DeMaMech
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Working at the laboratory --- sight seeing --- attending festivals and cultural events --- going to museums, restaurants, bars and clubs ---going to the gym --- wandering around in Osaka and other cities.

Home University

Technical University Berlin (Germany)

Mechanical Engineering and Transport Systems

Computer aided engineering

Supervisor:
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Host University

Osaka University

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Advanced Manufacturing Systems

Modeling of Designer's Intention

Supervisor"
Prof. Dr. Eiji Arai

Background:
CAD systems work with two or tree dimensional geometrical objects. Each object can be unitised into one or several sub objects. For instance *points, lines, faces, bodies* and so on
Every of this object has specific attributes such as length of an edge, area of a face or material of a body
Relations between more than one object is also represented with an attribute. For example: *an angle between two planes* or *coaxiality of boreholes*
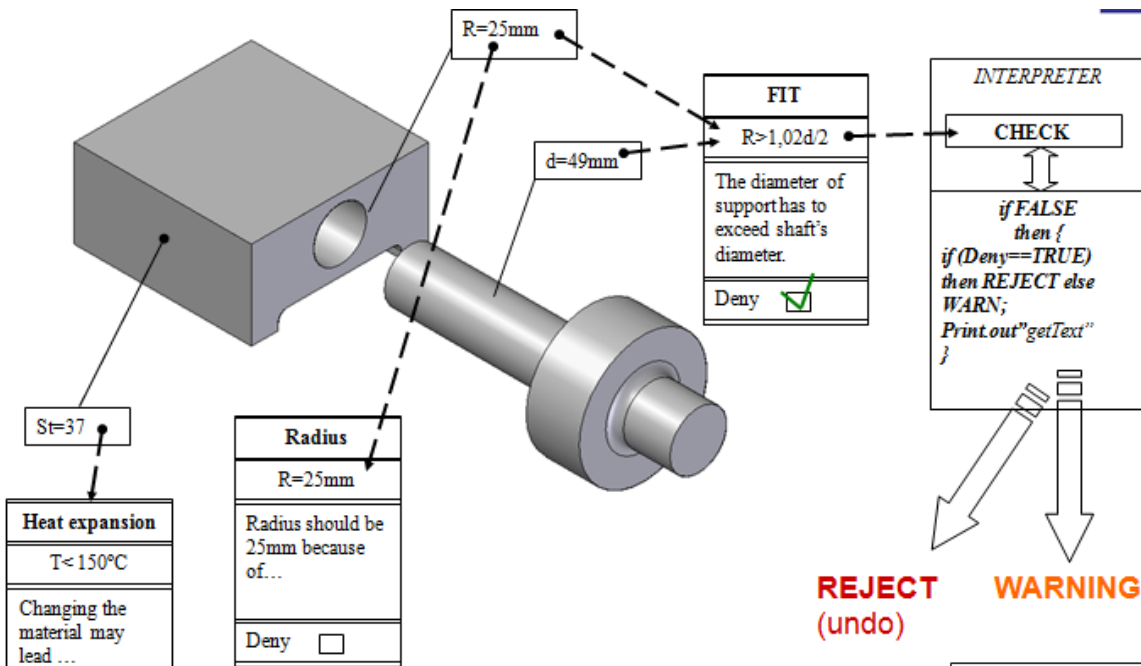
Problem:
These attributes are normally generated during a design process and don't have any information, why designer chooses or suggests this specific value or material. Thus it is difficult for other designers to understand these decisions in a case of evaluation or improvement.

Proposal:

Extending the system with a particular information item storing designers' intentions and Design Information generated during design process.

Not only geometrical attributes and relations can be described in this way. Designer can add any other attributes to an object; *i.e. electric resistance, transparency or allowed temperature range etc.*

R=25mm

R=25mm

d=49mm

FIT

R>1,02d/2

The diameter of support has to exceed shaft's diameter.

Deny ✓

INTERPRETER

CHECK

if FALSE then { if (Deny==TRUE) then REJECT else WARN; Print.out"getText" }

REJECT (undo)　　**WARNING**

St=37

Heat expansion

T< 150°C

Changing the material may lead …

Deny ☐

Radius

R=25mm

Radius should be 25mm because of…

Deny ☐

Designer chooses the important attributes and adds his intention or consideration as an information item.
After all important attributes has been set and other designer has tried to change the appropriate objects the behaviour interpreter compares the new value of the attribute with the mathematical formulation. In the case the equation is still valid the system accepts the change. In other case system rejects or warns about the change depending on the setting of the flag and bring out the textual description stored in the attribute.

The system checks the condition in the condition field itself or transmit the information to another analyzing system.
The database stores some predefined routines for the treatment of prevalent routines. Thus it is easier and faster to create a new Information Item.
Foremost we offer a treatment of some geometric and material conditions. However, not only geometrical attributes and relations can be described in this way. The designer can add any other attributes to an object, such as electric resistance, transparency or allowed temperature range.
After a new Information Item has been created, designer can decide to store this Item as a template for next sessions.

SolidMX

CAD System

Checks the condition

Transmit to analyzing system

•Select Object

•Add Attribute

Default Attribute Item

New Attribute Item

DB

NAME

Mathematic or machine readable formulation
Equation
Inequality
Set
...

Textual description

WARN or REJECT Flag