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CONCEPTUALIZING IS ARCHETYPES THROUGH HISTORY: A STUDY OF THE ROMAN CURIA

Social, Behavioral and Organizational Aspects of Information Systems

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Abstract

Many typologies of I.S. archetypes exist in the current literature. But very few rely on long term past perspectives, which could result in a precious opportunity to suggest innovative configurations related to specific institutional environments. On the other hand, historiography is a subject of growing interest in IS. Nonetheless, if many studies have already been carried out on the history of the technology or computer industries, very few have dealt with organizational IS history. This is regrettable, as it would give researchers a unique opportunity to understand long term IS dynamics and to grasp historical IS archetypes. Here, the author outlines a history of the IS of one of the oldest organizations in the world: the Roman Curia (the headquarters of the Catholic Church located within the Vatican). First, the specificities of the object of research (a missionary organization) are explained and methodological details are given. Then, a formal history (pointing out four chronological archetypal IS) is put forward. Lastly, the contributions, limitations and perspectives of this research are discussed.

Keywords: *I.S. archetypes; historiography in IS; historical method; Roman Curia; missionary organization*

Introduction

Typologies of organizational archetypes are numerous. Some of them are based on a logico-deductive work (see Mintzberg, 1979, 1983). Others rely on transversal (Woodward, 1958) or longitudinal¹ (Miller and Friesen, 1984; Greenwood and Hinings, 1993) empirical studies. Some are based on populations of organizations (Miller and Friesen, 1984) whereas others focus on single organizational settings (Cooper et al., 1996). In the case of IS, very few pieces of research have adopted a longitudinal approach over a long period of time, in the study of archetypes and their modes of emergence. Among those rare historical studies drawing on the archetypal approach, Mangan and Kelly (2004) can be mentioned. Nonetheless, as far as we know, no study really focused on very old entities such as religious organizations and analyzed the life of their IS over centuries by means of an archetypal approach. This is regrettable, as it would be a unique opportunity to conceptualize historical archetypes, and would likely illuminate the originality of today's IS and their institutional environments. In the prolongation with the previous limitation, this paper suggests adopting a historiographical perspective on the IS of one of the oldest organization in the world (Mintzberg, 1999): the Roman Curia, i.e., the Catholic Church's central administration located in the Vatican².

¹ More or less long term oriented.

² Levillain (1994: 500) also defines it as "the set of organizations which, with a triple status of board of directors, administration and jurisdiction, helps the Pope in his double mission of soul and of temporal leader. Within the Curia are gathered the governance structures of the Church."

Historiography is not really a new topic for IS researchers. Within the IS field, there is a growing amount of research on computer history (Bannister, 2002). Nonetheless, the bulk of this research focuses on "the history of specific technologies or technology companies or on the impact of technological developments on an industry or society as a whole" (Bannister, 2002: 1). Such is the case both in IS and other history disciplines. Many works have thus dealt with the emergence of the computer (Breton, 1990) or the computer industry (see Malik, 1975; Kidder, 1982; Campbell-Kelly and Aspray, 1996). Others have studied specific segments of this industry, like Wrexblat's research on computer languages (1981), Cringley's history of the PC industry (1992) or Collen's history of medical information systems (1995).

Compared to the aforementioned studies, historical research on organizational information systems has been extremely rare (Bannister, 2002)³. In IS, the Porra et al. history of the Texaco corporate information technology functions (2005), Yates' work on the structuring of early computer use in the life insurance industry (1999, 2005), Winter and Taylor's analysis of the role of IT in proto-industrial and post-industrial organizations (2001) or the Harvard MIS history project (Mc Kenney et al., 1995) can be mentioned. Some historians have also been interested in organizational information systems. Wells thus studied artefacts and outdated computers in Wall Street (2000) and Heide analyzed record management systems in France between 1935 and 1944 (2004).

If some of this research has adopted a descriptive stance (shedding light on the evolution of various forms of IS), other studies have drawn more on interpretive frameworks. Notably, Yates based her work on Giddens' 1984 structuration theory (1997, 1999). She explained that this theory could "provide a framework that allows us to incorporate individuals as well as institutional structures into our analyses. Using it, we can attempt to navigate the narrow straits between technological determinism and a force of social construction that provides little analytic power" (Yates, 1999: 181).

On the whole, history gives us an opportunity to make sense of the long term IS dynamic in different organizational settings. More precisely, Bannister (2002: 7) puts forward four possible contributions of IS historical research⁴:

- An account of significant past events;
- The use of data collected by inductive reasoning in an attempt to see historical patterns;
- Validation or refutation of theories;
- New propositions.

From our point of view, a fifth proposition can be put forward. History of IS results in helpful contrasting historical archetypes. It could be a way both to work out historical patterns in the structure of IS and to relate them on specific interpretive schemes.

Thus, we suggest here that a history of the Roman Curia offers a unique opportunity to conceptualize successions of IS archetypes in the long run, and thus to work out "historical patterns". Henceforward, our research questions will be: **What are the historical IS archetypes the Roman Curia has gone through from the first century until today? How do they relate to their surrounding institutional environment?**

First, the research object and method will be explained. Then, a history of the Roman Curia will be proposed. It will in four IS archetypes. Lastly, the contributions, limitations and perspectives of this research will be discussed.

Presentation of the Research Object and the Historical Method Implemented

This first part will be devoted to a presentation of the research object and method. First, organizational theory as applied to the so-called "missionary organization" will be discussed, with particular emphasis on the way it shares information its changes over time. Then, the historical method implemented here will be introduced.

³ Bannister (2002: 5) presents four main explanations: the interpretive nature of IS historical research ("(...) until relatively recently, interpretive research has been poorly regarded by many researchers"), the lack of familiarity of IS researchers with historical techniques, the documentary nature of most historical research and the absence of historiography in IS literature.

⁴ See also Kieser's view on historical contributions (1994).

The Roman Curia: The Core of a Missionary Organization

The Roman Curia is a typical missionary or religious organization. Two broad kinds of literature have been written on this research object. The first details the main features of this type of organization. The second is more specifically interested in its modes of change.

i) The Missionary Organization in Mintzberg's Theory

Very few authors deal with the case of religious organizations as part of more general typologies. As far as we know, only Mintzberg (1979, 1980, 1989, 1991) and Mintzberg and Westley (1992) have done so, and even then indirectly. Within the framework of his famous configuration theory, Mintzberg⁵ suggested that organizational structures could be associated with five lasting ideal-types, along with two other ideal-types, both more temporary (Mintzberg, 1991): simple structure, machine bureaucracy, professional organization, divisional bureaucracy, adhocracy; and political organization and missionary organization. All seven take the form of configurations, defined as "any form of organization that is consistent and highly integrated" (Mintzberg, 1991: 56).

More specifically as regards missionary organizations, several core propositions appear in Mintzberg's work. First of all, missionary organizations are focused on a specific ideology, i.e., "the rich culture of norms, beliefs, and values that knit a disparate set of people into a harmonious, cooperative entity" (Mintzberg, 1991; p 55). Then, missionary configurations are often a "varnish", superimposed on another existing configuration. In some cases (in particular religious organizations), they can be configurations *per se*, but this is rather rare in other kinds of organizations.

Generally, Mintzberg notes that missionary organizations imply a very specific mission, and that they are based on a standardization of norms ("everybody pulls together in the same directions"), which are almost always reinforced by the selection, socialization and indoctrination of its members. Moreover, the mission's organizational scheme gathers small units ("enclaves") "in a flexible and highly decentralized way, but subjected to powerful normative controls" (Mintzberg, 1990: 322).

To conclude this short presentation of missionary organizations, we would like to note their bureaucratic nature. **Missionary organizations are more inclined to change the world than to change themselves.** In other words, they are generally too occupied interpreting the 'word' to question it. **If we stick to Mintzberg's theory, it can be said that the missionary organization is far from favorable to change, or more broadly, to innovation of any sort.** From an IS point of view, they are extremely poor and informal, mainly based on direct interactions (preaching) and aimed at diffusing a fundamental message, such as a prophecy.

ii) The Dynamic of the Missionary Organization and its IS

What does organization theory as proposed by Mintzberg (and Westley) say about the modalities of change and the expansion of missionary organizations? In fact, it makes some very specific propositions, notably when compared with managerial organizations. Interestingly, it suggests that change and expansion are done by cellular agglomeration, through the set up of autonomous units, which will then reproduce properties related to an initial community (for example, in the Catholic religion, that of the apostles). The reason for this mode of change is very simple: "very strong ideologies depend on personal contact" (Mintzberg, 1989). Thus, missionary organizations evolve in a very "morphostatic" way (see Archer, 1995) and develop various rituals or routines which act as tools for the maintenance of social order and whose goal is to reproduce and reinforce the organizational structure. Mintzberg and Westley (1992) suggest three types of missionary changes:

- **Enclaving**, which consists in accepting new practices in a controlled and isolated way. This "involves the carefully controlled integration of learning within the existing structure, its 'capture', if you will, from a particular enclave" (Mintzberg and Westley, 1992; p 52). This process can also be seen as a sort of vaccination against change on the cellular (enclave) level, and a shoring up of a reserve of changes in the event of a major crisis in the organization.

⁵ "The structure of an organization can be defined simply as the total sum of the ways in which it divides its labor into distinct tasks and then achieves coordination among them" (Mintzberg, 1979).

- **Cloning**, which is more in line with the morphostatic nature of missionary organizations. It consists in a kind of cellular differentiation and replication of original enclaves into new entities, with added adaptations to local cultural elements. As Mintzberg and Westley note, it is "based primarily on exploitation of new learning, if not of a new vision than of a new way (or place) in which to execute the old vision" (1992: 54).

- **Uprooting**, which consists in regularly correcting members of the missionary organization of their habits, so as to bring them back towards original practices, purified, in order to find the "the charismatic intensity of the first stages of the organizational structuring" (see primitive Buddhism).

Whether the change process is centered on enclaving, cloning or uprooting, all are moderately morphogenetic. Missionary change is seldom an innovative dynamic and in most cases is not driven by concerns of efficiency (except sometimes in the process of diffusion of the original message and in the conversion process). The temporal is thus reproduced and reinforced. **In addition, the information system plays very little part in the change.** Missionary organizations are based on informal IS, rituals aiming at reproducing an original structure and an original message. With regard to their reproductive nature, they do not seem to need an organizational memory or a formal information dissemination system.

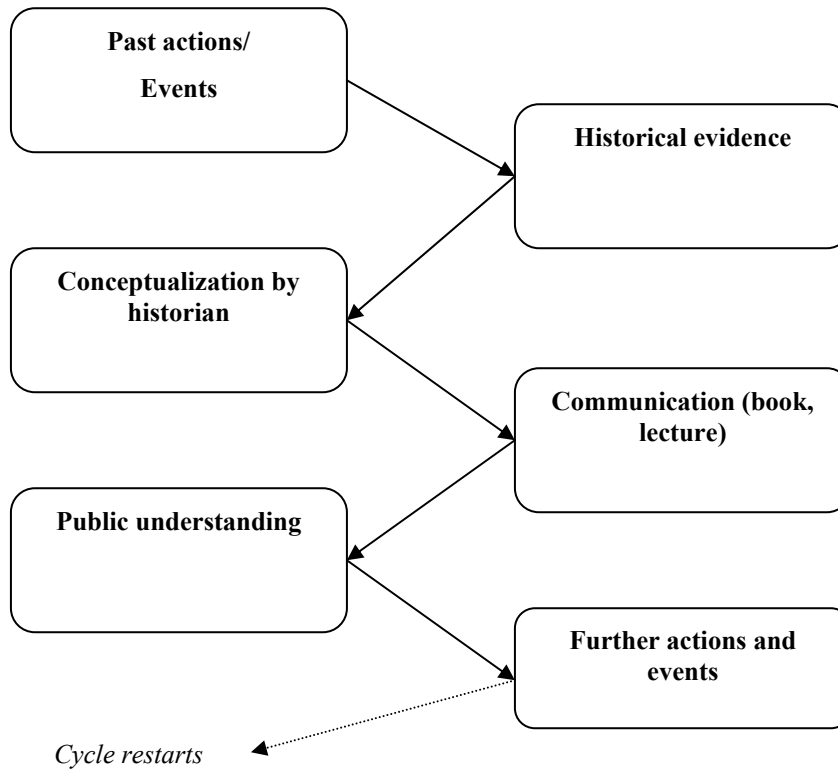
The Historical Method Implemented Here

At this point, it is necessary to briefly define "history" as understood and used in this study. Then, we will describe the conception of and methodology used in this particular historical IS research of the Roman Curia.

i) A Foreword about History

From a very positivistic perspective, some researchers have defined history as driven by the search for truth, that is to say, 'facts' (see Carr, 1961, in English speaking literature or Seignobos, 1898, in French-speaking literature). Carr thus wanted to "(...) show how it really was" (1961: 3 quoted by Bannister, 2002). Nonetheless, some researchers in historiography⁶ have challenged this view and proposed viewing history in a more interpretive and critical way (see for instance Aron's 1938 invitation to work out a critical philosophy of history by drawing on Dilthey, Rickert, Simmel, and Max Weber). In accordance with such an interpretive stance, Collingwood thus suggested defining history as "the study of thought" (1993). Thus, from the historian's point of view, history would be the "re-enactment in the historian's mind of the thought whose history he is studying". In the French-speaking field, Marrou (1954) also invited historians to adopt a critical stance and defined history as the "knowledge of human past history" (54). Surprisingly, she also insisted on the fuzzy boundary between the study of the present and that of the past by proposing that "from a logical point of view, there is nothing specific in understanding related to the past. It involves the same process as the understanding of others in the present, in particular (as most of the time and in the best situation, the document taken into account is a "text") in the comprehension of articulated language" (83). Finally, it seems that the move from positivist to interpretive research (which has fed fascinating debates in IS, see Walsham, 1993, 1995) has long since been done in many other scientific fields. From an interpretive stance, the historical method would imply a recursive method that can be described this way:

⁶ That is to say the history of history, or the meta-analysis of descriptions of the past. Furay and Salevouris (1988: 223) define historiography as "the study of the way history has been and is written--the history of historical writing... When you study 'historiography' you do not study the events of the past directly, but the changing interpretations of those events in the works of individual historians."



• **Figure 1. Stanford's 1986 structure in history, adapted by Bannister (2002: 3).**

From Stanford's point of view, history would leave traces, or historical evidence that can be excavated and utilized by the historian. The resulting framework will then be exposed to an audience, through books, articles or lectures. This will result in other interpretations that will also feed further actions and debates. Said in a different manner, here is the "double hermeneutic" involved in any work of social science (see Giddens, 1984).

Modelled this way, the historical method is in fact not that far from the interpretive process as described by Waltham (1993, 1995). The main difference "between historical research and interpretive research into current events may come down to the presence of living witnesses when studying the past" (Bannister, 2002: 3).

ii) Historical Research in IS

As explained by Bannister (2002: 6), the historical method is "close to that described by Yin (1994) for case-study research. In fact, if the case approach as outlined by Yin is combined with Waltham's idea on interpretive research, the result is a methodology quite close to the above outline." Basically, historical methods would draw in part on the same resources as longitudinal approaches: manuscripts, articles, books, objects, interviews (with experts or people that took part in the story under study).

But to continue with this remark, it may be useful to clarify some subtle differences between the historical method and the well-known IS longitudinal case-study (see Yin, 1993). According to Bannister (2002: 1-2), the main differences would be: the timescale (short-term versus long-term), the presence (the researcher can be present in the field in the longitudinal analysis, which is not the case for the historian), the real time dimension (historical research looks at things retrospectively whereas longitudinal research looks at events as they happen), the sources exploited (in the case of historical research, primarily document analysis or interviews with external observers or more rarely, experts; in IS, actual observation) and the focus (historical study may tend to result in more judgmental research).

More broadly, there are few writings in IS that have worked out a historiography of IS. Among the rare historiographical conceptualizations within the field, Mason et al. (1997) and Yates (1997, 1999) are worth mention.

Mason et al. propose two key concepts for IS historical research: *role* and *cascade*. First, they suggest that there are three main roles, which can be endorsed by historical figures: the leader (identifying phases of crisis), the maestro (mastering key business or technological domains) and the "supertech" (who will develop relevant innovations to overcome the crisis). Second, in their notion of *cascade*, the researchers insist on the importance of discontinuities in the flow of events, which is very close to the well-known notion of *alignment* (see Majchrzak et al., 2000). Following a crisis, IS would gradually converge to a balanced configuration of technology and human assets. Based on this conceptualization of historical change, Mason et al. put forward a three part-method consisting in the identification of key roles and variables, the specification of units of analysis, and the gathering of evidence.

Yates adopts a more practice-based view of IS history, and suggests using Giddens' 1984 structuration theory as a means to see the way structural properties are produced and reproduced through IS-related actions. Her method is thus less based on crisis identification and more on everyday continuous enactment of structure. She also tends to draw more heavily on an interpretive framework.

The formal view proposed here consisted simply in identifying archetypal forms of IS in the history of the Curia. We thus looked for systemic change in the way information was processed, shared and driven through technical devices (see Reix, 2004)⁷. In accordance with Greenwood and Hinings (1993, p 1052), an archetype can be defined as a "set of structures and systems that reflects a single interpretive scheme". Besides, the authors suggest that "defining an archetype in this way is a departure from the more common treatment of structures and systems as disembodied attributes of organizations related in an adaptive way to context and performance" (p 1055). They also propose to relate these beliefs to broader institutional contexts shared by other organizations belonging to the same institutional fields⁸. In this study IS archetypes will be defined *as a set of structures and systems devoted to the storage, dissemination and process of information within and between organizations, that reflects a single interpretive scheme*. It will be proposed to relate the interpretive scheme to a broader institutional environment made of a broader system of norms, knowledge and material resources.

In order to study archetypal evolutions of IS, we relied on documents, both internal and external, related to the Roman Curia and its history. We also drew on numerous articles and books about the enclaves linked to the Curia. Furthermore, we tried to develop a critical loop similar to that described by Stanford (1986). We had extensive discussions with historians specializing in the Curia or its related enclaves⁹; we completed thorough document analyses based on their new bibliographic proposals; and we then presented a first draft of our work to both historians and organization theorists¹⁰. A subsequent interview with a member of the pontifical council for social communication was a great opportunity to update our history to the present day.

The research introduced here is in fact the first part of a broader study aimed at analyzing the IS of the Roman Curia. First, we tried to model the long-term evolution of the Roman Curia IS. This was done mainly through document analysis and discussions with historians, and resulted in the framework presented here. Then, a second study focused on the recent period (from post World War II till today) was centered on the analysis of ICT-related practice within the Curia and its institutionalization (de Vaujany, 2006b).

⁷ Reix maintains that IS is "an organized set of resources: hardware, software, staff, data, procedures... enabling the acquisition, processing, and storage of data (in the form of texts, images, sounds, etc) in and between organizations" (2004: 3).

⁸ "There is no doubt that organizations exist in a milieu of ideas about appropriate ways of succeeding and behaving in their task environment." (p 1055).

⁹ See acknowledgements at the end of the paper.

¹⁰ During the SSIT ORF 2006 at the London School of Economics and a research seminar in France.

A History of the Roman Curia's IS: An Archetypal Interpretation

Based on a number of significant events over the history of the Roman Curia, the evolution of the organization and its information system may be divided into four broad periods: from the 1st to the 4th century, from the end of the 4th to the 16th, from the 16th to the end of the 19th, and from the end of the 19th century to the present day.

Period 1: A Local and Preservation-Oriented IS (1st to the 4th Century)

It is extremely difficult to mark the exact birthdate of the Roman Curia (Levillain, 1994). Symbolically, it can be tied to the Apostles (see Elliade, 1978; Hilaire, 2003; Baslez, 2004). A starting point could therefore be the first apostolic community's taking the message of Christ and announcing his resurrection, notably under the auspices of Saint Peter, the first Pope. From an historical point of view, things are of course not that simple. It is plausible to date the origins of the Roman Curia to the first traces of an administrative apparatus of the Church: at the end of the 1st century, when the Church was still extremely local and centered on the "parish" of Rome. During this first stage, the Pope was no stronger, richer, or more well-connected than any other bishop. Nonetheless, gradually, the bishopric of Rome began to gain and claim a specific authority, particularly towards the end of this period.

The structuring of the Pontifical chancellery cannot really be distinguished from the emergence of a prototypical dissemination of information, which was centered on the implementation of a memory, i.e., a formalization of tradition. To this end, the first office, the "scrinium", was established. Its function was filing legal bills and acts.

Those who worked in the Curia were general-purpose employees: "the files and library (housed in Latran before 650 AD) [were] entrusted to the guard of *scrinarii*, often confused with the *notarii*, because the same employees were charged to preserve and write the acts. They were both archivists and writers." (Levillain, 1994; p 502). Historically, another point is very striking: the techniques used by these archivists were strongly inspired by those of the Roman imperial tradition, in the language, the standards and the formats used.

At this time the first information transmission system for the Roman Curia was born. The *cursores* (the horse-riders in charge of the diffusion of messages within and outside the Church) conveyed and authenticated epistolary instructions for the Pope. Levillain notes that "*cursores* accomplished several important tasks. They had to convoke Cardinals and prelates, bear process files to auditors in charge of instructing them, and protect the palace when the Pope was on a journey" (Levillain, 1994).

At the end of this period, **the IS of the Curia remained a largely local one.** It aimed at archiving core documents, mainly legislative. There was no difference between the library and the archives. The *scrinarii* (in charge of the archives) and *cursores* were key-actors. Archival techniques were strongly influenced by the Roman Empire, and aimed at preserving the emerging tradition of the Church.

Period 2: A Centralized International Intelligence-Oriented IS (From the 4th to the 16th Century)

In the second period, the bishopric of Rome began to progressively assert its temporal and spiritual authority, articulating a growing set of foreign bishoprics around the Holy Father. Gradually, a relatively informal council (at least in its mode of selection) emerged at the Curia: the consistory. Later in the period, it was institutionalized and met regularly. By the end of the 16th century, this council was in charge of major decisions, such as the declaration of war, appointment of new cardinals, etc. It was also the place where indulgences (i.e., the remissions of the temporal punishment due to God for sin) were granted.

In addition to the consistory and old Curia entities, like the chancellery and the apostolic chamber (in charge of "temporal activities"), some new organizations emerged in the Curia, such as the Roman Rota, a company of judges created to manage indulgences.

With regard to information generation and management, the period was also characterized by increasingly structured pontifical decision-making. Indeed, specific entities of the Curia were devoted to each step of the process. Thus, "Whatever their importance, there was always a council to prepare decisions, a chancellery to put them in place — transmitting them, receiving letters and sending answers, in particular as regards indulgences and other privileges, either casual or permanent for diplomats — a court for local trials and for appellate stages when people related to the bishopric asked the Pope to settle a situation, a head of a local parish of the town and attached

churches, a house of the Pope (episcopium), a smithy for urban construction, charity offices, and lastly, financial services in charge of managing pontifical incomes and spending" (Levillain, 1994: 516).

Besides, an increase in IS specialization occurred. It was linked to the increase in information to be processed, with greater attention given to the filing and writing of pontifical acts at the level of the old scrinum. Archives and libraries also gained in specialized importance, and the period was characterized by an incredible increase in the number of the texts produced and filed. This trend was accelerated by the use of printing techniques. Printing technology arose in the middle of the 16th century in western countries. Previously, the production of books, most of which dealt essentially with theological topics, were carried out by copyist monks in scriptoria. Quickly, the Curia developed its own printing center. At the same time, both the chancellery and the apostolic chamber saw numerous new workers and types of jobs appear, many of which were gathered within colleges (such as "abbreviators", "solicitors", "janissaries"...). Some existing jobs evolved. A huge task loomed ahead. Pontifical documents were so diverse. They could be arranged into thirty categories (constitutions, bulls, decretales, briefs, motto proprio, decrees...). Besides, the amount of temporal activities (such as tax registration and collection) kept increasing. In the writing of pontifical acts (which were systematically collected and filed from the 14th century onwards), new jobs thus appeared in the 13th and 14th centuries within the apostolic chancellery (Barbiche, 1998), notably those of the "distributor" and the "rescibendarius", who were in charge of the management of the reception of letters and who levied taxes.

At the end of the period, the whole Curia (and especially the chancellery) also displayed a clear desire to classify the growing volume of information better, particularly in the field of law. Thus began the process of compiling a large reference bullarium. This was a catalogue of 922 indexed acts, which included 800 for the hundred years preceding 1488. It gathered documents primarily dating from the Renaissance. During the same period, the chancellery began to experience the beginnings of a major crisis: the rise of the first congregations (that is to say specialized ad hoc commissions of Cardinals) with their own filing and distribution systems.

Along with this evolution in data processing came the first elements of a strategic intelligence system, based on information collection and lobbying practices by pontifical embassies (nunciatures) or specialists of the Curia. Strategic intelligence has been used since the middle of the 16th century by the Curia for diplomatic negotiations, spying and lobbying. War had become too costly, from both a human and a financial standpoint, and the Curia could no longer afford repeated military action against powerful states. New diplomatic members thus joined the Curia. They were specialists in diplomacy, information acquisition and for some, coding techniques¹¹.

Finally, the IS of the Curia at the end of this period was clearly an **international, centralized and strategic intelligence-oriented one**. The Curia was at the core of a huge network of bishoprics and nunciatures all over Western Europe. Furthermore, it was involved in temporal activities, such as wars and financial ventures. It needed an ever expanding IS based on intelligence and specialized information.

Period 3: A Differentiated International Intelligence-Oriented IS (end of the 16th to the 19th Century)

The most important change in the Curia's structure over the past centuries was that which marked the start of this third period: the move from the consistorial system to the congregationist organization under Sixtus V (see the apostolical constitution "Immensa aeterni" in 1588). This shift corresponds to the shape of the Curia as we know it today.

Schematically, the Curia was transformed from an informal and general council of cardinals to a more specialized one based on various sorts of ministries, or "congregations" (emerging at the end of the previous period and both institutionalized and extended by Sixtus).

This did not happen by chance. It took place after a series of major military, political and religious crises, notably under the reign of Clement VII. Hilaire characterizes the disastrous reign of Clement VII as follows:

¹¹ The first use of cryptographic techniques within the Holy See dates back to the 14th century (Alvarez, 2002). And from the 16th, the function of coding secretary had become a key job of the Curia.

It can not be thought without emotion of Clement VII [1378-1394], the unluckiest of all Popes. He saw, from the top of castle Saint Angelo, Rome ransacked by Lutheran bands, and learned that Denmark, Norway, Sweden and England were detached from the Church. It was announced to him that Turks had invaded the Christian kingdom of Hungary and that Suleiman had appeared under the walls of Vienna. Was the Catholic Church on the verge of being swept away by the storm? (2003: 303)

In continuation with the trends of the previous period, **information and classification systems became more differentiated, remote, and generally more thorough.** The situation became more and more complex with the emergence of local IS within the congregations or some religious orders' headquarters¹², which had from now on their own systems of information filing and distribution. This resulted in the well-known contemporary problem of the integration of heterogeneous formats and modes of classification.

Library and archives became increasingly separate activities, notably in the 17th century. Archives were delocalized and the "secret archives of the Vatican" were created, while the library reorganized its collections with a system still in use today. As in the previous period, the drive to integrate and synthesize archives, particularly legislative archives, continued. Such was clearly the case under the reign of Benedict XIV who developed the most voluminous bullarium ever produced, in 1758. The magnum bullarium was divided into 32 volumes and included all the acts of the pontiff sovereigns from 440 to 1758.

In conjunction, **the background search for information when considering applications for canonization became increasingly thorough.** This process, which dated back to the second period, included among other elements long interviews, which were then meticulously transcribed (from the 17th century, in the vernacular), including even the interviewee's hesitations! The outstanding aspect of this third period was its use of printing techniques, which in particular allowed thematic classifications and simpler referencing in the event of an old canonization application being revived. In keeping with the period's general tendency to centralize symbolic power, from the 16th century on the Pope became the only church representative sanctioned to beatify individuals, whereas previously bishops were also granted this right. Indeed, from the outset of the 16th century, all the major acts of the Church (mainly liturgy, canonization and catechism) were to be decided and designed by the Holy See.

At the end of this third period, **the IS of the Curia was highly differentiated.** The rise of centralized congregations, drawing on their own means to collect and distribute information, had resulted in a complex and sometimes redundant IS. Clearly, the arrival of printing systems resulted in huge changes in the diffusion of information, as well as the influence of the Church within the broader knowledge system and influence in Western Europe.

Period 4: A Global Fragmented IS (from the 19th Century until Today)

This fourth and last period was marked by the appearance of a social doctrine, major changes in the structure of the Roman Curia and the Church, the end of pontifical states in 1870 (followed by the creation of the State of the Vatican), broader development of media use, and increased external communication.

As regards Church government, several reforms introduced a degree of collegiality in the decision-making process, notably in the 1908 constitution and at the time of Vatican II, whose 1965 session resulted in the creation of the synod of bishops (Jankowiak, 2002). Aubert et al.. note that "although this new body of the episcopate excluded the deliberate element which is essential in any traditional synodal meeting, it showed however the desire of the Holy See to answer, partially, to a general wish of the episcopate, and to come closer to the ancient ecclesiastical structure" (1975: 579).

¹² See for instance that of the Jesuits, especially as regards accounting information systems. A continuous correspondence existed between Rome, the Provinces and the colleges (Quattrone, 2004). The flow of this correspondence ("250 in a few days only" according to Saint Ignatius; Lamalle, 1981, quoted by Quattrone, 2004) was intense and was kept at the *Archivum Romanum Societatis Iesu (ARSI)*. It was regulated in the *Formula scribendi*, which "strictly prescribed the contents (i.e., the matters to be treated and their order of importance), the modalities (i.e., a standard format of cardinal points to be replicated in the following correspondence), and the timing (e.g. the periodicity) of all the correspondence between the center and the periphery." (Quattrone, 2004; p 667). Various codes were also used to identify and/or make anonymous documents.

In the 20th century, with a decrease in religious practice, a decline in financial resources, and major political setbacks (such as the French law decreeing church-state separation in 1905), the Curia, like many national churches, sharpened its managerial and financial methods. In France, the management of religious organizations became tighter more controlled at both the parish and bishopric levels (see Pesqueux and Dantziger, 1991).

The last two thirds of the 20th century demonstrated a shift from relative indifference¹³ on the part of the Church towards communication techniques to a very open attitude, notably towards new media. This was very explicit in the famous decree on social communications (*Inter Mirifica*) of Vatican II in 1963. In the case of computer technology, some clergymen even offered profound insight. In 1948 the Dominican father Dubarle saw computers as a substitute for failing human rationality, and thought that the new machines could offer a way to pacify human decisions.

Thus, the external communication and information system of the Church began to increasingly use new techniques and media.

Radio Vatican was set up in 1931 under the pontificate of Pius XI and experienced various technical evolutions. It was supplemented by the creation of Vatican Television (CTV) in 1983, which was officially recognized by, and associated with, the Holy See in 1996. Its primary activities consist of the transmission of major events linked to the sovereign pontiff (Christmas mass, benedictions, trips, etc) and the management of the audiovisual archive. Beyond the development of radio and television, the Roman Curia and the sovereign pontiff addressed public relations in other ways. In 1971 Paul VI constructed an audience hall (with a capacity of up to 12 000 people) and in 1991 the VIS (Vatican Information Service), the information service of the pressroom of the Holy See, was formed.

With regards to computerized IS, the Roman Curia has only recently adopted the modern tools at its disposal (PC, CD-ROM, telematic communication tools, etc). The real computerization process of the Roman Curia dates back to the beginning of the use of Internet technologies (Web and Intranet), in 1991¹⁴. Indeed, it was at that time that the Franciscan sister Judith Zobelein was recruited by the Vatican. She was heavily involved in the Vatican website design as a technical director of the IT staff. The site was officially launched in 1995, initially using only three servers (named after the Archangels: Gabriel, Michael and Raphael...). Soon, however, it had achieved astounding success: 10 million visits a day, and up to 50 million a day after the Pope's death.

This Internet project of the Vatican, based on Sun technologies, was followed by the launch of an intranet in the Curia that included an e-mail directory with more than 1000 addresses of members of the pontifical administration. The project was followed by other major projects, such as the World Youth Journey or the Year of the Jubilee in 2000, when an extranet devoted to all nunciatures all over the world was implemented. All of these achievements were clear signals to other parts of the Church (notably French bishoprics), which then went on to develop their own websites and intranets. At the beginning of 2000, the first interactive websites offering (moderated) forums appeared, and in year 2005 the first online sales systems were set up. In 2006-2007, the Roman Curia (again under the management of Sister Judith Zobelein and the Internet office) is preparing a vast and ambitious interactive website project for the Vatican, a "virtual portal for the Catholic community,"¹⁵ including forums, direct discussion tools and e-learning facilities. The portal will also make it possible to centralize and reference the numerous websites and intranets of the Church. Thus, it seems that the Curia is moving closer and closer towards a global IS and Catholic community, with a clear message coming directly from the Pontifical Council for Social Communications (PCSC): "We strongly recommend an exchange of ideas and information about the Internet among those with experience in the field and those who are new comers," (Foley, 2002).

Today, the IS of the Curia is becoming increasingly globalized. The Curia has developed a worldwide communication network, based primarily on the person of the pope himself. Beyond its lines of communication with each bishopric and congregation, it has also developed its own external networks (such as Radio Vatican and its

¹³ In the doctrinal area, hostile responses from the Church and its members have been rare. Nonetheless, it is worth remembering Saint Thomas Aquinas's reaction when he destroyed Albert Legrand's automatic head as an "embodiment of evil" (Breton, 1990: 35).

¹⁴ In a highly symbolical Angelus in 1990, John-Paul II stated that: "With the advent of computer telecommunications and with what are known as computer participation systems, the church is offered further means for fulfilling its mission," he proclaimed (1990: 2).

¹⁵ A project that will be based on 50 new servers.

current website). Similarly, many congregations or enclaves have also developed their own global tools, and thus the current IS of the Curia can be termed both "global and fragmented". The future "portal" of the Vatican will probably strengthen this trend.

Discussion about the Resulting IS archetypes

In the continuation with Greenwood and Hinings' (1993) vision of archetypes, we would like now to compare the four configurations, and relate them to stable set of beliefs. This section will also be devoted to a discussion of the contributions, limitations and perspectives of this works.

The Final Typology: Four Archetypes Related to a Broader Interpreted Environment

The four archetypal IS in the history of Curia are summarized in the following table:

	Local, general IS aimed at preserving traditional activities (1st till 4th)	Central, international IS oriented towards strategic intelligence (4th till 16th)	International, differentiated IS oriented towards strategic intelligence (16th till 19th)	Global and fragmented IS (19th till today)
Main features	A minimal information system centered on archiving legislation elements alone. No differentiation between library and archives.	The development of an organizational information system devoted to information transmission, intelligence and lobbying. The information system initiated a trend towards specialization around a central entity: the chancellery.	A continuation of the intelligence effort, but with more modularity, emergence and integration problems than in the previous case. Congregations develop their own filing and distribution systems.	The newfound importance of mass communication, aimed at individuals. The lack of control on the flow of information is even greater than in the previous era. The shift from a political and strategic effort towards a more moral one. Integration of new technologies and media.
Stakes	Conserving information without betraying the original message.	Conserving, transmitting and indexing a growing amount of information. Integrating printing techniques into the usual processes of the Church. Designing a strategic intelligence system for use on the international scene.	Differentiating IS (notably at the congregation level) without losing coherence.	Designing a global IS of the Curia and churches. Appropriating new forms of media in accordance with the Church's ethics. Integrating the Church into the world knowledge system.
Key IS jobs during the period	Scriptores Cursores	Scriptores and cursores Distributor, rescribendarius,	Same, with new jobs related to the congregations	Press journalists At the end of the period, jobs related to

		computator, auscultatores, corrector, and summator Pontifical litigators Local and foreign clergymen		television, radio and Internet. Jobs related to network computing
Core interpretations with regard to institutional context	The Church is isolated It has no real visibility within Western countries It is a parish among others, which should reach a primacy in the long run (a belief shared by most popes during this period).	Strong isomorphism between societal and Church knowledge Strong legitimacy of the Church within society The Church is both a spiritual, a military and a political power.	The Catholic Church experiences a growing competition within western countries Competing knowledge-producers emerge with the affirmation of laity Legitimacy of the Church within society is weakened It is becoming only a spiritual power.	The Church is isolated It is no longer at the core of Western countries Its legitimacy is weakened, except in South America and Africa (where it nonetheless although experiences a strong competition with other religions) Its resources become rare It feels more and more a gap between itself and the world

• **Table 1. Four Archetypal Forms of IS Linked to the History of the Roman Curia**

Exploration of these four archetypes chart the long term evolution of the Roman Curia's information system: its **autonomization** (with the move from a Church at the core of all Western knowledge to a church which is only a part of it), **differentiation** (characterized by a decentralization of filing and distribution activities), **openness** (with the development of a pontifical press and various medias) and ultimate **integration** (via the apostolical chancellery or different coordination modes). All in all, over the centuries, the Church information systems have grown in importance, in particular with the design of a strategic intelligence system during the second period, and more recently, with the emergence of computerized information systems such as the intranet, the website or the forthcoming portal.

From a more interpretive stance, the evolution in systems and structures epitomizes a deep change in the way the Curia and the Church perceive themselves in their environment. The move from archetype 2 to archetype 4 illustrates the move from a Church perceiving itself as being the environment, to a Church enacting itself as an endangered part of it. This result in a need for greater centralization epitomized both in the evolution of IS and that of organizational structures. More recently (especially with the council Vatican II), we can notice the emergence of a new aspiration. The Church now experiences itself as an actor of the environment, trying to deeply understand it before undertaking any action.

Contributions, Limitations and Perspectives of this Archetypal Approach

At this stage, the contributions, limitations and perspectives of this study will be discussed.

At first sight, our formal long-term analysis does not seem to result in a real difference between long term and short-term studies. The archetypal IS found here may therefore also be relevant to short-term evolutions in an

organizational IS¹⁶. The move from the first to the fourth archetype shows different possibilities in centralization, formalization and openness of IS. It also reveals a classic integration dilemma, interoperability dilemma. Nonetheless, we believe that each archetype can be related to some specific contents and institutional context. It is thus a way to realize the specificity of today's beliefs (with regard to markets openness, the variety of moral sources, the fluidity of society¹⁷, the rise of electronic medias and electronic tools...) compared to those of the first period (the world is a set of related islands, beliefs are situated and compartmentalized, the world is relatively stable...). More over, and conversely to the idea usually related to missionary organizations and their IS (see our first part), the case of the Curia illustrates that a religious organization can be based on a complex and evolving IS. Actually, this may be linked to the fact that religious organizations are also economic, political and (in the past) military entities.

Beyond the case of the Roman Curia, the reference to a religious organization and its IS, can be extremely helpful to understand the specificity of today's for and non-for profit organizations. As Bartunek (1984) suggests, religious organizations and their trajectories can thus be a helpful 'caricature' of broader organizational dynamics. She explains that:

Religious orders differ from other organizations in some ways. For example, they tend to elicit more concern about a shared mission than do most organizations, and members' life-time commitments to them ensure that leaders come from inside rather than outside the order. These differences limit to some extent the generalizability of the order's experience, but they also offer advantages. For example, interpretive schemes surrounding the organization's identity are much more salient than is often the case. In addition, they provide opportunities for seeing how changes in interpretive schemes occur in organizations whose memberships are relatively constant (...). (1984; p 370)

According to Bartunek, religious organizations would be thus a kind of pure situation with regard to interpretive schemes. They will enable researchers to shed light on interpretive evolutions in an extreme organizational setting.

We also see three main limitations in our work.

First, other theoretical frameworks, such as general system history (Porra, Hirscheim and Parks, 2005) or Orlikowski's (2000) Practice lens, could have informed our understanding of the overall long-term sociotechnical dynamic.

Then, history is always subjective, emphasizing some aspects and minimizing others. Our story of the Curia is therefore necessarily heavily reductionist. In particular, one can take issue with the choice of periods studied. For example, other phases or sub-phases may have been cited in the third phase of the formal history. Such could also have been the case with the practice-based view, in particular for the second period, which could have been subdivided. But as Marrou clearly states, the periodicity of a historical study "will always be a question of etiquettes, always provisional, relative to the point of view temporally adopted. Their role, practical and pedagogical, should not be over-emphasized: the resulting study can never be wholly deterministic" (1954: 161).

Lastly, this research does not make it possible to define the specificity of the IS archetypes under study (the Curia among others) relative to other religious communities (as Pesqueux and Dantziger did in the field of control management for Protestantism and Judaism). To achieve a comprehensive understanding of our archetypes as it relates to the Catholic Church, further research is required, and we eagerly invite colleagues and those interested to aid us in this pursuit.

In continuation with the aforementioned contributions and limitations, we see several possible perspectives for this research.

First, it may be interesting to focus more on some of the enclaves discussed in this research, such as Cistercian congregations. Their role in Middle Age technological development and their potential for innovation may be especially interesting to study, particularly given the huge amount of scientific production carried out on the subject.

¹⁶ We also proposed elsewhere a different, practice-based, interpretation of the Roman Curia's history (see de Vaujany, 2006b).

¹⁷ See Bauman (2000).

Then, as for the Curia, a field study of its current sociotechnical dynamic (from World War II until today) is in order, as opposed to research by mere historical methods. It may be particularly interesting to examine the impact of computerized tools such as the Intranet on the organization of the Holy See. In fact, an empirical study is currently in progress on the Curia's pontifical council for social communication, Internet office, Vatican Radio and CTV). It should help us to better understand current IS appropriations.

Lastly, it may also be interesting to study other ancient non-Catholic religious organizations to see differences, whether in the formal or practice-based evolutions of their IS.

Finally, we would like to emphasize a potential contribution of historical approaches in IS on the whole. In continuation with a post-modernist message, we believe that history is a way to identify structural constraints that weigh on human agency, in particular in IS. Thus, historical study is both a way to undermine recent technical evolutions and to free IS managers from any technical determinism. As Marrou (1954: 262) suggested fifty years ago, "history emancipates us from constraints, from the limitations that we as humans experience in a given place and a given society at a given point in time, and thus, it becomes an instrument, a means of our freedom."

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