TC205/WG1

「新しいISO/PWI 16813:-2 （建築環境設計ー屋内環境ーpart2: コンピュテーショナルデザイン）の紹介」

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Resolution 407 (Hybrid 2023-02)

@the 29th Plenary Meeting of ISO/TC205 (Sept. 29, 2023)

Registration of ISO/PWI 16813-2

ISO/TC205 resolves to register a Preliminary Work Item (PWI) ISO/PWI 16813-2, “Building Environment Design - Indoor Environment - Part 2: Computational design.”

Fujii Haruyuki (Japan) is proposed as project leader.

Building Environment Design - Indoor Environment - Part 2. Computational Design (PWIP-TS)

SCOPE:

This standard lists the variable manners of application of computation, their roles, significance, expected possibilities, and prospected limitations in the context of building environment design.

It includes, but is not limited to, terminology, technical specifications for computational design, characterization of various manners of computation.

Excluded:

- Computer Aided Design Technique in Drawings (covered by ISO/TC10/SC8)
- Methods of Building Information Modeling itself (covered by ISO/TC59/SC23)
- Calculation Methods of Thermal Performance and Energy Use in the Built Environment (covered by ISO/TC163)
- Calculation Methods of Indoor Environment themselves (covered by ISO/TC205/WGs)
- Digital Twin in general (covered by ISO/IEC JTC 1/SC41)

Building Environment Design - Indoor Environment - Part 2. Computational Design (PWIP-TS)

PURPOSE:

This document describes the roles and means of computational design techniques and clarifies their possibilities and limitations so as to promote a approach in which the various parties involved in building environment design collaborate with one another to provide a high-quality building environment by employing computation such as

generation of design candidates,
simulation of indoor climate provided by the design candidates,
evaluation of the design candidates,
building information modeling,
application of artificial intelligence in design,
and so on.

Building Environment Design - Indoor Environment - Part 2. Computational Design (PWIP-TS)

CONTEXT and JUSTIFICATION:

A various type of application programs for computational design, including form generation, simulation, optimization, building information modeling, and information processing, is becoming popular.

Some techniques, including artificial intelligence, are started to be employed in design practice, research, and education.

Even though those computation techniques themselves are sophisticated, the manners of their utilization do not necessarily fit the characteristics of building environment design.

It is recommended to standardize preferable manners of utilization of computational design techniques in the context of building environment design on the basis of their roles, means, significances, possibilities, and limitations.

Building Environment Design - Indoor Environment - Part 2. Computational Design (PWIP-TS)

OUTCOME:

Provision of sufficient information with which the following computational design issues would be taken into account in the design process of ISO/DIS16813

Simulation- Analysis
Suggestion or Generation of Design Candidates - Synthesis
Optimization - Seamless Linkage of Synthesis, Analysis, and Evaluation
Utilization of Artificial Intelligence in Building Environment Design
Building Information Modeling
Digital Twin, etc.

Building Environment Design - Indoor Environment - Part 2. Computational Design (PWIP-TS)

OUTCOME (continued):

The following information will be described from proposals of computational design techniques and/or introduction of practical applications

- Type(s) of practical use
- Characteristics of subprocesses in building environment design (*A)
- Types of computation (*B)
- Current Practicality
- Preferable Possibilities - synergy of *A and *B
- Known or Anticipated Limitations - inconsistent interaction between *A and *B
- etc.

Reference: Four Classes of Variables Describing Different Aspect in Designing

(Appear in ISO/DIS 16813 originally proposed elsewhere for design computing by Gero 1990)

Function (F) variables

describe the teleology of the object - *tangible or intangible*, i.e. what it is for.
- Values. Meaning of the object. Rather Qualitative.

Behavior (B) variables

describe the attribute that are derived or expected to be derived from the structure (S) variables of the object, i.e., what it does.
- Mechanism realized by the object. Quantitative and Qualitative.

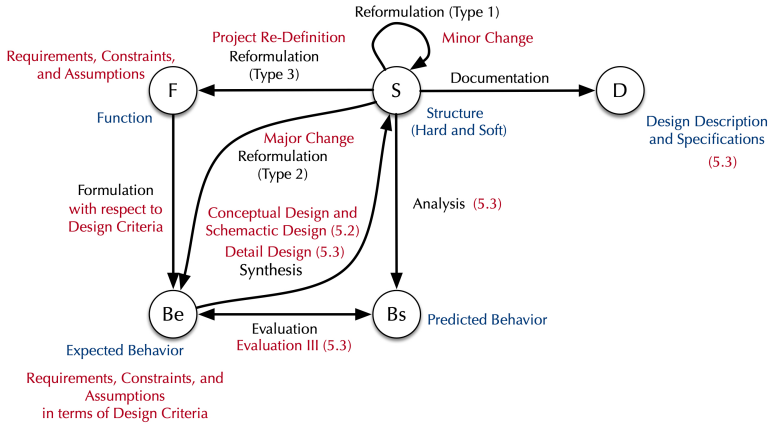
Structure (S) variables

describe the components of the object and their relationships, i.e. what it is.
- Building, Building Equipments, Operation Methods, etc.

Experience (E) variables (not in the FBS)

describe what the users interact with the object, i.e. how it is utilized.

Reference: The FBS Framework and ISO/DIS16813



Reference: The FBS Framework and ISO/DIS16813 (extended)