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Building and Launching an Intelligent Monitoring System in the Cloud

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Abstract: Organisations get benefits from cloud computing. Its high profitability and ease of expansion have led to its adoption by a number of businesses. Its increased privacy and security also make it a good option for investors and company owners (Yong, et al., 2012). For smaller businesses, the cloud may mean a significant drop in expenses. Cloud computing has made cross-industry collaboration and sharing easier and cheaper. Customer service that allows them to "pay as you go" is great. The use of cloud computing has several benefits for businesses, including improved efficiency in interacting with customers and employees and greater flexibility in allocating resources. According to Kambatala et al. (2014), "pay as you go" is more cost-effective and waste-reducing than purchasing a server in its whole. The "total cost" of hardware is going down, while cloud computing and storage are going down even faster in price. " It is much easier to monitor progress and notify clients of any changes using a cloud-based solution. As a result, it fits in with the budget and the way resources are used.

According to Armbrust et al. (2009), "any corporation has access to its own services through the internet" because of cloud computing. Worldwide, cloud-based services are expected to get 33.2% of the IT expenditure in 2016. The "real world" of modern organisations makes use of a wide range of cloud-based technologies that are interconnected (Devasena, 2014).

Keyword: *cloud- based services, cloud computing, real world operations*

Introduction

Companies must prioritise security (Frank, 2011). Traditional house security measures include building a "high wall." A lack of evidence or leads that may lead to the apprehension of those responsible for an illegal invasion is the result of a lack of prompt discovery. According to Morris, Moran, and Armstrong (1998), closed-circuit television (CCTV) is a crucial component of conventional security systems. Cameras installed as part of our security system keep our neighbourhood safe.

Visual surveillance is a computer engineering application that includes camera control, "video display and recording," and data transport. Conventional video surveillance systems include both digital and analogue monitoring, a front-facing camera, a transmission cable, and a video monitoring platform (Hossain, et al., 2012). The two primary functions of traditional video surveillance—also called "passive monitoring" due to the absence of cognitive management—are real-time monitoring and the capturing and playback of surveillance footage.

The effectiveness of "real-time monitoring" depends on the presence of security personnel who can keep an eye on the screen and respond appropriately to any suspicious activity. Finding the necessary evidence at such short notice is very challenging due to the abundance of surveillance footage. Another issue with conventional video surveillance systems is the time and effort wasted due to the difficulty of transferring surveillance footage between different locations.

Literature Review

The fast development of computer networks, digital image processing, and data transmission technologies is making it more challenging for conventional CCTV systems to remain competitive (BaoHong & Yan, 2015). Lots of places including schools, hospitals, warehouses, and companies still employ old-fashioned analogue security systems like digital video recorders and closed-circuit television (Soulsby, 2012). (Video recordings stored digitally). The intricacy of the network environment and the wide variety of video-recording devices make traditional surveillance systems inadequate for the analysis, storage, and exchange of huge data. A cloud-based monitoring system is now crucial more than ever.

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Cloud computing is advantageous for businesses. Its scalability and profitability have led to its adoption by several enterprises. Investors and business owners place a premium on its anonymity and enhanced safety (Yong, et al., 2012). The cloud offers small companies the chance to cut costs significantly. Thanks to cloud computing, sharing and collaborating across industries is now simpler and more cost-effective than ever before. Users would benefit economically from the "pay-as-you-go" approach. Not only can cloud computing provide more leeway when recruiting and reserving resources, but it may also simplify trade choices.

"Pay-as-you-go" reduces operational expenses and saves money on server purchases (Kambatala, et al., 2014). Despite falling hardware prices, other IT costs are falling at a faster rate, such as cloud computing and storage, which is outpacing WAN charges. A cloud-based system makes it easy to track and notify changes to customers. Consequently, there is harmony between the budget and the use of resources.

Every business now has internet access to its own services thanks to cloud computing (Armbrust, et al., 2009). Predictions for 2016 indicate that cloud computing will make up 32.8% of global IT investment. Many interconnected cloud-based business solutions exist (Devasena, 2014).

Because it allows users to do business from any location, cloud computing makes doing business online a breeze. Accountants use cloud computing to provide a "doable monthly" fee for their customers. The use of "cloud computing is on the rise" in the surveillance industry. Large data storage facilities are necessary for visual monitoring, which could be out of reach for certain businesses due to their high cost. Furthermore, companies are required to either delete data or replace storage devices if they retain it for an extended period of time. Additionally, backup is needed in case the storage discs are damaged or destroyed, which would result in the loss of the footages. With cloud computing, businesses may access their video content whenever they want, eliminating the need to manage storage facilities.

According to Jiang, Sekar, and Zhang (2012), there is evidence that VSaaS, a cloud-based visual surveillance system, outperforms other video surveillance systems already in use. An integral part of the VSaaS function is dynamic technology, cyber security, and remote access.

Statement of the Problem

Numerous data centres make up cloud computing solutions, guaranteeing a reliable and redundant system. According to Yadav and Singh (2016), in order to achieve maximum uptime using standard web platforms, a business would have to invest in extra gear that can withstand failures.

Costs associated with energy consumption may go down if a company made better use of its gear. Companies who run their own data centres aren't making the most of them. With cloud-based monitoring, any company may reap the benefits of upfront capital expenditures and reinvest them in other areas of business (Wo, et al., 2011).

The usage of cloud-based surveillance systems allows for the utilisation of shared resources, such as IT professionals and staff help, rather to the costly hiring of a whole IT department. Businesses might potentially reduce their IT spending by switching to a VSaaS. In cloud computing, all hardware is used, which means that infrastructures may be shared as servers. Furthermore, the platform allows for less work to be put into keeping it going.

Objective of the Study

• As needed, to make advantage of "NVA's computer vision functionalities in this cloud-based visual" safety system.

Research Questions

• In what way "can this cloud-based visual surveillance system incorporate the requisite computer vision features from" the NVA?

Research Methodology

Windows authentication, form authentication, and passport authentication are the three ways that users' identities may be confirmed on Microsoft's ASP.NET platform. Our cookie-based solution uses cookies as a form of authentication. A user's requests and the websites they see are tracked every time they visit a website by "cookies," as shown in the picture below.

Research Design

An intelligent surveillance system that is hosted in the cloud is going to be developed and implemented as part of this thesis. As seen in the graphic that follows, the design of our research is comprised of six distinct phases

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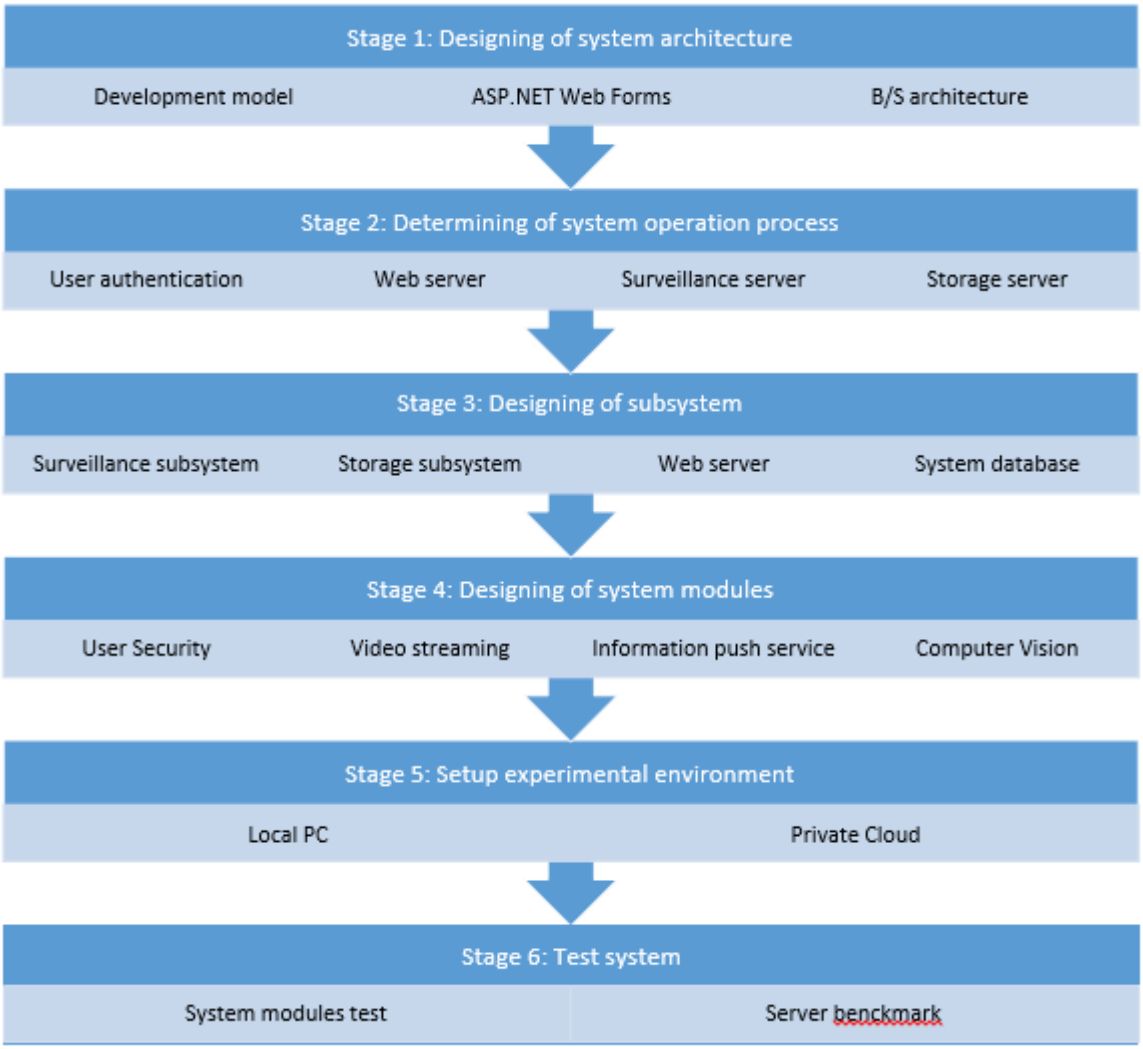

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Data Analysis

Setting up the IP camera with your network is the first thing that has to be done.

of this particular unit, the very first step of any "move forward" phase. If one were to subscribe to this line of reasoning, the visual stream was the transmitter. It is thus possible to make use of a media connection in order to link the phrase "photographing both of them at the same time."

The second step is to capture a screenshot of the video on the channel.

It is possible to utilise the ToImage() method in order to get the real picture from the video channel once the TakeSnapshot() function has initiated a snapshot by using the NVA module.

Tell it where to store the photo, which is the third step.

Using the built-in functions of the camera, you are now able to take a picture, give it a title, and save it in a location of your choosing. To make it simple for anybody who is interested in determining the time at which a certain event took place to do so, we rename each picture with the current date and time. This ensures that the name itself is included in the renaming process.

Conclusion

Simply said, the fundamentals of software engineering are being used in order to create an innovative, cloud-based, and intelligent surveillance system. Because of the terminals that have been placed, we are able to provide our customers with visual data and real-time monitoring capability. As long as they have a working Internet connection, users are able to use the cloud-based monitoring system from any location they want. It won't be until after the system has been fully implemented that any issues that were discovered during the

first research will be remedied. It is now possible for us to disclose the "findings," supposing that everything went according to plan.

This module (CISS) is made possible by the combination of computer vision (CV) technologies with cloud-based intelligent surveillance systems. For the purpose of providing identification in the event that it is ever required, some cameras will be equipped with a face recognition module. The vehicle plate recognition module will be activated, and the relevant parameters for car plate identification will be adjusted, in order to accomplish the goal of automatically identifying licence plates in images that are taken in real time. Unlike traditional surveillance methods, our idea is based purely on motion detection, which is a significant divergence from the norm. There are a variety of CV modules that may be used for various cameras that are part of the same system camera.

Limitations of the Study

In the first place, the implementation of our research is "limited by a lack of resources and equipment, as well as a lack of time for" For the sake of our project, PHP will serve as the programming language of choice. For two different reasons, we made the decision to migrate from C# to ASP.NET. Due to the fact that the IP camera can only be used in connection with a computer that has a B/S architecture and a web page, we have decided to employ C # as our first step. We construct a cloud synchronisation system by using FTP, iSCSI LUN, and OwnCloud APP linkage. This system is used to execute data syncing and push alerts. The framework that we use is the popular PHP framework known as OwnCloud.

The identification of licence plates is not included in this version due to limits imposed by the environment and the equipment. Following the completion of the camera alignment process, we proceed to test the licence plate recognition module. The recognition is correct, despite the fact that the accuracy is poor; yet, there is the possibility of success.

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