

# AN EXPERIENCE OF INTEGRATION IN THE MOODLE LEARNING ENVIRONMENT WITH ACADEMIC MANAGEMENT SOFTWARE – Q ACADÊMICO – AT CEFETES

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## **ABSTRACT**

*This paper describes an experience of integration in the Moodle learning environment with academic management software (Q-Acadêmico) at CEFETES. The institution introduced on December, 2007, the Technology in Systems Analysis and Development course in Moodle environment and decided to keep all the controls of information of the involved ones (students, tutors, content professors, etc.) in the software that already contained all the information of the presence courses (Q-Acadêmico). Thus, the objective is showing the steps that followed the distance course's approval at CEFETES, culminating in the integration between the Moodle and Q-Acadêmico environments. The project is under construction, with great part of the functionalities defined and in full activity.*

### **Key words:**

**EaD, Moodle, Academic Management System, Integration, Learning Environment.**

### **1 – Introduction**

The advent of the Internet revolutionized everyone's way of thinking and acting: companies, governments, public and private institutions and people observed the potential and diversity of opportunities in this means of communication. Under this view, the Distance Teaching (EaD) was developed,

as a tool able to bring knowledge, and spread a cultural and educational growth to peoples in countries of continental dimensions such as Brazil, to places of difficult access of presence teaching, besides the economic and social reasons. In current times of the capitalist model in force, in which the flexible specialization is settled [1] apud [2], it demands:

“... changes in the educational/formative process, so that they enable the worker to acquire necessary skills for following the speed of technological innovations. It worsens, concomitantly, the preoccupation of governments which represent countries of a low rate of students with a university degree, such as Brazil. The scope of the Brazilian Government is within this context for creating a Brazilian Open University Program and the university degree courses...”

The promulgation of the Lei de Diretrizes e Bases da Educação (the Educational Directives and Basis Law) [3], replacing the Law n. 1961[4], gives new incentive to research and development in the Distance Education Field. In its article n. 80, establishes [3]:

“The Public Power will incentivize the development and movement of the distance teaching programs, in all levels and styles of teaching, and of continued education”.

With such objective, The Open University of Brazil (UAB) [5] published, through the selection edict [6], public call for selection of the local poles of supportive presence and of degree courses of the Federal Institutions of University Education (IFES) in the distance education style, defying the following directives [3]:

“This system Will be formed by public institutions of university education, which will take the university education of good quality to the Brazilian local authorities, which does not have or does not have enough offer of courses to all citizens”.

The Centro Federal de Educação Tecnológica do Espírito Santo (CEFETES, stands for: *Federal Center of Technological Education of the State of Espírito Santo*) will be 100 years old in 2009, showing that its history is attached to the changes and advances of education in Brazil in the 20th and 21st Centuries, considering a broad experience in presence courses of secondary education, technology degree courses and several other degree courses, post-secondary and *latu senso* graduations; and it hopes to share all this know-how for distance education courses

In harmony with the UAB, the CEFETES, aware of its distinctive role in the context of being an educational, research and extension institution of quality, had its Technology in System Analysis and Development degree course (CSTADS), approved through the first edict [6] in 13 local poles of presence support, besides of applying for other 4 (four) courses on further edicts. The local authorities listed in Figure 1 take part with the presence support through the infra-structure and part of the staff necessary, such as coordinators of the poles, lab and presence tutors [7].

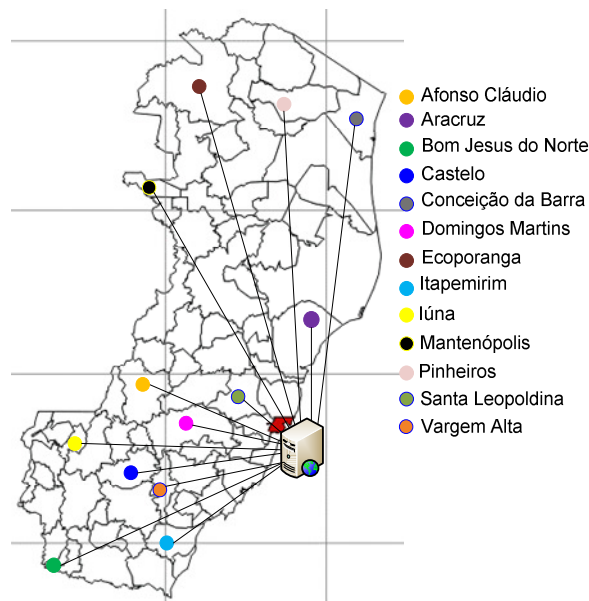


Figure 1 – Poles installed in local authorities of the State of Espírito Santo with the Technology in Systems Analysis and Development Degree Course

The UAB defines, therefore, after analyzing a variety of software specialized in learning environment, the Moodle as environment standard so that the IFES use as platforms of their distance courses. Software such as the Moodle are also defined as Course Management Systems.

With the definition of the Moodle, and, observing that the amount of software at the IFES did not have the necessary preparation for the treatment of the academic part of the distance courses, the UAB decides to make an allowance available for making the integration between the Moodle learning environment and the IFES' academic management software.

The following sections show a view of the Moodle environment, the academic management software used by CEFETES, besides some experiences of the Project developed, for that this integration could happen in a satisfactory level of the involved ones in the Project.

## 2 – Course Management Systems Moodle

Aiming to standardize the apprenticeship of the institutions which introduced their EaD courses through the participation in the first edict, besides facilitating the Exchange of experiences and standardization of this environment, the tool Moodle (*Modular Object Oriented Dynamic Learning Environment*) [8] was chosen.

Deeper studies in the Moodle through the behaviorist, cognitive and constructivist aspects, can be seen on [10] e [11]. For details of installation and support, see [8].

## 3 – Academic Management System – Q-Acadêmico

The CEFETES has tens of presence courses and in several levels which need academic management software for controlling them. Grades, attendance lists, students' and professors' report cards generate a mass of data which demands the mechanized systematization for the whole environment.

The system used for all these functions, among others, is the academic management - Q-Acadêmico. Developed by the company Qualidata Soluções em Informática Ltda. [12], company managed in Vitória-ES, it introduced the system at the CEFETES for 7 (seven) years. The system is maintained by the developing company for managing the information which involves the controls necessary for the academic environment. The software is also introduced in other CEFETs (currently 12) distributed throughout the country.

The Q-Acadêmico counts on the following modules:

- Module of Control of Library (Q-Biblio);
- Module of Control of Selective Process (Q-Seleção);
- Module of Control of Access (Q-Acesso).

#### **4 – PMBOK**

The PMBOK [13], or the Set of Knowledge of Management of Projects Guide looks for mediating several aspects that can be approached in the management of projects. It deals with the good practices, proved in what is referred as management of projects. They are typical of the PMBOK [13]:

- Does not distinguish the different types of Project (certainly managing administrative projects is totally different from managing projects of heavy construction);
- Does not use language peculiarities that respect the culture of different types of companies;
- Does not present specific models of papers to be filled in; they vary from company to company;

The PMBOK is not a methodology, but a manual that describes the universe of knowledge for the Management of Projects. However, considering its huge international importance, it becomes a standard and source of inspiration for almost all the methodologies existent.

The processes described in the PMBOK were used for realizing the projection, the control and monitoring of the integration Project.

#### **5 - Objectives, justification and motivation**

By the time the CEFETES had the distance CSTADS' approval, they verified two supporting basis of their distance course approved. The Moodle, chose by the UAB as standard of the called Sistemas de Gerenciamento de Cursos (SGC, stands for: Course Management Systems), and the Q-Acadêmico, as tool of academic management of the presence as well as the distance courses.

The necessity of interoperability between the data generated in the Moodle and in Q-acadêmico, such interoperability is supposed to be transparent for the final user. In this case, an integration project is necessary, and is supposed to answer some of the following questionings:

- How to add the data of the selective process (approved and substitute ones) in the Moodle, so that they join the classes as effective students?

- Who are or were those involved during the execution of the modules (distance tutors, presence and lab tutors, content professors, students, coordinators, etc)?
- How to save the information of the content of the disciplines for research and files?
- Generation of reports of several periods, notes, that is, how to deal with everything that was generated from the distance course in the Courses Management System Moodle?
- Even if a huge part of this information can be in the Q-Acadêmico, how can it be synchronized with the information of the Moodle?
- What should stay in the Moodle and what should be considered as academic information, like a presence course?

Aware of these common difficulties to the IFES, the UAB has allowance for each institution that had distance course approved, for the development of an interface for integration between the software of academic management and the Moodle.

The objective of this paper is describing the experience of development acquired with the Project of integration between the academic management system (Q-Acadêmico), introduced in several CEFETs, and the Moodle, environment chosen as a learning environment standard of the courses approved by the UAB, using the best practices of the PMBOK.

Allied to the UAB's solicitation, the team was made with three people, initially in charge of studying the Best model of development for a satisfactory result for all the involved ones. The team was composed of a Manager of Projects and two leaders of projects.

As requisites for the realization of the integration, some questions related to strategy were made:

- The team members themselves would develop the interface of integration or would hire a company for that?
- The possibility of involvement of other CEFETs that were in similar situations, using the same academic management system;
- Besides the question above, they also influenced: the financial control of the allowance of several CEFETs at the same time, and each one would pay for its part in the project.

## **6 – The Projection of the Integration Project**

The team gathered for managing the project had a great experience in systems development at middle and big private companies, of different segments, such as Vale e Arcelor-Mittal (steelworks), Accenture (Consultants and Services), EMESCAM (Medicine School), CESAN (ES Sanitation Company). Besides this experience, it was also of great importance that the members of the team knew about the PMBOK good practices [13].

Since the team's meetings, they identified several positive results from this Project:

- Tendency for the increasing usage of free software at the institution;

- Integration between the software developed by outsiders (owners) and the software recommended by MEC;
- Definition of a methodology for developing projects of software;
- Creation of standardized documents that can become standard to be used by the GTI;
- Technological innovation in the systems being developed by the institution;
- Integration between the several IFES of the federation;
- Increase of the interchange of managing information of the IFES and the MEC.

After studies of the viability of the Project, we took into consideration the time during which the allowance was available (until Dec/2007), the little team's knowledge on business rules of the current academic environment (despite the experience in development of systems in private companies, the team was composed by three professors who did not have more than 10 hours per week to give per member) , and the amount of allowance for study, construction, introduction, documentation and integration tests.

Before the difficulties imposed, the solution found was hiring the very company that developed the Q-Acadêmico, which would be in charge of analysis and programming of the interface of integration, and the team would take the strategic decisions and the progress of the Project. This decision was important, considering the knowledge already acquired by the company in academic environments, besides of having Just the Moodle part for getting to know and/or developing.

With this decision in hands, it was possible to bring to the Project two other IFES, aiming to share the costs of the project: CEFET-RS (Pelotas) and CEFET-RN. The team completed, thus, would have (*Stakeholders* of the project): Project's Sponsor, Project's Manager, two project's leaders, Works Supervisor (Who knows, at CEFETES, the Q-Acadêmico); TI Manager; UAB Technical Support; EAD CEFETES Coordination; FUNCEFETES representatives; CEFET-RN representatives; CEFET-RS representatives; CEFETES Computer Science Coordination.

Allied to the PMBOK good practices, an alteration control committee was created, composed by Project's Sponsor, Project's Manager, Works Supervisor and EAD CEFETES Coordination – This committee was in charge of the analysis and approval of the changes, considering the flow of change control to be defined within the project, as well as the acceptance or rejection of the changes suggested.

In order to reach the objective of integrating the Moodle and the Q-Acadêmico, some specific goals ought to be reached:

- Realize the documentation of a part of the academic system (Q-Acadêmico) to acquire and share knowledge between the Technology of Computer Science Management and the interested ones;
- Training in the Moodle environment;
- Specification of the functionalities to be developed in the integration;

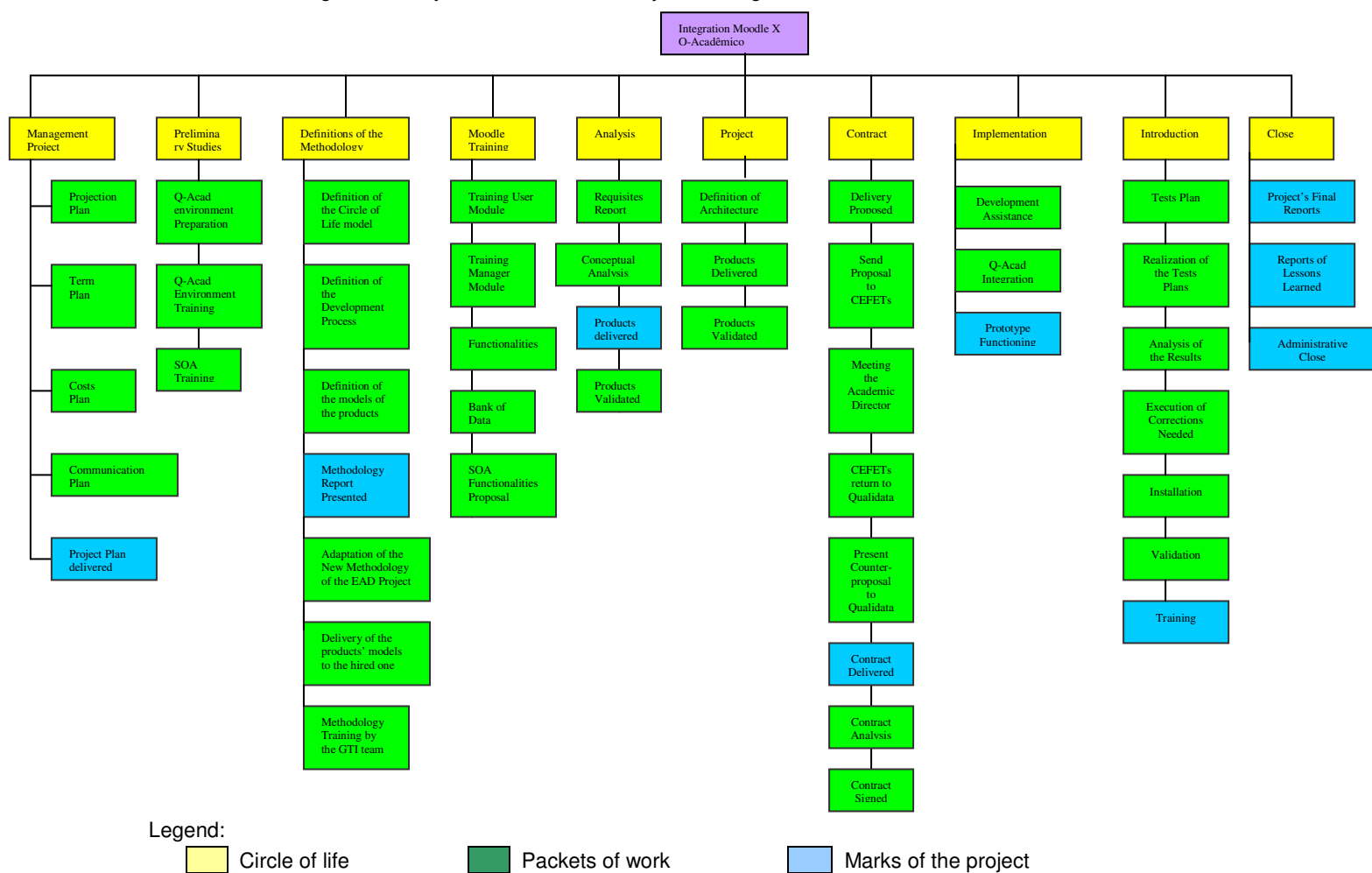
- Specification of the hardware and software technologies and tools needed, aiming the free software;
- Development of the module of integration and of the documentation needed;
- Introduction and training in the system.

The topics listed above aimed to develop and introduce the module of integration which allows the functional interaction between the Q-Acadêmico and the distance education environment Moodle, regarding restrictions of the allowance and the final term defined: 12/30/2007.

An important product in the development of the integration was the EAP (Project's Analytical Structure) defined in Figure 2, and which represents the project's circle of life through the summary activities (yellow boxes), being the main stages of the project. Through the circle of life it was possible to control the project's progress.

The packets of work (green boxes) are important for giving resources, costs and term to the project's activities. The marks of the project are represented by the blue packets of work.

Figure 2: Analytic Structure of the Project of Integration Moodle x Q-Acadêmico



Other products in the PMBOK's best practices were documented, as schedule, verification and control of the projection, financial marks of the Project and projection of the costs, which cannot be demonstrated here due to the content limitations for this paper.

## 7 – Systems Introduction

The system was introduced in a way to make the registration of the students' professors' and tutors' data in the Q-Acadêmico. After the registration, that data were exported to the Moodle, operation made in the beginning of each semester. In the end of each discipline (in the Moodle course) a reverse process happens, that is, the data generated in the Moodle, consolidated according to the necessity of the academic management software, are imported to the Q-Acadêmico.

### 7.1 – Setting Up Qualified Courses

The Field “Education Style” is used for statistics, and it does not mean that this course will be integrated to the Moodle. The Field Integrated to an EAD Tool” indicates if the course will have its groups exported to the Moodle.

Código	Descrição	Nível de Ensino	Área	Ativo
68	Rochas Ornamentais	Técnico	Conversao	Sim
76	Siderurgia	Superior	Indústria	Sim
78	Sistema de Informação	Superior	Informática	Sim
73	Superior de Tecnologia em Manutenção Eletromecânica	Superior	Indústria	Sim
75	Superior de Tecnologia em Metalurgia e Materiais	Superior	Indústria	Sim

Figure 3 – Cadastration Screen of Qualified Distance Courses

### 7.2 – Setting Up the Types of Tutors / Professors and Their Equivalent Profiles in the Moodle

Before forming the groups of students and define their tutors / professors, it must be shaped which types (roles) of tutors will be used by the institution, and which their equivalence is to the user profile in the Moodle, so that when the tutors are associated to the EAD attendance list, each one's role is indicated on each list, according to Figure 4.



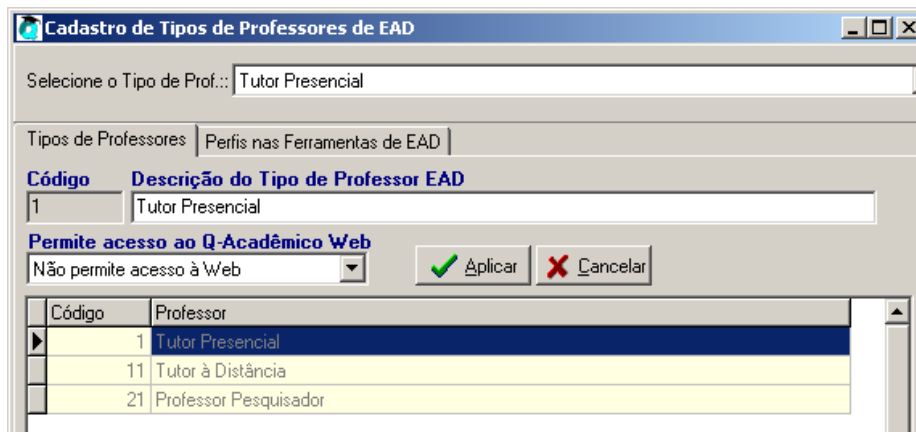


Figure 4 – EAD’s Types of Professors Register

The field “Permite acesso ao Q-Acadêmico Web” (it allows access to the Q- Acadêmico Web) indicates if the professor who receives this profile when associated to a attendance list can access it through the professor’s area in the module Web of the Q-Acadêmico for register of grades, etc. In our example, only the “Distance Tutor” would have the access.

For each tool it ought to have an indication of which profile is equivalent. For the Moodle, three profiles are available: Tutor, Editor Tutor, and Fictional Student. In our example, the Presence Tutor will have a “Fictional Student” profile in the Moodle, and the “Research Professor” (who prepares the content of the course) of “Editor Tutor” in the Moodle.

### 7.3 – Define the Tutors of Each Attendance List

In Figure 6 each attendance list Will be exported as a virtual room (or “course” in the Moodle case) to the EAD tool. In order to define the tutors of the attendance list and their roles, the attendance lists register that received a new guide is supposed to be used, the “Professores do Diário” (Professors or the Attendance List ).

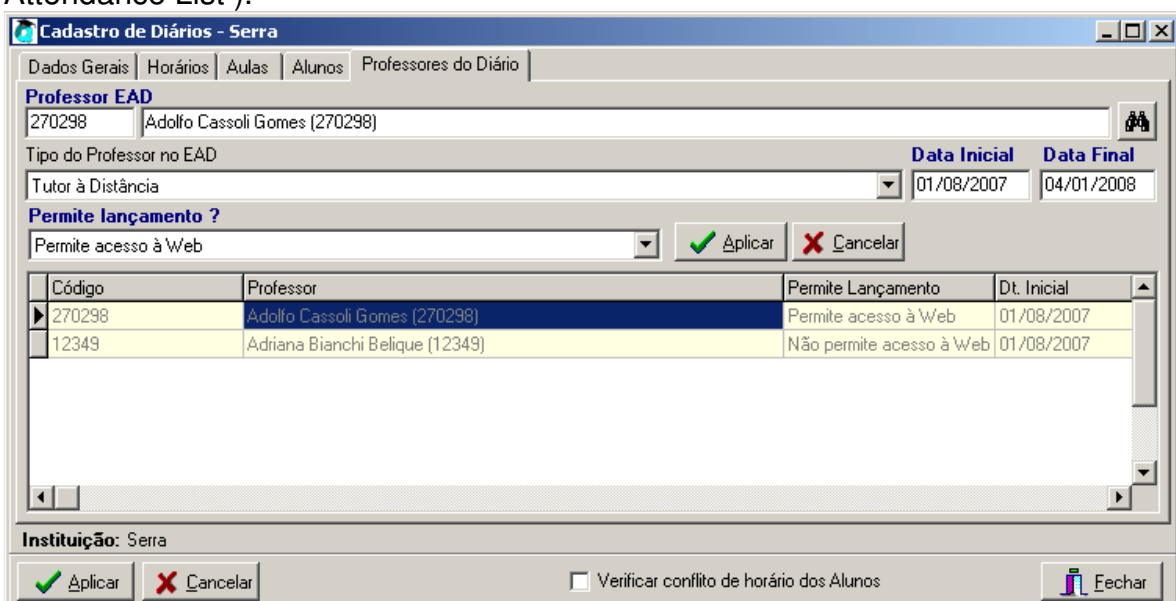


Figure 6 – EAD Professors’ Types Register

Only professors regarded as “EAD Tutor” can be selected for distance education attendance lists. When associating the professors / tutors to the attendance list, the professor’s type (profile) must be informed, according to the previous confirmed register if such professor must or must not have access to the Q-Acadêmico WEB module for grades registration. The number of tutors / professors is free.

## 8 – Conclusion and Future Works

This paper spoke about the experience of developing the integration between the Moodle and the Q-Acadêmico. The CEFETES and other IFES that had their distance courses approved through the first edict needed to integrate the software, having as difficulties:

- Too short terms;
- Sponsored allowance distributed between the CEFETES, the CEFET-RN and the CEFET-RS
- The orchestration of the interests of each IFES in building up the interface;
- Other problems were considered normal in an environment of development of computer science systems.

The Project was documented according to the outputs of the processes verified on the PMBOK, which gave the team safety for always having the steps of the Project mapped and within its established borders. The previous knowledge of the managers and leaders of the project in systems development and PMBOK ‘s better practices was important for the whole project’s documentation and attendance, since the teams’ assembly until the introduction of the tests.

The project was successfully realized, having its products (integrative modules) in full production.

As future works we have documented the lessons learned and the generation of managing information asked by UAB/SEED.

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