International Scholars Journals

International Journal of Banking, Economics and Finance ISSN: 8201-4728 Vol. 2 (8), pp. 001-010, August, 2018. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Application of cloud computing to learning

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Accepted 16 April, 2018

This study aims to develop learning system, and let the system become intelligent. We adopt the swarm intelligence and cloud computing for learning system, and develop friendly human-computer-interface software for users to use as personal computers or notebooks. We program the system and software with Extensible Markup Language (XML) and C sharp language. If the users begin to search, the kernel safety learning system automatically communicates with other agents, and the agents can search the closer camera for users. This study's result has been successfully implemented on one educational organization and it would be helpful for the paterfamilias to hold all situations about their children at one educational organization. This will be of great help in the grip of whole after-school remedial education, teaching and learning situation.

Key words: Swarm intelligence, cloud computing, learning system, after-school remedial education.

INTRODUCTION

Image-based Modeling and Rendering (IBMR) techniques are now widely used for image synthesis in computer graphics since they produce a novel presentation of composite images (Pazzi et al., 2009). Technological developments in content- based analysis of digital video information are undergoing intense progress, with ideas now being proposed and demonstrated for fully automatic systems (Hyowon, and Alan, 2006). Self-managing systems (that is, those that are self-configured, self-protected, self-heal and self-optimized) are the solution to tackle the high complexity inherent to these networks (Barco et al., 2008). Digital representations are widely used for audiovisual content, enabling the creation of large online repositories of video and allowing access such as video demand (Justin, and Timothy, 2008). Digital artifacts created via transformational technologies often embody implicit knowledge that must be correctly interpreted to successfully act upon the artifacts (Leonardi, and Bailey, 2008). With continued advances in communication network technology and sensing technology, there is astounding growth in the amount of data produced and made available through cyberspace (Chen, and Liu, 2006).

Chen (2009) adopts the Windows Media Player along the RTP/RTSP protocol in order to embed the mobile information system into the users' machines (personal digital assistants or smart phones), and provides a solution (including hardware solutions) to promote campus safety management. He also combines the swarm intelligence and Web Services to transform a conventional library system into an intelligent library system having high integrity, usability, correctness, and reliability software for readers (Chen, 2008; 2010). Chen and Chen (2007) built the intelligent system and developed a knowledge base of the computer-parts.

This study adopts the swarm intelligence and cloud computing for learning system, and develops friendly human computer interface software for users to use as personal computers or notebooks. We program the system and software with Extensible Markup Language (XML) and C sharp language. If the users begin to search, the kernel safety learning system automatically communicates with other agents, and the agents can search the closer camera for users.

LITERATURE REVIEW

With rapid changes in technology and globalization of markets, it has become very difficult for firms to "do it alone" (Pai, and Yen, 2010). Fasoranti (2010) recommends a greater coverage of the state by the scheme. Recipients should also be encouraged to reinvest their profits in other productive economic activities. Chen and

Hao (2010) intend to present clear pictures of research evolution in two research domains based on a thorough literature review: The service system design and mass customization areas. It identifies a necessity for integrating these two areas, which adopted the concepts of mass customization to guide the service delivery system design in order to cope with the traditional operation dilemma. In the highly-competitive leisure service industry, improving service quality to gain competitive advantages is the only key to sustainable management of leisure agriculture. However, developing leisure farming may cause positive and negative impact on local economy, social culture, and environment. Liu and Yen (2010) suggest that leisure farming operators pay attention to factors that affect tourists' perceptions of service quality, positive tourism impact, and total tourist satisfaction and also attempt to understand the difference among different types of tourists in their choice of leisure farming type, so as to enhance their business performance. Yang and Chen (2010) address the deficiency in service quality by integrating the "importance" and "satisfaction" indices to establish the "importance-satisfaction model (I-S model)" and provide a comprehensive assessment model for improving specific quality attributes. They apply this integrated measuring instrument in the Taiwanese hot spring and financial industries by conducting a questionnaire survey with their employees to assess "importance" and "satisfaction" in their capacity as "internal customers."Briggs (2009) undertakes to identify the issues affecting Ugandan indigenous entrepreneurs engaged in trade with regard to their deficient entrepreneurial traits in addition to other environmental factors that affect them. Qoi (2009) seeks to come up with a conceptual framework that investigates the different dimensions of total quality management (TQM) and its effects on knowledge management (KM).

For cloud computing

The cloud-computing or virtualization model gives computer users access to powerful computers and software applications hosted by remote groups of servers (Thilmany, 2010) . Lee and Zomaya (2010) investigate the effectiveness of rescheduling using cloud resources to increase the reliability of job completion. Li et al. (2010) proposed a secure collaboration service, called PEACE-VO, for dynamic virtual organizations management. The federation approach, based on the role mapping, has extensively been used to build virtual organizations over multiple domains. Peebler (2010) provides information about cloud computing, where consumers have the ability to leverage computer resources that they do not own, manage, or house. Paquette et al. (2010) discusses the current use of cloud computing in government, and the risks–tangible and intangible–associated with its use. Liu et al. (2010) discusses the challenges of cloud computing systems using limited bandwidth networking connections. He suggests a combined appropriation of network and computing resources in a consolidated computing system directly established on a wavelength-division multiplexing (WDM) network. Cloud computing is an emerging new computing paradigm for delivering computing services (2010) . Webley et al. (2009) discuss on how information of the ash cloud such as location, particle size and concentrations, could be used as VATD model initialization. Xie et al. (2010) presents a high-accuracy method for fine registration of two partially overlapping point clouds that have been coarsely registered. Stößer et al. (2010) propose heuristic and pricing schemes, find an interesting match between scalability and strategic behavior.

For swarm intelligence

Tabu search and ant colony perform better in the case of relatively large-sized problems, whereas, simulated annealing is optimal for small-sized problems (Stößer et al., 2008), and it is therefore, essential for a maintenance scheduling optimizer to incorporate the options of shortening the maintenance duration and/or deferring maintenance tasks in the search for practical maintenance schedules (Foong et al., 2008). Allahverdi and Al-Anzi (2008) addressed a two-stage assembly flow-shop scheduling problem with a weighted sum of makespan and mean completion time criteria known as bicriteria.

The learners and lecturers agree that style-based ant colony systems can provide useful supplementary learning paths (Wang et al., 2008). Ant colony intelligence (ACI) is proposed to combined with local agent coordination in order to make autonomous agents adapt to changing circumstances, thereby, yielding efficient global performance (Xiang and Lee, 2008). This indicates that the ACO algorithm is an optional compromise strategy between preferable phase unwrapping precision and time-consuming computations (Wei et al., 2007).

RESEARCH METHODS

This study adopts the swarm intelligence and cloud computing for safety learning system and develops friendly human computer interface software for users to use as personal computers or notebooks. The system is developed in the environment of: Microsoft Windows Server (2008), Internet Information Services 7.0 (IIS 7.0), Microsoft Structured Query Language (MS SQL) Server, 2008, and Visual Studio, 2008 (VS 2008). The programming languages are Extensible Markup Language (XML) and C#.

Cloud computing

Figure 1 shows the framework of Cloud system. Figure 2 shows the application framework. Figure 3 shows the single cloud. Figure 4 shows the relationship between provider and client.

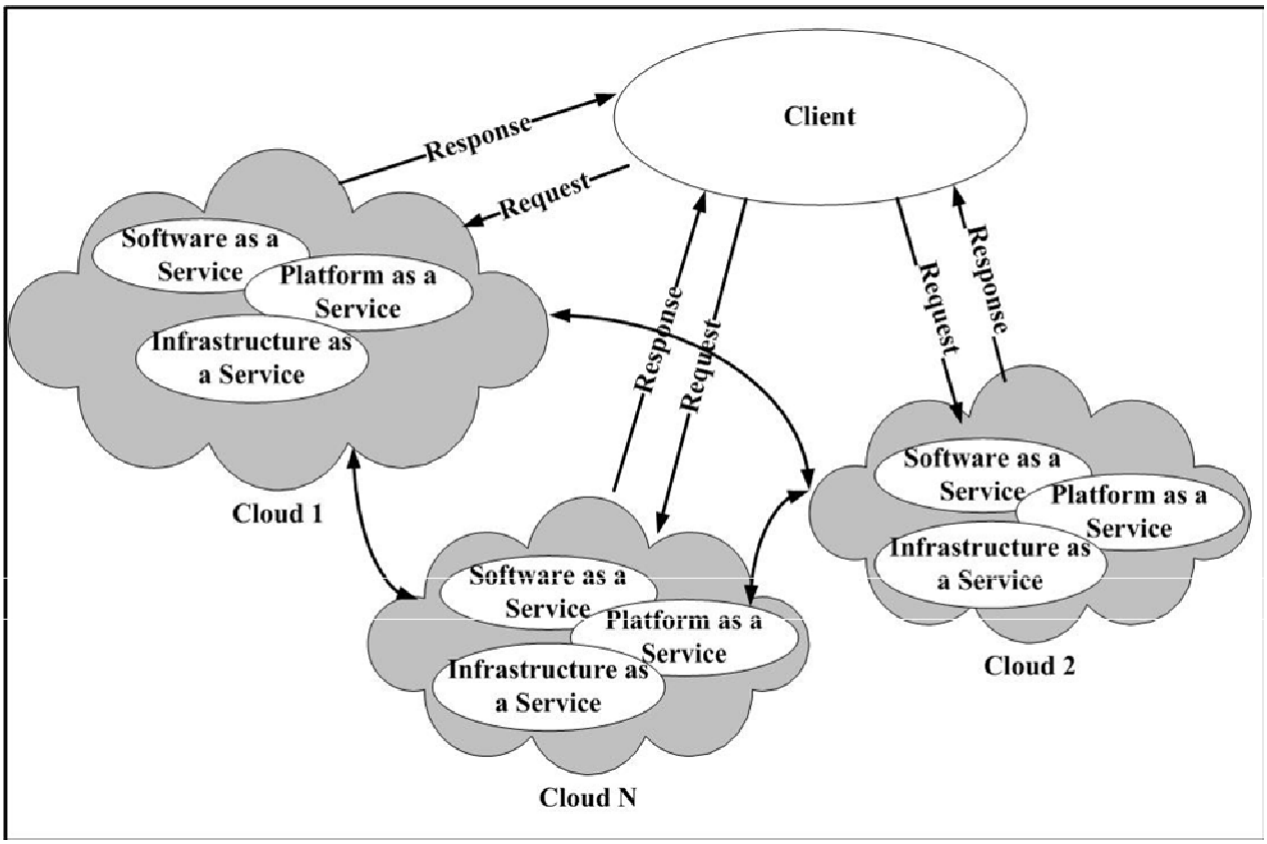

Figure 1. Framework of cloud system.

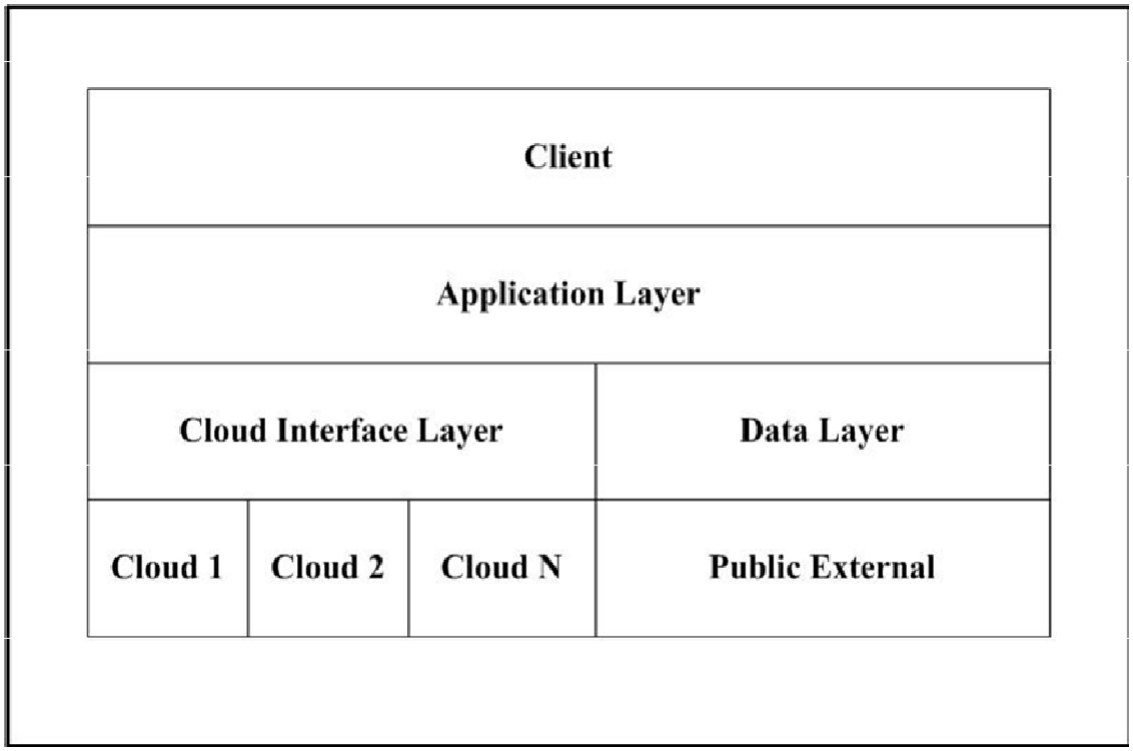

Figure 2. Application framework.

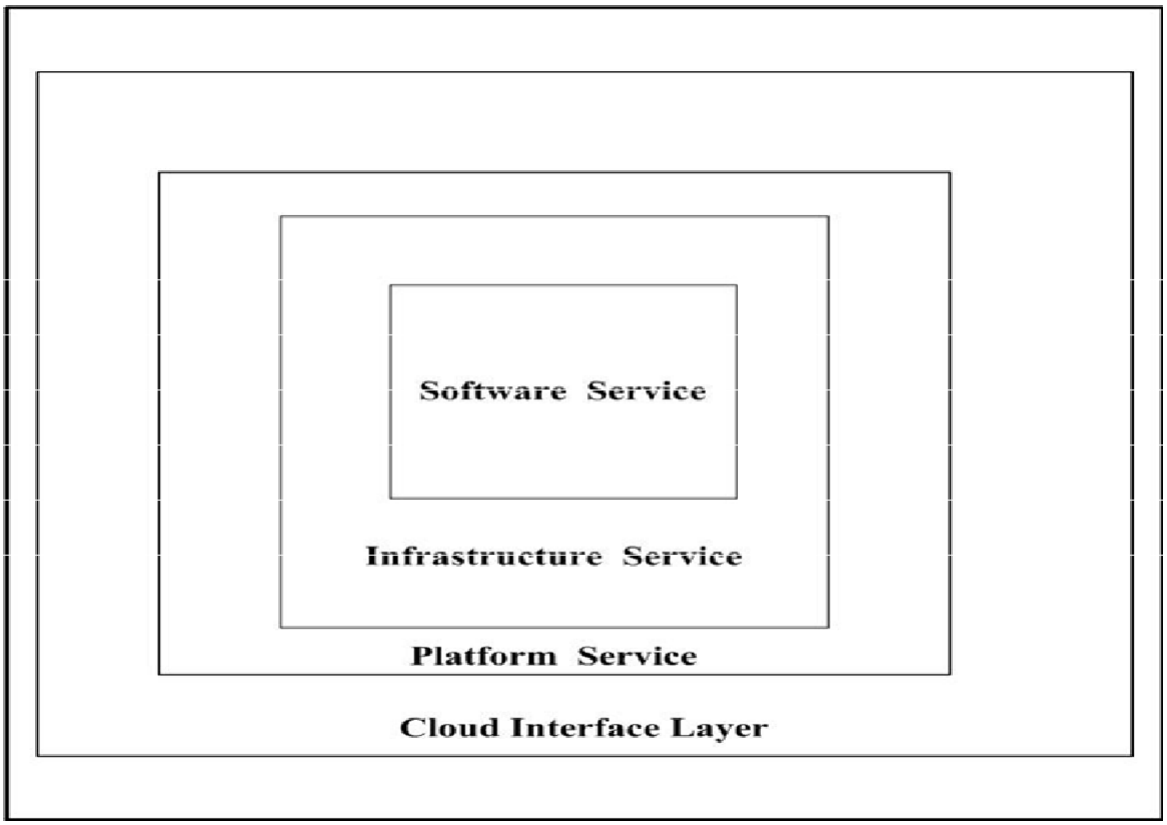

Figure 3. Single cloud.

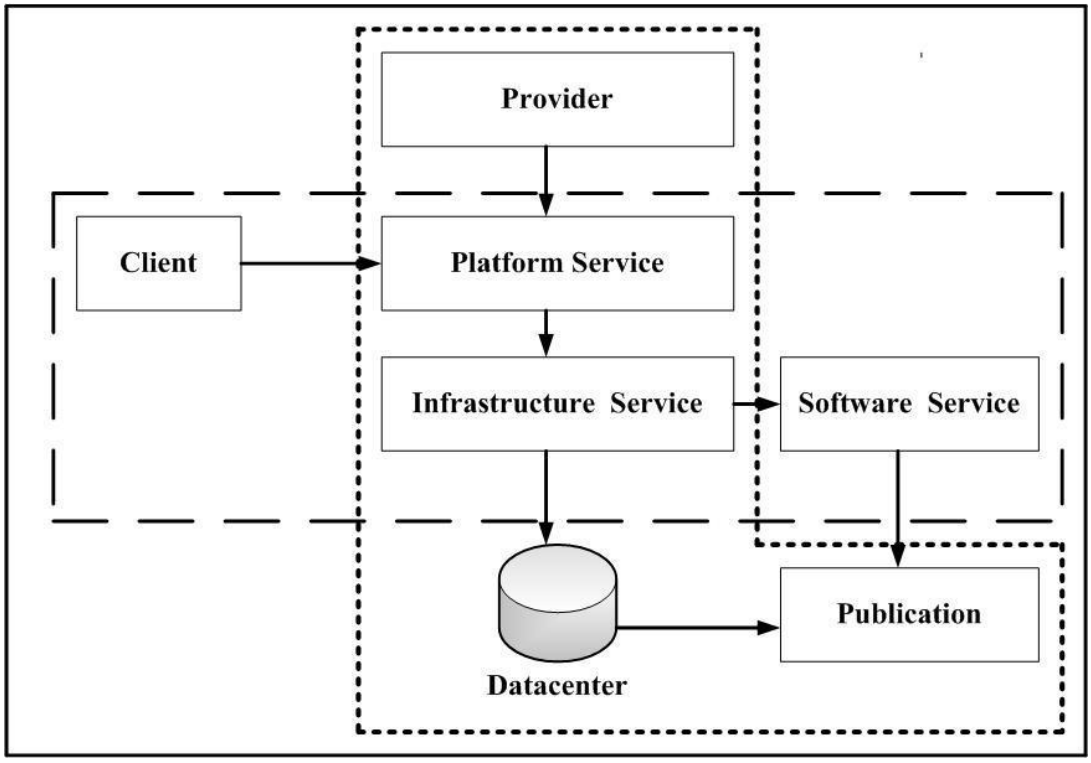

Figure 4. Relationship of provider and client.

Principle

This study amends the ant algorithm of Birattari et al. (2007). It can enhance the library system to become intelligent and mobile. The design of the "Library Querying System Modeling Base" is very important, and it is the kernel technology in this study. The developing process is thus described (Note: The agents are seemed as the ants).

Meaning of the symbols and nouns

(a)n: The numbers of cities

(b) m= $\sum_{i=1}^{n} b_i(t)$: The total agents; $b_i(t)$: The numbers of agents in the Agents Generator.

(c) d_{ij} : The distant of (Agents Generator) to (Reader)$_i$; This study considers that it is symmetrical; therefore, d_{ij} is equal to d_{ji}.

(d) $\tau_{ij}(t)$: The intensity of pheromone upper edge:

$$\tau_{ij}(t) = \tau_{ij}(t) + \tau_{ij} \quad (1)$$

This study uses (Equation 1) to update the pheromone.

The parameters of pheromone evaporation

(e) $\Delta\tau_{ij} = \sum_{k=1}^{m} \Delta\tau_{ij}^{k}$ (2)

τ_{ijk} : The kth agent remains pheromone going through the edge (i, j). It is defined as shown in Equation (3).

Q: The influential parameter of the pheromone

L_k : The total length of the route and the kth agent goes all over the (Readers)

$\tau_{ijk} = \frac{Q}{L_k}$, The Kth agent goes through edge (i, j) between time point t and (t + t_i):

$$\tau_{ij}^{k} = \begin{cases} \frac{Q}{L_k}, & \text{The kth agent goes through edge } (i,j) \text{ between time point } t \text{ and } (t+t_i) \\ 0, & \text{Otherwise} \end{cases} \quad (3)$$

(f) R: The cycles counter agent goes through all of the readers, and the R_{max} is the upper limit of R

(g)Tabu$_k$(I): The record of the kth has gone through the readers, the "I "is to make a visit to "Ith" reader. It can prevent the agent from going back to cities already visited.

(h) μ_{ij} : The inverse of the distance of (Agents Generator) to (Reader)$_i$

$$\mu_{ij} = \frac{1}{d_{ij}} \quad (4)$$

(i) $p_{ij}^{k}(t)$: The probability that kth agent goes from (Agents Generator) to (Reader)$_i$

$$P_{ij}^{k}(t) = \begin{cases} \frac{[\tau_{ij}(t)]^{\alpha}[\mu_{ij}]^{\beta}}{\sum_{k \in (n-Tabu_k(I))} [\tau_{ik}(t)]^{\alpha}[\mu_{ik}]^{\beta}}, & \text{if } j \in (n-Tabu_k(t)) \\ 0, & \text{otherwise} \end{cases} \quad (5)$$

The α and β are the important controlled parameters of τ_{ij} pheromone information and

Designing steps

The designing steps are described as follows:

Step 1: Set t=0 R= 0 ("t" is the time counter, and "R" is the cycles counter)

For all edge (i,j), Set $\tau_{ij}(t) = Constant$, $\Delta\tau_{ij} = 0$

To put m agents into n readers

Step 2 Set I=1 ("I" is Tabu list index)

For k = 1 to m (The record of the kth agent is listed in $Tabu_k(I)$ at agents generator).

Step 3 Set I= I +1

For k = 1 to m (Using Equation 5 to decide (Reader)$_i$ and moving the kth agent to (Reader)$_i$ recorded in Tabu$_K$(I)).

Step 4: For k = 1 to m do

To move the kth agent from $Tabu_k(n)$ to $Tabu_k(1)$ and calculate the total length of all paths recorded, and update the shortest path. To calculate each edge (i,j):

For k = 1 to m do

$\Delta\tau_{ij} = \Delta\tau_{ij} + \Delta\tau_{ij}^{k}$

Step 5: By $\tau_{ij}(t+t_1) = \rho\tau_{ij}(t) + \Delta\tau_{ij}$, calculating $\tau_{ij}(t+t_1)$ for each edge (i,j):

Set $t = t + t_1$, R = R + 1

Set $\Delta\tau_{ij} = 0$ for each edge(i,j)

Step 6: If ($R < R_{max}$) and (No entering in stop situation). Then clear the entire Tabu list

Go To Step 2

Else print the shortest path and stop

Figure 5. Login frame.

Figure 6. Welcome frame.

RESULTS

The safety learning system has been successfully developed as shown in Figure 5 to 9. Figure 3 is the “login frame”, and Figure 4 is “Welcome frame”. There are eight areas in this system; (1) The left side of the gate, (2) The right side of the gate, (3) The eastern side of the house, (4) House Back, (5) Classroom 1, (6) Classroom 2, (7) Office, (8) Leisure area as shown Figure 5. Figures 6 and 7 demonstrate the searching results.

Conclusion

This study aims to developed safety learning system, and let the system become intelligent. This study used artificial intelligence and cloud computing to directly guide paterfamilias in monitoring their children’s in-time images. Thus, it could save the paterfamilias’ time in operating the instrument. Even someone who does not have the professional knowledge about information technology could use them skillfully. This study also develops friendly

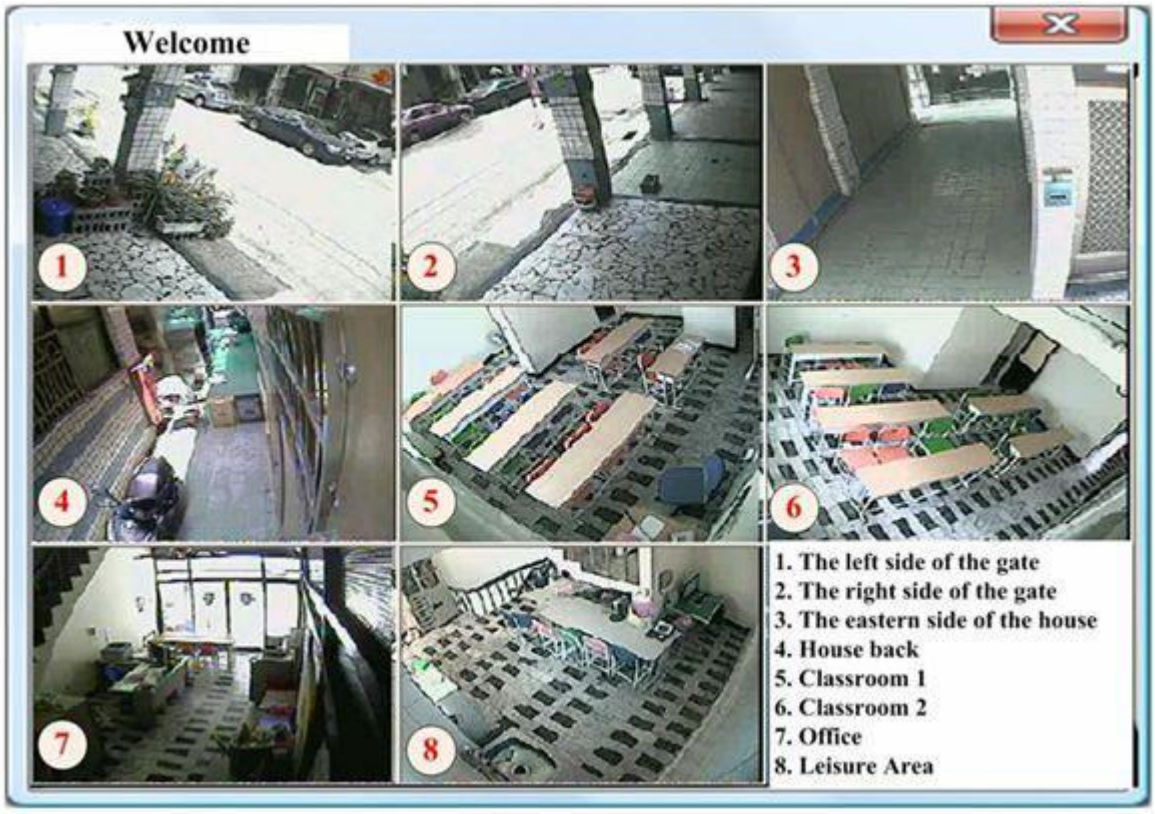

Figure 7. Eight areas.

Figure 8. Searching results (Classroom 1).

Figure 9. Searching results (Classroom 2).

human computer interface software for users to use as personal computers or notebooks. The size of the software is 45 kilobits; therefore, the software is not a liability for the users' tools. This study result has been successfully implemented on Chin-Huo educational organization and it would be helpful for the paterfamilias to hold all situations about their children at one educational organization. Paterfamilias can understand their children's learning, by going into the educational organization and leaving the educational organization, through personal computers or notebooks simultaneously or asynchronously by the computer mediated communication. The one educational organization staff also can understand the classrooms' situation through the system; and they do not need to make their round to classroom, personally. That will be of great help in the grip of whole after-school remedial education, teaching and learning situation.

ACKNOWLEDGMENT

The author gratefully acknowledged Chin- Huo educational organization for sponsoring this research.

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