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English for Specific Academic Purposes Mobile Learning Framework for Technical and Engineering Context: A Conceptual Framework

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Abstract: Highly skilled workers promises a nation with high income and the quest for it, highly skilled workers especially in engineering and technical context would pronounce a greater needs for effective language and communication skills. In a macro view of language learning, the English for Specific Academic Purposes (ESAP) serve this notion entirely. The advancement of technology in the field of teaching and learning has given new paradigm to language learners and educators to move on from 'in-class' to 'connected' and from E-Learning to a more flexible and personalized - *Mobile learning.* This paper proposes a conceptual framework for English for Specific Academic Purposes mobile learning framework for technical and engineering context which enables language learners in engineering universities learn English through mobile devices. The framework proposed adaptation of eight Mobile Learning and E-Learningframeworks selected from the literature and EAP Need Analysis as suggested by Dudley-Evans and St John [1]. The study proposes modified Delphi technique to confirm the elements juxtaposed and a quantitative study via survey techniques and SEM PLS to verify the framework. The proposed ESAP mobile learning framework would benefits both learners of English in technical universities and language educators cum developers of mobile learning.

Key words: Engineering education % EAP % ESP % ESAP % Mobile learning % Framework % SEM-PLS

INTRODUCTION

The upsurge of Information and Communication Technology (ICT) and the development inacquiring, organizing, interpretingand disseminating informationhas brought manychangesin thecurrenteducation system all over the world [2]. Web based teaching and learning has taken a great leap since the Internet has been a part of life and the technology has given new development in teaching and learning [3]. The current educational trends and the futureareto focus on theapplication of ICTin educationasone of themain focusesin the Education Development Plan for Malaysia 2001-2010 [4, 5]. Whereas, the National Higher Education Plan 2007-2010 focuses in *Improving the Quality of Teaching and Learning* as well as *Enculturation of Lifelong Learning* as part of the five main critical agendas [5]. All these contribute to the needs of future development, technique and new dimension of teaching and learning and the use of ICT effectively.

Advances in learning technologies have resulted in a ceaseless search for more effective and applicable methods of instruction. In Malaysia, the integration of technologies in daily teaching and learning processes started with the introduction of Multimedia Super Corridor in 1996 where one of its flagships is the implementation of Smart Schools. By integrating ICT, the way in which education is delivered has changed and students are connected to a wider world beyond the classroom door [6]. As in the 21st century classroom, the role of the teacher is to facilitate learning of the vast information available and to help the students to develop their skills in critical thinking, problem solving and decision making [7]. More importantly, the focus of the learning process now goes back to the students or favourably known as *Students Centred Learning* (SCL), in which freedom is given to them to learn themselves, instead of relying solely on the teacher in traditional classrooms.

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To add, previous studies on learning style, strategies and integration of technology indicated that most learning theories widely used is based on the assumption that teaching and learning take place in the classroom [8]. Since this might not be the case for today's process of teaching and learning, there might be a need to develop a theory and a certain framework of specific mobile learning situation that need to cater individual as well as institutions' needs.

Furthermore, with the recent developments in mobile, telecommunications and wireless technology, technology has given such a revolutionary impact to the way we communicate. The flooding of internet accessible mobile devices such as 3G and internet enabled handphones and tablets bundled with new and updated operating systems like Blackberry, Apple iOS android, Windows Mobile and Symbian have given a broader horizon not only for communicating but also to the field of teaching and learning.

Technology Integration in Teaching and Learning: In discussing technology integration in teaching and learning, one cannot run away from the word E-Learning. E-Learning is formally defined as electronically mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge with the goal of creating a community of inquiry independent of time and location through the use of information and communications technology. In short, the term E-Learning covers any form of activities from the use of technology to support learning as a 'blended' approach or learning that is delivered entirely online (http:// www.jisc.ac.uk/ elearning).

In Malaysia, the integration of technology in teaching and learning started with next to the nucleus of the idea of teaching and learning– the computer literacy. The computer literacy program can be traced back since 1986 with Computer literacy Pilot Project (CLLP), Computer in education project (CIE) in 1991, Computer Integrated Learning System Project (ComIL) in 1993, Computer Assissted Learning and Reaching (CALT) in 1994, Joint Advanced/Academic Research Integrated Networking Project (JARING) in 1996 and Smart School Project in 1997 [9]. The introduction of ETeMS in 2002, which see the large scale of exploiting computers and software by teachers in using English as medium of instruction. To add, numerous ICT injections have been made by the government of Malaysia in accordance to face the future of IT literate; 2010 demonstrates the National Broadband Initiatives and 1Malaysia Netbooks program.

The continuous effort of integrating technology in education in Malaysia is illustrated in Figure 1.1

Mobile Learning: The development of information and communication technology has made an aggressive impact to daily life. Positive phenomenon has prompted the country and around the world to draw interest to explore the advantages of technology to enhance the development of a country. Technology has changed and grown rapidly in all sectors including industrial and educational sectors. As evidence, the development of E-Learning or web-based learning either blended learning or full force online learning has been integrated in many universities. Abdullah and Mohamed [10] pointed out that E-Learning can become an alternative to the methods of

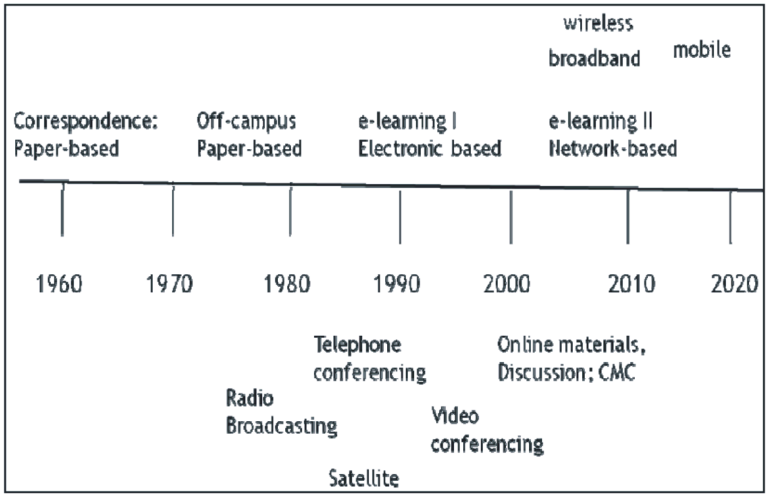

Fig. 1.1: A Continuum of Technological Integration in Education in Malaysia

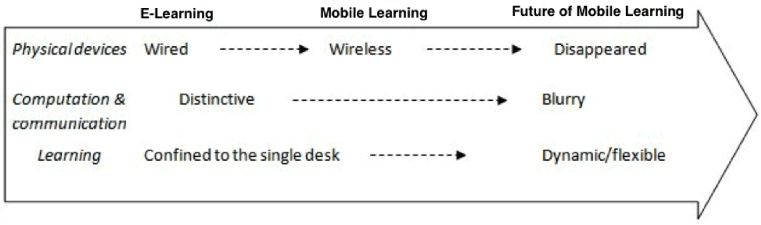

Fig. 1.2: The Comparison and Evolution of E-Learning and Mobile Learning

teaching that are still tied to the traditional or conventional methods and it is consistent with the National IT Agenda and one of Malaysia's National Key Result Areas (NKRA) efforts to bring the country forward inline in the era of globalization where one strategy is E-Learning.

The rapid development of ICT and education E-Learning has created a paradigm shift to the world of E-Learning. The evolution of E-Learning changes accordingly and the clash of computer technology and mobile technology has created a new phenomenon known as mobile learning.

Peters [11] perceived mobile learning as a constructive part of the flexible learning model. Brown [12] summarized several definitions and terms and identified mobile learning as "an extension of E-learning" (p. 299). Peters [11] also stated that it was a subset of E-learning, a step toward making the educational process "just in time, just enough and just for me" (p. 15). Finally, Pea and Maldonado [13] stated that mobile learning incorporates "transformative innovations for learning futures" (p. 437).

Mellow [14] states that:

- Mobile learning is a subset of e-learning and mobile learning can employ variations of learning strategies in delivering learning.
- Mobile Learning aims to enhance the learning experience seamlessly and not just rely on the use of E-learning (wired) as a key medium for delivering learning.
- Mobile learning is a great method that connects students to learn especially for students who are difficult to give full attention in class and to some students who are very difficult to attend class for any reason.

To add, Walker [15] emphasised that mobile learning is not about the use of variety of portable devices but more on learning across contexts.

English Language Teaching: With the statutory of English as Second Language (ESL) in Malaysia (National Education Policy, KPM, 1995, p.1) a lot of effort has been made to ensure the lingua franca is given enough exposure and emphasis in Malaysian education system. Numerous transitions in Malaysian education setting and revolution in teaching and learning for English specifically have taken over the years. A total of 11 years of English language exposure to students starting from standard one until form five is an example of commitment that the government has displayed as what Ambigapthy Pandian [16] illustrates as

> "…the paradigmatic shift from knowledge-based rote learning to self-access learning that promotes independence and life-long learning and to produce manpower that can think creatively and critically, the Smart Schools Project and the extensive reading programs.."

for both primary and secondary level of education in Malaysia.

In 2002, English for Teaching Mathematics and Science (ETeMS) was introduced nation wide that proposed as interim measure to guarantee that teachers of mathematics and science have the capacity to use English as medium of instruction in teaching the subjects as well as to enhance the language skills of Malaysian learners. This initiative was put to exercise by the government in knowing the needs of English as the language of business, trading and knowledge. However there were a lot of debates over the years and recently in 2010 due to the controversy, the government reverted back to the national language.

Interesting findings by Ali [17] on the ELT in Malaysian primary schools denote that the English language environment was lacking. The study shows English was limited to the classroom only during the language classroom whereas outside the classroom interaction amongst the pupils were reported as

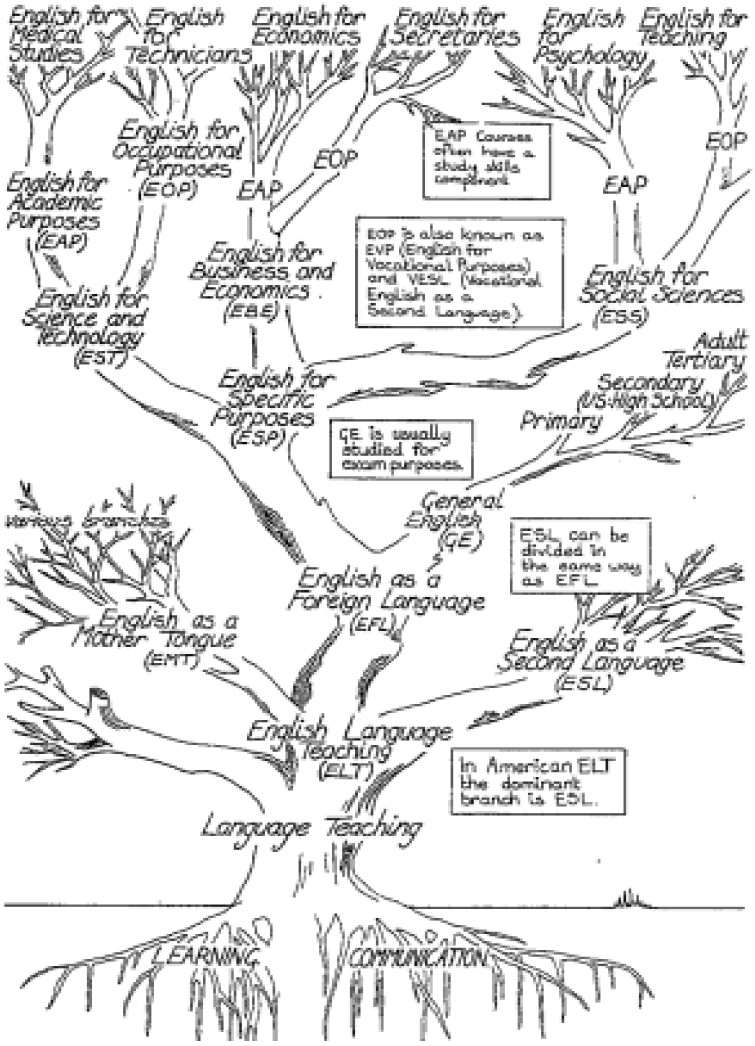

Fig. 1.3: Tree of ELT

practically non-existent. To add his report, English was not widely used at home or outside school area due to local culture and local dialect preferences to communicate. In addition, the teachers do not serve as a good role model for the pupils in which it is claimed that ESL teachers themselves seldom used the language in the classroom or outside the classroom either for instructional or communication purposes.

In the case of English language learning in higher education in Malaysia, it is found that the undergraduates do not have the language learning skills needed for the study in the university. [18] reported that students do not have the essential note-taking skills and resulted to problems when listening to lectures and discussions. Undergraduates too are reported having problems and weak at vocabulary knowledge and comprehending long sentences [19-21].

English for Specific Purposes (ESP): In the matter of tertiary education, English language in institution of higher learning (IHL) in Malaysia gauges or should gauge towards English for specific Purposes (ESP). This is due to the nature of the learning and the objective of the institution itself. For tertiary level, English language learning is no longer focusing on the proficiency but towards the individual, institution, organisation or the future working environment needs. The language learning at this stage is more incline to the building up the capability of the learners to learn and to use English effectively in various situations; while studying in the university and preparing for future working life.

In dealing with ESP it is clearer if we were to refer to the idea of ELT and how ESP is related in a larger context. Figure 1.3 illustrates the relationship in ELT as what Hutchinson and Waters [22] refer to as Tree of ELT.

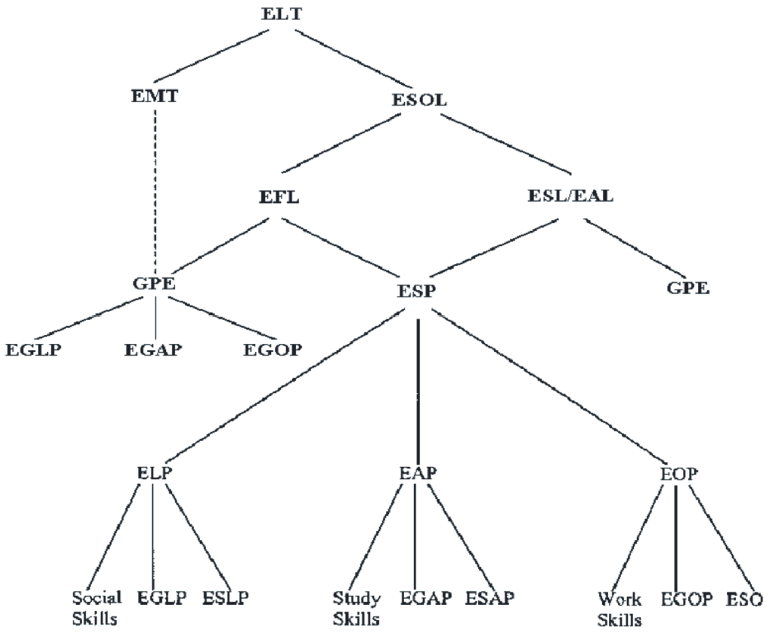

Fig. 1.4: Tree of ELT Revisited

The tree figure represents divisions in ELT and how English language teaching is interrelated. Fundamentally or the roots are the learning and communication of the language system. Later, it moves upward to the trunk as ELT. From ELT, it can be divided into two different types; ESL and EFL. According to the author, ESL can be divided the same way as EFL in terms of the branches of ESP and its context and it can be differentiated with the methodology of teaching. The next level of branches divides the types of ESP that the learners require, for example English for Academic (EAP) Purposes or English for Occupational Purposes (EOP) while the top most branches indicate where the point of individual ESP occurs.

From the figure, ESP itself can be divided to several specialisations and in this case are English for Science and Technology (EST), English for Business and Economics (EBE) and English for Social Science (ESS). All in all the important remarks that can be noted here is that ESP is not a product or method but it is an approach that heavily relies on context dependent in which in this case is the learner needs.

To comprehend the context of ESP-EAP, the Blue Blue (1993) revisited the Treeof ELT and gave specificity to the branches of ESP as in Figure 1.4.

Blue (1993) narrowed down ESP to three main branches that are English Language Program (ELP), English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). Further narrowed, English for Specific Academic Purposes (ESAP), English General Academic Purposes (EGAP) and Study Skills are all falls under EAP context. From the point of view of the author, ELP contributes to the field of social, EAP towards academic context and EOP focuses on in-service language learning.

English for Specific Academic Purposes (ESAP): English for Academic Purposes (EAP) practices have been theoretically reinforced with the emergence of critical theory (Benesch 2001). EAP is viewed as a bridge that has enabled the connection between 'the great divide' of arts and sciences which embraces an EAP course of language, literacy and content subject integration. The course accentuates constant investigations of needs analysis [23-27].

Clapham [28] introduces the grouping of English for Science and Technology (EST) and Liberal Arts under the umbrella of ESAP (Figure 1.5). ESAP refer to the specific field of study for example engineering, medicine, computer and nursing to name a few. What more important in the epistemology of ESAP is that it must be context dependent and it must be differentiated between the field of study or courses eg. Engineering and Social Science.

Methodology: Figure 1.7 is a conceptual framework that illustrates the development of the ESAP Mobile Learning framework for engineering and technical context. It proposes three phase i.e. INPUT, PROCESS and

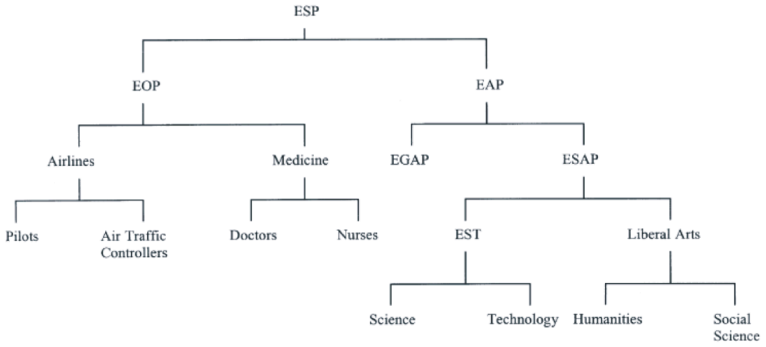

Fig. l.5: The English for Specific Purposes (ESP) Hierarchy with Examples of Courses. Source:Clapham [28]

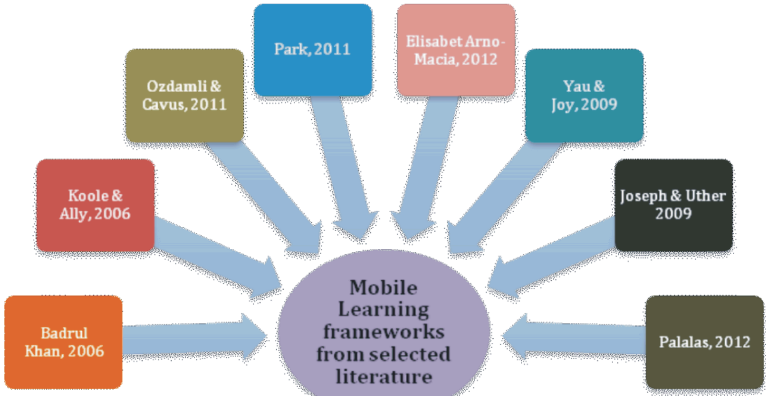

Fig. 1.6: Selected Mobile Learning Framework from literature

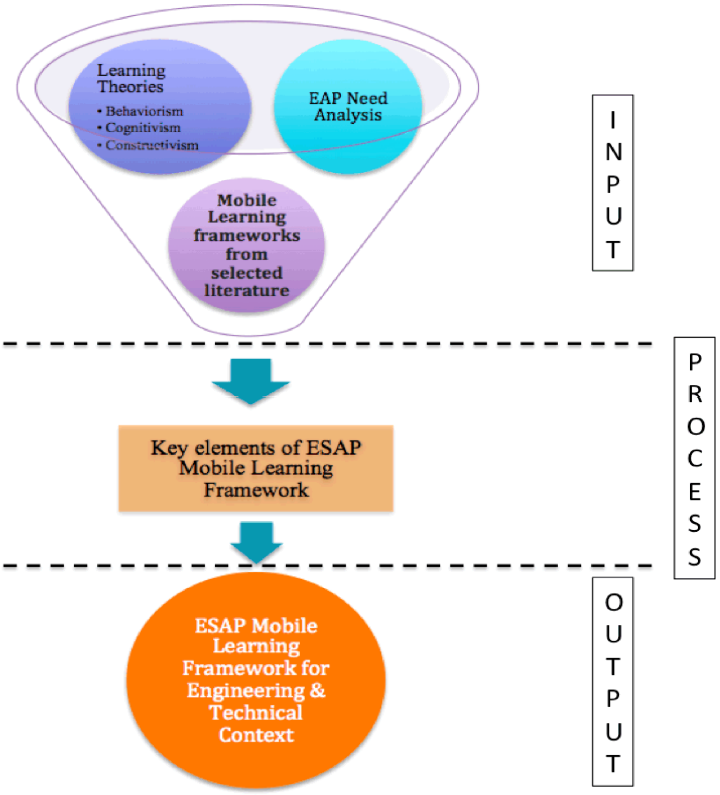

Fig. 1.7: Conceptual Framework

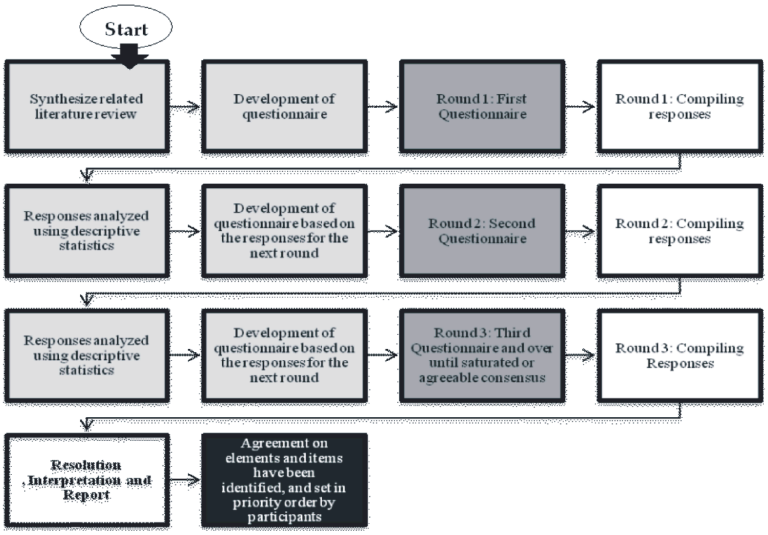

Fig. 1.8: The Procedure of the Modified Delphi Technique Implementation
Source: adaptation from *University of Illinois Extension*

OUTPUT. The conceptual framework recognizes learning theories of behaviourism, cognitivism and constructivism as a fundamental aspect in teaching and learning, EAP Needs analysis is specifically for ESAP needs whilst for Mobile learning environment applies several adaptation of related mobile learning framework from literature (figure 1.6). The process is a two part – one is Modified Delphi technique (Figure 1.8) to confirm the elements needed for Mobile Learning framework and secondly a set of questionnaire developed based on the modified Delphi resolution and interpretation. The output is the verification of the elements as a framework via SEM-PLS.

A Conceptual Framework of English for Specific Academic Purposes Mobile Learning Framework for Technical and Engineering Context: The conceptual framework of this study can be visualised as in Figure 1.6. By distinguishing the principles of three dominants learning theories (behaviourism, cognitivism and constructivism) this evidence would provide the scenario on what mostly the mobile learning framework would be based upon. Selected mobile learning frameworks and EAP Needs Analysis will be accrued and complete the key fundamental structure of the framework in which then personalised and proffer the intended user – the engineering and technical scenario.

DISCUSSION

Mobile Learning is still infant in Malaysia but as the devices that enable mobile learning are getting cheaper and Internet access and broadband are ubiquitous this calls for more understanding of the technology. Framework for specific mobile language learning – in this case is the English for Specific Purposes - is needed. A number of researches and study have been done and new ideas and theories have been inserted in the mobile learning related frameworks [29-39]. Apparently, however, most of the frameworks designed are largely focusing on the application in general and not concentrating on specific language learning. For that, this paper has sought to address the matter by presenting a conceptual framework that identifies key elements of ESAP Mobile Learning framework for engineering and technical students in tertiary education in Malaysia. Finally, the result of the study is vital in developing a specific learning environment, which addresses teaching, learning as well as material development.

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