Cloud Based Video Surveillance For Homes

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1 Executive Summary

The business idea is to implement a cloud based video surveillance of homes that will help to monitor homes from your personal PCs and Smartphones 24 hours a day and also to improve security of home. CloudIoT paradigm is used to implement this business idea. Emerging Technology used is Internet Of Things. The main pain point of this business idea was that Traditional surveillance system feed was available only on a single computer. Hence the urgent need was to implement a surveillance system in home in such a way that an owner can access live feeds of their homes anywhere at any time using their smartphones, tablets etc with just access to Internet. The Targeted customers are all those who want to surveillance int their homes. Competitors include well-established companies like Alarm Security and Ivideon.A IT team, Sales and Marketing Team and Finance team is needed to implement this business. The most important costs to be considered for this company is the cost of cameras. Data Protection Act, Information Privacy Act has to be reviewed and considered while implementing this idea. Cloud helps in the storage of video surveillance data. As the storage in cloud is scalable it is easy to expand business using cloud solution.

2 Analysis of Problem or Business Opportunity

Video surveillance has become an integral part of everyday life. Video surveillance can be find wherever you drive, where you eat and where you work. The need of feeling secured has increased with the development and rise in per-capita income of people. Currently surveillance system installed is mainly for commercial workspace. With the evolution of cloud the it is easy and cheap to install a video surveillance at homes. Hence the business idea is a cloud based home surveillance system that can monitor homes at all the time. Currently the working class people are increasing. The historical trend of only one member of the family is working is coming to end. Traditional surveillance used until now has a problem that feed was available on a single computer. But with the rise of cloud and IoT it is possible to implement a cloud based videos surveillance for homes.

Business idea is to implement a surveillance system in home in such ways that an owner can access live feeds of their homes anywhere at any time using their smart phones, tablets etc.By Implementing this owner can keep an eye on security at home from any place, as this surveillance is web based and can be accessed by any personal devices like smartphones, computers and tablets. The customers who will benefit from this are all those want to survey their homes all the time. The customers include the ones who have valuables at home and they want to keep an eye at all time. and also those who have children and pets at home and they have to look after them. This will also help the customers to know how caretakers are doing and whether they are taking proper care of their childrens or not.

Another reason to use video surveillance at homes is, According to the statistics as published in independent newspaper in Dec2014, average of 54 homes are being burgled in Dublin every day. This number shows that there is not enough security measures put up at homes in Dublin. A new paradigm has been developed Video Surveillance as a Service using cloud but common mostly non technical people are still unaware of it. They still think it is too costly to implement video surveillance at homes and they can only monitor it by sitting in front Of PC or by hiring a guy who has a specific task of monitoring home.

Also nowadays couples in the family both are working hence there is no one at home mostly during afternoon time. Hence the house is at security risk at this time period. The cloud based video surveillance system will help to monitor homes even from work by simply logging into your smartphones or laptop. This solution is also cheap. Not only security it will help to look after your children and pets and keep and eye on them. Also microphones can be attached to this video surveillance form where you can talk and redirect your children and pets. This will also be help to those customers who cancel their vacations in a fear of security at homes.

3   Solution

The company is a CloudIoT based video survillenece system company. The business will be implemented as video surveillance as a service(VSaaS). The server will run on our campus where company is established and all the client cameras will be connected here. For this we are using Amazon public cloud for Elastic Compute and Simple storage.The server will be upgraded and maintained by the company. It will be connected to cameras using a web portal. There will be fees incurred for the clients to use this service. The service is established in two ways either this will be pay per use model or customers can pay for subscription plans which will be for three months, six months and a year. The business is carried out in the following way:

The company will provide different range of cameras to connect at home. The customers will have an option to choose from them. The following are the types of cameras that company will provide:

1.Logitech Alert 750n: This camera can be easily installed in home based system. The basic feature feature of this camera is that it comes with a micro-SD card which can record and store data around 2 GB. Hence it is useful for those customers who want some in built memory along with the cloud solution. The drawback of this camera is that it can only be installed with windows PC and it is not compatible with other OS and Smartphones. Also it is plugged system camera hence its placement is an issue.

2.Samsung SNH-1011 IP SmartCam: The camera is a Wifi based hence there is no need to plug it but it doesn't come with in built memory and so for storage the customer has to fully rely on cloud storage. But this camera is compatible with any devices like Android and IOS Smartphones but it has very less resolution.

3. Netgear VueZone Video Monitoring System: This camera provides high resolution recording and video. The extra feature of this camera is that it is a auto-detatchable camera. Hence the customers can move the camera from one location to other according to the needs. It also have motion detecting system.

4.D-Link Day/Night Network Cloud Camera (DCS-932L): The extra feature in this camera is it come with night vision. It comprises of both motion and sound detection sensors. This camera is also Wifi based and is compatiable with all devices PCs and Smartphones. This camera also provide High Defination video recording

5.Swann ADS-445 SwannEye: This is a whole package camera that provide almost

all the services for home based video surveillance. This camera has all the features as described above but it has some added features like it comes with tilt/pan function which will give customers a view of 350 degrees. Also it contains microphone and speaker and provides two way function so you can do both talk and listen from the camera and also from your devices like smartphones and PCs.

The emerging technology used is Internet of Things. There is an option to customers who want to install wireless sensors like motion sensors and sound sensors to improve the security of the homes.

Our solution is different than others as we are not confusing the customers with providing them with a lot of choices of cameras to choose from .We are providing them with five basic different cameras that have different functionality and features. And also the solution is not like established companies who has service over 100 countries but they only provide cloud services and camera choosing and buying depends on customer choice who have to do independent research on cameras and buy them.

4 Market Segment

In the first phase we are establishing the company in Dublin. The target customers include the families with couple both working and have children or pets at home to look after and they both are not at home for majority of time in a day. Another section are those people who has valuables at home and they want a security system to be installed to secure their precious valuables. The market size we are targeting is 20,000 homes at the first phase and gradually increasing it to fifty thousand people. The marketing scheme is no cost for fitting and implementing the cameras will be incurred to first 500 people. Still after the evolution of cloud computing in video surveillance's many people still doesn't benefits of cloud computing solution. The main drawback of traditional system is that processing of video, recording all happens on one computer which has to be installed on the site. In this case customers home. With cloud the recording, video processing all are autonomous processes and it is handled by cloud. The customers itself doesn't have to look after the installation, maintenance and up-gradation of the installed systems.

4.1 Customer persona

Steven Gerrard is an family guy who has two daughters at home. His age is 40. He and his wife Julia both work in an IT corporation from 10am to 5pm. His daughters names are Anne and Angela. Anne is 10 years old and Angela is 3 years old. He want to install a video surveillance system at home so that he can keep an eye on his daughters to look whether Angela is studying or not. Is she playing a lot of games on computers or not. They also have a caretaker for Anne. He also want to keep an eye on her for example,is she taking good care of her or not.

Hence the basic requirements of Steven is a video surveillance system whose feeds are available both on his and his wife smartphones and PCs. He also want a microphone attached to camera so that they both can talk with their children in between and also guide them. He also wants a wireless sensors on the front door whose alarm system is attached to his smartphone rather than traditional alarm systems so that he know if anyone comes to his house in his absence. Also after wireless sensor are triggered the front camera will be automatically activated and feed available on his smartphone. Also

the front door lock system activation should be on his phone and he has power to decide whether to allow or not allow the person to enter.

5 Analysis of External Environment

The main competitors are the established providers who are providing cloud based solution to video surveillance systems for both homes and commercial systems. We identified the following companies as the main competitors that are conducting business closed to my business idea:

1.Ivideon is a company that provide video surveillance for both homes and offices. Their video surveillance feeds are available with a various of platforms like Mac OS, Android, Windows etc. They provide video surveillance all over the world with their own private cloud and globally distributed 18 data centres. But they don't have offices all around the world and they don't have an office here in Ireland. Hence personal customer support is a problem. they can give only virtual support via a webcam or skype. But still it is an established company and hence it is challenge to compete with Ivideon.

2.Alarm Security: It is a Dublin based established company run by McDonald Group Services. It provides security systems for homes since 1977 but their company still run on on-premise solution. Their business in particular is to provide security to homes and not video surveillance.

Nowadays, the customers are currently looking for a cost effective, scalable video surveillance with the feed available on their smartphones and PCs that will easily help them to keep an eye on their homes. Cloud influence the business in a way that it is cheap, easily scalable and reliable. Traditional systems that were connected with the a single computer has problems like if the computer crashes then your whole data is lost but in cloud multiple copies can be saved easily and differently. In our business model one copy of video feed of customers will be saved on our private cloud and the other in amazon storage service. Hence cloud help you to achieve data replication.

Currently the business trends in video surveillance is that it is moving form SD to HD. The HD CCTV cameras are in huge demands nowadays in public. The current trend is growth of IoT in residential applications and video surveillance is not an exception to this. The key growth drivers in 2016 in video surveillance are HD quality video surveillance, more storage options for streaming and IoT in video surveillance.

The SWOT analysis of this Cloud Based Video surveillance of homes is as follows: .

Strengths

- Using Cloud based video surveillance videos can be easily deployed on cloud via web portal
- Solution is scalable as the demand increases the storage space can be increased.
- The cloud based video surveillance system is very cheap.

Weakness

- Privacy is a issue here as all the data of all customers is stored in same storage device. Hence it is huge risk that data of one customer will get mixed with another customers.

Opportunities

- With the growth of VSaaS market in coming years more safety and security measures can be put up.
- Also with the growth of IoT new features smart home systems will be added to this surveillance system

Threats

- The system is implemented in hub and spoke model hence if traffic is increased at server side it may result in loss of network connectivity.
- With loss of connectivity performance may degrade.
- The whole storage system is in public cloud hence there is huge risk of security

6 Analysis of Internal Environment

The basic hierarchical structure of the various departments and teams needed in the company are as follows. .
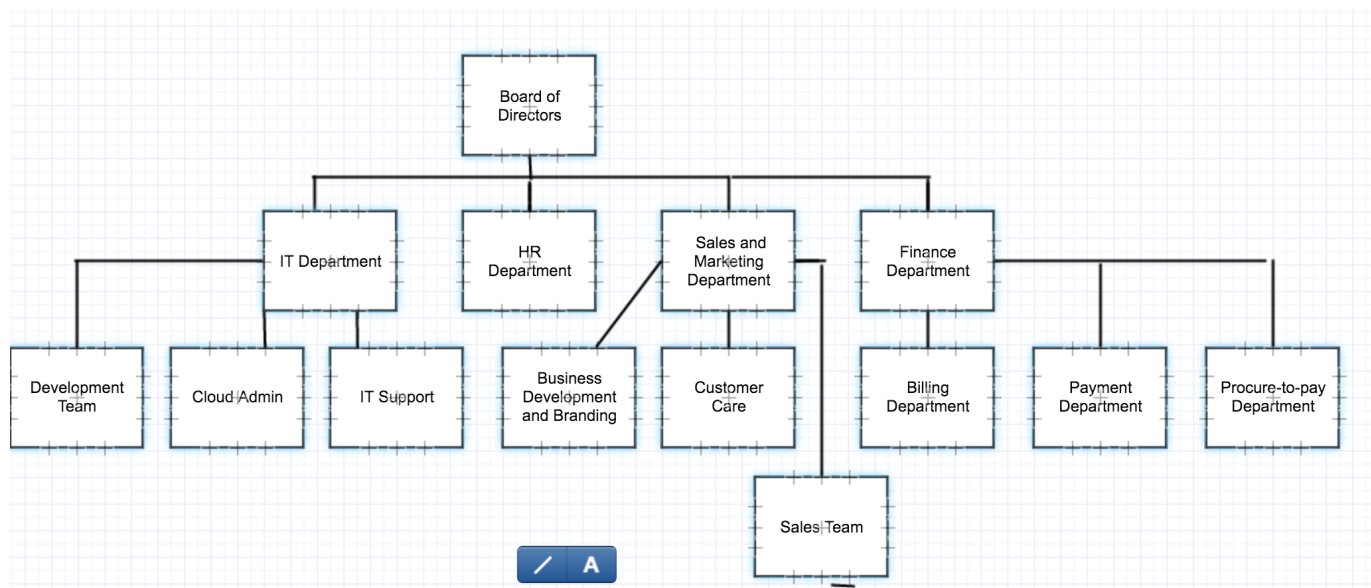
6.1 IT Department

The IT Department consist of three sub departments mainly Development team, Cloud Admin and IT support. The basic roles that cloud Admin are as follows:
1) Building, maintenance and upgradation of servers.
2) Resource and Storage Space Allocation to all the customers

3) Addition of racks, increasing storage space as needed.

4) Allocation of projects and tasks to development and monitoring those tasks.

5) Cloud Admin will carry out both the roles of System admin and network Admin.

The development team will work on creation and maintenace of the website. One senior Web Developer and Junior Web Developer is needed for this task. The IT support team will help the customers with the technical issues in the setup, working and maintenance and any technical issues that will rise while using our video surveillance systems. The number of members required in the support system will increase with rise in number of customers.

6.2 Sales and Marketing Department

This department has three sub departments namely, Business Development and Branding department, Customer Care and Sales Team. The task of Business Development and Branding department is to carry out processes and tasks that will help in the growth of company. This department has the task to carry out processes and tasks that will maintain long term relationship with the customers. The customer care service person role in the company is to provide the service to the customers. The services here include that customers can inquire about the various products and services that company is providing. This department also has to handle problems, complaints of the customers and find a way to solve them. The Sales Team role in the company has to work in such a way that will help to increase and transmit brand values of the product and services in an efficient way. It has also some added functionality like monitoring the competition and get to know about latest trends in the market.

6.3 Finance Department

The Finance Department is divided into three subdivsion namely Billing Department, Payment Department and Procure-to-Pay Department. The role of Payment Department is to handle all the payments of the company. This will include the buying of cameras from providers and then selling them to the customers. The Billing Department will have to keep tracks of every bills and Payments done. They role of this department is to keep and main copies of each transactions made by the payment department. The tasks that will be carried out by Procure-to-pay department is to maintain the Accounts of Company and also handle purchase orders, receiving the goods and to maintain supply chain management.

The HR department has the task to look after all the departments and to take decision on whether or not there is need to hire more persons in a particular department.

7 Customer Acquisition and Revenue Model

The marketing strategy is of two types online marketing and offline marketing The online marketing will be done by uploading a video on you tube which will show a graphical version of house with all the features and cams installed and their usage and different types of service we produce. Also a facebook page will be created to attract customers with the graphical model of home added to it. The same video will be uploaded on our website.

Another marketing strategy is a demo house will be shown with all the cameras and features installed like motion sensor and sound sensors. The sales person will help customers and showcase all the features of the system to customers and explain the advantages of video surveillance system. During the first month of business leaflets will be distributed among houses which will have the information about the security system and various product and services we are offering with the pricing.

The important costs and business that will be considered for doing business include the cost of cameras. We are going to buy cameras as an initial investment and then sell them to customers. Hence a initial investment on buying huge bulk of cameras will be incurred. The initial establishment, creating websites, marketing will require a substantial investment.

Huge costs have to bear in traditional systems as the system created is for one particular customer while in cloud many customers can be attached to a single server and storage can be distributed between the customers while in traditional system different storage has to be created for different customers.

7.1 Revenue Pricing Model

The cost for setting up the cameras along with the fitting charges and connection with the cloud are as follows Not but the cost is for only one camera. The pricing model for

Camera Type	Price in euros	
Logitech Alert 750n	300	
Samsung SNH-1011 IP SmartCam	120	
Netgear VueZone Video Monitoring System	480	
D-Link Day/Night Network Cloud Camera (DCS-932L)	50	
Swann ADS-445 SwannEye	180	

using cloud services including storage is as follows:

Pricing Model For using Cloud Services

Three months Subscription	Six months Subscription	One year Subscription
20 euros per month	15 euros per month	10 euros per month

8   Legal Considerations

There are different types of Service Level Agreements and contract are established to conduct the business. There will be different contracts that are established in the business. This company has four separate contracts between the service providers of company and also contract between the customers of the company. One of the SlA is between the company and amazon web services whose services like storage and elastic compute cloud we are using. Another agreement is between the company and the provider who provide the company with hardware materials like camera, wires and etc. Another agreement is inside companies different departments regarding the restrictions and disclosure of information. between the various departments. An example of this will be an agreement between the shareholders and stakeholders. The last agreement is between the company and the customers deciding on the copyright issues of data, data protection and misuse of data. Agreement will also include the customer rights like refunds on not providing the service to the customers.

The laws that have duly signed and considered include the data protection law as the company will have access to customer private data which will be stored in the cloud. The amendments that the company has considered in data protection law include the Amendment Section 2 which refers to collection, processing, keeping, use and disclosure of personal data of Principal Act. Also Amendment of section 4 which refers to right of access to the data. The company has studied and understand and duly signed the Ireland and EU rights of consumers before starting the business. The copyright and related right acts has been studied and incorporated by the company.

Different types of legal entities have been checked before conducting the business. This company comes under Private limited company. A separate legal adviser will be appointed by the company who looks after the company all legal activities, agreements, shareholder's participation and their rights along with the rights of stakeholders. A written agreement is taken of employers of company before accepting all the terms and conditions of company before giving employment. The employment law was signed before starting the business in Ireland. All the Ireland laws were taken into consideration before starting the business in Ireland and duly signed and followed for example consumer law protection.

9 Value proposition

Cloud based video surveillance system solve the problem of users who want live feed of their homes at any time at any place. This solution will help to clear drawbacks of traditional system where the feed was available only on the single device. The cloud based solution helps in following way:

1) Cloud helps to connect the feeds with your own personal devices like smartphones and PCs using a web based portal

2) The problem of storage of tremendous amount of video recording is solved by cloud as cloud storage is scalable.

The benefits of this cloud based video surveillance at homes is that it is a flexible, cost effective model with no hidden fees. Only one time cost of cameras has to be paid and the rest use of cloud services can be paid by using either pay per use model or by subscribing to monthly subscriptions. The camera models that are covered are only five that will help in reduction of complexity of choosing from a wide range of variety of cameras. The basic need of customers of surveillance of homes is cleared only with the five models.

References

[1] "Top Video Surveillance Trends For 2016 - IHS Technology". Technology.ihs.com. N.p., 2016. Web. 25 Apr. 2016.

[2] "Samsung Smartcam Wifi Home Security Camera (SNH-1011N)". PCMAG. N.p., 2016. Web. 25 Apr. 2016.

[3] "Cloud Video Surveillance — Ivideon". Ivideon. N.p., 2016. Web. 25 Apr. 2016.

[4] Cericola, Rachel. "12 Simple, Stand-Alone DIY Home Security Cameras - EH Network". EH Network. N.p., 2015. Web. 25 Apr. 2016.

[5] Mitchell, Robert. "Keep Watch: 5 Cloud Security Cameras". Computerworld. N.p., 2016. Web. 25 Apr. 2016.

[6] "Driving Innovation For Surveillance And Smart Home Market And Other Key Iot Developments - Iot Now - How To Run An Iot Enabled Business". IoT Now - How to run an IoT enabled business. N.p., 2016. Web. 25 Apr. 2016.

[7] "The 10 Responsibilities Of Marketing Departments". Sales Layer Blog. N.p., 2013. Web. 25 Apr. 2016.

[8] "LAW ON DATA PROTECTION - Data Protection Commissioner - Ireland". Dataprotection.ie. N.p., 2016. Web. 25 Apr. 2016.

[9] "10 Affordable Small Business Marketing Strategies". Smallbusinesscomputing.com. N.p., 2016. Web. 25 Apr. 2016.