

## Research Paper


# Investigating the Tendency of Investors Toward Building Smartening Based on the Technology Acceptance Model (Case study: Coastal areas of Māzandarān Province) ❖

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## Abstract

In recent decades, along with the growth of technology and its entry into the construction industry, the smartening of buildings has increased in developed countries. Yet, despite targeting the country's development plans in Iran, investors have not shown much interest in working in this field. The present study aimed to identify the factors affecting the tendency of investors toward building technology-based construction and use the TAM model to investigate the relationship between technology acceptance and the amount of investment in the intelligent building industry. This research is based on the Technology Acceptance Model (TAM). This research was applied in terms of purpose and descriptive-correlational in terms of method. Data were collected using the library method and questionnaire tools. The research population included activists in the field of the construction industry in the coastal areas of Māzandarān province. After confirming the validity and reliability, the questionnaires were randomly distributed among 160 members of the research population. The data obtained from the questionnaires were analyzed using the Pearson correlation parametric test in SPSS25 and AMOS software. The findings confirmed the existence of a significant relationship between the "trust" variable and "perception of usefulness," "perception of ease," and "attitude" variables in the research model. Given respondents' lack of trust in intelligent building technology, there is not a very positive attitude towards technology among the research population. Given the lack of trust of respondents in smart building technology, there is not a very positive attitude towards technology among the statistical community. This has led to their unwillingness to accept this technology in the construction industry, as building intelligence has a minimal share of construction in the coastal areas of Māzandarān, which can be due to a lack of knowledge and awareness of the benefits of intelligent building technology and lack of proper information.

**Keywords:** Building Smartening, Investment, Trust, Technology Acceptance Model (TAM), Coastal Areas of Māzandarān Province.

## Highlight

- Providing the ground for the implementation of smartening building policies in the coastal areas due to increased population concentration and investment in these areas.
- Examining the existence of a significant relationship between the "trust" variable and the variables of "perception of usefulness," "perception of convenience," and "attitude" in the research model concerning the important role of "trust" in "technology acceptance" in societies.

## Extended Abstract

❖ This article is taken from the doctoral dissertation of the first author Ashkan Khatibi entitled "Design methodology for environmental functions along with structural approach for designing moving facades" under the guidance of Dr. Majid Shahbazi and consulting professor Dr. Zohreh Torabi at the Islamic Azad University of Zanjan.

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## Introduction

With the growth of technology and its entry into the construction industry, the issues related to the environment and the energy consumption have become very important. Using renewable resources and smartening building technology by reducing human dependence on mechanical facilities has led to major changes in lifestyle and interactions with the environment. In addition to optimizing energy consumption, this technology leads to rational and sensible energy use. Comprehensive control significantly reduces losses due to the depreciation of building facilities and equipment.

In recent years, along with population growth and concentration of people in coastal cities of the world in order to create industrial hubs and free tourism zones, reconstruction activities and large investments in these areas have also increased. In such a situation where the ground is ready for investment, due to the extremely suitable climatic qualities of the coastal areas for the use of renewable energy and the construction of intelligent buildings, we can take a step towards the spread of this industry. For this purpose, if the community of consultants, contractors, and construction executives have sufficient knowledge and awareness in the field of smartening building systems, by transferring this information and their comprehensive guidance to the investors about the usefulness of the intelligent buildings, they will drive investment towards the intelligent buildings. The issue that arises is the acceptance of intelligent technology by the active community of the construction industry. Why people adopt or refuse to accept and resist technology is one of the most important issues in technology.

Considering that various factors are involved in the acceptance of new technology in society that without them, it can lead to failure and the difference of factors according to the technology, users, and existing conditions; the authors of the present study tried to investigate the acceptance status of intelligent technology in the construction of coastal areas of Māzandarān province and identify the factors of acceptance or non-acceptance. Therefore, the first question arose: How much is the acceptance of intelligent building technology in the coastal cities of Māzandarān province? Is there a significant relationship between technology adoption and investment in the intelligent building industry?

## Methodology

The present study was applied in terms of purpose and descriptive-correlational methodology. The research population included consultants, contractors, investors, and mass builders of the construction industry in the coastal areas of Māzandarān province. Due to the time constraints of the research, sampling was done by random cluster sampling, and data collection was done using library research and questionnaire. Considering the quantitative nature of this research and the use of the integrated TAM model along with the trust variable, it was necessary to examine the model fit, in which structural equation modeling was used. After confirming the validity and reliability, the questionnaires were randomly distributed among 160 members of the research population. The data obtained from the questionnaires were analyzed using Pearson correlation parametric test in SPSS25 and AMOS software.

## Results and discussion

Findings showed that the variables "perception of usefulness," "perception of ease," "trust," and "attitude" have taken significant conditions. That is, at the 95% confidence level, the P-value in all variables was less than 0.05, indicating the confirmation of all research hypotheses. Therefore, in the presented research model, the "perception of ease" affected the "perception of usefulness," "attitude," and "trust," whose coefficients were (0.27), (0.20), and (0.23), respectively. The variable of "Perception of usefulness" also affects "trust" and "attitude" with path coefficients of (0.32) and (0.27). Meanwhile, the variable of "trust" with a path coefficient of (0.30) affects the attitude, and the variable of "attitude" with a path coefficient of (0.40) affects the variable of "willingness to use." The results of field studies also confirmed the inferential findings of the research and showed that smartening the buildings and using new technologies have a minimal share of construction in the coastal areas of Māzandarān. This showed that a large number of people in the research population understand and are aware of the convenience and usefulness of intelligent technologies. But due to their lack of trust in this technology, they do not have a positive attitude towards it. This has led to their disapproval of this technology in the construction industry, as even predicting its use in the future is far from their expectations. Of course, this lack of trust in technology can be due to a lack of knowledge and awareness about its benefits and lack of proper information.

## Conclusion

Basically, appropriate technology policy-making is practically impossible regardless of the obstacles and difficulties of its development. This also applies to smartening buildings with the approach of using renewable energy. In order to identify the problems and provide appropriate solutions to overcome them, the present study examined the factors affecting the acceptance of intelligent building technology and, consequently, the tendency of construction industry activists to this technology in the coastal areas of Māzandarān province. Here, an optimal model was obtained by adding the "trust" variable to Davis's "technology acceptance" model to investigate the

factors affecting technology acceptance. The results of investigating the relationship among the variables in this integrated model showed that construction industry activists' positive attitude toward intelligent building technology was closely related to their perception of the qualities and benefits of smartening buildings. Meanwhile, the "trust" variable with a positive and direct effect on people's attitudes increases their willingness to use technology. Generally, it can be concluded that trust in technology can affect the willingness to use technology, so the direct and positive impact of the "trust" variable on people's tendency to invest in the intelligent building industry is explained in the proposed research model.

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### **Authors' Contribution**

Authors contributed equally to the conceptualization and writing of the article. All of the authors approved the content of the manuscript and agreed on all aspects of the work

### **Conflict of Interest**

Authors declared no conflict of interest.

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