

An Interdisciplinary Maturity Model for Accompanying Sustainable Digital Transformation Processes in a Smart Residential Quarter

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Abstract : Digital transformation is playing an increasingly important role in the development of smart residential quarters. In order to accompany and steer this process and ultimately make the success of the transformation efforts measurable, it is helpful to use an appropriate maturity model. However, conventional maturity models for digital transformation focus primarily on the evaluation of processes and neglect the information and power imbalances between the stakeholders, which affects the validity of the results. The Multi-Generation Smart Community (mGeSCo) research project is developing an interdisciplinary maturity model that integrates the dimensions of digital literacy, interpretive patterns, and technology acceptance to address this gap. As part of the mGeSCo project, the technological development of selected dimensions in the Smart Quarter Jena-Lobeda (Germany) is being investigated. A specific maturity model, based on Cohen's Smart Cities Wheel, evaluates the central dimensions Working, Living, Housing and Caring. To improve the reliability and relevance of the maturity assessment, the factors Digital Literacy, Interpretive Patterns and Technology Acceptance are integrated into the developed model. The digital literacy dimension examines stakeholders' skills in using digital technologies, which influence their perception and assessment of technological maturity. Digital literacy is measured by means of surveys, interviews, and participant observation, using the European Commission's Digital Literacy Framework (DigComp) as a basis. Interpretations of digital technologies provide information about how individuals perceive technologies and ascribe meaning to them. However, these are not mere assessments, prejudices, or stereotyped perceptions but collective patterns, rules, attributions of meaning and the cultural repertoire that leads to these opinions and attitudes. Understanding these interpretations helps in assessing the overarching readiness of stakeholders to digitally transform a/their neighborhood. This involves examining people's attitudes, beliefs, and values about technology adoption, as well as their perceptions of the benefits and risks associated with digital tools. These insights provide important data for a holistic view and inform the steps needed to prepare individuals in the neighborhood for a digital transformation. Technology acceptance is another crucial factor for successful digital transformation to examine the willingness of individuals to adopt and use new technologies. Surveys or questionnaires based on Davis' Technology Acceptance Model can be used to complement interpretive patterns to measure neighborhood acceptance of digital technologies. Integrating the dimensions of digital literacy, interpretive patterns and technology acceptance enables the development of a roadmap with clear prerequisites for initiating a digital transformation process in the neighborhood. During the process, maturity is measured at different points in time and compared with changes in the aforementioned dimensions to ensure sustainable transformation. Participation, co-creation, and co-production are essential concepts for a successful and inclusive digital transformation in the neighborhood context. This interdisciplinary maturity model helps to improve the assessment and monitoring of sustainable digital transformation processes in smart residential quarters. It enables a more comprehensive recording of the factors that influence the success of such processes and supports the development of targeted measures to promote digital transformation in the neighborhood context.

Keywords : digital transformation, interdisciplinary, maturity model, neighborhood

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