SOFTWARE REQUIREMENTS & SPECIFICATIONS

A lexicon of practice, principles and prejudices

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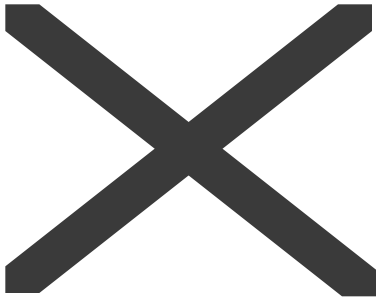
Background on Michael Jackson

- Worked 10 years as a consultant
- Started his own company in 1971 which offered courses, tools, consultancy and project support.
- Played leading role in developing the JSP program design method which is described in his book Principles of Program Design
- System Development was written to describe the JSD method of systems analysis, specification and design. Received an Honorary DSc from the University of West of England, 1992, for his work on software development methods
- Currently an independent consultant in software development as well as a part-time researcher at AT&T Bell Laboratories in Murray Hill, New Jersey

Jackson's Central Theme



- Problems and Descriptions

- Problems and Problem Frames

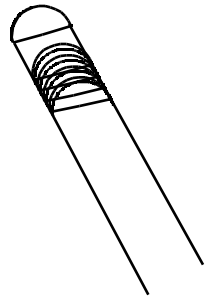
Description

"Descriptions are the heart of software development."

- *Programs are descriptions of machines*
- *Requirements are descriptions of the application domain and the problems to be solved there*
- *Specifications are descriptions of the interface between the machine and the application domain*

Issues of Descriptive Technique

- Definition
- Description: SCOPE or SPAN
- Refutable Descriptions
- Separation of Concerns



DEFINITION

1. *x* is a human being (homo sapiens) = Human(x)
2. *x* is male = Male(x)
3. *x* is female = Female(x)
4. *x* is the biological (genetic) mother of *y* = Mother(x,y)
5. *x is the biological (genetic) father of* y = *Father(x,y)*

In PREDICATE LOGIC: V*x,y* •((Human(*x*) ^ Mother(*x,y*)) (Female(*x*) ^ Human(*y*)))

SCOPE of Description

Domain	Designation	Description

SPAN of Description

X is a citizen of country *Y* = CountryCitizen(X,Y)

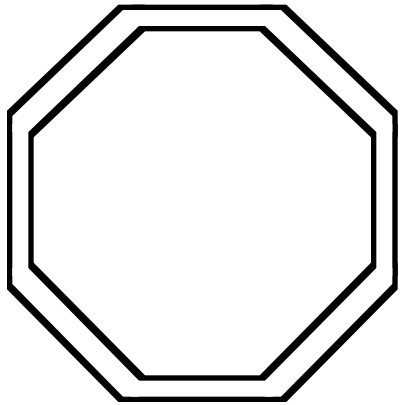
**Span includes any citizen of any country.

Citizen(X) is a citizen of country *Mexico* = CountryCitizen(X,Mexico)

**Span includes any citizen of the country of Mexico

REFUTABLE DESCRIPTIONS

EXAMPLE BUSINESS RULE:



NO EMPLOYEE WORKS
ON MORE THAN ONE
PROJECT AT ANY ONE TIME

SEPARATION OF CONCERNS

- ***Partial Descriptions:***
  - Don’t take in too much at one time
  - Breakdown complex structures into simpler parts

SEPARATION OF CONCERNS: HIERARCHICAL STRUCTURE

Problem Frames

Problem Frame

Actual Problem

Jackson Structured Programming (JSP)

- A data structure-oriented design approach
- Developed in 1975 by Michael Jackson
- First, Models the specifications of input and output data structures
- Then, Structural model derived based on input and output tree structures.
- Finally, a detailed model that includes all the operations or processes needed for the requirements

Jackson Structured Programming (JSP)

Input-Output
Condition

Output Streams Program Input Streams

JSP Example

Relax. It's CarMax.sm

Customer's
Credit/Finance
Information

System Outputs
Available Financing

CarMax
Database System

Customer Inputs
Credit Info.