

A Professionalization view: A Framework for Research on Information Technology and Organizational Form Evolutions The Case of Webmastering

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ABSTRACT

Although the importance of an organization's information technology (IT) human resources is widely acknowledged, especially in the arena of new technology development, most organizational research has taken a "black box" approach to the study of IT professionals, treating the IT human resource as a relatively homogeneous community that operates as a fixed department or group within the landscape of the business enterprise. Further, the relationship between professionalization of emerging IT occupations and organizational use of IT is not understood. Using three case studies of the emergence of the "webmastering" specialty, we show the interplay between the types of professionalization and the organizational appropriation of web-based technologies. One theoretical paradigm grounds our analysis: Abbott's [2] concept of jurisdiction in the development of professions. This concept enables us to analyze how the organizational form changes under the impact of IT evolution. We use our case study data to expound a framework of four major professionalization processes: (1) set, (2) amalgam, (3) proactive, and (4) breaking. These represent variations in how organizations have managed the development of web-based capability within their human resources. We then relate these four professionalization processes to three major aspects of web technology appropriation in the firm: (1) attitudes toward the technology, (2) distribution of jurisdiction over web sites, and (3) types of (web-based) technology use. Our results have implications for both scholars and managers interested in the study of new IT jurisdictions in the firm, the professionalization of IT occupations, and organizational use of emerging technologies.

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H.5.1. [Multimedia Information Systems]: *Animations, Evaluation/methodology*

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Management, Human Factors

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Professionalization; Appropriation; Web Technologies.

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1. INTRODUCTION

The term webmaster first appeared in "*The Etiquette for Information Providers*", published by Berners-Lee in 1992 [21]. By the end of the 1990's, webmasters were noted to be in short supply, and wages for this newfound profession were increasing at a rate of 10-12% annually [16]. By the year 2000 the professional niche of webmasters was firmly established in most companies, though its precise role and importance varied considerably. For example, some organizations created new units, new job profiles and/or new training and certifications for web professionals (formal structures), whereas others added web-based expertise to existing IT, library, or even secretarial skill sets (informal structures). Some organizations placed authority over all web-based technologies in a single locale (such as a specialized IT group); others divided authority among two or more distinct groups, with differing responsibilities; and still others diffused control of web-based technologies throughout the organization. By 2000, according to the *Techdirections* magazine, annual salaries for webmasters ranged from \$40,000 to \$70,000 [4]. Articles in the professional press presented numerous stories of the new, established profession of webmaster. For example, IBM boasted a website of 4.5 million pages yielding \$9.2 billion a year in revenue, all managed by a team of 20 webmasters [15].

In order to understand the new profession of webmaster, researchers can document required skill sets, tracking job tasks and relating these to the attributes of the IT professionals who perform them [11, 21]. Although useful, this trait-based approach is limited in that it considers webmasters as a relatively fixed subgroup within the IT profession and fails to consider the variety of ways in which organizations manage the emergence of the profession. As an alternative, we propose to study the *professionalization* of web-based work in organizations. A professionalization view argues that IT professions emerge in the firm as an area of authority that oversees the application of new technologies [2]. A professionalization view facilitates understanding of the variety of ways in which firms direct human resources to new technologies and, in turn, how new IT jurisdictions act to shape appropriation of those technologies by the organization.

We use three case studies to illustrate variation in organizational approach to the professionalization of webmaster work. One theoretical paradigm grounds our analysis: Abbott's [2] concept of jurisdiction in the development of professions. This framework provides an insightful view of the professionalization process. Our paper proceeds as follows: first, we outline the concept of

professionalization and explain how formal and informal structures in the firm operate to generate variants in professionalization. We relate four professionalization processes to three major aspects of web technology appropriation in the firm: (1) attitudes toward the technology, (2) distribution of jurisdiction over web sites, and (3) types of (web-based) technology use. We describe our three case studies of emerging webmaster work and show how management of the professionalization process in each case interacted with firm appropriation of web technologies. We conclude by dressing the limitations of our study and directions for future research.

1. THEORETICAL FRAMEWORK

1.1. Professionalization of webmastering

The evolution of IT is swift and guarantees “an acute and continuing skills shortage” [9]. Managing continuing human resource shortages associated with emerging technologies points to the importance of understanding the process by which new IT professions surface in the organization, or existing professions lay claim to new IT-based work. Professionalization is a human resource process that changes with time, especially as a new IT becomes more and more established in the organization. Benghozi and Bureau [5] apply a professionalization approach in their study of webmaster emergence at France Telecom, the largest telecommunications company in France. They describe how, along with the evolution of technology, the webmaster role emerged and became professionalized. A form of symmetry between the technological cycle [3] and professionalization was observed. Their study suggested the potential value of a professionalization approach to understanding emerging IT specialties, but they offered no general framework to explain variation in IT professionalization across organizations.

A central concept in the process of professionalization is that of jurisdiction [2]. An IT jurisdiction is an arena of authority over which IT human resources oversee application of new IT technologies. Evidence of a new profession lies not so much in the evolution of institutions per se (educational degree programs, professional associations, etc.) but instead in the ongoing creation of a jurisdiction. A jurisdiction is anchored by formal and informal structures that lie both inside and outside the organization (see Table 1). Formal and informal structures are not opposed. These two types of structures represent two different dimensions which could both increase or diminish together [13, 19]. Formal structures encompass training programs, professional associations, codes of ethics, new organizational units, and job profiles. Informal structures include the recognition of the new occupation in the organization, the culture of those engaging in practice with the technology (i.e., IT professionals), and the social relationships between them. These structures may be more or less relevant to establishing and maintaining jurisdictional authority over the emerging technology over time.

Table 1: Formal and informal structures anchor the new jurisdiction of webmastering

New Formal Structures	New Informal Structures
- Unit / entity - Job profiles - Training / certification	- Expertise recognized by colleagues - Network of competent actors - Shared culture of web technologies

When faced with a new technology, such as web-based systems, there are typically several professions which confront each other to obtain the jurisdiction over its development and application.¹ Both objective and subjective features of the technology are relevant to this jurisdictional process. In terms of objective features, a container (server, web pages), some contents (text, pictures, videos, sounds), and a link between them (“a go-between” such as the HTML editor) are required to create websites. The subjective features are more socially malleable. For example, website development might be seen as a communication, a marketing, or a computer science issue. Jurisdictions change under the impact of professionals on objective and subjective features.² If traditional (existing) professionals cannot manage the technology, because of a lack of competencies or legitimacy, new actors may emerge to try to occupy a new position in the organization. Many or few structures may develop to anchor a new jurisdiction. Table 2 outlines four possible variants in professionalization that might emerge depending on the extent to which formal and informal structures develop to anchor the new profession.

Table 2: Four variants of professionalization

Types → ↓ Dimensions	Set (1)	Proactive (2)	Amalgam (3)	Breaking (4)
Formal structures	Old (*)	New	Rather old	New
New unit / entity	No	Yes	Sometimes	Yes
New job profiles	No	Yes	No	Yes
New training certification	No	Yes	Sometimes	Yes
Informal structures	Old	Rather old	New	New
Recognition of the new expertise by colleagues	No	Limited	Yes	Yes
Use of a network of competent actors	No	Limited	Yes	Yes
Sharing of the culture	No	Limited	Yes	Yes

1.2. Appropriation of web technologies

The notion of appropriation, used in the Adaptive Structuration Theory perspective [12], has been specified as faithfulness (the extent to which structures provided to a group are used in a manner consistent with the *spirit* of the technology), consensus (the extent of the agreement among group members on how the technology should be used), and attitude (beliefs about ease of use or usefulness) [8]. Orlikowski proposed an alternative to this

¹ We use the term technology in the broad sense, to include not only hardware and software but also know-how for developing and applying technology for organizational benefit.

² The case of alcohol is illustrative; this issue has been seen throughout history as a religious matter, then as a medical one, but also as social and psychological, or even legal. Because of the evolution of the system of professions, jurisdictions have been modified (Abbott 1988).

concept of appropriation with the notion of enactment [17]. However, both these approaches apply appropriation or enactment to the sole end-users, whereas, in our research, the focus is on professionals who create and manage Internet or intranet websites inside organizations. In this research questions cannot be the same because the relation is not as simple as a vertical exchange such as that of designers to end-users. Issues are much more transversal and linked with the division of tasks among different units and professions. In this perspective, we define appropriation with two main components: attitude and distribution. Together with the four professionalization processes described above, four major types of web technology appropriation can be identified.

Attitude toward appropriation

Attitude can be considered on an individual level as well as on an organizational level. It refers to the degree of favor or disfavor expressed by professionals when evaluating new web technologies. Attitudes can range among the three following categories:

- Ignorance: web technologies are not considered as essential, they are not truly taken into account.
- IT friendly: web technologies are not at the core of their work but a certain curiosity and awareness lead professionals to develop some knowledge about them.
- Focus: web technologies are considered as a hobby or as the main core of the job of professionals.

Distribution

Distribution of appropriation refers to how the objective elements of website management (container, go-between, and contents) are distributed among professionals in the organization. Distribution occurs as a process of solving jurisdictional conflicts brought about by the new IT. "In claiming jurisdiction, a profession asks society to recognize its cognitive structure through exclusive rights" [2, p.59]. The main "audiences" which enable the legitimization of such claims are legal, public, and colleagues at work. In the case of professionals working on websites, multiple claims are possible. For example, both an IT and a communications departments might claim jurisdiction over web technology. Over time, jurisdictional conflicts are solved by different settlements. Websites are new tools to manage information and therefore they could imply a modification of whatever former settlements exist in the organization.

Building on Abbott, we identify three types of settlements:

- *Uni-jurisdiction*: the whole jurisdiction of website issues is monopolized by one profession;
- *Bi-jurisdiction*: two professions manage websites ;
- *Multi-jurisdiction*: three or more professions manage websites with a separation between functionally interdependent but structurally equal parts (e.g. webmasters, IT and communications departments).

These settlements may give rise to new forms of appropriation associated with the web-based work; or the settlements may be similar to the established settlements for information management work in the organization. For instance, if information management was first managed by computer scientists and communications executives inside a firm, and if the same professionals work on website management with the same formal and informal structures, then the settlement remains the same.

Types of appropriation

Our assumption is that different processes of professionalization are associated with different kinds of appropriation of technology

among professionals working on website management. Table 3 shows how each of the four processes of professionalization are likely to be associated with different kinds of attitudes and distribution of appropriation. The result is four general types of appropriation:

Table 3: Proposed relationship between professionalization and appropriation

Appropriation of web technologies			
Prof.	Attitude	Distribution	Type
Set	Ignorance	Remains the same	Obsolete: Websites are frozen
Proactive	IT friendly	New one	Deficient: Processes are not rationalized
Amalgam	IT friendly	Remains the same Or New one	Business oriented: Technology follower: websites are only a tool to do business
Breaking	Focus	New one	New IT oriented ³ : Technology leader: websites are first a matter of technology

At this point, we do not try to corroborate these processes; instead we modestly propose an illustration of these various dynamics:

- Obsolete appropriation: there are very few formal or informal structures which link the work (website management) and the professionals. These professionals ignore web technologies because of a lack of expertise but also because the organization (i.e. the "audience") does not recognize these activities as important. The only evolution is due to a weak learning by doing. This type of appropriation progressively leads to an emerging obsolescence of websites due to neglect.
- Deficient appropriation: the formalization of new structures enables a clear recognition of the new jurisdiction. Professionals who work for this task are selected not so much for their competencies but instead for their attitude towards new technologies (IT friendly). Expertise is acquired thanks to training and a process of learning by doing. These very new professionals do not produce optimal websites as they do not totally take into account the organizational goals. In this sense there is a deficiency.
- Business-oriented appropriation: websites are considered as a key element to do business but the company does not necessarily want to develop a lot of competencies around it. Outsourcing could be highly or partially used. Traditional professionals have to develop a certain amount of new expertise (IT friendly), at least to be able to manage relationships with web agencies. Progressively, these professionals integrate new tasks linked with websites. If there are no new formal structures, the creation of new informal structures can either change or not the distribution of appropriation of technology.
- New IT-oriented appropriation: new formal and informal structures are developed. The case of web agencies is very illustrative of this situation. The organization considers websites as a new activity, which generates the formation of new jurisdictions. New professionals, who are trained and often passionate about web technologies, are hired to work in new units with new job profiles.

³ It could be business oriented as well, if the business is oriented towards new IT (e.g. web agencies).

Through three case studies we apply this professionalization framework to put forward how the process of appropriation of web technologies creates a dynamic which impacts IT jurisdictions.

2. METHODOLOGY

We used the “Small-N analysis” method, which emphasizes “neither choice nor constraint” and produces both situated and universal knowledge [1]. The approach is qualitative and interpretative, using case examples to illustrate the potential power of our professionalization framework. The logic for case selection was not replication but exploration, meaning that the cases were not chosen for their similarities but for their differences [7]. Following twenty-four exploratory interviews in fifteen organizations gave us a substantial amount of contextual data which enabled us to build a “meso vision”. For example, we carried out interviews with executives of professional associations and authors of books on webmasters in order to examine their perception of the general trend of the professionalization process.

We selected three organizations for in-depth study. These cases belong to three very different industries: the press, industrial engineering and IT engineering. The common feature across the cases was that an intranet or Internet website had been developed for at least three years, and that the companies were large enough (more than 500 people) to have a division of labor in the management of websites. In each case we interviewed employees from various professions in order to identify how the process of website jurisdiction emerged in the organization. Where possible, all professionals working on the organization’s website management were interviewed. Each interview was composed of five parts. Firstly, interviewees were questioned about their career and training experiences. Secondly, the person interviewed was asked to describe the different websites used in the organization. Thirdly, the interviewee was asked about everyday work patterns: description of a typical day, relationships with managers, users, other employees, contacts outside the firm, and so on. Fourthly, interviewees were asked to describe who and how web technologies were selected and developed in the firm. Finally, interviewees were asked about whether webmasters belong to a profession inside or outside the company, and they were asked to describe career prospects.

The three exploratory case studies are presented in chronological order [22] and divided in three periods. We broke them into three phases based on the moments where major shifts in technology occurred. These three periods have been chosen because of the technological evolutions of the websites under study (conception, development, major transformations). The choice of three phases is a coincidence – two or four or even more phases could emerge from other studies. For each case, we operationalize “professionalization” by presenting the evolution of formal and informal structures, which link the new activity – website management – and professionals; and we describe the process of appropriation by showing the modification over time of the two dimensions – attitude and distribution – in these organizations. We conclude by characterizing the evolution of IT jurisdictions.

The word count method [10] was used as a relevant complementary source of information for our analysis. This method enables a “systematic comparison across groups” [18]. A word count of professions / occupations and of the web technologies named in each organization was conducted. The term “webmaster” was not counted, as our questions were

oriented in such a way as to obtain information on the webmaster population inside or outside the firm. Web technologies were very widely defined. The definition includes tools (software, hardware), languages, but also names of companies present in this web / multimedia industry. As our sample was composed of many kinds of professionals, and not only purely technicians, there was a risk that some of them might be excluded too fast if a narrower definition of web technologies was adopted. The level of appropriation was fixed by two elements: the number of kinds of web technologies and their occurrences. The rank was the result of the multiplication between kinds and occurrences. Moreover we weighed this rank with the length of interviews⁴. For the professional orientation, we only mentioned the occurrences as we wanted to identify inside each discourse the profession the employees were feeling the closest to. No comparison between professionals was really required here.

The research sites presented here are those of three French companies within different industries. Every situation is presented with a narration, divided into three main periods. For the last period, we indicate the word counts in brackets.

3. CASE STUDIES

3.1. Case #1: IT Company

Created in 1991, with 1800 employees in 2004, its business increased quickly for ten years on the market of information system engineering. However, financial difficulties made a major restructuring necessary in 2002. In 2000, a new Internet website was created, and in 2001 an intranet was developed. Two semi-structured interviews were completed with the chief technical officer (CTO) and the head of the communications department – these two people were in charge of the company’s websites. Three other people worked occasionally on the websites (less than 5% of their working time). To corroborate the data already collected thanks to the interviews, a follow-up questionnaire was sent to them via e-mail.

Period 1 (1999-2000): creation of an Internet website, developed by a web agency

Professionalization by amalgam: few new formal structures and many new informal structures

Before 1999, the firm did not have any website. Considering the expansion of the Internet at that time, it would have been unusual for an IT company to do business without a website. To end this situation, the CEO asked the CTO to manage the website development. The CTO knew the Information System (IS) very well as he was working in this field since the creation of the company. He had already implemented an other communication tool, which provided documentation to the employees via a server. Though technologies used for this service and all the other IS were not web technologies but “traditional computer science tools”, the CEO asked the CTO to manage the website project as if it was included in his natural set of skills. The CTO did not get any new resources. He wasn’t offered any training linked with web technologies, nor were dedicated human resources hired. To achieve the project, he relied on a large informal network inside (engineers, head of communications, managers) and outside (web agency) the company.

⁴ Attitude = (nb of occurrences * nb of kinds)/(duration of the interview in minutes /10). We divided by 10 the length of interview to avoid digits under 0. We rounded off results to the closest unit.

Business oriented appropriation: IT friendly attitude / new bi-distribution

The aim of the project was not to develop a very high-tech tool but to follow the market standards by having an Internet website and doing business. Even if the CTO was aware of the importance of these new “special technologies” and although he was IT friendly, he had no expertise and was not familiar with web technologies: “I had to update the websites but that was quite an issue for me as I didn’t know how to do that and moreover I didn’t have time to do it” (CTO).

Nobody in the company, apart from the CTO, was really dedicated to this new task. A web agency developed the static website which was only related to an institutional purpose. The three home engineers of the IS team did almost nothing. The critical tasks of the CTO were to establish the link between the internal resources and the web agency. The CTO did the updates thanks to the editorial contribution of the head of communications and some top managers. The container part was outsourced and both contents and go-between issues were managed by the CTO.

During this first period, there was no new jurisdiction. It was the same subordinate jurisdiction with the CTO who controlled the IT solutions provider – a web agency. The CTO had simply “amalgated” his panel of activities thanks to informal ties: “I am in charge of the technical direction and therefore of web sites. (...) Communication is closely linked with technical issues in our company”.

Period 2 (2001-2002): creation of a semi-dynamic intranet, developed by a web agency

Professionalization by amalgam: few new formal structures and many new informal structures

Once again, the company was slightly under the market standards for corporate websites. Its Internet site was really basic for an IT company. To improve the website and make the web technologies a means to increase efficiency, the CTO’s secretary began to work on it. She did not want to do the same job any longer as she was over qualified (undergraduate degree in accounting) and wanted to be given new tasks. The CTO suggested that she could become the “executive of the communication tools”. As “she was very enterprising” and as “she learned fast,” she contributed to a significant improvement of the Internet website. Informal structures were essential assets when trying to cope with weak formal structures (a former secretary was simply named communications executive):

“she had contacts almost everywhere, she knew all the company, she brought back information, files, documents (...) she presented projects to me that she had elaborated (...) I did almost nothing for the websites (...) she was considered as the webmaster of the site” (CTO).

The process of amalgam was expanding thanks to a reinforcement of informal structures and a slight development of formal structures (new job profile).

Business oriented appropriation: IT friendly attitude / new multi-distribution

The new communications executive was working next to the engineers’ office, so the interplay between what was technical and what was not was well assumed according to the CTO even if “she was not a technical person”. This evolution favored a better use of the Internet within the company: “she understood very well what a company is and what a website is and how to put one into

the other” (CTO). Her work was so impressive that the CTO admitted that he was almost doing nothing for the website at the end of this period. Meanwhile, a new semi-dynamic intranet was developed by a web agency. The CTO was still the project manager but contrary to what happened concerning the Internet website, the computer scientists of the IS department were very committed. They programmed several workflows (billing, indicators, contacts, vacations, training, etc.), which were designed to improve processes in the firm. Because of this new intranet and the work done by the new communications executive, professionals within the company began to be more committed to the websites, which avoided the isolation of the project manager. The new job profile was really symptomatic of the process of amalgam. On the one hand, the name of this new profile was linked with communication but on the other hand this job was under the responsibility of the CTO. There was a tension between two jurisdictions: communications and computer science.

Period 3 (2003-2004): websites progressively frozen

Set professionalization: few new formal structures and few new informal structures

Because of financial difficulties, nothing was outsourced for the websites. Moreover, the executive of communications was made redundant because such a field was not considered as vital for the company: “people say we can continue without it” (CTO). To avoid a lack of human resources, the head of communications, who was trained in advertising, was asked to replace the “webmaster”. Her profile was very similar to the CTO’s. She was in the company since the very beginning and she was not familiar at all with web technologies. In fact, none of them were really comfortable with web tools. During the interview, no one talked about specific web technologies. The technical tools or languages quoted were only HTML, Word, Excel, and PowerPoint.

The former amalgam process was suddenly stopped with the economic downturn and led to set professionalization: one professional – the head of communications – remained a traditional communications expert (12)⁵ and the other – the CTO – did not feel close enough to this new domain and reasserted his former computer science background (8).

Obsolete appropriation: ignorant attitude / same old bi-distribution

The former distribution, which enabled a better use of the Internet, disappeared. There was no “go-between professional” anymore, as the “webmaster” was made redundant: “there is a dichotomy between what is technical and what is not, nobody does the link. I have to do it and it is not a pleasure for me” (CTO). The professional orientations of the CTO and of the head of communications had probably limited their commitment to the websites. For example, the CTO believed much more in his computer science tool, which was “very precious” to him and which was considered as much more efficient, than the intranet: “intranet is always slower and the download is sometimes very bad during the day. With my solution, it is linked to the home server so there isn’t any trouble.” (CTO)

⁵ The term ‘communication’ appeared 12 times during the interview.

Table 4: Appropriation of IT moderated by the attitude level – IT Company

Job title	Appropriation: attitude level (0 ⁶)	Quotations
CTO	Although he was not against web technologies he did not feel familiar to it. (1)	“I am not competent in this domain (...) I am a pure computer scientist trained at the old school”.
Head of com.	She never explicitly said that she couldn't bear new technologies but she spent a long time during the interview talking about her former traditional communication activities as if it was the best aspect of her job. (0)	“I probably use less than 10% of the software to do updates”. “I really enjoy my work, but between 96 and now it changed a lot. For the past 2 years, it has not been so good”.

A few improvements were made but only if really compulsory: “we froze the website 2 years ago, we only updated the main magic digits such as the turnover rate, that kind of thing.” The situation was not easy to deal with: “the third period is very difficult to manage” (CTO). Overall, websites were not a core issue in the company, there was a sort of indifference toward them: “nobody cares about websites here (...) our leaders do not focus on the websites” (CTO).

The process of professionalization helped to find a solution which protected the traditional professionals. To face the economic downturn and the expansion of new technologies such as that of the Internet, the set professionalization was the emergent answer. There was no new jurisdiction: the traditional intellectual jurisdiction between IS and communications departments reappeared as it used to be.

3.2. Case #2: Industrial Company

Created in 1902, and with about 35 000 employees today, this worldwide company has several websites (Internet, intranet, extranet), but only the Internet portal website was studied. It was set up in 2001 to replace the former institutional static website. An e-business project manager and a communications project manager in charge of the portal were interviewed. The secretary of the e-business project manager, who worked for a while on the portal, was also interviewed.

Period 1 (2001): a new Internet portal, developed by a web agency

Proactive professionalization: many new formal structures and few new informal structures

To develop the Internet portal, a new structure – e-business unit – and a new job profile – e-business project manager – were created. The major aim was to build an interactive site in order to increase relationships with clients via the Internet, and to homogenize the different websites worldwide. To do so the head of communications of the R&D department – a former researcher (PhD in chemistry) – was asked to manage this project. He had

⁶ Attitude = (attitude of the CTO + attitude of the head of communications) / 2

Attitude of the CTO = (5*1) / (50/10) = 1

Attitude of the head of communications = (0*0) / (45/10) = 0

Aggregate attitude = (1 + 0) / 2 = 0.5. As we rounded off, we obtain an aggregated attitude equal to 1.

already created the R&D intranet just before being appointed to his new function. He had no specific training in web technologies, but he was quite familiar with the web: “I took the initiative to create the R&D intranet (...) I like that because it enables me to discover many different things and people”.

The project manager met many managers in order to define their expectations but he had to take into account the technical constraints imposed by the IS department. His position was not always considered as legitimate as his occupation was new. Moreover it was difficult for him to rely on a network of competent actors and a shared culture of web technologies, since situations were extremely diverse around the world:

“There are 50 to 60 Internet websites around the world. They have to be hosted on the same server to have a professional and safe service. Actually, it's not what happens as there are at least 10 to 20 websites which are not on the platform.”

This proactive professionalization launched by the headquarters was not well understood and perceived by the rest of the employees.

Deficient appropriation: IT friendly attitude / new bi-distribution

If technical choices have been made by the computer scientists of the company, the development of the new semi-dynamic website was outsourced. The communications department was involved in the project as well but the e-business manager had the main responsibilities – this reveals a new distribution in information management: “at the beginning of the project, we had *carte blanche*”. He managed both editorial issues and the link between technical and non-technical matters: “I was the central point who gathers and gives lots of information”. At that time, the portal was essentially institutional and was not fully implemented. There was a new jurisdiction as the task was linked with a new e-business structure and profile but the jurisdiction was not clear-cut for everyone yet. For example, the e-business manager considered that “managing a network without having a hierarchical relation with people is not easy”. The jurisdiction can be qualified as advisory since the project manager has to take into account the technical constraints imposed by the IS department.

Period 2 (2001-2002): incremental improvements of the portal

Proactive professionalization: many new formal structures and few informal structures

The portal was in the implementation phase, which enabled to reveal several issues: “we didn't do it right the first time. We then understood the corrections we had to do and we did a second release” (e-business project manager). The goal was not to modify technical elements but to improve the architecture and the contents. To do so, a trainee with a chemistry degree was hired as webmaster for one year. He rectified the different flaws of the portal. Moreover, a position of communications project manager centred on communication tools (especially on websites) was created. This new manager had a master's degree in communications and new IT management. These professionals neither had a deep knowledge of the organization nor a strong legitimacy: the webmaster was self-taught in webmastering and the new project manager used to be a trainee in communication in the company. Concerning technical aspects, many tasks which used to be outsourced were internalized and a computer scientist from the IS department was in charge of maintenance, software development, and firewall management. By hiring two new professionals who were explicitly dedicated to website management, and by confirming the e-business project manager's

position, the proactive professionalization process was maintained and asserted.

A deficient appropriation: IT friendly attitude / new multi-distribution

During this period, appropriation was still deficient because several iterations were needed to make the portal function properly. Gradually, the division of labor was clarified and there was a better comprehension within the company of what the portal's functions. Progressively home professionals took web technologies into account. As the communications project manager was in charge of the implementation of the company charter, local managers were much more aware of the corporate web project:

“We hold meetings with heads of communications worldwide to talk about the web. Interest for the web is variable because some have difficulties with network or technical aspects. (...) at least 80% are really committed.” (Head of communications).

A new multi-distribution appeared with three clear-cut activities: container – a specific computer scientist within the IS department – contents – the communications project manager in charge of editorial tasks – and go-between – the e-business project manager but was supported in his task by the webmaster.

The e-business manager confirmed his jurisdiction on the website by hiring one dedicated professional and by refining the different tasks handled by several professional groups.

Period 3 (2002-2004): the portal, an e-business tool
Professionalization by amalgam: few new formal structures and many new informal structures

Once the structure by project was ended, “an operational mode” (e-business project manager) began. The webmaster's contract finished and the e-business manager's secretary replaced him. She worked on the portal but also for the company's websites all over the world 80% of her working time (during the 20% remaining she worked on e-business projects). She followed a ten-day training course to learn more about the activities of a webmaster. Her official job profile was not that of webmaster – the human resources executives did not file the latter occupation. However, she did not consider herself only as a secretary: “I have two roles: webmaster and secretary.” She claimed the recognition of her two jobs, as it was not formally explicit: “she doesn't like it when people say she is a secretary” (e-business project manager). Moreover, once a year a trainee worked on editorial issues inside the e-business unit, analyzing the number of visits of web pages and encouraging managers to update the contents of their pages.

Although two job profiles were created – e-business project manager and communications project manager – they remained inside traditional departments: marketing and communications. Moreover these professionals lost their “*carte blanche*”. The secretary and computer scientist working on the website did not have any new job description or title. The professionalization was not proactive anymore: a process of amalgam emerged.

Business oriented appropriation: IT friendly attitude / same multi-distribution

The communications department managed contents with the project manager who was in charge of editorial issues only. Computer scientists dealt with container aspects:

- “all technical issues are taken in charge by the IS department” (communications project manager)

- “they told us [the computer scientists of the IS department] we should not use Linux or PHP (...) the data base must be in SQL...” (e-business manager)

The workload of the IS department increased and a restructuring of their department led to the division of their activities into three major sections: computing network, e-mail system and web. As employees could not add to the contents by themselves, the e-business project manager and his secretary did the link with the container: “we are still in a webmaster mode, which means that people cannot modify their web pages by themselves. They have to go through us.” (e-business manager). Even if all professionals stayed within their professional domain, their attitude towards web technologies were open minded. Major professionals working for the portal remained well aware of the technological evolution. They were able to talk about these technologies but not as specialists.

Table 5: Appropriation of IT moderated by the attitude level – Industrial company

Job title	Appropriation: attitude level (6)	Quotations
E-business project manager	Without any formal training, he acquired a wide experience in website management (R&D intranet and Internet portal). (9)	“we changed the HTML website to a semi-static website in ASP and linked with a database. It is much more technical”
Communications project manager	During her master's degree (in communications and management of new information technologies) she learnt about web tools. (1)	“We support local teams when they make their websites”.
Secretary	She had basic notions concerning the development and management of websites but she was not a pure specialist. (8)	“I create web pages and websites but it is very restricted, I am not a real developer”.

Technologies were standards, the aim was certainly not to develop new innovations in web technologies. The e-business project manager mentioned despite the fact that he had great freedom of manoeuvre to manage the portal project during the first two periods, he noticed a return to normal with a “the take-over of the IT department”. During this last period, new tools were implemented to develop business. The e-business project manager, who only spent 30% of his working time on the portal and 50% on e-business projects, declared clearly that “the new portal also had to be a marketing tool, oriented to the customer”.

In this case, old jurisdictions were finally widened thanks to a process of learning by doing which began during the first period. The website issues were progressively amalgated within three traditional departments: computer science, communications and marketing.

3.3. Case #3: Press Company

Created in 1953, this leader on the news magazine market is affiliated to a worldwide company. In 1996 a new technology created by an American company made it possible to put a part of the magazine on-line. At the end of 1997, a new website was produced by a web agency. Today, between 500,000 and 1 million web pages are visited each month. The seven people in the website team were interviewed.

Period 1 (1996 – 1998): a new website as an archive tool

Professionalization by amalgam: few new formal structures and many new informal structures

Two employees – the former executive of the archive department and a computer scientist – were in charge of putting archives on-line. At the same time, they were working for their department as senior managers. They were very familiar with the company since they entered the firm over 20 years ago. Their expertise in archiving was well established and they could rely on their network within the firm:

- “I was in charge of the computerization of the archive department (...) my contacts are archivists and computer scientists” (chief technical editor).”
- “I have been working in this company for the past 28 years.” (executive of the archive department)

The fact that there was no new formal structure and that the two professionals working on the project were well-known employees of the archive department illustrated the amalgam process.

Business oriented appropriation: IT friendly attitude / same bi-distribution

At that time, it was really unusual to use such technologies and these professionals had to be open-minded in order to be in charge of such a project. The supplier developed the technology, and the computer scientist created databases and explained that he enjoyed the development of new tools: “I like to develop projects freely (...) I am a free electron.” The distribution remained the same: the former executive of the archive department implemented articles from the paper magazine and the computer scientist created databases. This device, which enabled an easy access to different articles, was not free and was designed to bring new business: “we wanted to increase the value of our archives (...) the magazine could be downloaded but only for our subscribers” (computer scientist).

There was no new jurisdiction, the old intellectual one was simply widened. The website was first managed as though it was just a new tool to exploit databases of archives.

Period 2 (1998- 2001): the website as a multimedia tool

Breaking professionalization: many new formal structures and informal structures

The web was progressively removed from the archive department to a specific web team composed of multiple professionals with rather diverse training backgrounds and professional experience.

In 1998, the firm launched a new website to offer more functionalities. The development was outsourced and a new person was hired to improve the editorial management. She had a double degree: editorial (undergraduate degree in history and communications) and technical (master’s degree in management of new IT). She explained that this double competency was one of the main reasons why she had been selected: “in the beginning, nobody knew if it was better to have journalists or technicians. As I had both, they hired me.” In 2000, a second version of the website was developed with a new updating tool. A new unit for the website was created. New employees were gradually recruited:

- A young person was taken on as web integrator. He had double training, having done a two-year course in a film-making school and spent a year and half in a multimedia technologies school.

- A journalist, who had already created and managed a website, was hired as editor. He used to be a freelance journalist for the magazine. He was trained in journalism.

- Another young person was recruited as web integrator. He had been trained in the multimedia technologies school as well. He was specialized in Flash.

- A new journalist was hired for the literary on-line magazine, and she was in charge of the literature section of the general on-line magazine.

- A secretary was also in charge of different aspects of integration (proof-reading, spelling corrections...).

- In the meantime, the director of the archive department became director of the electronic edition and the computer scientist became the chief technical editor.

- Moreover, five people working in the advertising, marketing and communications departments began to work on the website, but they remained officially in their traditional departments.

Most of the employees working for the websites shared a web technology culture because of their training, or because they had worked on the web for several years. In the company this new unit was not really well integrated even though these new professionals were recognized for their expertise concerning website management: “in the beginning people did not know what we were doing” (second web-integrator).

The division of labor the paper version was not simply duplicated; a real break with the traditional structuration of work appeared with this process of professionalization.

IT oriented appropriation: focus attitude / new multi-distribution

At the very beginning, the website was a simple mirror of the magazine and access was not free. Then, a new top management executive of the holding decided to be a leader in the “net-economy”. They were highly involved in the development of web technologies: “our director told us to invest a lot in new web technologies, he said it was the future” (the chief technical editor). The nascent web team led by these new corporate executives filled out the website with videos, pictures, and text, to differentiate itself from the paper magazine. The perspective was to develop a “rich media pole”. They first produced some video reports but results were far from being perfect as it was not effective enough at that time: “videos looked like a gadget, they were not really watched by people (...) the quality was not really good” (the first web integrator). This new orientation, which was much more IT oriented, was confirmed with the arrival of the second web integrator:

“When he arrived, we started to work with Flash (...) it was a great combination because we had sound, text, picture and all of that in an animation. In fact, that is the basic definition of multimedia...” (the first web integrator)

The distribution began to be well divided with on one side the web agency, which developed websites, and the computer scientist who made all the technical choices; and on the other side, the editorial issues which were managed by the director of the electronic edition and by the chief editor. Moreover, a journalist was in charge of the literature section. For images and videos, the two web integrators took 20% of their time to produce contents. At last, a secretary controlled some editorial aspects such as spelling. To coordinate container and contents, the two web-integrators integrated the contents for 80% of their time and the assistant editor helped to make the link between what was technical and what was not: “I am sometimes the translator

between what has been decided for the editorial domain and what has been decided technically” (assistant editor).

The breaking professionalization led to the creation of new jurisdictions, especially with the emergence of professionals who were neither pure technicians nor trained journalists.

Period 3 (2001 – 2004): an on-line magazine as a means to increase profits

Professionalization by amalgam: few new formal structures and many new informal structures

The economic recession had an impact on the management of the website: the secretary was made redundant and the web agency went bankrupt. The web team was still there but the “rich media project” had to be put aside until a more favorable context appeared. Progressively, the different employees of the team tended to adopt a traditional professional orientation. For example, the two web integrators became graphist journalists. Overall the organizational structure of the team was very similar to the one of the paper magazine: “we copy the model of the paper magazine with a technical team and an editorial one” (chief technical editor). Most of them considered themselves as working inside the journalism, computer science, or graphics fields. Webmastering was not a truly new jurisdiction:

People of the paper version “don’t really know [about the role of the web team], it’s really the Internet bubble on one side and all the rest on the other side, even if now it has changed but at the very beginning they didn’t know what it was.” (first web integrator)

Meanwhile, there was a development of relationships with the other professionals working on the websites of the other corporate magazines and newspapers: “we meet them 2 or 3 times a year in special meetings (...) we also have some projects with them (...) they sometimes bring us technical support” (editor assistant).

The amalgam professionalization led to the decrease of differences between the web team and the paper magazine, and within the team itself they turned to traditional professional orientation.

Business oriented appropriation: IT friendly attitude / same multi-distribution

The website had to make money. This new business orientation could be illustrated by several events. Firstly, to improve the editorial process, a new tool for integration was developed by a freelancer, in collaboration with the computer scientist. Moreover, in January 2004 a major overhaul of the graphics was completed (by a freelancer as well) and data on the visit of websites were considered essential to increase advertising. Secondly, a project of mutualization of the various corporate websites emerged: marketers and advertisers, working in their traditional departments, could work for any of the websites. This new orientation was coherent with the fact that there was a mix of attitudes (ignorance, IT friendly and focus) among professionals. On average, professionals were aware of new web IT.

Table 6: Professional orientation moderated by the word count method – Press company

Job title	Professional orientation(s)	Quotations
Director	- Journalist (12) - Manager (9)	“I have to manage the budget, think of investments” “I often meet the other journalists doing on-line press”
Chief editor	- Journalist (8)	“My job is really like the one of any chief editor anywhere else (...) I really feel like any other kind of editor. (...) I am a journalist, I like that job”
Chief technical editor	- Computer scientist (16)	“I am the assembler of software bricks”
Assistant editor	- Journalist (5) - Web mastering (5)	“I am between journalism and web mastering”
Literature editor	- Journalist (4)	“I would like to write more”
Graphist journalist 1	- Journalist (13) - Integrator (13) - Graphist (8)	“I am a graphist journalist (...) not a webmaster” “I was the web-integrator and then I evolved” “The great things are (...) all the graphics stuff.”
Graphist journalist 2	- Journalist (7) - Integrator (7) - Graphist (6)	“I really enjoy doing interviews and videos. “I am a sub-webmaster” “Graphics editor synthesizes what I do very well”

The evolution towards a more classical press organization favored a better integration with the rest of the magazine. Employees outside the team were getting more and more familiar with the new activity:

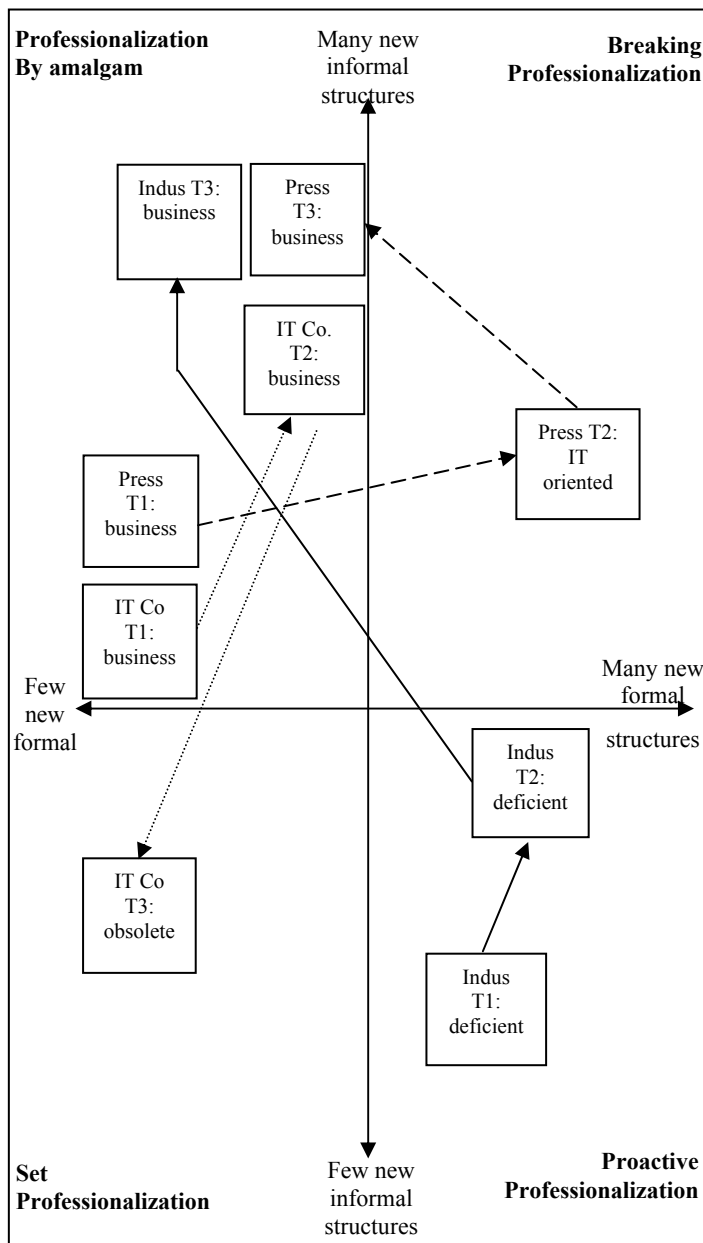
Table 7: Appropriation of IT moderated by the attitude level – Press Company

Job title	Level of appropriation (15)	Quotations
Director	She had a broad view of the different technical domains and specialties. She knew who does what and how. (8)	“The chief technical editor does lots of development. (...) The two integrators have specific occupations and if the website was closed down, they could not find a job in the magazine”
Chief editor	He was not an expert in web technologies but he knew about web tools evolutions. (8)	“What is expected from a chief editor like me is to be able to talk with technicians, to understand them.”
Chief technical editor	He was competent in the use of web technologies but he had a certain contempt for them. (1)	“Nowadays tools have become easy to use (...) it is like word processing, at the beginning it was unobvious.”
Assistant editor	She had enough technical knowledge to talk about technical issues. (6)	“I am the go-between between technical and editorial aspects.”
Literature editor	She did not need to know about web IT and she ignored it. (0)	“Updates are very easy because it is just like word.”
Graphist journalist	He was very up to date concerning the use of web IT, but he was not qualified in computer science. (44)	“I have been to the exhibition for a new video tool.”
Graphist journalist	He had more or less the same profile as the other graphist journalist. (39)	“It is essential to know what the new techniques are.”

Since the specificity of the new team was progressively reduced, the distribution between contents and container became almost identical to that of the paper magazine. As the web agency went bankrupt, most technical aspects had to be dealt with by the computer scientist. The director of the electronic edition and the chief editor continued to develop the editorial quality of the on-line magazine with the journalist specialized in literature. After a period when they had to stop making videos, the graphist journalists could once again do this task for 25% of their working time. Finally, the assistant editor still made the link between container and contents issues. The role of the former two web integrators was reduced on this task as the new tool enabled a faster process of integration.

The breaking professionalization disappeared because of the strong constraints imposed by the financial department. They asked for an appropriation of websites, which was relevant for the business model. In order to achieve this goal, a professionalization by amalgam was acknowledged much more relevant.

Figure 1: Synthesis of the different patterns



Discussion and conclusion:

In this article, there is no definition of what a webmaster is. Of course, we could define this occupation through an analysis of the webmaster’s tasks and his various specialities. Many institutions (associations of professionals, public agencies, etc.) already offer different classifications of new IT occupations, which provide several definitions of the webmaster occupation, although they are heterogeneous. From a micro perspective, this endeavor to produce a definition is not particularly relevant. To determine the job contents of IT professionals is certainly useful, but results could be very precarious for they do not take into account the fuzzy situations. Above all our aim was therefore to better characterize patterns of professionalization to describe the sharing of IT jurisdictions among several professional groups.

Abbott considers that the solving of interprofessional contests is done either by amalgam or division [2, p. 239] and that “technologies and organizational forms appear unpredictably. (...) There is no uniform pattern of “professionalization” (...) For individual professions, the jurisdictional results of general social change depend on their particular situations.” [2, p. 150]. Our framework makes it possible to identify three contributions to this professionalization view. First, it integrates technology in the model: technology is not an exogenous variable which impacts the system of profession at one point in time. On the contrary, we put forward the continuous interplay between technological dimensions (e.g. appropriation) and professionalization aspects. Second, we offer a less relativistic perspective by providing general patterns: these can be explained with a simple quadrant build on two dimensions which are formal and informal structures. Third, we refine the dichotomy between amalgam and divided professionalization by providing four patterns: set, proactive, by amalgam, and breaking.

Some conclusions could already be drawn from our three case studies. As professionals within firms appropriate new web technologies, jurisdictions – that is links between professional groups and their work – evolve. This process is not necessarily linear: what is at stake is the balance between formal and informal structures which anchor jurisdictions. We do not have enough data to propose a general result but two main factors appear to be critical in the effectiveness of websites: the proportion of formal and informal structures at one point of time and the evolution of these proportions.

According to our case studies, without any new structures website management cannot be effective. The IT company offers an example of such a situation in the third period but we make the assumption that this would occur whatever the technical stage. This result does not address the issue of the dynamics of professionalization but simply a general static management policy. As for the dynamic aspects of professionalization and appropriation we need to analyse the different patterns. During the second period, formal and informal structures grew in the three cases. This could be a coincidence but we could assume that once managers become more familiar with websites, they take action by creating structures. The sole difference between them is the amount of structures they develop. From few to many – amalgam (IT Cie), proactive (Industrial Cie), breaking (Press Cie) – impacts on the website and on organizational forms are not the same. Although the breaking professionalization strongly modified jurisdictions in the Press company, it did not lead to increased effectiveness. The Internet website was extremely costly for a negative return on investment. With the economic

downturn, the formal structures weakened and the informal structures developed slightly. This professionalization by amalgam and the new business orientation made the website very close to becoming profitable. The proactive professionalization followed by the Industrial company during the first two periods sped up the implementation of the portal. The aim was to be always as close as possible to the organization's needs and once the tool was more mature, the professionalization by amalgam enabled a new business orientation. On the contrary, the IT firm followed an amalgam process which was not strong enough to resist financial difficulties: the new structures were partially destroyed and with it the websites' effectiveness.

What should be analysed is the dynamics of the process through time. For traditional firms (not high-tech firms), the business oriented appropriation is the one they are looking for. However to reach and stabilize this configuration, breaking or proactive professionalization could be necessary steps. Further investigation would be necessary to identify trajectories in deeper detail and to analyse the impacts of professionalization on the effectiveness of technology. For instance, in order to limit the scope of the research we did not focus on end-users, but the same framework could be used to measure the effects of professionalization on the jurisdictions and the process of appropriation among all types of actors.

Many authors underline the professionalization or occupationalization of organization [6, 14, 20]. MIS scholars could investigate this new avenue of research to understand how the development of IT – through rising expertise and abstract knowledge – leads to a process of professionalization which redefines the interplay between organizational and IT designs. To do so they would have to take into account the fact that professionalization is not a teleological process and that it cannot be treated case by case. The core issue is not to establish whether a new profession has emerged, emerges or will emerge but to focus on the modification of IT jurisdictions. This perspective makes it possible to avoid a classical dichotomy as it takes into account both formal and informal dimensions. Moreover, the unit of analysis is the system of professions, which goes beyond the organizational boarders.

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