

# Business Platform Model for Smart Home for Technology Planning Task Force

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**Abstract.** In this study we used an architectural research method based on the Open Services Gateway Initiative and Mobile Agent Technology, which is a model for analyzing smart home business platforms for technology governance planning tasks that include the recommended decision flow process and as recommendations from established business models and expanded to include a series of additional parameters needed to produce a business platform so that it can analyze the business model offered by the developer and detailed analysis of proposed governance in the service sector. And finally this research produces a Framework that presents a technology governance model for updating strategic plans and governance models for technology and frameworks designed to meet the needs of the elderly population and as recommendations for smart home management that aim to measurably improve the welfare of people in Indonesia . The proposed model and strategy recognizes the diversity of the community with existing providers of household tools and developers to optimize resources to achieve the goals and objectives of elderly smart home residents

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## 1. Introduction

Smart homes are currently facing challenges that are increasing with the diversity of their residents' needs. At present cellular internet usage is growing rapidly including the use of cellular applications and smart phones, thus increasing device connectivity and the Internet of Thing. Sensor costs and radio frequency identification (RFID) technology are things that are currently needed in smart homes and even existing smart homes still cannot meet the needs of their residents including elderly residents. The increasing number of elderly people in Indonesia in the face of challenges related to the number of elderly who occupy hospital beds due to the low availability of homes and community services and the lack of care for nursing homes and home care arrangements. There seems to be inconsistency in elderly care services in terms of effectiveness and efficiency, and lack of rehabilitation services, especially in the public sector. Older Indonesians generally want to live independently in their homes or in communities to elderly residents. This challenge is related to the business model of the new service that can be combined with the development of the internet industry and information and communication technology and the need to improve and update strategic plans and models of technology governance. In this paper smart homes are built using architecture based on the Open Services Gateway Initiative and mobile agent technology for technology task force planning. Open service gateway initiative is an open model standard that can spread services to smart home environments and is a business model that

can be chosen because this model is service oriented and this method is combined with cellular agent technology in smartphone.

It is known that in recent years, many researchers have carried out research to improve middle ware related to the technology of open service gateway gateway [1] but at first it was only for the development of gateways in smart homes, and other models using server-centric [2]. So that the technology of open service gateways, all services and computing tasks are fully managed at a centralized gateway, including other information equipment that can be controlled independently in a smart home [3]. Other studies regarding the initiating open service gateway using supporting devices and equipment in smart homes and home environments such as smart phones, cars, and other things that devices can install for monitoring [4]. The use of mobile agents and server centric intended for smart homes as supporting devices for elderly residents is a previous study [5] and the results of these studies do not take full capacity for computing devices that are used because of incompatibility between devices with limited computational environments.

In this study the we propose the use of mobile agent architecture based on the initiative of open service gateways in smart homes for technology task force planning to meet the needs of elderly residents, and in other writing it has been suggested to combine Mobile agent architecture with existing smart homes to solve problems caused by the client server concept that is distributed with technological computing. Therefore, Mobile Agents can dynamically move to household appliances everywhere in the home environment and use sensor devices installed inside the house to monitor the condition of occupants and run services through cellular phones so that the utilization of smart home task force planning technology can fully done.

The proposed strategy for the future will be built on the success of innovation and support from developers and home appliance providers. This approach is used to work as an information technology (IT) person who can form a consortium to improve and optimize the resources of various parties to achieve the overall goals and objectives of the existing smart home business model by developing. This paper starts from the perspective of a smart home that starts with the concept of a smart home and includes the use of cellular services combined with the open service gateway method and mobile agent for technology task force planning related to cellular services for elderly residents. Cellular services are needed as a case to explore new ways of thinking about platform business models in a public context and propose new theoretical frameworks to address current challenges.

The proposed model and strategy recognizes the diversity of the community with existing tool providers and household developers to optimize resources to achieve the objectives of elderly smart home residents. In this paper, section 1 to discussion introduction and section 2 discussion of methode of research and section 3 for result and discussion

## 2. Methode of Research

This research was conducted by reviewing a number of comprehensive literature from previous studies that discussed smart homes by using open service gateway technology, initiating with mobile agents installed in smart homes to monitor elderly residents. The search process in this study determines several keywords through literature review, initiate inclusion and exclusion criteria, extract data and analyze findings to answer research questions with 20 papers as cited.

## 3. Result and Discussion

### 3.1 Mobile Industry in Smart Home

In this paper, we will provide additional cellular services that can be used at home. For example, some hardware devices can be used and become a crucial tool installed in smart homes for the elderly. The smart home prototype has been developed in the past few years and is also a business that is quite inviting market demand that is quite widespread and currently has been developed by Google and Apple

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[1, 2]. Distribution design in the seller's equipment is the driving force in the provision of household tools and equipment made to improve and encourage home developers to become Smart Houses for the elderly. The use of Smartphones is now vital and also affordable for all people in Indonesia so Smart Houses Become Smart and Popular for Making Smart Homes for Elderly Residents. In turn it becomes a technical requirement for the ICT business model with cellular services. The cellular industry and smart home perspective are becoming trends of smart home movements including unresolved problems. The first thing is infrastructure and connections in the network and cellular devices that are connected to the network. There are still many home developers who announce technology compilation smart homes that pair Wifi / Wimax [3] for residents and can be used after various failed attempts around the world. At present there are several business models that have been tested, and approved in smart homes beaten by commercial Wifi projects offered by old operators, or high-speed cellular networks such as LTE [4]. One area of housing that is related to infrastructure is where houses are more likely to play the role of developing and wireless sensor connections, connecting everyday items and home infrastructure (eg furniture, home electronics) [5].

The next important part is the second point about developing hardware devices (devices) and cellular services (software) that will be installed in smart homes related to data that can be accessed by other parties who have permission to monitor / monitor the occupants of the house. At present the city government is only passively receiving information related to aspects of life that are in the home environment, but data is not publicly available or not easily understood [6]. In this activity encourage open data utilization between local and national developers. Some cities have held "hackathons" and "Applications for x" competitions to facilitate software developers to create innovative visualizations or new services that use data sources from cellular service applications. Although there are still many technical questions (related standardization, machine readers, standardization, and interoperability regulatory data), the first agreement looks at increasing success and providing interesting results. The third point and the most important business activity currently in the cellular industry is platformization. It supports companies that use different strategy platforms, use several "sides" of the market with innovative ways to gain dominance in the cellular industry in this case. This strategy is well illustrated by what Apple has predicted and imitated by Google, Microsoft, Samsung and others [7], which offers easy connections between hardware and software (including media content) so that it can make choices for hardware propositions, home developers, service providers and residents who live at home. These things simultaneously produce results from competitive industries from those who have the ability to change dramatically in a short time. This increases the level of importance for residents who live and stay at home and developers who work at home with the government who want to be active in this sector. Points and related problems above can affect the business model compilation of local and national developers to be important parties who are actively active in the value network [8]. Following this, we developed a work project to analyze (platform) a business model involving public entities such as household equipment providers in the process of assessing and valuing cash using the cellular service sector.

### **3.2 Business Platform Model for Smart Home**

In systems such as ERP, SCM systems, mobile host agents can be implemented as service packages, and any conditions in monitoring devices such as sensors and equipment in the household can be practically downloaded even in equipment inside the house so that the conditions to regulate the environment around the house can be done for a mobile agent [8]. Thus, by performing the instrument in real terms as a tool for interacting mechanisms in an automated manner and other approaches through a control process to handle hardware devices that are controlled automatically, the host agent can not only be used in the design of moving agents that can even interact with the external environment through the home web services.

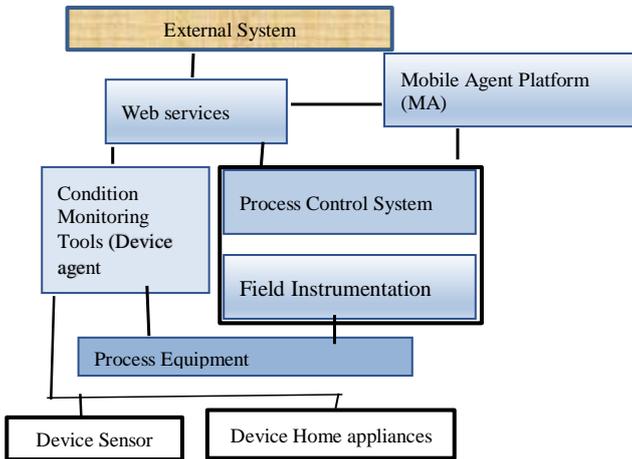


Fig 1. Proposed Business Platform model Smart home

On Fig.1 It can be seen that the design model proposed in the writing of this smart house, the Mobile Agent can transfer to a number of host agents used on different business platforms and can do several services provided by the targeted platform. In this case, non-public service packages local can be called a Mobile Agent through a system control process with the proposed instrument, and can solve the problem mentioned at the end of the previous section. Judging from the process that the Mobile Agent transfer behavior is actually a sensor of transportation equipment and home appliances through the agent mechanism, and the behavior of the Mobile Agent service event is actually realized by the service component equipment which is an instruction by the translator in accordance with the conditions of monitoring devices as agent devices. There are several functions, interactions and devices possessed by the agent device [9].

1) Function: in this case the Agent device is the only one that is connected to the hardware and can be connected to communicate directly with all hardware devices. This will be a service package that depends on the device in charge of controlling the device's equipment, to monitor occupants' activities, and also to collaborate with other device components, this function receives requests for service for residents and / or reports to residents of the device. In addition, it can also monitor the state of the environment around the house and make the conditions observed and occur in the home environment become raw data.

2) Interaction: The agent device is registered as a directory in the agent's directory so that it can provide information about how other service packages can be interacted with other agent devices, it will receive service requests from other components. The existing raw data will be sent to the context agent to be used as several conclusions for the circumstances that occur around the home environment.

3) Device Tools: Hardware controlled by device agents can and can be divided into two categories, namely: sensors and hardware devices. The difference between the two is that it can control the occupants of the house, while the sensor is only to collect the raw data captured.

Architectural design supports pulling and encouraging device agents. In the push section, the host agent service package has a passive role, that is, waiting for documents to be captured through the installed device. The syntax that is in the process on device equipment to support hyperlink services, which are web documents. For example, to improve service, the equipment process document can send one data document or many documents over long distances by providing a uniform resource finder (URL) that is

used as a reference material. On HTTP, it is the duty to retrieve the type of document remotely from the device agent, which usually is a Web server or application server that serves to host or make the document equipment process. In the pull section it functions as a process of equipment that is dynamically generated at runtime by the script-server language that is on the web server, for example PHP (Pre Hypertext Processor) provided by the Apache web server (ASP) which is owned by Internet Information Server (IIS) . Server-side scripting technology greatly enhances the equipment flexibility process because the resulting server is a document that is personalized according to different service requests.

### **3.3 Technology planning task force**

#### *Vision of Technology*

The technology vision proposed for smart homes for the elderly is collaboration, initiative and innovation in each region nationally so that it can be adopted by other regions to improve services for the elderly and provide better comfort and quality of service within the community [10].”

#### *Principles of Technology*

The guiding principles that have been considered establish a set of guidelines for decision makers on technology projects. The framework for smart homes has adopted a set of guiding principles that have fundamental values and also provide overall direction for technology programs in the home developer network. As a principle material for establishing conditions in the progress of technology projects. The guiding principle is intended to be able to modify existing services so that home developers can improve service quality for elderly residents.

Home developers adopt the principles 1–10 below. The Technology Planning Task Force recommends adding principles 11-14 [11].

1. Ensuring effective and efficient access to services and equity so that residents can improve their health, especially for elderly residents.
2. Include services to residents who need additional services so that device agents can be tailored to the needs of residents.
3. Maintaining innovative accommodation access for conventional access to public services.
4. Provide Design for Ease of Use for residents of the house including the elderly. Build user-friendly services, and use widely available technology.
5. Providing Education and Support by developing training and support for all technological solutions, especially technology that will be developed in smart homes.
6. Provide personal information security by providing service design to comply with privacy laws and to convince residents of smart homes that personal information is protected properly.
7. Providing reliable information services by ensuring the accuracy and timeliness of information provided to residents of the house to household appliances developers, software developers, the government and the surrounding community.
8. Protecting from the failure of a technology by setting possibilities and solutions to ensure that residents of the elderly do not lose comfort when technology fails or residents cannot operate the system successfully.
9. Improve service packages in the environment around smart homes by making full use of technology and, in turn, providing better services to residents including elderly residents.
10. Plan ahead by creating technological solutions. Creating technological solutions that think ahead and can adapt to changes in the state of the occupants of the house including the elderly.
11. (NEW) Improving existing smart home compatibility through technology standards and providing smart home technology guidelines related to access to information and receipt of documents that support the goals of smart homes that provide greater compatibility for elderly residents.
12. (NEW) Consider existing smart home collaboration and economies of scale by identifying opportunities to collaborate on technology to reduce costs, utilize expertise and training, and improve consistency.

13. (NEW) Provides encouragement in national decision making by developing, funding, and implementing technology to improve local business processes that can provide models for broader implementation.

14. (NEW) Conduct Local Innovations by increasing the development of smart home technology and enabling adaptation to meet the needs of residents, encourage innovation, and provide, if appropriate, models for broader implement.

#### *Initiatives Category Technology*

The technology initiative category provides a framework and scope for strategic technology decision making for smart homes. There are several initiatives that are categorized as intended to provide guidance on how technology solutions can be managed and developed in a smart home environment including increasing the needs of its residents [12].



Fig 2. Initiatives Categories Technology

#### **Smart home of programs and solution**

- Solutions are interpreted, processed and developed through a business platform model for governance structures in smart home technology and in collaboration with many parties such as developers / providers of household appliances, software providers, and home and government developers [13].
- Participation activities are mandated when the house applies technology for the development of existing smart homes that are tailored to the needs of its residents, such as elderly residents.

#### **Smart Home Standard and Guide**

- Standards and guidelines in smart homes are created through a platform of smart home governance structures that have been considered by all parties involved in collaboration with residents of the house.
- In specific smart homes are still being developed to implement technological solutions and also adapted to the needs of smart homes that meet the standards [14].
- There are a number of guidelines which are still categories that may be permissive and can be used as more recommendations in developing smart housing.

#### *Roles and Responsibilities*

It can be seen that Figure 3 is a Technology Planning Task Force that can provide recommendations for creating a governance structure that focuses on cooperation as part of the IT community. This design will provide certainty that the business model for smart home initiatives and the use of related resources in the IT community that collaborates with proper governance and supervision by home developers, all parties and local residents. So in some conditions, the business model for smart home technology will be needed to work directly with the IT community to encourage collaboration and utilize smart homes as an existing center for innovation and smart home development.

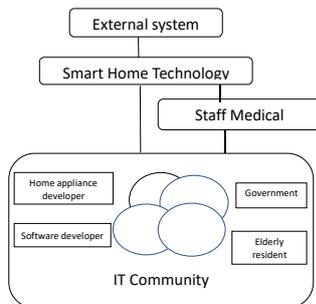


Fig 3. Propose model for Technology Planning Task Force

The actors in smart home development are needed to be more active and involved in the scope of management and implementation of development projects. To be able to increase the scope of the IT community to be able to build and develop smart homes with innovation that collaborate on efforts to expand, improve, and adapt to the needs of residents. This requires commitment from many parties in the development of smart homes to contribute human resources to homes, home developers and occupant innovations to their applications in the needs of other residents [15].

#### Technology Goals

In this paper the Technology Planning Task Force proposes four technological objectives for smart homes in supporting the increase in the needs of residents and other residents.



Fig 4. Goals Planning task force

Based on Figure 2. That there are four objectives, namely digital home promotion so as to increase the comfort of residents in a timely, efficient and effective manner, by offering comfort and maintaining a healthy life, and improving the home environment for the elderly. Digital Smart Home includes a series of comprehensive services for interactions between residents and their home and surroundings, and for partners to collaborate with various parties. Optimize Resources is a smart home that can maximize the potential and efficiency of its technological resources to the fullest and supports infrastructure and assets that are needed now and in the future, and improve information technology resources through procurement, collaboration, communication, and education for residents of the house. Optimizing infrastructure is a condition that will be improved in developing smart homes by utilizing and supporting reliable and safe technology infrastructure. This will ensure sustainable investment in existing infrastructure and consolidated and shared computing exploration if needed and smart homes will encourage modernization of laws, rules and procedures to facilitate the use of technology in home operations and the delivery of service documents to residents [16].

### 3.4 Conclusions

In this paper the design of a smart house consists of cellular service elements with a technology planning task force that becomes an important element in the development of smart homes that will meet the needs of elderly residents. The rapid change in evolution in the housing business sector and the complexity that occurs in the business model makes it a smart home development platform and a recommendation for making existing smart homes. The big challenges facing the current government that play a role in the ecosystem development of technology needed in smart homes currently do not meet the needs of the elderly population and the increase in the elderly population and public facilities for them has not been fulfilled. Also, the existing analytical framework fails to capture certain difficulties (business models) faced by cities in providing services to citizens. In view of this, we apply the "business model logic" to the case of cellular services, and expand and redefine the existing framework to better capture this specific challenge.

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