What is wellbeing?

Like Wikipedia says:

Well-being, wellbeing, welfare or wellness is a general term for the condition of an individual or group, for example their social, economic, psychological, spiritual or medical state.

And one of the main tasks of technology nowadays is to make our well-being high and comfortable. There are a lot of things that make it high amoung them thermal comfort.

Why is thermal comfort so important?

- Bell & Greene (1982) in Evans & Cohen (1987) stated that if core body temperature is above of 37ºC this can cause heatstroke, fatigue, and ultimately death.
- According to Fanger (1982),Vitelg & Smith (1946) in Altman & Stokol (1987), human intellect performance, and perception in general will reach its maximum potential if the human is in a comfortable thermal condition.

Thermal index

- In 1923, Houghten and Yaglou began their study to seek the a thermal index . Three parameters in physical variables, air temperature, humidity, and air velocity are combined in the equation of ET (Effective temperature). ET thermal index gives a value that is defined as comfortable or uncomfortable. With the developing of this principle the PVM model was made.

PMV?

- Model of room thermal comfort performance quality used to define the standard of air control design ISO 7730.
- The researches showed that this model isn't really effective for office buildings in Jakarta and houses of Surabaya and Yogyakarta, Indonesia, so the question is if it will be effective for teaching rooms of universities in Yogyakarta.

Problem

- So the problem sounds like:

Is the PMV index model effective in predicting thermal comfort in learning activity rooms in a warm humid tropical climate zone, Yogyakarta Indonesia?

The problem solving strategy

- The assessment of the significance of the difference between the value of PMV with the value of the real vote.
- If there is a significant difference between PMV and real vote-> the model isn't effective, from the other hand if there is no such difference then the model is effective.

Objective, Hypothesis and Research Boundary

- The objective is to asses if model is effective or not in predictable of thermal comfort.
- There are 2 hypothesis: 1)Ho: There is no difference between PMV and real vote-> the model is effective, 2)Ha: there is a difference-> model isn't effective
- The research boundary are the rooms for learning and teaching

The variables of thermal comfort

- Climatic physical variables:

1. Air temperature
2. Mean radiant temperature
3. Air Velocity
4. Relative humidity

- Personal physiological variables

1.Level of metabolism

2.Thermal resistance of clothing

These Variables can help to predict the thermal comfort.

PMV model

- H-Ed-Esw-Erc-L=K=R+C(Fanger thermal comfort formula)
  H: Internal heat production of body
  Ed: diffusion heat loss in the skin
  Esw: sweat evaporation heat loss at the skin surface.
  Ere: latent heat loss by lung respiration
  L: respiration heat loss.
  K: heat exchange from the clothed skin surface to the outer clothed surface.
  R : radiation heat loss from the outer clothed skin surface to the environment
  C : convection heat loss
- This formula is very complicated to use manually so computer software is needed here(for instance ASHRAE)

The Bias of PMV in The Yogyakarta Climate Building Context

- The climate characteristics of Yogyakarta are parallel with the conditions that cause significant bias between PMV and the real vote on the field. Therefore it can be predicted that there is significant difference between the value of PMV and the value of the real vote on the field.

Research method

- Location, Place and Sample
- Data Collecting
- The Method of Data Analysis

Location, Place and Sample

- The location of research is Yogyakarta Indonesia. The place of research is the building of the Civil Engineering and Planning Faculty, Islamic University of Indonesia.Four samples of rooms are used. Three of those samples are architecture studios and one of those samples is a classroom. The samples of occupants are students and lecturers comprising approximately eighty two respondents.

Data collecting

- Measurement with appropriate tools: air temperature, mean radiant, air velocity, relative humidity
- Observation: Activity data
- Questionnaire: the level of thermal comfort that people experience, clothes that they wear

The Method of Data Analysis

- 1) The transformation of raw data to basic information using ASHRAE
- 2) The method to assess the hypothesis. Analytical method to prove the hypothesis is the statistical method of mean comparison of pair samples that is done by SPSS 11.00

Results and Conclusions

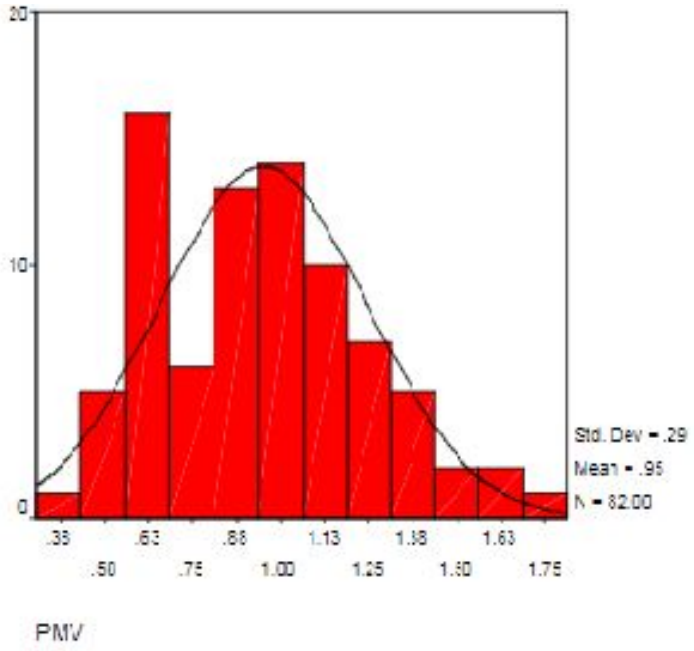


Figure 1: The figure of room thermal comfort based on PMV value

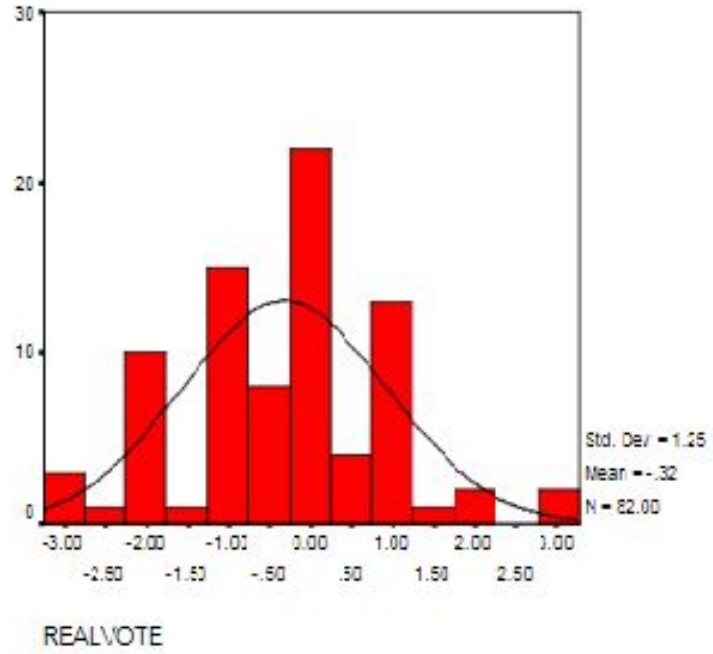


Figure 2: The figure of room thermal comfort based on the real vote

Describing of results

- The characteristics of PMV in cases as described in figure 1 can be seen. The mean of the PMV value is 0.95. This means that based on PMV the thermal comfort of the rooms is close to warm +1.
- Based on figure 2 it can be seen that the mean of the real vote value is – 0. 32. It means that based on the real vote, the thermal comfort of the room is close to slightly cool -0.5.

We can see that there is a significant difference between PMV and real vote so PMV model isn't effective.

EnviroInfo Conferences: Knowledge Exchange Platform for Information Technology in Environmental Sustainability Research

The Role of Environmental Informatics

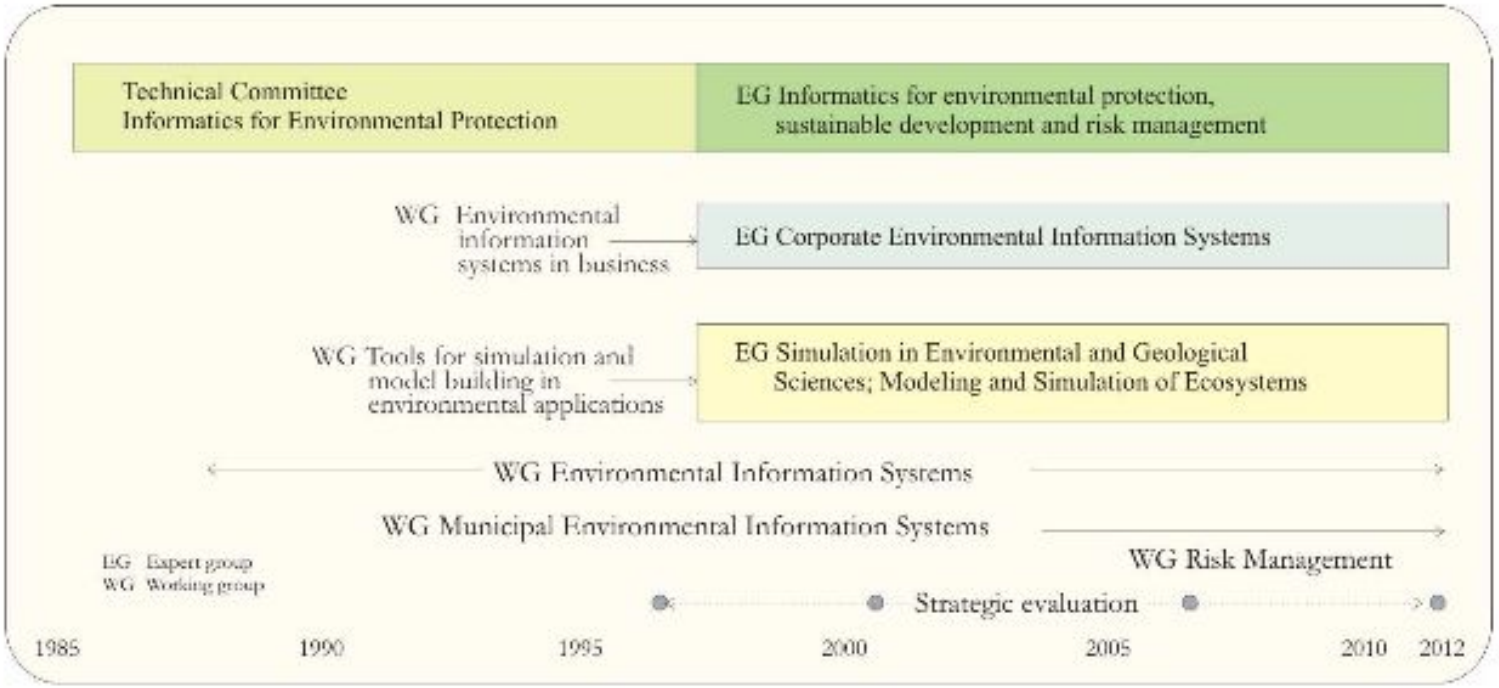
Ecological information technologies are very important in solving ecological problems nowadays. That's why it was improved the right of access to environmental information: updated Directive 2003/4/EC, then “Arhus Convention on access to Information, Public Participation in Decision-making and Access to Justice in Environmenatal Matters.

This information shows that we have highly unsustainable trends and the alarm sigals are increasing.

Development Phases of the EnviroInfo Network

With the increasing of amounts of waste substances the pollution has grown. There are tree phases of the development of environmental informatics: an early development phase(1up to 1990)(the time that was ripe for the application of information systems in the emerging field of environmental protection), the establishment efforts(1990-2000)(through the activities of several TC members, specialised working groups become operational in this era), and current phase(The “German Conference has transformed to an international meeting one with the English like conference language”).

Structure of the Technical Committee Environmental Informatics of the Society of Informatics



The Technical Committee Environmental Informatics of the Society of Informatics is structured in 3 Expert groups(Informatics for environmental protection, sustainable development and risk management, Corporate Environmetal Information Systems, Simulatio in Environmental and Geological Sciences; Modeling and Simulation of Ecosystems) ad presently three working group(Environmental Information Systems, Municipal Environmental Information Systems, Risk Management)

Environmental Informatics – the way ahead

Interdisciplinary diversity of environmental information -the future. The FP7 project ICT-ENSURE – iCT for Environmental Sustainability Research shows what has been made and broaden this path.