



# Building Enterprise Workflow

## Abstract

This paper presents an optimized workflow for HomeSmarts.com. The company needs to adopt several new technologies and architectures to build a streamlined operational workflow for product delivery through the company's sales channels (e-commerce, m-commerce, and retail). Competitive and operational advantages for each topic are also required to support and improve the company's current market position and its business objectives.

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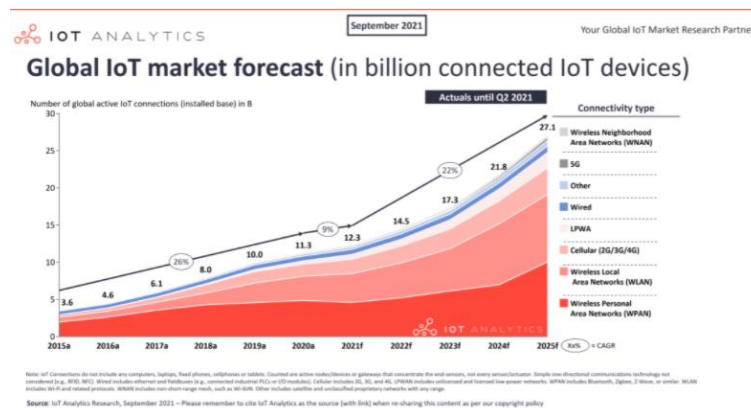
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## Section 1 - Introduction

HomeSmarts.com is a technology company primarily offering and managing home assistant Internet of Things devices such as security sensors and alarms, smart lamps, thermostats, etc. The company's business strategy is selling these types of devices and providing mobile management applications to their customers through e-commerce, m-commerce, and retail. Currently, HomeSmarts.com's main business is in the US and the company has a presence in India, China and Russia. HomeSmarts.com has their own e-commerce and m-commerce representation to their customers, but also has strong relationships with other eco-system vendors (i.e., Google, Amazon, Blink, Phillips) and retail stores (i.e., Best Buy, Target, Walmart). The company is aiming to provide high quality niche products, satisfactory customer service and high performing mobile applications to attract more consumers and make profit.

## Opportunities and Challenges

Fast growing Internet of Things industry has brought HomeSmarts.com significant business opportunities. Based on Statista (2021), the global market for Internet of things (IoT) is expected to grow to around 1.6 trillion by 2025. Continuously evolving mobile networking technology such as 5G, Wi-Fi 6, and LPWA are also driving IoT industry to thrive with faster and smarter device connections (Satyajit Sinha, 2021). However, winning market share would be challenging because many tech giants have gained a foothold in offering similar products such as Amazon Alexa, Amazon Eco, Google Assistant, and Samsung SmartThings Hub (Forsey Caroline, 2021). It will be very difficult for HomeStarts.com to compete against these giants with lower price since they have a much stronger bargaining power with suppliers. Additionally, the Covid-19 pandemic and chip shortage also have negatively impacted IoT industry, mainly on the supply chain. Many companies are suffering disrupted supply capacity, making them unable to meet demand (Hamblen Matt, 2021).



Source: [State of IoT 2021: Number of connected IoT devices growing 9% to 12.3 B \(iot-analytics.com\)](https://www.iot-analytics.com)

Due to these factors, HomeSmarts.com should deemphasize competing with market giants such as Amazon and Google in terms of pricing, and instead utilize other competitive strategies such as differentiation and innovation (especially creation of niche products) and focusing on taking a decision-based approach to improve their workflow, provide high quality products, and personalized customer services based on better management systems, architecture, and massive

data analysis. HomeSmarts.com should also adopt a supply chain management system to have better visibility into their supply chain's structure, have a better communication and collaboration with their vendors and suppliers and invest in mapping their supply networks wisely to cope with the Covid impact. These new architecture/technologies are listed in the following:

Recommended architecture/technology	Purpose
Service Oriented Architecture	The streamlining of operations for delivery of the mobile application
Data Mining	Improving decision making to compete more effectively
Workflow and Business Management Systems	The streamlining of operations of product delivery through the e-commerce process
Supply Chain Management	Have better visibility into the supply chain's structure and improve communication and collaboration with your customers, suppliers, and alliance partners. <sup>1</sup>

## Section 2 –Technology-driven workflow and improvement

### Service Oriented Architecture

According to Module 3 online material, “Service-oriented architecture (SOA) is an architectural style that attempts to ensure service coordination is supported.” (Arakelian, 2021). SOA provides interoperability and loose coupling between each service so that these services can be reused without rewriting their existing distributed systems (Mahmoud H Qusay, 2005). SOA would facilitate workflow by allowing various services to smoothly communicate across different systems through API regardless of these systems' locations, computing languages, and transport protocols (Nolle Tom, 2021). Especially for mobile applications, IT developers would be able to easily add support or integrate data and applications across the company so that a streamlined and efficient operation can be delivered, and the company's overall goals of providing high quality products can be achieved. <sup>2</sup>

### Data Mining

According to Wikipedia (2021), “Data mining is a process of extracting and discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems.” In other words, data mining is the process of discovering and identifying valuable information and metrics to better assist companies in decision making and driving profits. Common types of relevant data mining include Market-Basket Analysis, Classification, Clustering and Trend Analysis (Arakelian, P.25). These methods are used to organize and filter data, and explore unseen patterns and anomalies from various

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<sup>1</sup> Table text excerpted from assignment example

<sup>2</sup> More detail will be discussed in subsequent sections (3, 4, 5, 6) for SOA and the other three topics (Data Mining, Workflow and Business Process Management Systems, and Supply Chain Management).

sources, so that companies can have a better understanding of their customers, market, and industry. By enjoying the benefits from data mining, HomeSmarts.com would be able to improve workflow by efficiently making intelligent business decisions.

### Workflow and Business Process Management Systems

Organizations use workflow and business process management systems to manage, streamline, and monitor the flow of internal and external work for optimal efficiency (Arakelian, 2021). Workflow and business process management systems help companies to achieve such goals by identifying repetitive or redundant work processes and bottlenecks, outlining the workflow in an optimal state, and automating the work process (Kissflow, 2021). HomeSmarts.com would gain many benefits through this type of system, especially helping the streamlining of operations of product delivery through the e-commerce process, thereby aiding accomplishing the company's overall goals of improving workflow and providing high quality products and customer services.

### Supply Chain Management

Supply Chain Management (SCM) is used to manage the entire production flow of a product or service from raw material suppliers to the customers (IBM, n.d.). Effective supply chain management systems minimize companies' cost and time spent on their production cycle and help identify potential risks and problems. HomeSmarts.com could utilize SCM to streamline their production workflow and make strategic business decisions to ensure customer satisfaction and obtain sustainable competitive advantages.

### Joint Improvement of Workflow

The IT department of the company should make a proposal regarding applying SOA, Data Mining, Workflow and Business Process Management Systems and SCM jointly so that the company's current workflow can be greatly improved. The proposal would be:

Build a SOA-based Workflow and Business Process Management System to foster a better collaboration between the company's business analysts and IT developers and allow IT developers to build and deploy reusable business services based on the company's business needs (BEA, n.d.). Also, use SOA and Workflow and Business Process Management Systems to optimize the company's operations in their e-commerce and m-commerce fields so that the e-commerce site and m-commerce applications could be coordinated smoothly. Data mining would assist SCM in better understanding their current supply chain structure, anticipating potential material shortages, and allocating inventory. Also, use SCM and Data Mining together to retrieve and analyze useful data and make smart business decisions to enhance communication and interactions with their customers, suppliers, and partners. Further, use SCM and Data Mining together to facilitate IT developers to gain a better understanding of their customers and suppliers, and thus make a better use of SOA and Workflow and Business Process Management Systems in delivering a higher quality of products and services. Additionally, use data mining to help the company dive into IoT new trends study and analysis such as cellular IoT, LPWA connection, AI/AR-driven IoT, cloud-computing, etc. Finally use SOA-based workflow and Business Process Management Systems and SCM to assist the company to have a streamlined workflow and thus bring innovative ideas into reality in an efficient manner.

With these technologies/architectures working jointly, HomeSmarts.com would have a stronger weapon to succeed in achieving the company's objectives of IoT product quality improvement and innovation, personalization in customer services, and niche product development.

## Section 3: Service Oriented Architecture

HomeSmarts.com is using a traditional and monolithic approach to build their mobile application. Since each component of the application is tightly coupled, each component cannot be reused and scaled independently, and thus the operations for delivery of their mobile application is very rigid (Gnatyk Romana, 2018). With the growing number of products and services offered to customers, the application has become very complex and costly for the IT team to maintain and upgrade. To solve these problems and build an efficient mobile application eco-system for their IoT devices, HomeSmarts.com would need to abandon this approach so that code repositories and data sources for different parts of the application can be separated, reused, and maintained independently. Each component of the application should be loosely coupled, and they can communicate each other through defined interfaces (Ram Prashant, 2018). For example, many IoT devices such as home security alarms, home energy monitor and smart lamps can be connected on the same mobile eco-system platform but should be managed, upgraded, and maintained individually.

### Operational

Transforming to service-oriented architecture (SOA) would help HomeSmarts.com to achieve the above goal and improve efficiency and agility of their mobile application, which leads to a streamlined operational workflow. By applying SOA, application functionality is created based on self-contained services (Arakelian, 2021). Such services can be reused and combined in various scenarios based on the company's different IoT devices. Also, because the two major mobile operating systems (Google's Androids and Apple's iOS) both promote component-based and loosely coupled development (Mannem Sreenivasulu, 2021), instead of the IT developers writing and integrating a brand-new mobile application, SOA would enable their developers to quickly build or add new features on a complex application by reusing and combining some services that are from different, platform-independent sources (IBM Cloud Education, 2021).



Source: [Service Oriented Architecture - Bing images](#)

## Competitive

Applying SOA would assist HomeSmarts.com in gaining many advantages on workflow from a business competitive perspective. SOA would allow HomeSmarts.com to bring down the time and cost spent on their data integration, application integration, business process integration, and application development and improvement, so HomeSmarts.com would be able to invest or focus more on other essential competitive strategies, such as innovating new services and finding a niche market to differentiate from other competitors like Amazon, Google and Cisco. Also, due to this reason, HomeSmarts.com might be able to reduce the price disadvantage with their main competitors and maintain the same or even higher quality of their products and customer service. Furthermore, as mentioned above, SOA also facilitates faster application developments, which would help HomeSmarts.com introduce new products in the market in a faster manner and increase the likelihood of becoming a 'first mover' to obtain more market share.

## Section 4 - Data Mining

Currently HomeSmarts.com is only self-obtaining information such as online surveys, customers' feedback, and sales figures for analysis and to make business decisions and predictions. HomeSmarts.com has detected a substantial deviation between their forecast and actual situation and thus has realized that such information is not sufficient to determine their business and competitive strategies. Therefore, data mining should be introduced to aggregate data in various sources and address the issues on how to improve decision making to compete more effectively.

### Operational:

Data mining can be used in various areas to improve operational workflow. To take a marketing operation as an example, HomeSmarts.com could use data mining to analyze their customers' characteristics, which might include their biometric information, income, habits, behaviors, preferences, etc. to identify customers who are most likely to positively respond to their products. This would allow the company to target specific groups of customers in advertising campaigns. On the other hand, the company could also use data mining to analyze which groups of customers who are more likely to switch to their competitors, assisting the company to recognize any critical hidden factors so that they can make adjustments to improve their customer loyalty and satisfaction. Also, data mining would enable HomeSmarts.com to predict market trends, future opportunities, and risks, and thus develop more products and services that best fit in the reliable forecast and optimize their risk management (Niesz Marley, 2020). Additionally, with data mining techniques (i.e., anomaly detection), HomeSmarts.com would be able to detect any system abnormalities that deviate from the data's normal behaviors (Cohen Ira, 2020). For instance, similar to financial institutions using anomaly detection to detect fraudulent activities for their customers' security, HomeSmarts.com could quickly detect any changes in customer behaviors, sales figures or other factors that primarily affect the company's performance so that they can quickly analyze and react to these changes.

### Competitive:

First, data mining techniques such as market basket analysis and clustering, would help HomeSmarts.com quickly pinpoint their marketing strengths and weaknesses, identify their ideal customers, and discover



the most effective marketing channels to enhance personalization in customer service, raise their brand and product awareness and thus obtain more market share (Arakelian, 2021). Also, HomeSmarts.com would be able to have a clear understanding of their customers' preferences, which leads to greatly improving their product/service personalization. For instance, HomeSmarts.com could send relevant information regarding offers and promotions to their target customers by emails, recommend and list out proper products on their e-commerce sites based on each customer's search history or a specific category to which each customer belongs. This would help HomeSmarts.com build a strong brand so that their customers would not be likely to switch to competitors. This is particularly important because the company's competitors (i.e., Amazon, Google, and Samsung) are much better known by customers, and customers are prone to switching to well-known brands. Moreover, HomeSmarts.com would be able to make intelligent business decisions to reduce unnecessary cost and time spent on the issues that are irrelevant to their business goals and prioritize critical objectives of providing high quality product and services. Lastly, with all the benefits of data mining mentioned above, in a highly competitive business environment, HomeSmarts.com would be more likely to outcompete other competitors who have not used data mining techniques in their business.

## Section 5 - Workflow and Business Process Management Systems

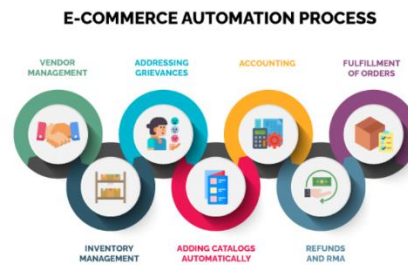
HomeSmarts.com's e-commerce is divided into different components including order handling, shipment tracking, payment processing, customer interaction, inventory management, and vendor management. The current workflow is lacking in efficiency and collaboration because each component has separate goals and responsibilities, and tasks are handled independently. A workflow and business process management system are needed to address this issue and improve the streamlining of operations for product delivery through the e-commerce process.

### Operational

Applying workflow and business process management systems would provide many operational advantages to HomeSmarts.com. A good workflow and business process management system would be able to automatically decide when a workflow is to be started, divide the workflow into a sequence of tasks and monitor the flow of work to detect any errors and provide reports or alerts when necessary (Arakelian, 2021). These systems help HomeSmarts.com integrate automation with manual work to greatly reduce time and budget spent on repetitive manual tasks, prevent manual errors, and thus improve their business operational productivity and efficiency. Also, these systems would help HomeSmarts.com improve the collaboration between each department throughout the organization and even with their external partners. To take HomeSmarts.com's e-commerce as an example, utilizing a good workflow management system would greatly reduce the amount of manual work and create an efficient and reliable e-commerce workflow automation system to continuously maintain their e-commerce operation. Major components as mentioned above (vendor management, inventory management, order handling, payment processing, shipment management) would be automated and streamlined to ensure their e-commerce efficiency and productivity. Each order would be completed through the pre-defined workflow, from order generation to completion. By utilizing the workflow management tool, each component would also be highly collaborative, because not only should their own goals and responsibilities be identified, but transparency should also be created to ensure that the flow of work is efficient and seamless. Additionally, since HomeSmarts.com also has presence in other countries beside in the US, each team



should adapt the same workflow and business management system so that their business operation process can be standardized.



Source: [e-Commerce Workflow Automation to Streamline your Online Business | Quixy](#)

## Competitive

Workflow and business process management systems would improve HomeSmarts.com's business workflow competitively by substantially increasing efficiencies and cost savings. Many components of the company's e-commerce workflow such as order handling, shipment tracking and payment processing would take significant less time through the use of automation. With high efficiency, their e-commerce team would be able to monitor the status of workflow and quickly tackle disruptions or errors during the flow of work to ensure a high quality of customer service. At the same time, the e-commerce team would be able to handle many more orders with less manual work and lower cost. Therefore, providing a constant high quality of customer service and lower price of products (at least narrowing down the price difference with other competitors) could be two major advantages that workflow and business management system would bring to help their e-commerce team to compete against competitors. This would again help the company implement its business strategies and accomplish its goals of providing high quality products and services.

## Section 6 - Supply Chain Management

Like many other companies, HomeSmarts.com also has received negative impact on their business due to supply chain disruption caused by the pandemic (their raw material suppliers are mainly located in Asian countries such as Indonesia, China, and Vietnam, and their main chip supplier is in Taiwan). The procurement team is struggling to secure raw materials and protect supply lines to meet their demands. HomeSmarts.com has realized that the pandemic is a wakeup call to the fact that they need to utilize a supply chain management (SCM) tool (such as SAP Supply Chain Planning Software and Microsoft Dynamics 365) to help them obtain a better picture of their supply chain structure to cope with future challenges.

## Operational

Based on Investopedia (2021), "Supply chain management has five key elements—planning, sourcing raw materials, manufacturing, delivery, and returns". All these five elements would greatly help HomeSmarts.com to achieve its operational objectives. For instance, the company could use SCM statistical analytical algorithms to facilitate the company to manage and forecast their assets and resources, balance supply and demand, and identify risks to quickly reallocate sources, which would allow HomeSmarts.com to have a better plan to map their supply network more locally or quickly find available alternatives to meet their demands. Also, SCM sourcing, manufacturing, and delivery would

help the company control their production processes, ensuring high product quality, reducing the risk of recalls and lawsuits (Fernando Jason, 2021). SCM returns allow the company to create an efficient and streamlined process to return defective or unwanted products to avoid losing customers. This is very important for HomeSmarts.com because one of their main objectives is maintaining customer retention by providing high quality IoT products and customer services.



Source: [supply chain management - Bing images](#)

## Competitive

Supply Chain Management allows HomeSmarts.com to achieve its competitive goals by improving communication and collaboration with the customers, suppliers, and partners. With SCM, HomeSmarts.com would be able to create an efficient and collaborative relationship with their suppliers and partners to constantly balance supply and inventory based on the company's demand. This would greatly reduce the likelihood of delaying products' arrival caused by unplanned shortage of inventory, which would certainly lead to an enhanced relationship with the customers and preventing them switching to other companies. Additionally, the long-term collaborative environment created by SCM also facilitates HomeSmarts.com in obtaining innovative advantages. For instance, their suppliers and partners might have developed cutting-edge technologies or products in the fields of semiconductors, microcontrollers, and microprocessors that could be more efficiently used in the process of IoT product innovation through aid of SCM. Such suppliers and partners could become one of the important sources to drive HomeSmarts.com to succeed in innovation and developing truly unique, niche products which stand out from the market.

## Section 7 - Conclusion

Facing multiple current challenges, HomeSmarts.com needs to adopt Workflow and Business Management Systems, SOA architecture, Data Mining and SCM in order to streamline operations for product delivery through e-commerce, m-commerce and retail, and in order to make intelligent decisions

and enhance communication and collaboration with their customers, suppliers, and alliance partners. By accomplishing these goals, HomeSmarts.com would be able to leverage their own advantages, which include providing high quality products and customer service and developing innovative initiatives (especially niche IoT products), to differentiate themselves from competitors, and thus place the company in a stronger competitive position.

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