INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: Evolving design heuristics for Graphical User Interfaces of smart devices -A semantic approach

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Thesis Submitted to the Academic Division	:	Academic Research
Date of completion of Thesis Viva-Voce Exam	:	13-10-2025
Key words for description of Thesis Work	:	Graphical User Interfaces (GUI), Internet of Things (IoT), User-Centric Design, Semantic Design, Usability, Information Communication Technology (ICT), Indian User Groups, Design Guidelines

SHORT ABSTRACT

Product Graphical User Interfaces (GUIs) act as the first point of contact in human–machine interaction. In everyday life, users interact with various ICT products like mobile phones, music players, and smart meters that aim to make technology easy to use. While GUIs are meant to communicate meaning and build user connection, many users still find them difficult or ambiguous. With the coming of IoT, interaction is changing, bringing more complexity and dynamism across platforms. In India, users differ in culture, language, and socio-economic background, yet the same interface is often used across rural and urban contexts. Most interfaces are westernized, English-heavy, and lack customization. This raises questions about how existing GUIs meet the needs of diverse Indian users and how they will adapt to IoT-based products. A state-of-the-art review found no specific guidelines related to meaning issues for the Indian context. Using user-centric and semantic design approaches, this thesis focuses on IoT device interfaces, studying the transition from analogue to digital with a view toward emerging mediums like VR and AR. Field and user studies with rural and urban users identified problems in readability, meaning interpretation, and usability. Further studies explored user priorities and expectations through semantic analysis using automobile dashboards as study interfaces. Based on findings, context-specific design guidelines were created and applied to design simulated IoT-based smart energy interfaces. Usability was tested using ISO 9241:11 and TAM frameworks. Results showed high user satisfaction and acceptance across user groups. The thesis contributes by developing a validated framework and design guidelines for IoT-based GUIs suitable for diverse Indian conditions.