16 Working Women Perception towards Smart Home Automation and Ambient Intelligence in Coimbatore District

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Abstract

Women are the driving force of any economy. Working women on the other hand plays dual role in office and at home. Work life balance is the crucial problem of the working women today, as their responsibilities in office and home becoming complex than before. This study focuses on the level of perception of working women on smart home automation and ambient intelligence in Coimbatore district. Working women were selected for this research because the major issue for working women is work at home. They have to accomplish their official objective as well as home objective. Work at home is primary for women and need more time to perform but smart home automation and ambient intelligence make their work at home highly simple. Coimbatore district is selected as the place of research as most of the women at Coimbatore district are working women. Most of the working women find highly comfortable with smart home automation and ambient intelligence.

Keywords: Working Women, Smart Home Automation, Ambient Intelligence, Coimbatore District, Economy.

Introduction

Smart home automation and Ambient Intelligence, the technology being adopted at home to make life more secure, easier, comfortable and safe. The evolution of smart home automation and Ambient Intelligence dates back to early 2000s. The global home automation market size was USD 90.75 billion in 2023. The market is projected to grow from USD 101.79 billion in 2024 to USD 237.07 billion by 2032 at a CAGR of 11.1% during the 2024-2032 period.

Source: https://www.fortunebusinessinsights.com/industry-reports/home-automation-market-100074 . Home Automation Market Size, Share and Industry Analysis, By Component (Product and Services), By Network Technology (Wired, Wireless and Power Line-Based), and Regional Forecast, 2024-2032.

Home automation is a broad concept and includes all technology that makes work at home convenient, energy saving, time saving, secure, reduce cost of products and so on. Among the above the sector which is developing at greater heights is security system. People around the world are more interested towards fully automated security system which makes their home more safe and secure. Some examples of smart home and ambient intelligence devices are smart thermostat which is a wi-fi enabled device which allows to control the temperature at home from phone, tablet or computer., Smart plugs makes your home highly smarter, smart speakers entertains you at anytime simply with voice command with collection of music, smart lock which is keyless door lock which can be controlled from anywhere using applications in smartphone, smart camera which provides 24 hours security without operating manually and so on. Smart home automation and ambient intelligence devices are not so limited as said above. As the technology develops constantly, new inventions emerges in, which make home more smarter and work simpler than before.

Literature Review

With a view to have a deep knowledge into the research area, previous studies relating to the study were analysed and reported

Barlow, J and Gann, D (1998) in the paper entitled “A Changing Sense of Place: Are Integrated IT Systems Reshaping the Home?” critically evealuated and analysed the contribution of smart home technologies in reshaping the home. The objective of this study is to analyse the emerging smart home technologies in Europe and to know the way they influence the society and economy. The study reported that a set of smart home technologies is evolving to manage domestic functions with home. But these are nor properly understood. The study concluded that the development of smart home technologies raise crucial ethical issues associated with privacy, consent and security. Further the study reported no sufficient tangible evidence from existing demonstration project to measure the cost and benefits of these technologies in use.

Maria de-los-Angeles Gil-Estallo, Fernando Giner-de-la-Fuente, Carles Griful-Miquela (2009) in their article entitled “Benchmarking Corporate Social Responsibility within Spanish companies” focuses on the influence of corporate social responsibility upon business profitability. In this work, an index was created which assigns between one and five points to the companies depending on the importance given by them to CSR. The paper took into account their return on equity (ROE) and return on assets (ROA) of 2005 and 2006. The authors’ purpose was to demonstrate that the relationship between CSR and business profitability is neutral.

Sandeep kumar and Mohammed Abdul Qadeer (2012) in their article entitled “ Application of AI in Home Automation”, deals with the various classifications of home automation system. This study also investigates the utilization of the AI tools for increasing the effectiveness, powerfulness of the same. The study defines the four important applications of the systems namely comfort, remote access, effective resource utilization and safety. The paper gives conclusion that application of AI is emerging as highly useful technology for home automation.

Blerim Quela, Hussein T Mouftah and et al(2012) in their article entitled“ Observe, Learn and Adapt (OLA) – An algorithm for energy management in smart homes using wireless

sensors and Artificial Intelligence" investigated and presented algorithm based adaptable learning system principle. In this study the Observe, Learn and Adapt (OLA) algorithm proposed is the result of integration of wireless sensors and artificial intelligence concepts towards the same objective: adding more intelligence to a programmable communicating thermostat (PCT) for better energy management and conservation in smart homes. The study presents the overall system improvements with respect to energy consumption and savings are demonstrated via simulation for the zone controlled home equipped with OLA and knowledge base versus a home without zone control, knowledge base nor OLA.

Arian Virancic, Hana zadravec, Tihomir orehovacki (2024) in their article entitled " The role of smart homes in providing care for older adults: A systematic literature review from 2010 to 2023" undertook a systematic review and explores that smart home technologies increases the safety of older adults and help them to monitor their health condition. This review analyses in detail the importance of smart home technologies in improving their life style. This review analysed 58 studies. The findings focuses on the potential of smart home technologies to enhance the daily living for older adults which includes security, monitoring of health and interaction with people.

Abbas shah syed, Daniel Sierra Sosa and et al (2021) in their article entitled "IOT in Smart Cities: A survey of Technologies, Practices and Challenges, Smart Cities" discussed fundamental aspects of Internet of Things in smart cities. Review of the most existent practices and applications in various smart city domains were held with in the study in detail. The study concludes with the challenges that deployment of IOT systems for smart cities encounter along with mitigation measures.

Shwetank Dattatraya Mamdiwar, Akshith R, and et al (2021) in their article entitled " Recent advances on IOT- Assisted Wearable Sensor Systems for Healthcare Monitoring, Biosensors" stressed the importance of the role played by IoT in many industries and analysed its role in improving the overall health of people. The article discusses the various IoT architectures, different methods of data processing, transfer and computing paradigms. Further the study explored the various applications of IoT assisted wearable sensor systems in healthcare. It also discussed its advantages to the world. The study also dealt with the comparative analysis of all the wearable technology in healthcare. The study also reviewed and analysed all the problems commonly faced in IoT assisted wearable sensor systems and remedial measures for the problem.

Aishwarya Zamindar (2022) in their article entitled "Review on the Application of Artificial Intelligence in Smart Homes" critically analysed utility and application of AI over years. The article critically analysed fundamental studies on applying AI generation to smart houses. It also dealt with the distribution of smart houses with the AI application. The article made a comparison of the technology of AI in smart homes in the literature and products. A detailed review of many researches and several products were critically reviewed.

Vili Lehdonvirta, Lulu P. Shi, Ekaterina Hertog and et al (2023) in their article entitled "The future(s) of unpaid work: How Susceptible do experts from different backgrounds think the domestic sphere automation?" emphasized on the expansion of future of work debate to unpaid domestic work. In this study, 65 AI experts from the UK and Japan were the respondents to identify the automatable of 17 housework and care work tasks. Sociological

approach was applied in the study . The results of the study predicted that 39 percent of the time spent on a domestic task will be automatable within ten years.

Objectives of the Study

- To study the socio-economic background of working women
- To examine the reasons associated with perception on smart home automation and ambient intelligence

Methodology

The present study is carried out with primary and secondary data. Working women were the respondents of the study. A structured questionnaire was designed and circulated. About 114 respondents responded to the questionnaire. The method of sampling adopted was Convenience sampling method. For theory and review of literature Secondary data is applied Percentage analysis and Henry Garett ranking were the tools used for the study.

Socio-Economic Profile of the Working Women

The socio-economic profile of working women includes age, educational qualification, occupation, type of family, monthly family income, marital status. Table 1 has been prepared to identify the socio-economic profile of working women.

Table 1: Socio-Economic Profile of Working Women

Profile	No. of Respondents	Percentage to total (%)
Age		
25-35	36	31.6
36-45	60	52.6
46-55	18	15.8
Above 55	-	-
Educational qualification		
PG	30	26.3
Higher secondary	30	26.3
UG	54	47.4
Occupation		
Entrepreneur	-	-
Private employee	114	100
Government employee	-	-
Type of family		
Joint family	42	36.8
Nuclear family	72	63.2
Monthly family income		
Below 50,000	66	57.9
50,000-75,000	36	31.6
Above 75,000	12	10.5
Marital status		
Married	90	78.9
Unmarried	24	21.1
Separated	0	0

From the above Table 1 it is clear that, out of the total 114 respondents who are working women, 52.6% are between the age group 36-45, Most of the respondents are under graduate, Almost all the respondents are private employee, about 63.2% of the respondents live in nuclear family, about 57.9 % respondents' income are below 50,000 and 78.9% of the respondents are married.

Reasons for Moving towards Smart Home

Working women have plenty of reasons for moving towards smart home. The most important reasons which were taken for the study were Necessity (1), Lack of time (2), Work made highly simple (3), Secured feeling (4), Easy access (5), Offers and discounts (6), Energy conversation (7). Garett ranking was adopted to identify the most crucial reason which make working women to move towards smart home.

Table 2: Reasons for Moving towards Smart Home

Reasons	1	2	3	4	5	6	7	Total	Average	Rank
	78	65	57	50	42	34	22			
1	24	6	12	24	11	7	29			
	1872	390	780	1560	715	455	1885	7657	67.16667	II
2	24	24	18	6	12	30	0			
	1872	1560	1170	390	780	1950	0	7722	67.73684	I
3	24	24	24	0	24	6	12			
	1872	1560	1560	0	1560	390	780	7722	67.73684	I
4	6	6	24	42	18	14	6			
	468	390	1560	2730	1170	910	390	7618	66.82456	III
5	12	24	24	29	17	0	6			
	936	1560	1560	1885	1105	0	390	7436	65.22807	V
6	6	12	12	6	0	41	35			
	468	780	780	390	0	2665	2275	7358	64.54386	VI
7	18	18	0	6	30	17	22			
	1404	1170	0	390	1950	1105	1430	7449	65.34211	IV

Table 2 above clearly exhibits that under Garett ranking method, out of the seven reasons to move towards smart home, Lack of time and work made highly simple are the dominating reasons to move towards smart home followed by Necessity, Secured feeling, Energy conservation. Further it is revealed from table 2 above that most of the working women responded Easy access and Offers and Discount as the least dominating reason to move towards smart home.

Conclusion:

Out of the total 114 respondents who are working women, 52.6% are between the age group36-45, Most of the respondents are under graduate, Almost all the respondents are private employee, about 63.2% of the respondents live in nuclear family, about 57.9 % respondents' income are below 50,000 and 78.9% of the respondents are married. From Garett ranking it is clear thatout of the seven reasons to move towards smart home, Lack of time and work made highly simple are the dominating reasons to move towards smart home followed by Necessity, Secured feeling, Energy conservation. Futher it is revealed that most of the working women responded Easy access and Offers and Discount as the least dominating

reason to move towards smart home. To conclude working women, feel highly comfort of having smart home and it makes ease to balance their work life and personal life. But they fear about security. Other than that, they are highly happy of smart home.

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