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Proposal [TITLE]

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Introduction:

Smart Home Technology is bringing innovation in each aspect of a man's life. According to a survey [1] in United States one person among four is using smart devices in his home and 81% of these smart device users are willing to buy Smart Home services at their homes.

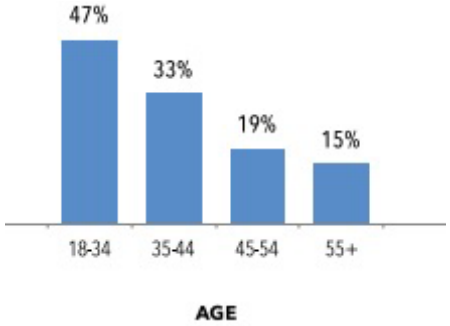

Fig. 1. Age wise percentage of US citizens willing to buy a smart home at earliest [1]

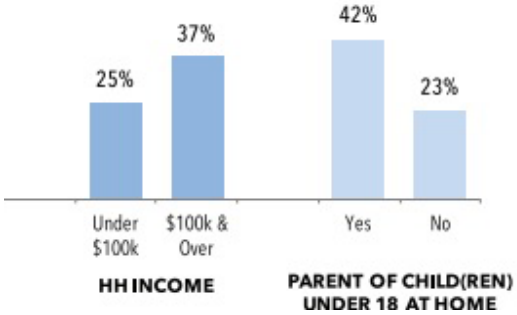

Fig. 2. Income wise and parents percentages of US adults willing to buy a smart home at earliest [1]

Smart Home Technology is working like a semi-intelligent care-giver while a man is not at home. Xu, B., et al. in [2] says Elderly Population of China was raised to 12.5% of others in 2009. Japan and Korea are also entering into elderly aging era. It is also a known fact that elderlies are more prone to chronic diseases. Considering the fact that they have facilitated us with this present – there is a need and they deserve a better healthcare.

Our work will incorporate social and environmental factors to make the environment acceptable. In social factors we shall use calendar and social events to make the elderlies engaged into social life and connected with their neighboring mates using preferred notifications. In environmental factors we shall incorporate weather related factors along with sensor usage data to make the behavior detection more accurate.

Research Objective:

A research objective is a clear, concise, declarative statement, which provides direction to investigate and measure the variables, and sometimes identifying the relationship or difference between two variables.

- A well-worded objective will be SMART, i.e Specific, Measurable, Attainable, Realistic, & Time-bound.

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- Research objective should be Relevant, Feasible, Logical, Observable, Clear & Measurable.
- Objectives are very close to Problem Statement

e.g. *To identify the factors associated with high unemployment rates*.

Rational and Significance of Study:

Rationale: Based on what is already known and published in the literature, does you planned experimental approach have a logical reasoning?

Significance: If your experimental approach went well and yielded good quality results, how does the result contribute to what is already known (academic significance) and/or application in reality?

Scope of Study:

The scope of this study is to highlight the social needs of the elderlies which are being ignored in proposed Smart Home environments. Also we are going to use environmental factors for more accurate behavior detection along the sensors **data**. Our proposed model will incorporate self-learning mechanism to improve alarming system by using sequential activity patterns proposed in Suryadevara, N., et al., in [3]. System will learn common changes in the ADL patterns and will adjust the thresholds accordingly for minor and continuous changes.

Problem Statements:

Description of an issue currently exists which needs to be addressed.
Provides context for the research study and generates the questions which the research aims to answer.
A good problem statement is just one sentence (with several paragraphs of elaboration). e.g.:
"The frequency of job layoffs is creating fear, anxiety, and a loss of productivity in middle management workers"

Elements:

1. The problem itself, stated clearly and with enough contextual detail to establish why it is important.
2. The method of solving the problem, often stated as a claim or a working thesis.
3. The purpose, statement of objective and scope of the research work being proposed.

Related Work:

Smart home technology is brining innovation in each living aspect of a man's life. Published facts reveal that world is entering into an era of aging population. Yu, M., et al. in [4] By 2009 approximately 25% of United States citizens were somehow using smart devices in their homes. This need gets more highlighting for the aging population. Elderlies need more care and health monitoring. A number of smart home environment have been proposed for elderlies but there are a number of challenges in acceptability. Some important challenges include wearable sensing devices, privacy concerns because of continuous monitoring, feeling loneliness etc.

The negligence of the elderlies in social life is a major concern. Maximum of the Smart Home environment proposed for the elderlies force them to live alone. Addressing the social negligence Miller, K.J., et al., [5] proposed a virtual gaming solution for the elderlies. It will create some physical activity platform but Likewise [6] proposed GiraffPlus project which combines social interactions and long term monitoring. Here the single living elderlies joins local network of the elderlies living nearby to interact with.

Methodology:

The research will be carried out by following a customized Design Science research model shown in Figure.3. Area/Topic Selection, Literature Review and Problem Identification of the model are steps which will be followed in IS-I.

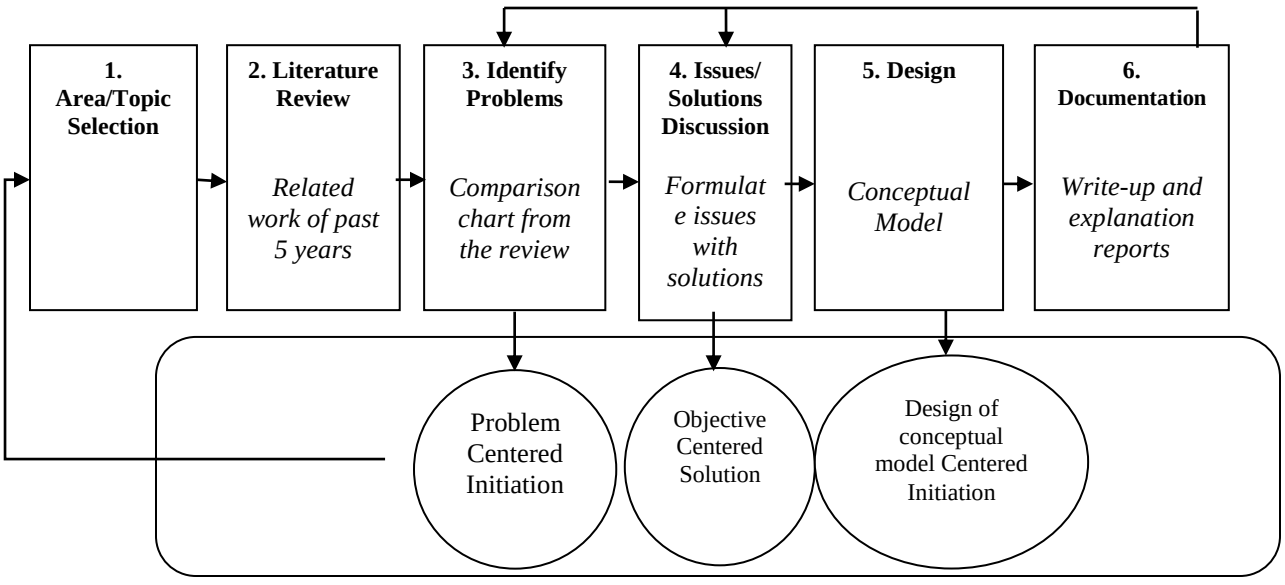

Figure.3: Design Science research model

Based on the limitations and analysis in IS-I, a conceptual model is proposed which will also be validated by using simulation tool later. The conceptual model will consist of all components along with structure and flow of the WSN. Major parameters will be measure Time series

analysis, Association rule mining for predicting wellness and missing value of WSN and network life time. Major steps in this methodology will be:

- Systematic Literature Review
- Proposed conceptual model.
- Write up and explanation of the conceptual model.
- Reports preparation and submission.

Tentative schedule for carrying out the IS-1 research:

Sr. #	Activity	Duration															
		Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	**Selection of Paper**	1	■														
2.	**Brief background study**	1		■													
3.	**First 5 papers study (Strength and weakness)**	2			■	■											
4.	**Next 5 papers study (Strength and weakness)**	2					■	■									
5.	**Last 5 papers study (Strength and weakness)**	2							■	■							
6.	**Critical Evaluation**	3									■	■	■				
7.	**Finalizing Long and Short Report**	2												■	■		
		13															

References:

[1] R. Brown, "Survey says: Smart homes can pay off when it's time to sell." vol. 2015 CNet, 2015, p. We partnered with Coldwell Banker on a survey to find out what people think about owning and living with a connected home. Here's what we found.

[2] B. Xu, Y. Ge, I. Chen, Z. Chen, and Y. Ling, "Elderly Personal Safety Monitoring in Smart Home Based on Host Space and Travelling Pattern Identification," 2012.

[3] N. Suryadevara, S. C. Mukhopadhyay, R. Wang, and R. Rayudu, "Forecasting the behavior of an elderly using wireless sensors data in a smart home," *Engineering Applications of Artificial Intelligence,* vol. 26, pp. 2641-2652, 2013.

[4] M. Yu, A. Rhuma, S. M. Naqvi, L. Wang, and J. Chambers, "A posture recognition-based fall detection system for monitoring an elderly person in a smart home environment," *Information Technology in Biomedicine, IEEE Transactions on,* vol. 16, pp. 1274-1286, 2012.

[5] K. J. Miller, B. S. Adair, A. J. Pearce, C. M. Said, E. Ozanne, and M. M. Morris, "Effectiveness and feasibility of virtual reality and gaming system use at home by older adults for enabling physical activity to improve health-related domains: a systematic review," *Age and ageing,* vol. 43, pp. 188-195, 2014.

[6] S. Coradeschi, A. Cesta, G. Cortellessa, L. Coraci, J. Gonzalez, L. Karlsson, F. Furfari, A. Loutfi, A. Orlandini, and F. Palumbo, "Giraffplus: Combining social interaction and long term monitoring for promoting independent living," in *Human System Interaction (HSI), 2013 The 6th International Conference on*, 2013, pp. 578-585.

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