THE VIRTUAL LEARNING ENVIRONMENT - AVA AS TOOL AUXILIARY SYSTEM OF EDUCATION PRESENCIAL MEDIATED BY TECHNOLOGICAL RESOURCES IN THE STATE OF AMAZONAS

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Abstract

This article presents the result of implementation of a Virtual Learning Environment (VLE) as a auxiliary tool to assist educational learning process in a course graduation from the University of the State of Amazonas (UEA), which uses technology education named System of Education Presential Mediate by Technological Resources (SPMTR). This technology uses, for transmission of lessons, a complete studio-based television technological platform, broadband Internet, satellite (data, video and voice), iterative digital TV over IP (video conference) and other resources in real time to all rooms geographically distant from the headquarters of the university, in the state of Amazonas, where the course is being offered, enabling the preparation of instructional resources in multiple languages: films, documentaries, illustrations and animations, researched or specially produced for the lessons of the course. In this scenario, have been deployed and used the capabilities offered by VLE whose main contributions have been evaluated for the consolidation and evolution of new teaching ways.

Keywords: Distance Education, Educational Technology, School Attendance Mediation by Technology Resources (SPMTR), Infrastructure for Education, Virtual Learning Environment (VLE).

1 INTRODUCTION

In the year 2001 with the creation of the University of the State of Amazonas was created a model of education based on technological resources, by its nature as a complex socio-technical system involves a strong relationship between technology and basic human factors to their development [1] . Defined as System of Education Presential Mediate by Technological Resources (SPMTR) it currently is considered as presential but has all the characteristics of distance education, becoming a hybrid and sustained by essential pillars: the way of transmission lessons, teaching methods and specialized personnel.

Experiences in the graduation of almost 19,000 students through SPMTR define the system as a "technological modality", which appropriate of varied elements of ODL (oriented distance education), extended by the possibilities that new tools of communication and information added in teaching-learning process, based on the principles, guidelines and procedures leading this new practice teaching [2]. The one of the main characteristics of ODL is the practice of higher education without the physical presence of a teacher or student at the same time in the same geographic location held through some technological way and the two being separated spatially or temporarily [3]. Many of these characteristics are present in SPMTR, Teacher-presenter, originator of artifacts specialized educational who presents the lessons, guides students and assistant-teachers, prepare the evaluations, all within a Studio television through a technological environment that includes hardware, software, physical environment, procedures, people trained, specific legislation and regulation. This system, whose principles are coordinated among themselves, needed other technology elements that shared information, quickly and seamlessly, motivating and challenging for the human factors involved [4] [5] [6]. The virtual learning environment (VLE) serves the purpose established by this system, working in the role of e-infrastructure, establishing a new tool in the construction of the student's knowledge.

2 SYSTEM OF EDUCATION PRESENTIAL MEDIATE BY TECHNOLOGICAL RESOURCES (SPMTR)

The System of Education Presential Mediate by Technological Resources is an educational method established in 2001 by the University of the State of Amazonas (UEA), with the purpose to overcome distances and existing access difficulties in the Amazon region and provide quality education. It consists in the transmission of lessons, from a television studio located at the headquarters of the University, live and simultaneously for all classrooms geographically distant, through a VPN-Virtual Private Network connected via satellite, using three types of media: data, voice and video: "…If you have set up the instrument of Presencial Educational Mediated System based on tripod – technological resources, personnel properly qualified and specific instructional procedures – creating then the environment comparable to classrooms with teachers-led in class…" [2]. The technological resources used in the template are: Television Studio with appropriate structure; student support center with toll-free telephone; and transmission technology lessons thru a dedicated satellite channel and bandwidth of 2 Mb being divided into: 1 MB for transmitting video lesson; 512 KB for Internet access; and 512 KB for VoIP.

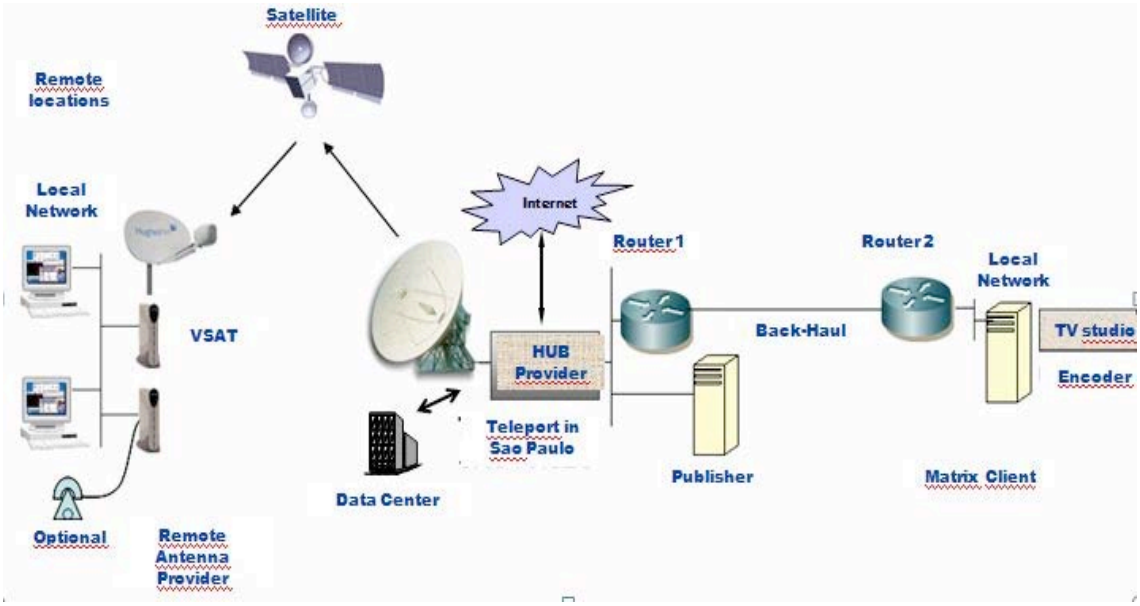

Fig. 1 Technological Model used in SPMTR.

The human resources involved are: principal teachers-led online, also known as teachers- presenters who are responsible for preparing and delivering lessons from Studio television; teachers-clerks, that support students with physical presence; design and technical team, responsible for the transformation of material available for a standard used in television. The specific instructional procedures consist in the production of technical books; and preparing lessons reproduced on texts scripts and slides that have in addition to the description of the content, illustrations, photographs and other audiovisual resources.

2.1 The construction of knowledge through the SPMTR

For the construction of knowledge is achieved through the method of teaching SPMTR all the elements above need to be working together. Fig. 2 below provides the interrelated processes, as well as their inputs (entries), tools and business rules involved, getting as final product student learning.

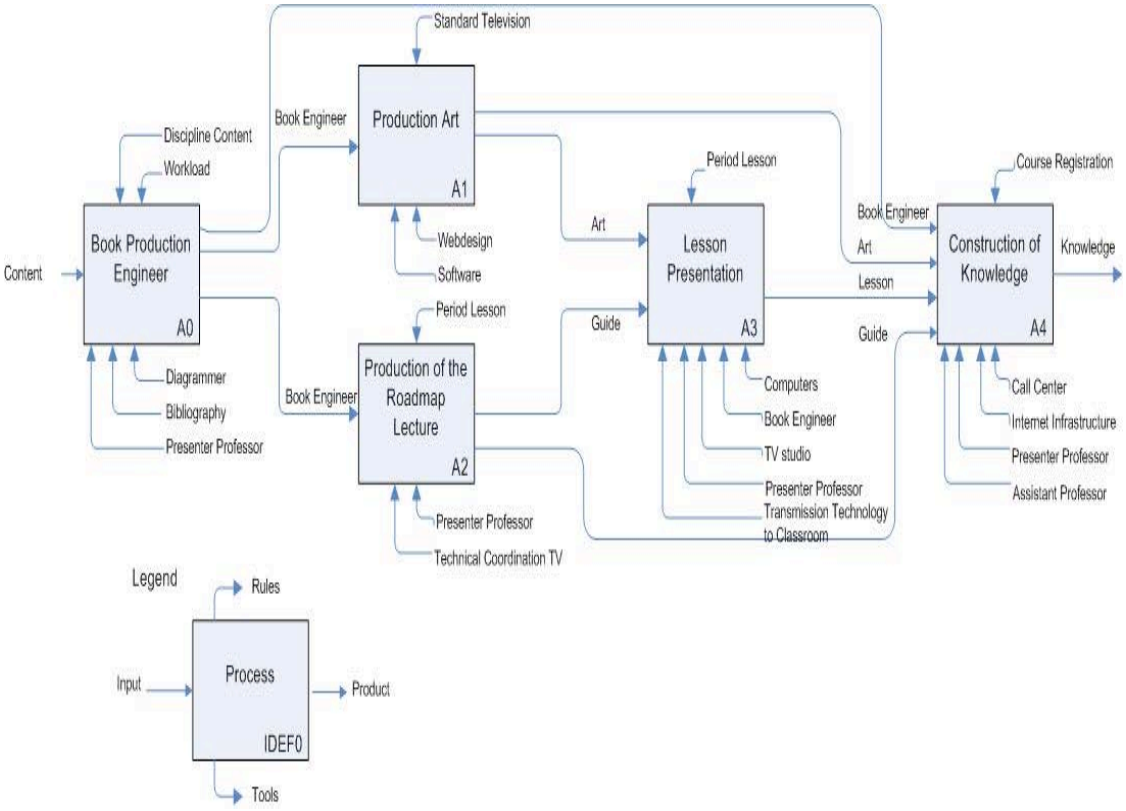

Fig.2 Interrelated processes for construction of knowledge.

The first step is the *Production of Technical Book*. This process consists in defining tools: choosing 03 (three) principal teachers, 01 (one) designer and several bibliographies, that serve as theoretical complement. The programmatic content, working hours and the syllabus of discipline (from pedagogical plan) are respectively the input and the business process.
The second step is the *Production of art*. This process consists in defining tools: allocation of Web design and the choice of appropriate software for preparing lessons in television standard. The technical paper and standard broadcasting are respectively the white paper and the rule of this process.
The third step is the *Production Script*. This process has specialized as a tool for the work of teacher-presenter in conjunction with the television technical coordination that define the correct use of time in relation to the content to be presented during the lessons, as well as the selection of appropriate audio and video resources. The technical book and the daily period reserved for lessons (04 hours divided into 03 times of 70 minutes each, with 15 minutes break) are respectively the insume and the rule of the process.
The fourth step is the *Presentation of Lessons*. This process has the tools: technical book, computers, television Studio, classroom transmission technology and teacher-presenter. As a input the process has the art and scripts produced and as a rule the correct use of lesson times defined on script (defined on step 3).
The fifth and last step is the *Construction of knowledge*. As a tool this process relies on the Internet infrastructure, Teacher-presenter, assistant teacher and student support center. Inputs include the technical book, the arts and scripts of lessons; the existing rule is the requirement for student regularly registered in the course.

3 VLE – VIRTUAL LEARNING ENVIRONMENT

To facilitate self learning collaborative environments online also known as virtual learning environments are resources that serve a purpose clear: "… develop interdependence and inter learning between persons who are grouped by motivations and converging needs to achieve a particular goal, whose scope depends on the participation and commitment to performing actions ..." [7]. The self management, characteristics of these environments, allows the student to recognize what

is important for their learning and, through the mediation of technological resources, e-infrastructure, reach this purpose.
The VLE needs develop fluency technology, media, language and people, facilitating the creation of an area relational acceptance and call for participation, social interaction, supported on tools, concepts and signs [7]. On the Virtualization of ODL courses the VLE favors student, teacher and tutor when elaborated by technological resources that stimulate objects of study, of learning and experimental initiatives. Many characteristics are offered in a virtual learning environment: communication group to group, allowing the student to communicate with others online; independence of place and time, enabling students to access the contents depending exclusively Internet, organization and control of dates and events allowing students monitor the conduct of activities, access controls and activities, allowing managers to monitor the activities developed by students in these environments. In addition to these characteristics the VLE allows the use of artifacts pedagogical practice and evaluation, corresponding to the face-to-face education that are converted in tasks, exercises, tests and participation in various arrangements provided in the space by information and communication technology (ICT) [8].

3.1 The VLE as auxiliary tool in SPMTR

The students of a course of Education Presential Mediate by Technological Resources have all physical and technological infrastructure of the classrooms, but still are limited in daily contact and exchange of experience from the theoretical and social contact student-student and student-teacher. his is because students of the same course, but geographically distant classrooms do not have media that provide a cooperative environment among presenters and between teachers, holders of much of the theoretical knowledge of the disciplines offered.
The course technology analysis and development of systems (TADS), offered by the University in SPMTR, held an experience from the year 2008, when it make available in your portal a collaborative environment for their students. For do this was chosen a software ***M**odular **O**bject **O**riented **S**oftware **D**istance **L**earning* (Moodle).
The virtual environment of learning has been adapted to SPMTR to give additional support expected become much more than a space of communication. This environment has overcome many difficulties experienced by students, among the most important access to educational objects developed during the construction of knowledge (lessons, roadmaps slides, texts, programs-programs-examples, exercises, tools, and other typical digital resources of information and communication technology course as is the nature of the TADS).
In addition to the unrestricted access to these objects, the environment offered a message exchange, promotion of the construction of knowledge through discussion forums, information about the discipline, on the tools used, virtual debates (chats), as well as extension courses, lectures, announcements, calendars, and information about teachers-presenters and students.
Other experiments have been possible when VLE was used, not only as an instrument to support teaching learning process but also could promote socialization between students who were able to make photos, personal information, details of the municipality, local culture, making more universal and attractive environment.
As is known the concept of transposition with respect to relocate in order to implement the lesson or activities face-to-face to virtual environment, the VLE for SPMTR transposed inversely to offer face-to-face environment of universities in a virtual technological environment and on which System of Education Presential Mediate by Technological Resources was created. As an example teachers-presenters after finish lessons at the studio began to talk and answer questions and discussions thru messaging and communications services of the VLE, allowing the student approached the teacher and improve their experiences. As each discipline has SPMTR 03 (three) teachers presenters, the support to a student is done several times a day for several teachers jointly or separately, keeping the student involved in the activities of the discipline.

4 EVALUATION METHODOLOGY OF VLE

A questionnaire was developed to evaluate the effectiveness of virtual learning environment, as a tool to support SPMTR on pedagogical and social areas. For this objective were compiled and released 09 issues for 12 municipalities of course TADS involving 248 (two hundred and forty-eight) students. The questionnaire was VLEilable from 02 (two) ways to students: through questionnaire in own VLE, within a period of three (3) weeks and through document delivered by Clerk-teachers. Due to the geographical characteristics of the Amazon region, where in many cases the access to the Internet

only happens via satellite, the students have (three) ways to respond to the questionnaire: the first shape students have used the Internet VLEilable in the laboratories of cores University distributed by municipalities. In the second form students worked offline, and sent via the software used in data transmission during lessons; and the third form students accessed VLE LAN-house and replied to the questionnaire or sent via email. These forms were gathered and the information recorded in the table below:

Tab.1 Results obtained in the assessment of AVA.

Question	Text Response	Counts	Percentage
1	Yes	37/248	14,92%
	No	211/248	85,08%
2	Yes	202/248	81,45%
	No	46/248	18,55%
3	Yes	123/248	49,60%
	No	38/248	15,32%
	Sometimes	87/248	35,08%
4	Chat	63/532	11,84%
	Forum	66/532	12,41%
	Exercises	153/532	28,76%
	News	143/532	26,88%
	Calendar	107/532	20,11%
5	Yes	225/248	90,73%
	No	23/248	9,27%
6	Rubbish	37/248	14,92%
	Regular	81/248	32,66%
	Good	98/248	39,52%
	Excellent	32/248	12,90%
7	Worsened	19/248	7,66%
	Not changed at al	53/248	21,37%
	Improved considerably	176/248	70,97%
8	Yes	35/248	14,11%
	No	213/248	85,89%
9	Less than 3	9/248	3,63%
	Between 3 : 5	14/248	5,65%
	Between 6 : 7	52/248	20,97%
	Between 8 : 9	77/248	31,05%
	The grade is 10	96/248	38,71%

As presents the question 1: *The tool Moodle can replace the explanation of Assistant Teacher within the lab?* 14.92% of students from the presence of Assistant teacher in the computer lab when completion of the hands-on activities of analysis and development of systems. 85.08%, i.e. 211 students think Teacher Wizard needs to accompany them in lessons practices and help dispel the doubts that arise during the hands-on activities.

In question 2: *Improved their performance in graduation?* 202 students, 81.45% believe that performance disciplines of course improved due to use of a tool socio-technical support. Only 18.55% of students not describe improvements in their performance.

The question 3: *Usually frequently access the tool Moodle and the TADSVirtual?* the TADSVirtual is the name by which the VLE is known by students and teachers. 49.60% of students responded that Yes, access often VLE, 35.08% responded that only sometimes can access the resource. Only 15.32% of students, i.e. 38 students, replied that they did not search the environment during the lessons.

On question 4: *What resources you most uses on the site?* Several features have been tested and evaluated by students: chat, Forum, exercises, news, and calendars. They could choose one or more resources that they want and were important for improving its performance. The result demonstrates that students use more than one resource during the accesses to VLE. The most requested were exercises and news of the course and disciplines that are posted in the environment. They receive 153 (28,76%) and 143 (26,88%) votes respectively. Following the timetable of the course and of disciplines, with important dates for the student, who endorsed supplementary questionnaire on interviews, to produce its own agenda of appointments, received 107 (20,11%) votes. For the last, but not less important, Forum and chat with 66 (12,41%) and 63 (11,84%) votes respectively.

The question 5: *Shares information with students from other municipalities where the course is offered?* 225 students, i.e. 90.73% talks and exchange experiences with colleagues from the same course but studying and living in distant cities. The difference, 9.27% not practising this experience.
In question 6: *How do you sort the interactivity between students and teachers in the course TADS prior to deployment of the tool?* the questionnaire refers to teacher-presenter, lying in the Studio television during the lessons. 39.52% of students choose good interactivity between parties; only 12.90%, 32 students choose great this interactivity. 32.66%, i.e. 81 students were not satisfied and choose regular channel of interaction and 37 students, 14.92% choose as awful.
On question 7: *After deploying TADSVirtual the interactivity?* 70.97%, choose a significant improvement on the interactivity between the teacher-presenter and student. 21.37% not seen changes in interacting and 7.66% think that the channel has worsened.
On question 8: *Think complicated handling tool Moodle deployed in virtual learning environment?* As students of a course of technology, 213 students, 85.89% per cent replied that they did not consider complex tool. Only 35 students, 14 11% considered complicated tool.
On question 9: *What note you assign Moodle/TADSVirtual tool for teaching learning process on TADS?* 38.71% of students rank tool with maximum note, i.e. 10. 31.05% of students, or 77 students rank tool with notes ranging in the interval between 8 and 9. 20.97% of students, rank tool with notes ranging between 6 and 7, 14 students, 5.65% rank tool with notes ranging between 3 and 5, and finally, 9 students, 3.63% rated tool with note smaller than 3.

5 THE EVOLUTION OF SPMRT WITH USE OF VLE

Seeing the results presented it is obvious that the use of a virtual learning environment assured to the student a approach between the various actors of System of Education Presential Mediate by Technological Resources. During the weeks in which the forms were being answered and sent several inquiries were made by students in order to understand the question and justify the choice of an alternative as the answer. As a rule, the question of the availability of the Internet beyond the period of lessons (mainly in laboratories), was the most critical factor to the template, which generally reflected in student responses.
On the other hand, several positive points were incorporated into routine SPMTR bringing an evolution to the role of teacher-clerk, teacher-presenter, students and course coordinators. First, the teacher-clerk starts receive artifacts of disciplines through VLE quickly and organized. The contact with teachers-presenters of discipline favoured the understanding of the technical content and prior understanding of the assessments, exercises and their resolutions. Second, the teacher-presenter went to meet students and teachers assistants through the media of VLE, reducing calls to the call-center in the Studio. In addition, teacher-presenter expanded its regular hours of work and support student getting this in VLE in predetermined periods. In addition to all artifacts lessons, defined originally in SPMTR, Teacher-presenter spent building and have other objects educational, extra classroom tools, educational debates, keeping the environment always innovative and motivating for the student.
Third, the coordinators of the course passed to monitor the evolution of education, the rise of VLE as social environment of students, news and schedules classroom work and extra activities, the participation of teacher-presenter and their hours, and primarily the doubts of students who have come through this direct channel, and not just through Assistant Teacher. Fourth, the student now uses VLE as social tool, such as building blogs, sending messages and search for news about the course, discipline, extension materials, among others. Now know and interact with coordinators and teachers-presenters, equaling or trying to bring the relationship built between them and their assistant teachers. The access to artifacts and educational objects became direct, which improved substantially the provision of student motivation to follow and accomplish the activities of disciplines. The following figure shows the interrelated processes of SPMRT including the VLE like a tool to support in the “Construction of Knowledge”.

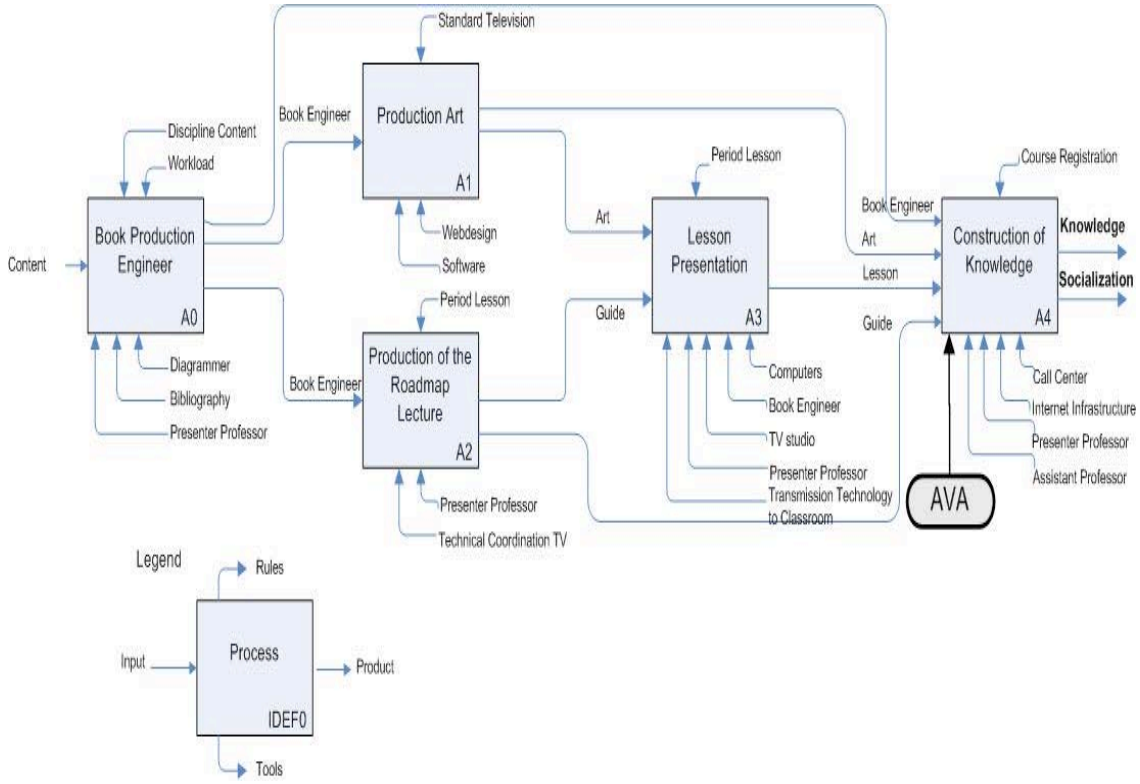

Fig. 3 Auxiliary Tool VLE in the process of constructing knowledge and socialization.

The figure above shows still a relevant factor as a product of the use of VLE: the socialization of human elements of SPMTR. This characteristic, however, should not be assessed objectively but aggregate social values such as: independence, communication, universalisation of knowledge and resources, the organization of activities and schedules, among others, confirming the nature socio-technical model SPMTR.

6 FINAL CONSIDERATIONS

In order to enrich the model SPMTR, and with the purpose of motivating students and the teacheres, the VLE caused an evolution in the system. Caused a change in student profile, making it more independent in search of artifacts lessons, learning practical and socialization that course built during periods of formation of a man. The student of the TADS in each of the municipalities where the course is present, came to be, the owner of relevant information (news, information school, availability of tools, among others) not only its own course but also other subordinates of UEA and the courses offered in these municipalities in the same modality of TADS. Most students and teachers search in extra interactivity-room classroom VLE the functionality needed to exceed the difficulties of understanding between people, understanding the disciplines and the distance between the municipalities and their representatives.

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