MODEL-BASED APPROACH FOR NATURAL LANGUAGE GENERATION FROM SEMANTIC VIRTUAL ENVIRONMENT

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PLAN

- Introduction
- Linguistic properties of UML model elements
- Semantic Relationships
- Generating NLG
- Conclusion

INTRODUCTION

Motivation

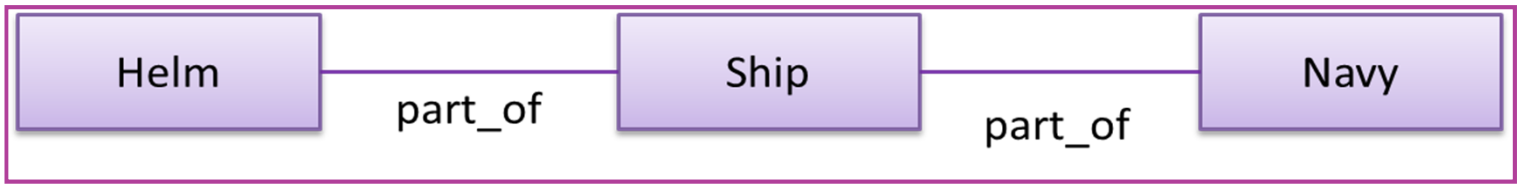
- Use of semantic VE as source of knowledge for conversational agents

- Generating gramatically correct and unambiguous sentences needed for users to emerge into VE
- A very few attempts are made for the natural language generation (NLG) from the model of VE

INTRODUCTION

Issue

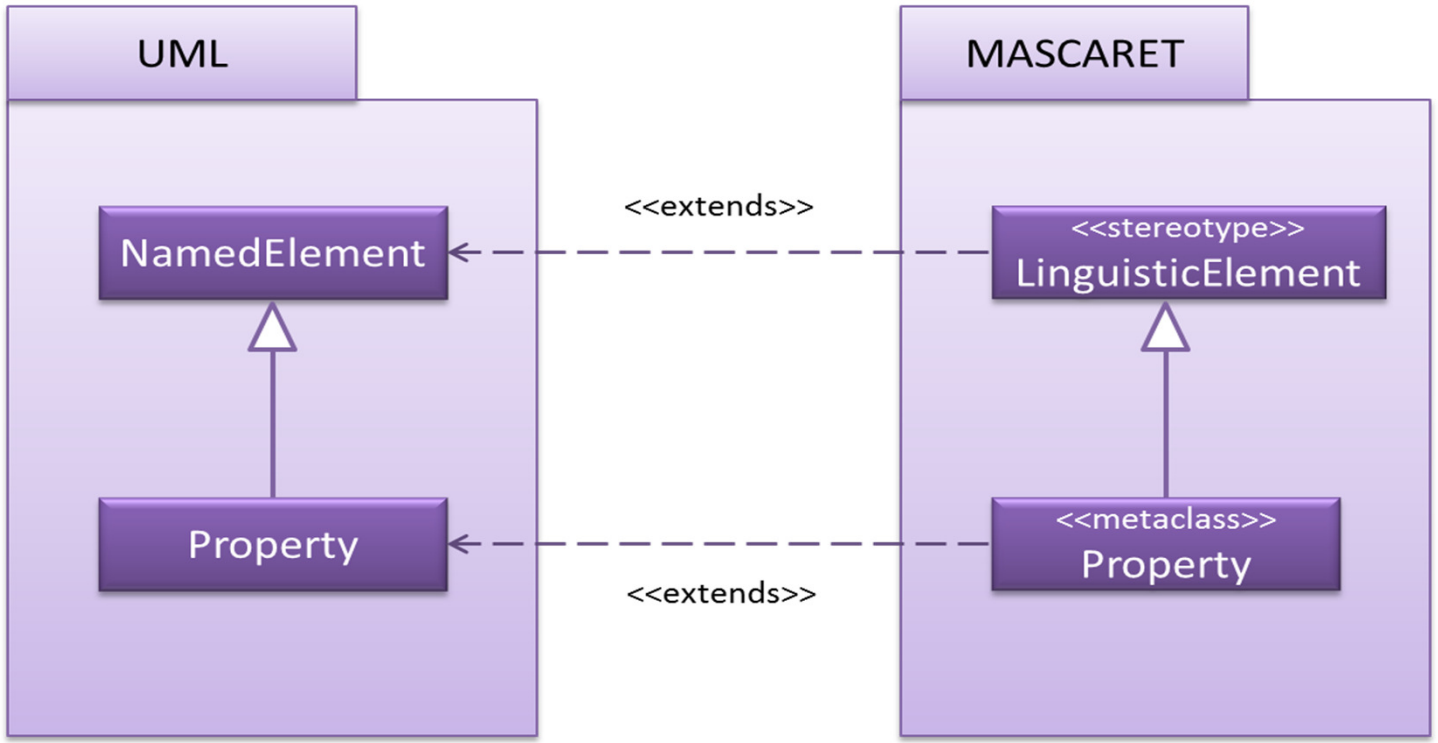
- Existing conceptual models of VE fail to include NL properties
- UML does not provide built-in features to include Linguistic properties
- Semantics of associations in UML are not sufficient for clear and unambiguous interpretation of relationships



Semantics of UML associations do not fit exactly the Needs of NLG

LINGUISTIC PROPERTIES OF UML MODEL ELEMENTS

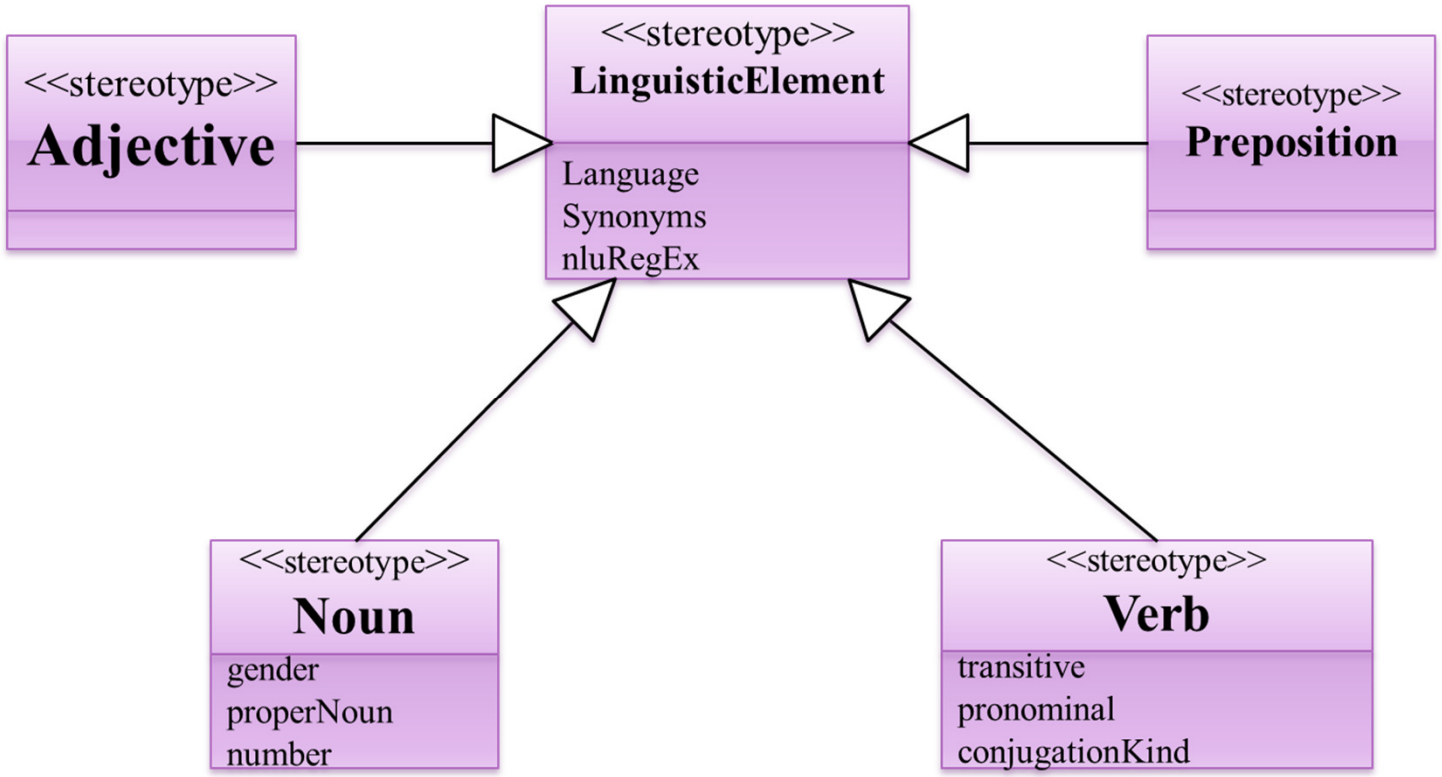
Extending UML in MASCARET[1] Profile



[1] Pierre Chevaillier, Thanh-Hai Trinh, Mukesh Barange, Frédéric Devillers, Julien Soler, Pierre De Loor, and Ronan Querrec. Semantic modelling of virtual environments using MASCARET. In Proc. of SEARIS, in conjunction with IEEE VR 2011, Singapore, 20 March

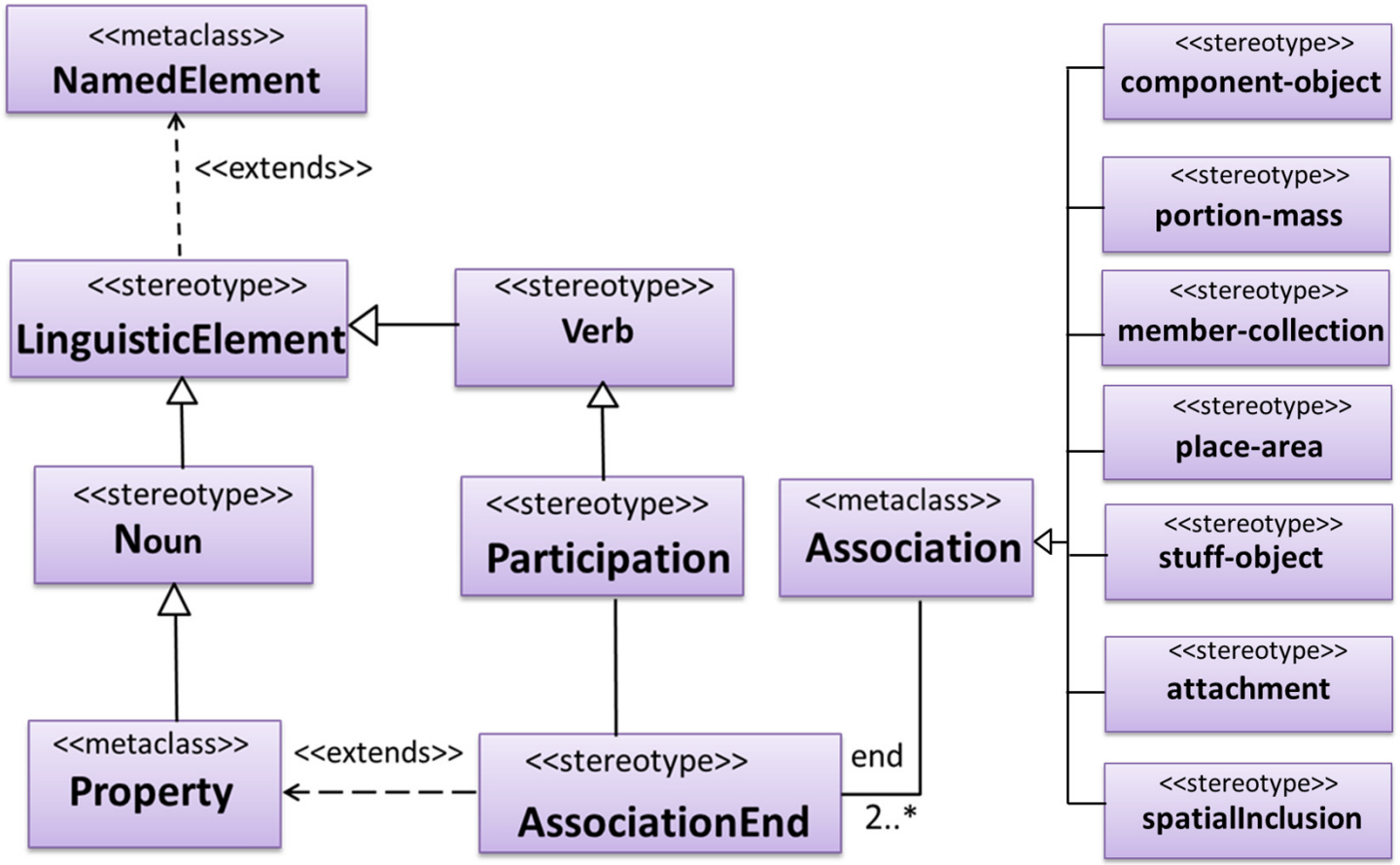
LINGUISTIC PROPERTIES OF UML MODEL ELEMENTS

Stereotypes of Linguistic properties



SEMANTIC RELATIONSHIPS

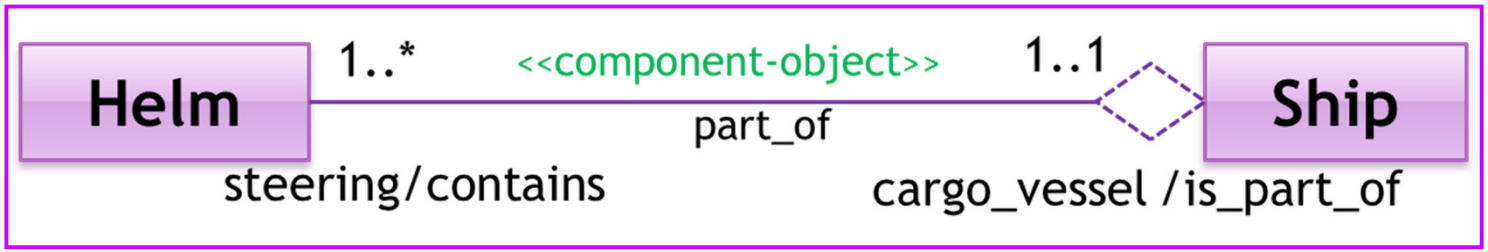
Stereotypes of Association [2]



[2]Morton E. Winston, Roger Chaffin, and Douglas Herrmann. A taxonomy of part-whole relations. Cognitive Science, 11(4) :417-444, 1987.

SEMANTIC RELATIONSHIPS

Component-object type of «part_of » relationship



GENERATING NLG

Desirable properties of a Conversational Agent [3]

- Do not deliver all information related to the context at once
- Do not deliver the information at once so as not to overload the user information

Information-Retrieval protocol

If the Agent is processing the concept for the first time

focus on Novelty

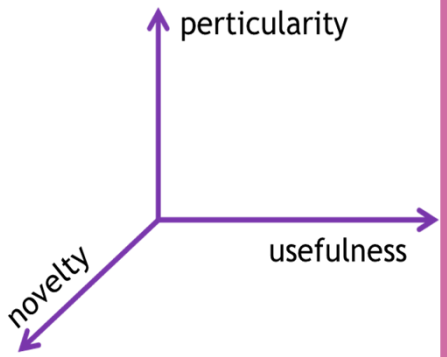
focus on Usefulness

else if the Agent has already talked about the concept

focus on particularity

else if (! explained(Detailed description))

generate summary or explanation of concept



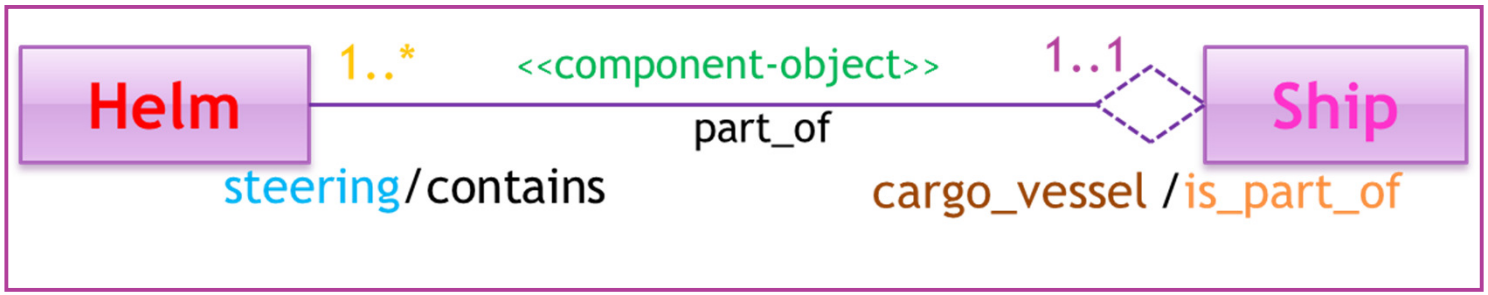
[3]H.P. Grice. Logic and Conversation. William James lectures. Harvard Univ., 1970.

GENERATING NLG

Generating from Associations

Template:

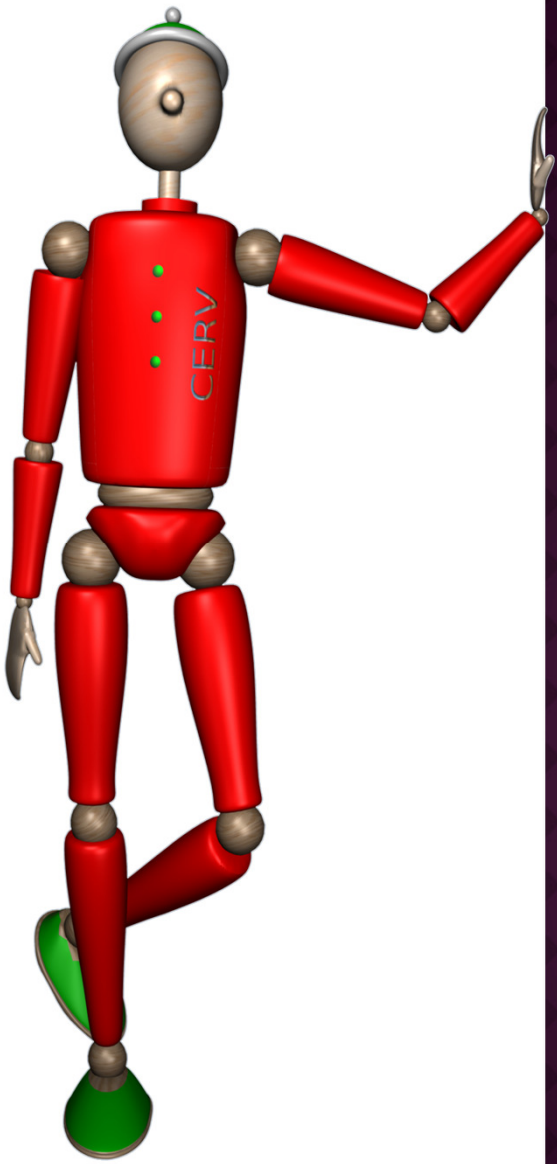
<q1><inst1>{assoEnd1}<partRole2><q2>{assoEnd2}<inst2>



A helm which is a steering is a part of cargo vessel that is a ship.

CONCLUSION

- Conciliated Linguistic point of view in a consistent unified modeling framework
- Proposed extension of UML for clear and unambiguous linguistic interpretation of Conceptual VE by Conversational Agents



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THANK YOU

Mukesh Barange

REFERENCES

1. Pierre Chevaillier, Thanh-Hai Trinh, Mukesh Barange, Frédéric evillers, Julien Soler, Pierre De Loor, and Ronan Querrec. Semantic modelling of virtual environments using MASCARET. In Proc. of SEARIS, in conjunction with IEEE VR 2011, Singapore, 20 March 2011.
2. Morton E. Winston, Roger Chaffin, and Douglas Herrmann. A taxonomy of part-whole relations. Cognitive Science, 11(4) :417–444, 1987.
3. H.P. Grice. Logic and Conversation. lectures. Harvard Univ., 1970.
4. Joerg Evermann. A cognitive semantics for the association construct. Requirements Engineering, 13 :167–186, 2008.
5. Vede C. Storey. Understanding semantic relationships. The VLDB Journal, 2 :455–488, 1993.