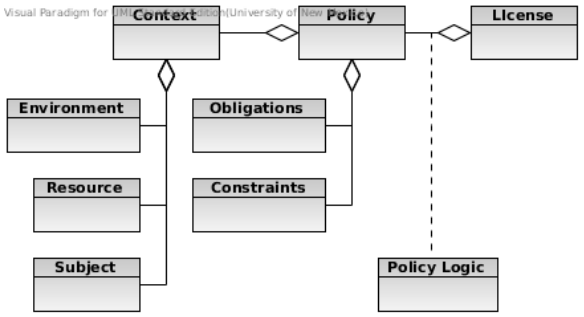

Figure 2: Basic Language Ontology

In order to develop the appropriate DSL giving users the power and expressivity they need to easily express usage management concepts, we begin by developing a model describing how we expect it to be used, and by whom, identifying key functional and non-functional characteristics. We use roles codified as actors to identify the primary user base, and link those roles to specific use cases we expect to be common in day to day DSL use. We also identify common inputs and outputs from expected activities, and show how those input and output elements are related. We finally specify the essential core structure of the DSL, as well as extension points and default implementations of those points.

2.2 Domain Ontology

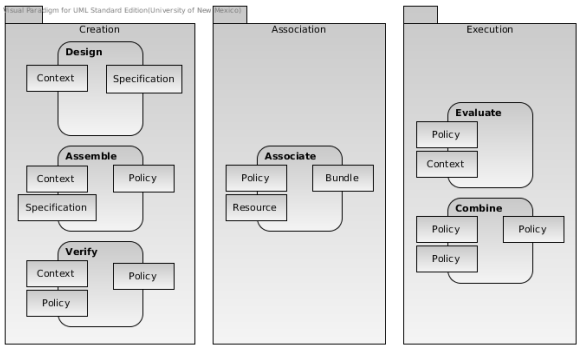

Figure 3: Policy Development Lifecycle

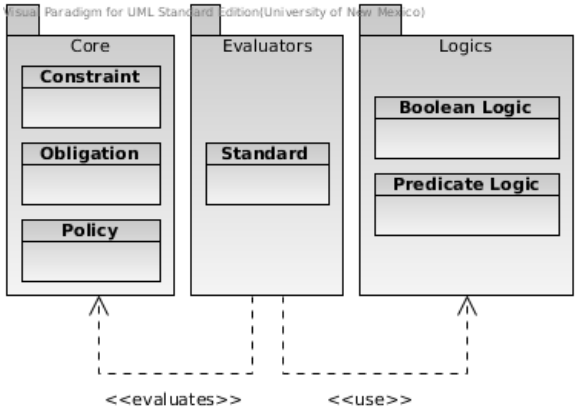

Figure 4: Language Elements

2.3 Envisioned Lifecycle

2.4 Language Components

3. LANGUAGE

Language implementation

4. APPLIED

Application section

4.1 Creative Commons

Creative commons applied

4.2 XRML

XRML applied

4.3 ODRL

ODRL applied

5. CONCLUSIONS AND FUTURE WORKS

Conclusion & future works

6. REFERENCES