Scenario based DCMS for e-Learning Environment

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Abstract—In learning process of classroom concentration is one of the key factors. Due to various distractions, it is difficult to maintain the concentration in classroom during teaching method. In e-learning environment, where various distractions exist, it is much harder to maintain concentration. In this project for maintaining the learners concentration scenario based Dynamic Content Management System (DCMS) is used. DCMS is a highly effective tool which is employed by existing edutainment (Education with Entertainment) providers. But the existing Content Management System does not have Scenarios based content selection and the result has not been up to expectation. The proposed method shows how to implement the scenario and Dynamic Content Management is the approach of providing the personalized curriculum to learners. With this method, the efficiency of e-learning can be increased. The method guides the content modification by providing entertainment in scheme of story and learning elements. The learning elements are classified related to the difficulty level. This level is used to make the learners customize curriculum.

Index Terms—DCMS, Scenario, Edutainment, e-learning, customization, Content Director.

I. INTRODUCTION

E-learning is one of the most encouraging applications that are required to an knowledge society. The advancement of the Internet is provide online education to people in corporates, educational institutes, government, and other sectors and both require for growing appeal of stable flow of education and the involvement of new multimedia technologies become core factors for the expansion of lifetime teaching. Besides pure virtual colleges and universities, more and more traditional educational institutions are adopting the purpose of Information and Communication Technologies (ICT) to provide beginners with a easy situation for their learning procedure. Furthermore, new Web 2.0 technologies such as wikis and blogs have created new way for generating and contribute content. In case, combined with the scheme of open educational assets, facilitate a new surroundings for learners that focus the whole Web as a learning area with many opportunities. Web-based content management systems (CMS) provide all the aspect of content management, from formation to deployment (Boiko 2001). In fact, many educational institutions such as universities are also the publishers for their own data, mainly generated by their teachers. These contents are mainly textbooks, but also research papers in academic journals or formal project deliverables such as technical reports. The use of the internet for not only content delivery but also for improving communication and interaction between students and teachers has created a completed new scenario.

II. RELATED WORK

A. Concentration

Focusing term is the most relevant features which mainly predict the outcome of learning, for example precious resources, focusing is very rare [1, 2]. Generally speaking, for 2-year-old babies, 7 minutes are the average time of focusing criteria. The time interval of concentration gets longer as the babies get older. For example, 10 minutes for the 4-year-old children and 12 minutes for 5 to 6 year-old children. But this interval has its limitation. According to Pomodoro technique, concentration (focusing) can be lasted for 25 minutes and 5 minute break should be provided between intervals [3]. Even though, this 25 minutes long attention is not a neutral length of concentration. This size is the outcome of the best managed situation. Numerous interruptions can appear at any time and they will break the concentration. This is the cause why in disconnected classroom, before lectures start, doors are closed, phones are turned off, desks are cleaned. In e-Learning, it is tougher to neglect these interruptions.

B. Edutainment

In order to provide an efficient education, edutainment is the sequence of education and entertainment like wise students are well interested in this type of education an try to mix the entertainment with education has been optimal. The outcome of this grouping is called edutainment [4]. It has made a enormous evolution in education. But there is no light without shadow. Edutainment cant work in specific conditions. Beginners take the entertaining part only. They may read the comical part but the explanation part. This is a natural instinct. Sweets are accepted and bitters are spit out. Therefore, it is required to make it inseparable. As the amount of edutainment becomes superior with this combination, the plan of dividing the insides gets to be more important.

C. Dynamic Content Management System

Dynamic Content Management System (CMS) is a system that switches the content by publishing, editing, modifying,
This system is usually used to track websites where various users make their individual content and share with others. Joomla [6], Drupal [7], Concrete5 [8], and TinyCMS [9] are most extensively used CMS platform. The important indication of this system is that the content is divided from the view. Each front-end user gets his/her personal view of the same content. If the view can be promptly changed according to the request of the modification, the term dynamic will be added for the system. This invention is one of the most valuable features to provide the communication to learners. The customization of curriculum is realized through this interaction.

III. PROPOSED SYSTEM ARCHITECTURE

The intention is to retain the learners attention while providing educational matters. In order to decide this objective, personalization of contents is hired. The outcome of this customization will improve the success level and it will manage in social relation based competition. This result organization is to create the loyalty of learners to keep studying. The abstract model of this method is shown in Fig 1. Competition Arena is the module that achieves each learners avatar and position. The competition is implemented inevitably and the equipped items, which can be accepted with the learning points, define the winning.

The learning points can be acquired after achieving the curriculum. This curriculum is made for each learner. Content Director makes each learners specialized curriculum by selecting contents according to the storys progress. Content Pool manages the available contents and for the request of Content Director, it finds the correct content. Scenario Pool manages the scenario, which is used to perform the story. Story is a way of the edutainment in this proposed model. Every learner becomes protagonist of the story and by finishing the adventure, the desired lesson are taught. Stories are composed with 4 elements; Introduction, Development, Turn, and Conclusion. These elements are selected from the Scenario Pool.

And the parts of scenarios are instantiated with the contents in Content Pool. Each content, which is selected and provided to the learner, is evaluated. Evaluator takes this responsibility. For every content, learners gets 2 tasks. One is the short information to be learned. The other is the question to check the accomplishment. Evaluator checks the answer of the question and proposed the further step of the story. The complexity level of contents and the progress of the story is the outcome of the evaluation. The details of main concepts will be explained in following sections.

The focusing or concentrating includes attentions, centering focuses, single minded concept in figure 2 the tree structure depicts the extended graphical representation of term concentration.

A. The Structure of Scenario

Outline or Scenario is a base of the story. To make the entertainment factor more realistic, a story is active in this model. A story is signified in scenario and the approach of initialization of each property in the scenario makes every discrete story. In introduction, the background of the story is defined. Once upon a time, in a kingdom far, far away, there lived a young boy who want to be the king of pirate is one of the most popular introductions of tales. Then the story goes to the next stage. The boy takes his trip to make the dream come true. The trip may for finding the teammates, finding treasures, or establishing a reputation. With this development, next step is turn. A story can have one or more turns. The goal of the trip can be changed and every change can be considered as turn. The final step of the adventure is coming back to home.
So as the conclusion. In conclusion, the summary of the trip is provided. This is the simple sample of how the story can be made by selecting the current elements. The situation is not predefined but defined sequentially. And the total length of scenario is less than 20 minutes because it is the boundary of safety where the attention can be definite according to the Pomodoro method. After the scheme is defined for the given step, the content for that position should be assigned.

**B. The Structure of Content**

The design of Content The contents in the content pool are selected to make up for the scenario. The design of contents is shown in Fig 3. It consists of 5 columns. Scenario position means where the content can be applied to the scenario. Therefore, when for a content which has turn as scenario position, it can be selected as the turn element. Every content has its type which identifies.

<table>
<thead>
<tr>
<th>Scenario Position</th>
<th>Content Type</th>
<th>Degree of Difficulty</th>
<th>Content</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loyalty</td>
<td>Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotation</td>
<td>Loyalty</td>
<td>Loyalty</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig. 3. Concentration Term

what the content is about. Algebra, data analysis, and concept definition are the examples of this property. With this information, the customization can be executed. The level of difficulty is used as the criterion for responding the learners reaction. When the learner fails to solve the difficult content, then easier content will be selected for the next stage. This property is used to keep the learner from giving up the study. Content is a unit of learning. This consists of concept explanation and its related question. Each contents length is around 1 minute not to spoil the concentration. As the maximum time limit for scenario is defined as 20 minutes, this time constraint is used.

The method of selecting proper content for the scenarios step follows these steps. The first stage is to search the contents which have the same scenario position to the scenario. In turn position, the contents for turn can be assigned. The second stage is to find the constraints satisfaction. The constraints are difficulty level and time. For the learner who keeps failing in the comprehension, easier contents should be selected and vice versa. The selected content should not Out Space the total time limitation of the story. The content type is considered only when the learner explicitly specifies the learning domain. If the learner selects algebra lessen, then only the algebra related contents should be selected. But if it is not specified, the selection is made randomly. When a content is selected, it is provided and the result will affect the next content selection.

**C. Evaluation of Learning**

When the learning of each content is finished, the result is evaluated to decide the next content and its degree of difficulty. In order to choose the next content, the behavior of the learner is evaluated. For the difficulty selection, the answers correction is checked. As described in previous section, the content contains concept explanation and its related question. For the first part, learners interact with system by choosing the domain of the content. Basically, learners can choose whether to move to other domain or to dig deeper domain. For example, when the avatar of the learner encounters monster, a battle begins. To win the battle, the avatar should solve the question. The monster gives a concept and its applied question. If the answer is correct, the avatar gets one of the treasures which the monster carries. If the answer is false, the avatar loses one of the gears which it equips. Then the avatar can select its next behavior. After winning, it can select one from re-challenging, and moving to next monster. After losing, it can select one from re-challenging and running away. The difficulty level is changed according to the avatars behavior. The difficulty decreases after losing and increase after winning. For new adventures, it maintains.

**D. Loyalty Management**

There are 2 factors which motivate learners. One is the need to study. We study what we need to learn. This need can be classified into 2 sub categories. One is the self-imposed need. The other is the enforced need. In this paper, this factor is not considered. The edutainment, which means the sugar-coated education, is not for these motivated learners. The other factor is the loyalty that is considered in this paper. Loyalty, which can be seen as the affection for the achievement, can make the learners to keep studying. According to the strategies in role playing games (RPGs), the affection can be controlled. For this control, 2 factors can be used. They are sunken cost and social relation. Sunken cost means that the item which cost more time and labor is considered as a more valuable. But when the cost exceeds the threshold which the learner can endure, the item will be abandoned. And such abandon comes with disdain. According to the cognitive dissonance theory, the abandon of strenuous efforts is so hard to endure that a reliable pretense is needed. So, it should be carefully managed to ask the learners efforts. Social relation means that the achievement in learning needs to be shown to the public. This opening has 2 goals. One is the competition. We, human beings, are understand ourselves by comparing us with others. If the learners competitive spirit can be activated, more time and labor can be invested and this sunken cost can increase the loyalty. The other is the customization. In order to participate in the competition, each learner should be distinguished from others. As the customization requires the learners time and labor, to win the competition means that more resources are used. This cause the more sunken cost and the loyalty will be increased. To manage the learners loyalty for the study, the customization is executed by selected contents and the achieved contents difficulty. When the scenario is finished,
the result is evaluation is exchanged into the points. Learners use these points to buy the avatars items. The avatar, which is equipped with these items, participates in the duel with others. This duel is automatically executed, and the one, who is equipped with better items, will win. The ranking of duel can activate the competitive spirit and learners will try to get better items and it requires better achievement in the learning. As the learner, who is in high rank and has superior items, will not give up the position, the study will be kept.

IV. CONCLUSION

Concentration is the most significant factors which determine the quality of study. But it is hard to maintain high concentration. Dynamic Content Management is a way of maintaining the high concentration. According to the learners accomplishment Dynamic Content Management modifies the contents of study. But only maintaining the concentration is not sufficient. In this paper, a method we use scenario. By providing entertaining story and its learning elements this method guides the contents modification. The difficulty level is classified according to the learning elements. Using this level the learners customized curriculum is made. Through this, learners can study the contents without losing concentration. The proposed model uses basic rules for selecting scenario and content. Domain knowledge can be used for more intelligent and refined customization, contents. The way of employing knowledge in this model will be studied for future works.

REFERENCES

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