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The Development and Use of Cyber Learning School Community (CLSC) Application to Build Learning Community

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Abstract
The research was conducted through Sinas Incentive Program of Ministry of Indonesia Research and Technology. The objectives of this study were to develop and implement a system called Cyber Learning School Community (CLSC) to facilitate the establishment of learning community. The system development included five stages: preliminary study; design; development, limited testing, and refinement; implementation and evaluation. The system characteristics used Self-Regulated Learning (SRL) model, which was appropriate based on testing system, content and operations. The level of acceptance of the system was tested by using Technology Acceptance Model (TAM). The system was implemented in 18 schools consists of Elementary, Secondary and Senior High School dispersed in 6 districts/cities in West Java Indonesia. The results of the application were CLSC could facilitate academic communication and build a learning culture of the school community for both teachers and students. By the use of this CLSC application system, teachers and students could increase their creativity and the academic achievement of the school community directly or indirectly.

Keywords : *Cyber Learning School Community (CLSC), Self-Regulated Learning (SRL), Technology Acceptance Model (TAM).*

1. Introduction

The development of information and communication technology (ICT) in the daily life today is a new reality to improve the quality of learning. Creating qualified human resources in national development efforts which are undertaken in all areas evenly and thoroughly is one of the goals of education mision. Education is a conscious and deliberate effort which concerns environment condition and academic atmosphere as well as its processes by involving learners actively; it is explisitly written in Indonesian regulation of national education No. 20 of 2003 clause 1 subsection 1.

Learning motivation is one of internal factors that is important in the learning process, while learning media is one factor that can conduct a successful learning process (external). By selecting and using the appropriate learning media will automatically support the achievement of learning objectives.Learning media based on information and communication technology (ICT) nowadays has become an exciting trend in school. Even some excellent school programs are stimulated by ICT. Learning through ICT devices enables students to do the learning activity without limited by space and time. The use of ICT tools and facilities among high school students has also become an ordinary thing, especially the use of social media system such as facebook.

The phenomenon of social networks, especially facebook in Indonesia have drawn nearly 70% of the users which are students as published in APJII (2009:131). This is something interesting to be responded. Through the phenomenon, it can be drawn a hypothesis that students are very interested in the social network as a communication medium to convey their ideas. Yet, many educational communication media such as e-learning developed by schools are in fact less active. We can take a note that the applications of e-learning

built by using Moodle are static and different from facebook which is so dynamic. Both systems have actually different characteristics.

By considering both characteristics of the system, it is as if there are two poles—one pole is static and the other is dynamic. Under these two conditions, there is something we can take namely collaboration of both model characteristics of the system; how to build and combine a model of social media which is contained by knowledge.

On the basis of the above things, this study develops a system model called Cyber Learning School Community (CLSC). CLSC system model adopts the characteristics of social media that is devoted to build learning communities among teachers and students. Besides, social networking sites can also create opportunities for learning as opinions stated by Boyd and Ellison (2008:212). This study here inafter conducted empirical studies toward communication of academic learning community among teachers and students which is facilitated by Cyber Learning School Community (CLSC) systems.

3. Methodology

This study used Research and Development (R & D) design and validated the product used as a medium of learning. The methodology of Development used was a methodology adapted from a media development methodology that included five stages namely preliminary study; design; development, limited testing and refinement; implementation and evaluation as stated by Munir (2008:178). Next, the use and the level of acceptance of the system were studied.

The preliminary study phase aimed to collect relevant data and information to the development of the system. In this phase, cooperation between schools, teachers, and students are conducted.

The design phase involved determining elements that need to be contained in the system which will be developed in accordance with the learning design. At this stage, the goals design, flowcharts, storyboards, and user interface are resulted. The development, limited testing, and refinement phase aimed to produce preliminary products in order to obtain the desired data from prospective users. The system development phase includes the setup steps of storyboards, flowcharts, graphs, media (voice and video), and system integration.

The implementation and evaluation phase aimed to determine the feasibility of the system developed. The implementation of the system conducted in the West Java—a province in Indonesia, involved 18 schools dispersed in 3 cities and 3 districts nearby i.e. three (3) elementary schools, secondary and senior high schools each. The content of the system was limited to science for primary and secondary school, and Biology, Physics and Chemistry for High School. Evaluations are conducted on the aspects of media/system to determine the feasibility of the product, subject matter to know the compatibility of the product, and the level of acceptance of the system by using the Technology Acceptance Model (TAM) as stated by Arief Wibowo (2008:2). Evaluation phase was also conducted to see the user's response toward operating system, shortages, excellencies, and other constraints.

In this research and development, some of the instruments were used to collect the data needed included questionnaire of exploratory study at the beginning of the study, questionnaire of expert validation on the development phase, and data analysis techniques used were adjusted to the characteristics of the data collected. The

data resulted from the questionnaire of survey field (preliminary study) was processed by calculating the frequency of the alternate answers selected by the respondent which was then converted into a percentage and then categorized. The result data of expert validation questionnaire were processed by using weight calculations on rating scale measurement and was compared to the ideal score to obtain the average percentage of the feasibility of the resulting system. The data resulted from the questionnaires of TAM was processed by the multivariate techniques of Structrual Equation Model by using Amos software version 18.0.

4. Results and Discussion

Analysis phase begun with the theoretical literature related to social media and e-learning to obtain a general overview of the system which will be developed. From the results of the literature study, information about some of the principles that should be applied in the application of an academic communication system was obtained as stated in Patterson, Strickland (1986:5), i.e. Individualization—where learning material (knowledge) was made according to the individual needs of the user (learner), and the system developed adopted individual user level, which included; Feedback Active is a compatibility and a velocity to improve learning and reduce ignorance of learner toward the material presented, and the system developed provided a quick feedback and contextual; Active Learning was an attempt to actively include the users in sharing information and knowledge, and the system developed provided an environment that allowed to do so; Motivation was to motivate users with rewards given in the activity, and the system developed to facilitate a long usage; Social was an open process of participation, and the system developed might be used publicly (multiuser) or involved the community of equal user, and Transfer was an ability to transfer information and knowledge from one user to another, and the system developed was to encourage users to transfer information from one context to another.

The literature study also found a few things that must be considered by the system which were: Ease of navigation should be designed as simple as possible; Content programs should provide cognitive experience (knowledge) required by users; Media Integration should involve some aspect and other skills to be learned such as language skills—listening, speaking, writing and reading; Aesthetics aspect was to draw the user interest so that the system had an artistic display; Overall function was to provide learning to the user so when they finished running the system, they have learned / gained something.

In relation to the criteria of a system, the survey was also conducted to teachers and students to analyze the needs of system model which will be developed in terms of users. Based on the survey, the following results were found: the system must be interactive—not only the admin who was active but also students were involved; the material contained in the system should use a clear and understandable language to users and provide illustrations or images that were typically seen in daily life today; the navigation should provide a simple link to facilitate users to see the desired material and was responsive to user requests; the learning packaging should be interactive, not boring and provide intelligent solutions in solving the issues contained in the materials; the system display should be popular and sought after by users; the experience desired by user—the system could provide an easier learning experience in order to comprehend the material/topic easily. The literature study also provided a guidance theory related to the independent educational models, i.e. Self-Regulated Learning (SRL) model in a Contextual Learning. There had been many studies revealed that SLR could improve learning outcomes as stated in Zimmerman, B. J. (1989:21). The system developed had been adapted SRL learning model in its implementation.
The survey was conducted toward teachers of science subject, Biology, Physics, and Chemistry and students. The survey toward teachers of science subject, Biology, Physics and Chemistry was conducted through interview to determine the matterials to be raised at the CLSC system. Meanwhile, the data collection

technique was used toward the students by using a questionnaire to determine the power support of the CLSC system usage.

From the results of the literature study and surveys, the description of learning atmosphere within the school community was obtained. Learning pattern by using web-based media showed that the creativity of the students in seeking information outside of the material in the classroom was pretty high. The independent learning pattern of students was indirectly established although there were some students who did not like but if there was stimulation, the students will keep attending it.

The design phase had been resulted a cyber learning concept with social media approach. In general, the educational system was a type of social media that invited users to explore information and knowledge. The subject material was inserted on each occasion that would be followed by users in academic communication. Through a flowchart, the interface sequences that could be displayed by the users of the system were generated. The storyboard described each system display to facilitate the development of the system. The storyboard also added a script dialogue in accordance with the expected flow. The user interface was created as good as possible as to attract the attention of the users; in this case they were teachers and students. The development phase was divided into several sub-phases i.e. the phase of interface creation, coding, testing and refinement, and the final the packaging phase.

The validation of the system was conducted by some lecturers and teachers with the parameters which consisted the aspects of general (G), software engineering (SE), and visual communication (VC). The validation results of the system by expert could be shown in the following table 1, the average percentage of the system feasibility was 87.61%, which could be considered very good. The content validation involved lecturers and teachers through general aspect (G), pedagogy aspect (P), and material substance aspect (MS). The validation results of the system by material experts could be seen in the table 2, the average percentage of material feasibility was 87.22% and classified as very good. Students were also involved in the validation of the operational systems which the results could be seen as the table 3. The validation by users indicated the operational feasibility of 81.67% and classified as excellent.For this study, the members of the community had been listed by admin and each had an account. For the purposes of this study, the system had not been opened yet to the public in order to sterilize the community from outsiders. The system could facilitate personal activities such as comments, chat, and message. System provided the material in the forms of text, audio, video, youtube, and flash multimedia. The materials are uploaded by the whole community, especially teachers of Science, Biology, Physics, and Chemistry. The types of material from teachers were syllabus, instructional materials, learning media, general knowledge, and articles related to the subject matter. The material could be shared by the three models of permission. First, open model—the material could be opened by all community of CLSC. Second, school community only—the material could be opened by school communities. Third, peer to peer—only users who become friend could access to the material.

Every community member had an identity profile. Personal activities of community were grouped into feed, counselling, and agenda. The number of community members who enrolled in this study were 2297 people from 18 schools consisted of elementary, secondary and senior high schools, each in 3 cities and 3 districts in West Java.

Technically, the CLSC system implementation was not complicated; even simpler than the existing educational system or social networking system. However, it was not easy to drive the school community to maximize the systems based on information and communication technology (ICT). Essentially, the school community especially school leaders and teachers agreed the CLSC system as a part to build a learning community and protected freedom of the ICT use which was poor of academic atmosphere.

The students as CLSC community started to be active especially when they were stimulated by the teacher as the main initiator. The video content of Youtube was the most uploaded multimedia content by the community as observed in the module of report system.

The uploaded Youtube were downloaded from elsewhere and shared through the CLSC system by learning category or science-related subjects. Based on the graph above, it could be considered to provide or encourage users to produce its own product which will implify to the provisioning of competence and facilities.

Beside uploading, the community which downloaded the material to be placed in his/her directory in the form of youtube, video, and flash the most was the teacher.

This could be understood since teachers required multimedia as the learning materials. It could be interpreted that the CLSC system could trigger the teachers to complete the material by using multimedia for innovative teaching and learning.

The contents of CLSC were mostly text–based; it was because the production and management were relatively easy. Documents in the form of text were generally references or science scripts of a subject matter/ science.

It was quite encouraging and might imply that the school community has a scientific culture in every activity. The emerged writings generally often had scientific level. This contributed the message that in order to build academic and scientific culture, facilities and regulations should be provided. Communities could be encouraged to behave scientifically through an adequate facility.

Many teachers also downloaded text documents; this meant that the teacher continued to enrich the material which would increase the quality of education.

The size of the uploaded documents was generally large; it indicated equity of the content. This meant that the document was quite creative to enrich the scientific content. Creativity could be triggered by adequate facilities in term of the need for a sense of creativity. However, large-sized material could be a problem when uploaded or downloaded because it relatively took a long time. It made users lose patience even failed in doing both. Observing it could be a challenge for researchers and practitioners to attempt producing light multimedia materials in its management.

The CLSC system during the study had only 921 pieces of content. This might imply that the CLSC system could trigger the treasury of knowledge/science that would lead to intellectual equity.

The CLSC system also provided a quick search facility of the content to meet user needs. All community of teachers had put the content on the CLSC system in the form of a syllabus, presentation of media materials, assignments, sample questions and discussion, schedules guidance, personal schedules, and various articles supporting. The activities of the teachers at CLSC system were shown in the table 4 and 5.

All community of teacher managed subject material, for this study it was one subject by each teacher. Teacher community could assign tasks with more frequency—they gave the task per each material/meeting. At first, the teachers' community was rather overwhelmed to check the student task, however by accessing it any time and any where, by examining the easy task, generally the examination could be completed. Each time they enter the system, teachers became accustomed to open and respond the forum. Teachers' community became familiar to initiate the forum with a simple problem that required a response from the community. The teachers' community was getting triggered to update and add material enrichment.

The activity of student was learning and downloading various materials. The student community also opened the CLSC system independently using the given account . The students downloaded the material and kept the hard copy of such materials. 10% of the average of students got assignment from his friend. 5% of students got the problem to send a task. 30% of students did not use the forum. 20% of students got the material from his friend. 35% of

student's community was not interested in forums. 10% of students had difficulty following the online quiz/exam. 15% of students did not take the matter of the CLSC system. All students had the materials in the form of hard copy.

Comments on the dashboard and chat were the most active communication facilities. The issues raised at these facilities were encouraging because the academic atmosphere was quite visible. Teachers community stimulated scientific issues in the comments and chat facilities and students community responded. At first, the students were a bit hesitant to initiate comments or chat as they were known to the teacher. But the researchers stimulated with a guest account and run by a team of researcher who played as a student. After the student community paid attention to the initiation from the other students (guest), they gradually started to express original ideas. Until the end of the study, the students' community in general was accustomed to use CLSC by initiating and responding to comments and chat with the questions or the answers they knew. However, they were not as free as giving comments or chat such as in facebook—they were free to submit things outside the context even unethical. Discussion and asking about the assignment were mostly appeared in comments or chat. Even in the dashboard, teachers did not hesitate to call or ask where the A, B, or C student if they were not active. Cross-school communication was also frequently happened. They informed each other about school extracurricular, events, and more. They also paid attention to manners in communicating since they knew each other.

The level of acceptance of the system in the implementation phase by using the Technology Acceptance Model (TAM) determined that the CLSC system used among high school students affected by the initiator factor—in this case teachers, content organization or E-resources Organization (ErO), education media, Individual Differences (ID), Perceived Ease of Use (PEoU), Perceived Usefulness (PU), Behavioral Intention to Use (ITU) and Actual System usage (ASU).

Individual differences of users could be seen from the functions knowledge required to interact with the system. Based on the questionnaire and the results of data processing, it could be seen that the ability of users to understand the functions of the system features showed the condition of the individual differences that affected its ability to address learning needs. The functions of the features in this system were as a form of material organization and not the dominant affecting factor. This was because as far as any material is outlined in the various features were not really used moreover if the user did not have the knowledge and the readiness to use it.

Perceptions of the benefit of system usage could be seen from the ease level of system to increase knowledge by using the system. Based on the questionnaire and the results of data processing, it could be seen there were various ways to respond to the ease of learning level that influenced the perceived usefulness and effective interaction with the system.

Perceived Ease of Use could be seen from the repetition activities in the system usage. Based on the questionnaire and the results of data processing, it could be seen that the repetition of the system usage reflected Perceived Ease of Use that influenced it. While repetition as a form of actual conditions is an influential factor, the high of frequency and duration of use indicated the level of user satisfaction and loyalty.

The dominant and interrelated factors which affected the level of technology acceptance, especially CLSC were: accommodating Individual Differences (ID) of user affected the Perceived Ease of Use (PEoU), the organization of electronic teaching materials (E-resources Organization (ErO)) and the Perceived Ease of Use (PEoU)) affected the Perceived Usefulness (PU), the Perceived Ease of Use (PEoU) and the Perceived Usefulness (PU) affected the Behavioral Intention to Use (ITU), and the Behavioral Intention to Use (ITU) effected the Actual System Usage (ASU). User, both from the teachers and students who already understood the ease of CLSC usage (PEoU) and the benefits of using it (PU) had the intention and willingness to use the system (ITU). From the interest, the users constantly used the CLSC as part of learning resources and media everyday.

The existence of Perceived Usefulness (PU) was strongly influenced by external factors i.e. E-resources Organization (ErO) owned by the system. Another case for understanding Perceived Ease of Use (PEoU) which was influenced by external factors for the condition of the learning media was Individual Differences (ID).

The acceptance model of a new information technology, in the form of a CLSC system applied to teachers and students in 6 schools in West Java was ErO (e-resource which was relevant to the learning needs and accessibility and ID (visibility of the use, self development of the computer, experience of computer usage, and knowledge of instructional materials) as independent variables. PEoU (ease of learning/understanding, ease of use, and usage frequency in learning), PU (ease of improving learning skills, enhancing the effectiveness of learning, answering user needs, increasing achievement and efficiency of learning, and allowing for the development of learning), ITU (adding software / plugin support, motivation in learning, and motivating other users) and ASU (long usage in learning and usage satisfaction in learning) as the dependent variables.

Considering the CLSC usage by teachers and students were affected by the ease of use factors, such as ease of learning/understanding, ease of use, and usage frequency in learning, and then CLSC concentrated more in developing the system and prioritized things that related to the user ease i.e. paid more attention to the influence of individual differences condition in community/users. In addition, the use of this system was also influenced by usefulness factors such as ease of improving skills, enhancing the learning effectiveness; answering user needs of users, improving learning achievement, improving learning efficiency, and allowing for the development of learning.

To attract users, developers always considered the convenience and the actual and relevant benefit to the school environment and learning. By considering the factors that formed the interest usage, the provision of additional software / plugin support was easily and free; creating a communication space with users such as consulting services and complaints, chat and more as a vehicle to motivate in order to remain faithful in the usage and opportunities to create motivation between users.

5. Conclusion

The CLSC system generated was a package that collaborated a potential social media and e-learning. The system was easily accessible by each school community who already had accounts. In general, both teacher-and student community had no difficulty in operating the CLSC system. The CLSC system included materials related to Science subjects, Biology, Physics, and Chemistry in the form of text, video, audio, Flash, and PowerPoint. CLSC could facilitate information sharing, comments, chat, guidance, discussions, upload-download, community's personal agenda, friendship, and a quick search. The system fulfilled the eligibility standards of the system, content and operations. Based on the level of acceptance test, the system also fulfilled the standards of good acceptance based on the Technology Acceptance Model (TAM).

In general, the school community had used the system developed which was Cyber Learning School Community (CLSC) to build a learning culture. School leaders and teachers had a strong commitment to use the application of CLSC system. Schools were encouraged to have an empowerment program and provide a budget for the development of ICT. The teachers could exchange information/knowledge, store the academic content, update the information/knowledge, control student's academic activity. The students could receive and exchange information / knowledge, had the academic content and be creative academically. By the use of this CLSC application system, in general the teachers and the students increased not only their creativity but also the academic achievement of the school community directly or indirectly.

The activities of teachers and students showed good qualifications on the average of 75.00% and 75.50%. Though the school community was still waiting for the content rather than developing it, the community was expected to develop academic content to be shared among communities. However, motivation had been formed to empower the systems such as the ownership of the content.

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Figure 1. The Login Page to CLSC System

Figure 3. Multimedia data

Figure 2. Dashboard Page of CLSC System

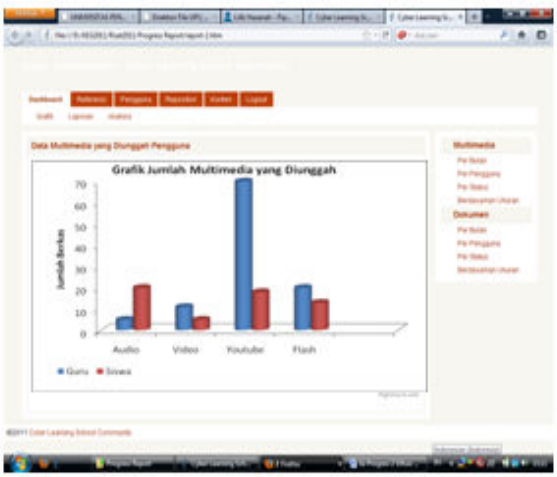

Figure 4. Data of Uploaded Multimedia

Figure 5. The Displayed, Reported and Deleted Multimedia Data

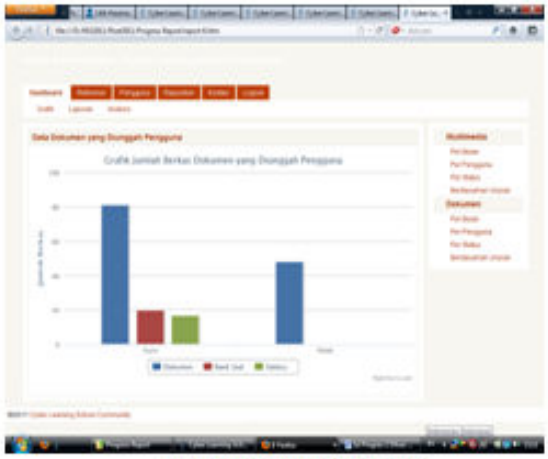

Figure 7. The Uploaded Documents

Figure 6. Data Documents

Figure 8. The Displayed, Reported and Deleted Multimedia Data

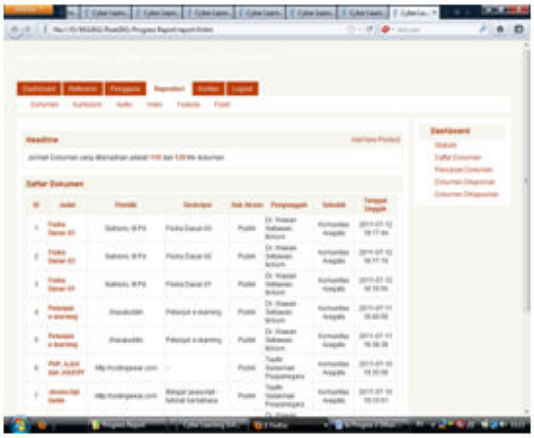

Figure 9. The Available List of Documents on the CLSC

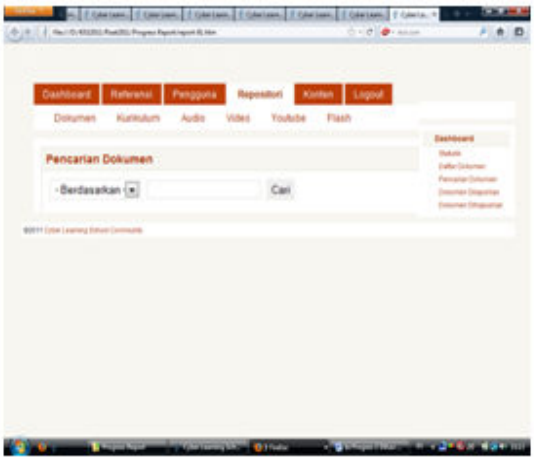

Figure 10. Quick Search Facility

Figure 11. Dashboard Comments

Table 1. Validation System by Experts

Aspect	Sum of Expert	Sum of Optional	Ideal Score	Resulted Score	%
G	3	3	30	26	86.67
SE	3	9	90	80	88.89
VC	3	11	110	96	87.27
Average					87.61

Table 2. Content Validation System

Aspek	Sum of Expert	Sum of Optional	Resulted Score	Ideal Score	%
G	3	3	26	30	86.67
P	3	4	34	40	85.00
MS	3	12	108	120	90.00
Average					87.22

Table 3. User Validation System

Aspect	Resulted Score	Ideal Score	%
Navigation keys on the system			
The navigation keys on the system easily understood	11	15	73.33
The navigation keys on the system easily to use	13	15	86.67
System Display			
The system display easily understood	13	15	86.67
The system display should be interesting	12	15	80.00
The Ease of the System to Use			
The CLSC system easily to use	14	15	93.33
The CLSC system convenient to use	11	15	73.33
System Interactivity			
The system interactivity easily understood	11	15	73.33
The system is interactive in supporting to comprehend the subject matter	13	15	86.67
Total	98	120	81.67

Table 4. Teacher Community Activities

No	Activity	Frequence
1	Open cource	100%
2	Give assesment/quiz	100%
3	Read the assesment/quiz	90%
4	Open and respond the forum	60%
5	Initiating the forum	75%
6	Updating material	25%
	Average	75,00%

Table 5. Student Community Activities

No	Activity	Frequence
2	Open the assesment	90%
3	Send the assesment	95%
4	Open the forum	70%
5	Open the material	80%
6	Respond the forum	75%
7	Initiating the forum	85%
8	Answer the quiz/test	90%
9	Download the material	85%
10	Own the hard copy material	85%
	Average	75,50%

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