SERIOUS PLAY: PRE-CONCEPTUAL SCHEMAS IN ACTION

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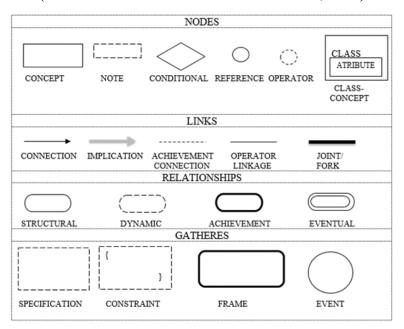
ABSTRACT

Pre-conceptual schemas are knowledge representations of any domain. Since such schemas are close to the natural language of the stakeholders and translatable to source code, we propose in this serious play an experience for creating a pre-conceptual schema in a 90-minute classroom and then generating the alpha version of a software application based on such schema.

INTRODUCTION

Zapata *et al.* (2006) create the pre-conceptual schemas as modeling tools for representing knowledge related to any domain. In fact, pre-conceptual schemas can be used for gathering information related to such domains in order to be understood and then translated into software applications. Such information comes from the stakeholder discourse and can be represented by using the basic elements depicted in Exhibit 1.

EXHIBIT 1 BASIC SYMBOLS OF PRE-CONCEPTUAL SCHEMAS (SOURCE: ADAPTED FROM ZAPATA, 2012)



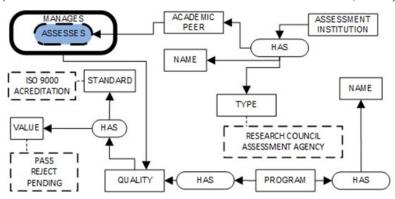
Some descriptions of such elements are:

- Concepts: nouns and noun phrases
- Structural relationships: verbs "is" and "has"
- Dynamic relationships: activity verbs
- Connections: arrows for linking concepts to relationships
- Implications: arrows for expressing cause-and-effect relationships

- Conditionals: special restrictions
- References: pointers for breaking arrows
- Notes: possible values of the concepts
- Achievement relationships: achievement verbs to represent goals
- Frames: elements for gathering together some elements or even entire pre-conceptual schemas
- Specifications: detailing the contents of dynamic relationships
- Constraints: restrictions to elements like concepts and dynamic relationships
- Events and eventual relationships: elements for expressing events

A piece of a pre-conceptual schema translated from Ortiz et al. (2014) is depicted in Exhibit 2.

EXHIBIT 2 PIECE OF A PRE-CONCEPTUAL SCHEMA (SOURCE: TRANSLATED FROM ORTIZ *ET AL.*, 2014)



After a pre-conceptual schema is created, we can generate a software application by using some rules defined by Zapata (2007). Even though such a process is currently hand-made, we can deduce some information based on the pre-conceptual schema in order to develop graphical user interfaces. For example, Exhibit 3 can be coded from the information depicted in Exhibit 2. Be advised that all possible values of assessment institution type, quality value, and standard come from the pre-conceptual schema, while the information belonging to the program is related to the database.

DESCRIPTION OF THE EXPERIENCE

LEARNING OBJECTIVE OF THE EXPERIENCE

Making the participants aware about the importance of modeling tools in the software development process, since such modeling tools are the means for developing the right applications.

PROCEDURE

In this session, we will discuss the information related to any domain in order to detect several elements like concepts, structural relationships, dynamic relationships, events, conditionals and achievement relationships. By using such elements, we will draw the pre-conceptual schema related to such information and we will validate such schema with actual values. Once validated, the pre-conceptual schema will be translated into the alpha version of a software application representing the domain. Please consider the fact that usually the software development process lasts several months, but if we properly use the pre-conceptual schemas for gaining understanding about the domain, we can dramatically shorten such time for creating the alpha version of the software application.

FINAL REVIEW

In order to achieve the learning objective, we will conduct a short discussion about what the practitioners discover about the experience and the way they will conduct similar experiences in the future.

EXHIBIT 3 GRAPHICAL USER INTERFACE BASED ON EXHIBIT 2 (SOURCE: THE AUTHORS)

Assessing quality				×	Assessing quality			×
Assessment Institution					Assessment Institution			
Institution type				•	Institution type			_
Program				•	Program	RESEARCH COUNC ASSESSMENT AGEN	CY	
Standard				_	Standard			_
Quality Value				•	Quality Value			_
	Eval	uar	1			Evalu	ar	
Assessing quality				×	Assessing quality			×
Assessment Institution					Assessment Institution			
Institution type				_	Institution type			•
Program				•	Program			•
Standard	SOFTWARE ENGIN				Standard			•
Quality Value	LAW			_	Quality Value	ISO 9000 ACREDITATION		
	Eval	uar	1			Evalu	uar	
		Assessing q	uality			×		
		Assessment	Institution					
		Institution ty	pe			▼		
		Program				▼		
		Standard				•		
		Quality Value		PASS REJECT		V		

REFERENCES

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