

Indoor temperatures in buildings of the future will automatically adjust to user needs

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The HumanTool project being led by VTT Technical Research Centre of Finland involves the testing of new indoor temperature control concepts for adjusting spaces to individual needs. Energy is saved when unused rooms can be left unheated or uncooled. The final result of the project will be a completely new product.

We spend around 90% of our time indoors. Our experience of thermal sensation is important to productivity and comfort, and is mainly affected by a room's [temperature](#) level. The HumanTool [project](#) aims to enhance the comfort level of indoor temperatures, which affects the thermal comfort, health and well-being of a facility's users.

Begun last autumn, the project will involve the practical testing and development of a smart temperature control concept in [hospital](#) and office conditions during two heating and cooling seasons. The first pilot sites will be VTT's main office, Digitalo, in Espoo, the Seinäjoki Central Hospital and Kuopio University Hospital. In the hospitals, testing will begin in office premises and then proceed to patient facilities.

The experiences of various end-users of the rooms, such as staff and patients, will be gathered.

"We will use the Human Thermal Model (HTM) method developed by VTT. We will evaluate the thermal sensations of various user groups, which will be taken into account in the design of comfortable and energy-efficient buildings. Because digital solutions for facility monitoring are now cost-efficient, we will use the latest technology for temperature control," says project manager Pekka Tuomaala of VTT.

The results will be ready at the end of 2018 and can be applied in places such as offices, hospitals,

hotels, schools and in vehicles.

VTT is coordinating the HumanTool project, which began in October 2016. The project sponsors and partners are VTT, the Seinäjoki Central Hospital, Kuopio University Hospital, Senate Properties, Siemens, Uponor, Granlund, Mecastep and New Nordic Engineering.

Further information on the Human Thermal Model HTM method:

People's evaluation of thermal sensation is based on individual anatomy and physiology. The HTM method is used to assess the impact of individual characteristics - gender, age, [body mass index](#) and muscularity - on the volumes of various tissue types (bone, muscle, fat and skin). The transfer of warmth and moisture between a person's anatomy and clothing and the environment can help to determine the local temperature of body tissues. This can be used to calculate local thermal sensations in different parts of the body.

Provided by VTT Technical Research Centre of Finland

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