World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:12, No:02, 2018

# Soil Moisture Control System: A Product Development Approach

**Authors :** Swapneel U. Naphade, Dushyant A. Patil, Satyabodh M. Kulkarni

**Abstract :** In this work, we propose the concept and geometrical design of a soil moisture control system (SMCS) module by following the product development approach to develop an inexpensive, easy to use and quick to install product targeted towards agriculture practitioners. The module delivers water to the agricultural land efficiently by sensing the soil moisture and activating the delivery valve. We start with identifying the general needs of the potential customer. Then, based on customer needs we establish product specifications and identify important measuring quantities to evaluate our product. Keeping in mind the specifications, we develop various conceptual solutions of the product and select the best solution through concept screening and selection matrices. Then, we develop the product architecture by integrating the systems into the final product. In the end, the geometric design is done using human factors engineering concepts like heuristic analysis, task analysis, and human error reduction analysis. The result of human factors analysis reveals the remedies which should be applied while designing the geometry and software components of the product. We find that to design the best grip in terms of comfort and applied force, for a power-type grip, a grip-diameter of 35 mm is the most ideal.

**Keywords :** agriculture, human factors, product design, soil moisture control
**Conference Title :** ICMEDA 2018 : International Conference on Mechanical Engineering Design and Analysis
**Conference Location :** Mumbai, India
**Conference Dates :** February 22-23, 2018