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## Hyperdocumentation According to Paul Otlet

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Paul Otlet is now known and recognized by information professionals such as librarians and documentalists as well as by key players in computing and Web development such as Google when it comes to the history of information processing tools. However, his writings have not always been examined with all due attention, outside of a few information science researchers and major works devoted to him (Rayward 1975 and Van Acker 2011). Indeed, it is often easy to extract a few quotations to present Otlet as a visionary of Internet networks, the Web and Wikipedia-type encyclopedias. But the study of Otlet's writings and achievements actually shows a greater complexity of thought that remains influenced by the authors and theories of his time, but that projects itself beyond our current technical environments.

If we must resist at all costs wanting to re-read Paul Otlet in the light of our present time, we must admit that he was nevertheless able to anticipate some of our evolutions to the point that some of his remarks only become understandable today. This is the case of his description of hyperdocumentation, the objective of which is indeed to show a historical progressiveness of documentation and the use of documents during the different periods of human societies. Otlet thus begins to describe the first five stages that precede the final documentary stage:

The evolution of Documentation is developed in six stages. In the first stage, Man sees the Reality of the Universe through his own senses. Immediate, intuitive, spontaneous and thoughtless knowledge. In the second stage, he reasons the Reality and

accumulating his experience generalizing it, interpreting it, he makes a new representation of it. In the third stage, he introduces the Document that records what his senses have perceived and what his thought has constructed. At the fourth stage, he creates the scientific instrument and Reality then appears enlarged, detailed, specified, another Universe successively detects all its dimensions. At the fifth stage, the Document intervenes again and it is to directly record the perception provided by the instruments. Documents and instruments are then associated to such an extent that there are no longer two distinct things, but only one: the Document-Instrument. (Otlet 1934, p. 53, author's translation)

The fifth step marks the arrival of an essential conceptual logic, this alliance, not to say hybridization, between the document and the instrument. For Otlet, it is the marker of the need to be able to benefit from new intellectual machines and high-performance workstations. This fusion between the document and the instrument was a key research issue from the 1930s onwards, and one of the most famous descriptions was Vannevar Bush's Memex, a project on which the American scientist had been reflecting for some 15 years when the famous text "as we may think" was published in 1945. But Otlet projects himself even further. To this end, he describes a new stage for documentation, a sixth stage as the ultimate stage:

In the sixth stage, one more stage and all the senses having given rise to their own development, a recording instrument having been established for each one, new senses having emerged from the primitive homogeneity and having been specified, while the mind perfects its conception, Hyper-Intelligence is glimpsed under these conditions. 'Sense-Perception-Document' are things, welded notions. Visual and sound documents are complemented by other documents, pertaining to touch, taste, smell and yet more senses. At this stage also the 'insensitive', the imperceptible, will become sensitive and perceptible through the concrete intermediary of the instrument-document. The irrational, in turn, all that is untransmissible and was neglected, and because of this revolts and rises as it happens in these days, the irrational will find its 'expression' in ways still unsuspected. And then it will really be

the stage of Hyper-Documentation. (Otlet 1934, p. 53, author's translation)

The reading of this long quote allows us to understand all the importance that Otlet really gives to documentation. It goes far beyond a simple librarianship approach to get closer to a global, total (but not to say totalitarian) vision. We have chosen not to keep the hyphen between *hyper* and *documentation* as Otlet had written it, because the purpose of this book is precisely to show that the concept can now be written in one piece.

The reason why we are currently interested in hyperdocumentation is that the step-by-step process described by Otlet seems relevant, even more so than at the time of writing. If we tried to situate ourselves nearly 90 years after this text, it is possible to consider that we are probably at stage five with paths opening up to stage six.

We are gradually entering this ultimate phase because of the processes of hyperconnection and hyperreality that we have previously mentioned. But let us return to another key issue, that of demonstrating the importance of documentation in the evolution of human societies and civilizations. This quasi-documentary primacy is therefore in line with the theory of documentality described by Maurizio Ferraris (Ferraris 2014), which places the document as an essential element of humanity. Before returning to these similarities, it is necessary to better understand the use of the concept of hyperdocumentation according to Paul Otlet.

### **1.1. The different levels of hyper in hyperdocumentation**

We can distinguish three main levels to grasp the meaning of hyper in the concept of hyperdocumentation as explained by Paul Otlet:

– Initially, the prefix *hyper* clearly marks the desire for extension in the possibilities of processing documents, as well as in an approach that is that of the “augmented man”. This increase lies first of all in the increase of intellectual faculties and information processing potentialities. It is in this that hyperdocumentation is linked to hyperintelligence according to Otlet. But we will see that Otlet goes even further.

– In a second step, one must also consider that it is also an extension of the domains on which the documentation will be based, and finally all the

actions of indexing, conservation and memorization. Hyperdocumentation marks the increase of documentary perspectives where a too quick examination could make us believe that it was only a passage from a documentary web to a commercial web. It should also be remembered here that Otlet is going to take a close interest in all professional fields that use documents, especially accounting. According to Otlet, documentation is not a side discipline, because it concerns absolutely all human activities.

– At the last stage, hyperdocumentation marks an increase in the documentary formats taken into account. The metaphor of the invisible web has often been understood as a territory not indexed by search engines, but one must remember that there have always been unindexed territories of human activities. Consequently, hyperdocumentation fully marks this continuous increase in the indexing of the activities of individuals and organizations by now taking into account a diversity of activities and different types of forms. In the same way that search engines have sought to index more and more different formats in addition to HTML pages, hyperdocumentation seeks to document a maximum of actions and events that occur.

We will now see in detail how it is possible to understand and take into account this boom in documentation in its final hyperdocumentary stage.

### **1.1.1. *Hyperdocumentation as an extension***

First of all, hyperdocumentation can be understood as an extension, that is as an increase in the faculties of processing ideas and information mobilized by the human mind. This possibility quickly appeared essential to Paul Otlet for personal reasons. As a young lawyer, he had quickly realized that his memory was deficient and not conducive to fully practicing this profession without using a maximum of notes based on an optimized organization.<sup>1</sup> This intrinsic memory deficit was probably the consequence of meningitis during his teenage years, which had greatly diminished his mnemonic capacities. Faced with a reduced anamnesis, he necessarily had to “increase” his external memory or “hypomnosis”. Otlet therefore largely developed a system of memory aids, or hypomnemata as described by Michel Foucault:

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<sup>1</sup> Françoise Levie relates this confidence that Paul Otlet made in a document with an introspective value, “le cahier bleu”, in 1916 (Levie 2006, p. 47).

The hypomnemata, in the technical sense, could be account books, public registers, individual notebooks serving as memory aids. (Foucault 2001, p. 1237, author's translation)

The basis of the system then rested on records that Otlet would try to standardize, because above all it was a matter of envisaging documentation, which offered him considerable possibilities as an individual, and in which he quickly saw the potential to envisage shared and collaborative documentation. He developed this logic while working in Edmond Picard's law firm, which had set up the project of putting all the summaries of law journals from around the world on file, as well as the Belgian Pandects project. It is within this framework that Otlet developed a real passion for the production of standardized index cards and development of methods to carry out this work efficiently and quickly. In 1892, he met another enthusiast of cards, Henri La Fontaine (1854–1943) who carried out this documentary work for the sociological field. From then on, the two men would never leave each other to set up ambitious projects in the field of documentation as well as at the level of international associations. Their meeting was the trigger that finally allowed them to go beyond the stage of individual intelligence to begin the stage of “hyper-intelligence”. The ensuing projects, such as the Universal Bibliographic Repertory, were based on the will to develop a collective intelligence:

Collective intelligence is the pooling of intellectual data through speech and writing, through tradition and education, through the realization of desirable or reproduced things themselves (...).<sup>2</sup>

From that point on, documentation and its maximized possibilities up to the stage of hyperdocumentation mark an increase in the human brain, what Otlet generally calls the “mechanical brain”, referring in particular to the invention of Georges Artsrouni (1983–1960) who designed typewriters with a machine translation capacity (Daumas 1965). The set of tools and devices that make it possible to produce high-performance machines in terms of information processing is of constant interest to Otlet. The same reflection

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2 Documentary report for the Union of International Associations; Geneva, International Institution of Sociology; 10th congress: Geneva 1930, conference: “Comment du désordre passer à l'ordre, du chaos passer au cosmos?”.

was also mobilized by HG Wells, who developed his own conception during the documentary congress in Paris in 1937:

IT IS DAWNING UPON US, we lay observers, that this work of documentation and bibliography, is in fact nothing less than the beginning of a world brain, a common world brain. What you are making me realize is a sort of cerebrum for humanity, a cerebral cortex which (when it is fully developed) will constitute a memory and a perception of current reality for the entire human race. (Wells 1938, p. 91)

In Otlet's works this question of the mechanized and machinic brain is regularly addressed. He thus imagines the *Mondothèque*<sup>3</sup>, which is a workstation that aims to gather all available media at hand. The device then appears as a precursor of computerized workstations and current logics concerning the digital humanities. But Otlet goes even further by imagining the association of machines:

However, one must consider a similar unit, the office organized in the manner of the workshop, with in perspective the work, divided, continuous, in series, in the chain, the 'Ford apron'. We must have a complex of associated machines that simultaneously or consecutively perform the following operations: (1) transformation of sound into writing; (2) multiplication of this writing as many times as it is useful; (3) establishment of the documents in such a way that each piece of data has its own individuality and in its relations with those of the whole, that it is recalled where necessary; (4) index of classification attached to each piece of data; perforation of the document in correlation with these indices; (5) automatic filing of these documents and placing them in the binders; (6) automatic retrieval of the documents to be consulted and presentation, either in front of the eyes or under the part of a machine having to make additional entries; (7) mechanical manipulation at will of all recorded data to obtain new combinations of facts, new reports of ideas, new operations using numbers. The machinery that would carry out these seven

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<sup>3</sup> One can find representations of the *Mondothèque* and see the model that was made for the current Musée du Mundaneum in Mons. Archive inventory number: ARC-MUND-EUMP-8141.

desiderata would be a true *mechanical* and *collective brain*.  
(Otlet 1934, p. 391, author's translation)

We have here the description of a mechanical ideal which rests on an externalization and an extension of the intellectual potentialities of humans:

The human species has risen above the purely biological world since the time it began making tools. Machines cannot be distinguished from men except by their function. And machines applied to intellectual work make real auxiliary brains. (Otlet 1935, p. 374, author's translation)

Paul Otlet saw documentary activities and their efficient management as a way to improve the entirety of intellectual work. Documentation is then a logical and desirable organizational outgrowth that must be optimized to improve the functioning of the entity for which it is developed.

This extension is also reflected in the fact that the archives of the Mundaneum constitute a kind of access to the spirit of Paul Otlet. André Colet, a close collaborator of the Mundaneum, related Otlet's words at the end of his life:

I repeat, my papers form a whole. Each part is attached to it to constitute a unique work. My archives are a 'Mundus Mundaneum', a tool designed for the knowledge of the world. Keep them; do for them what I would have done for them. Do not destroy them! (remarks reported by André Colet, quoted by Levie 2006, p. 320, author's translation)<sup>4</sup>

Paul Otlet relied on techniques, methods and principles. Among the techniques were the card and mobile systems, among the methods was that of note-taking, which was based on the monographic principle:

Observe the monographic principle. One element, one record; one record, one element. Several cards can be used if there is not enough space on a single one. It is preferable to write only on one side of the card, for later cutting and pasting. But exceptions are possible. The extended notes and the manuscript

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<sup>4</sup> His will contains several reminders of the need to preserve his work and the coherence it possesses.

prepared for printing will be made on flat sheets or folded in half. It is preferable to have only two formats: sheets and cards. Be sure to give each card its title and heading and assign it the classification number from the table of contents of the work.

a) In the development of thinking and writing, notes are both milestones and representatives of existing realities. Impossible to neglect them: they claim to be and it is important to take them into account. The repertoire is also comparable to a ‘thinking machine’.

b) It is necessary to hasten to note the ideas which seem to be able to be fertilized. They are often very fleeting and it is sometimes when you look for them later, in the collection of notes, that you are able to get the most out of them.

c) The confrontation of notes with each other brings out other ideas, even late in the day. (Otlet 1934, p. 256, author’s translation)

This logic is the one applied to the RBU (*Répertoire Bibliographique Universel*) that journalists have nicknamed the “paper Google”<sup>5</sup>, but it is also that which Otlet applies to his different activities. The monographic principle is inspired in particular by the work carried out on the German-Baltic chemist Wilhelm Ostwald, who would set up a large-scale documentary project in collaboration with the Otlet and La Fontaine Bibliography Institute: *Die Brücke (Internationales Institut zur Organisierung der geistigen Arbeit Die Brücke)*. The monographic principle was also inspired by the work of Karl Wilhelm Bührer, founder of the Internationale Monogesellschaft, who sought to normalize and standardize advertising inserts: the “monos” (Hapke 1999). In Otlet’s work, this monographic principle is also found in the concept of the *biblion*, which constitutes the smallest manipulable unit of knowledge.<sup>6</sup>

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5 Dijan, J.-M. (2009). Le Mundaneum, Google de papier. *Le Monde Magazine*, 19 December.

6 “The ‘Biblion’ will be for us the intellectual and abstract unity, which can be found concretely and really, but in various modalities. The biblion is conceived in the manner of the atom (ion) in physics, of the cell in biology, of the mind in psychology, of human aggregation (the socion) in sociology” (Otlet 1934, p. 43, author’s translation).

It is likely that the *Le Traité de documentation* was conceived in this way, accumulating notes and cards to better bring them together and later classify them together to give them a new form that could then be printed. The rush to print the treatise, despite the efforts of Milisa Coops, the young apprentice documentalist daughter of a good friend of Otlet, explains the few errors that dot the treatise, notably sometimes in the numbering.

This desire to benefit from increasingly high-performance intellectual machines<sup>7</sup> can be seen in Otlet's work, both in the monitoring work he carried out and in his desire to conceptualize devices. We are thinking here of course of the *mondothèque*, but also of the bibliophoto that he designed with the Belgian engineer and TSF specialist Robert Goldschmidt (1877–1935). The bibliophoto consists of a mobile object that allows one to carry his library with him and to consult it by “video projection”. The importance of having “intellectual machinery” is thus defined:

Intellectual machinery: Notion: The machine is an extension of (a) the organs of perception of man (senses); (b) the organs that store and combine perceived data (memory and reasoning); (c) the organs of action and expression (hands, feet, body, head, voice).

– Purpose: The purpose of the machine is to assist, replace or intensify human power in these three directions.

– Operation: The machine is applied to all three operations: (a) Writing (typewriters, printers, photographers), (b) Reading (gramophone, projection machines), (c) Thinking (recording observations, thermometer, barometer-recorder: combining data: calculating and equation-solving machines, doing the four fundamental arithmetic operations, establishing averages and proportions).

Otlet is here in a long line of those who imagine and develop information and knowledge processing tools. He is familiar with previous works, particularly bibliographical ones. He cites, for example, those of Conrad

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7 The Mundaneum archives include two files devoted to “intellectual machines”: Archives du Mundaneum, PPO 461 and PPO 462.

Gesner<sup>8</sup>, but he is also interested in machines that maximize the power of the workstation<sup>9</sup>:

Furniture. – (a) To improve the work table in terms of the possibility of access and filing of the documents deposited on it and the arrangement with it of the machines and auxiliary instruments of intellectual work. (Suggestion: the work table with the position of the worker in the very center.) (b) To establish a work table with multiple writing surfaces, on which can be spread out, separately and distinctly, the elements necessary for different work in progress, without having to move and reclassify these elements each time a work is momentarily interrupted to proceed to another. (Suggestion: the wheel-shaped work table whose spokes are made of articulated shelves that can be moved at will. Such a table was made in the 18th century.) (c) To facilitate the double movement of filing and consultation of documents by means of a large-capacity filing cabinet that is always open, within reach of hand and eye, and movable on rails (straight or circular and powered by electricity). (Otlet 1934, p. 390, author's translation)

The extension of the permitted documentary potential is also increased by the fact that accumulation effects occur.

### **1.1.2. Hyperdocumentation as accumulation**

The increase marks the fact that one accumulates sources and documents to the point of being faced with an accumulation from which one must manage to draw meaning both semantically and organizationally, as Michel Foucault described it:

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8 “After the invention of printing, it was Konrad Gesner who produced the first Universal Bibliography, *Bibliotheca Universalis*, a 16th century work that quickly became famous and was supplemented, indexed and summarized many times” (Otlet 1934, p. 291, author's translation).

9 We refer here to the chapter devoted to hypertext and the workstation in our previous book on the history of the digital humanities (Le Deuff 2018). There the reader will find a short synthetic chronology of hypertextual devices and the reference to the machine cited by Otlet, which was originally a drawing and plan by Augusto Ramelli.

But the archive is also what determines that all the things said do not accumulate endlessly in an amorphous mass, nor are they enscribed in an unbroken linearity, nor do they disappear at the mercy of chance external accidents, but they are grouped in distinct figures, composed together in accordance with multiple relations, maintained or blurred in accordance with specific regularities. (Foucault 1972, p. 129)

Accumulating documents requires storage possibilities, which Otlet and his team often found problematic. It should be remembered here that storage is only a technical prerogative which, under certain conditions, allows documents to be kept. However, storage is not similar to recording and processing documents. It is also not similar to the potentialities of backup and less long-term archiving. It is therefore necessary to think about backup based on the qualities of the document, which marks a form of resistance to time and the ephemeral but deserves specific treatments in terms of archiving.

In fact, the document can constitute a form of anti-event to use Robert Escarpit's formula (Escarpit 1976, p. 59) thanks to the process of fixing and recording. It is therefore possible to go beyond the event stage to more historical stages thanks to traces and especially writing, but also to envisage more easily manipulative stages via a documentary production that allows the management of individuals, groups of individuals as well as any other logistical aspect. The document thus allows the accumulation of informational elements:

The accumulation of books also poses a crucial problem of managing numbers. A sum of books – of 'book places' – also remains a place. Therefore, as the number of books increases, it is advisable to ensure their extension and management. The place in question quickly transforms itself into a sort of filing cabinet, a hyper-document. (Robert 2010, p. 59, author's translation)

Without going into further detail, this cumulative question corresponds to this willingness to compile so as not to lose anything in the fear of being once again in a process of loss of knowledge, or even oblivion and neglect. This fear of a loss of ancient knowledge, particularly that of Antiquity, was

particularly present in the late Middle Ages and early Renaissance (Blair 2011).

Accumulation becomes an essential condition for hyperdocumentation, particularly because it will then require the implementation of specific treatments to classify the documents and make links between them at least to ensure a certain degree of retrievability.

### **1.1.3. *Hyperdocumentation as an increase in documentary forms***

Hyperdocumentation is indeed observable through the generated mass that produces the current and somewhat fantastical discourses around *big data*. It is also and above all a progressive extension of the documentary forms we are confronted with. This extension of documentary forms implies tools and instruments to carry out their indexing. The success of Google as a search engine is based both on algorithmic choices for processing websites, but also on a success in indexing the different types of documents that can be found outside the initial web formats. We will also recall that this success is also made possible by the first condition of the accumulation and thus the storage of data. The web index being an index of documents readable and accessible from the web and based on HTML type formats. Obviously, the engines have sought to index a maximum of formats beyond the simple HTML page marking an increase in the formats taken into account.

This extension of documentary forms can also be measured by the fact that personal or individual data are increasingly indexed as well, and have even become the primary interest, as we will see in Chapter 5.

In the *Traité de Documentation*, this documentary increase in form is mentioned very quickly. Otlet begins by quoting them. Here we take up again the main categories he lists: A. Particular Documents, B. The Library, C. The Bibliography, D. Documentary Archives, E. The Administrative Archives, F. The Ancient Archives, G. Documents other than bibliographical and graphic documents, H. The Museum Collections, I. The Encyclopedia (Otlet 1934, p. 6).

As for the G., Otlet specifies its scope:

These are the relatively recent processes by which the image of reality in movement is recorded and transmitted (cinema, film,

film library) and spoken thought (phonograph, record, disc library). (Otlet 1934, p. 7, author's translation)

Nevertheless, the hyperdocumentary issue and its increasing effects require methods and treatments that allow us to solve the problems of space as well as the different types of formats that contain the data.

## 1.2. Hyperdocumentation as reduction

In order to understand the world, we must be able to have a reduced view of it, that is to say, one that can be apprehended by humans on their physical and intellectual scale. Hyperdocumentation is also the result of the scientific process of reducing reality to better study and categorize it. This scientific logic, well demonstrated in particular by Bruno Latour, corresponds fully to that of Paul Otlet:

Collections, cabinets, illustrated books, stories, and libraries serve instead as intermediary passages, as junctions, telephone exchanges, dispatchers, in order to regulate the multiple relationships between the work of reduction and the work of amplification. (Latour 1996, p. 28, author's translation)

This scientific logic of reduction in laboratory conditions can be seen in many places and knowledge environments. Otlet, for his part, seeks to reduce the world in order to make it more easily accessible through games of scale and projection.

The ultimate stage of documentation (Le Deuff and Perret 2019b) as hyperdocumentation is addressed by Otlet in a drawing and diagram (Figure 1.1) which refers to the fact that the user at the center of the system will be able to benefit from a machine that records all available facts, the cosmograph, and a machine that allows us to observe and understand the universe, the cosmoscope (Le Deuff and Perret 2019a). The machine is obviously idealized and in no way realized. It is part of his idealized visions of human-machine interfaces (Van den Heuvel 2011) which places Otlet in hypertextual reflections that are the roots of Ted Nelson's Xanadu project, as Boyd Rayward reminds us (Rayward 1994).



The observer of the world ultimately becomes a potential manipulator who possesses divine qualities to the point of being able to contemplate knowledge and having access to an ordered cosmos. The Mundaneum thus described becomes a center of the world as a space of knowledge, but also as a spiritual space:

We have seen that it was not only temples that were thought to be situated at the ‘Centre of the World’, but that every holy place, every place that bore witness to an incursion of the sacred into profane space, was also regarded as a ‘centre’. These sacred spaces could also be constructed; but their construction was, in its way, a cosmogony, a creation of the world which is only natural since, as we have seen, the world was created in the beginning of an embryo, from a ‘centre’. Thus, for instance, the construction of the Vedic fire altar reproduced the creation of the world, and the altar itself was a microcosm, an *imago mundi*. (Eliade 1980, p. 72)

The center of the world is also a “computing center” that gives a special place to a privileged observer, which Bruno Latour once again explains perfectly:

In fact, as in Einstein’s relativity, there is indeed a privileged observer, one who in the computing center can capitalize on all the drawings, data, statements, maps, observations, bewitched by the observers stripped of all privileges, and who can also, through a series of corrections, transformations, rewrites, conversions, make them all compatible. It is precisely because the observers delegated from afar lose their privilege – relativism – that the central observer can elaborate his panoptic – relativity – and be present simultaneously in all the places where he does not reside. It is this practical negotiation between observers from the periphery and those from the center that gives flesh and meaning to the expression. Without it, ‘universal laws’ are empty. As soon as an observer, an instrument, an investigator becomes too specific, too particular, too idiosyncratic, he interrupts the movement of immutable motives, he adds fraying to the line, he weakens the center, he prevents the privileged observer from capitalizing, that is to say, from knowing. (Latour 1996, p. 41, author’s translation)

The objective of the reduction is to be able to respond to the cartographer's risk as described by Borges (1982). The goal is not a scale of 1:1, but rather a system that reduces documents so that they can be consulted *a posteriori* with a device that enlarges them. The bibliophoto library based on this objective with a nomadic library offering the possibility of projection was mentioned earlier. These microfiche logics will allow the reproduction of documents and thus their diffusion and consultation in different places. We know that it is by being part of this reduction/projection game that Emanuel Goldberg's (1881–1970) device, his statistical machine, which, according to Michael Buckland (Buckland 2006), was one of the first search engines in history.

The reduction operation is also part of the most classic documentary logic at the professional level. It consists of developing activities and exercises which aim at reducing the contents of a document to facilitate its diffusion and accessibility. The operations of reduction are well known; they are essential to the documentary analysis; they are the indexing which aims to reduce and represent a document by an index, a keyword or a series of keywords, for example, and the operation of condensation, that is, summarizing a document either by a summary of indicative type or by a summary of informative type.

As far as the indexing operation is concerned, it also introduces the idea of creating qualified links between documents.

### **1.3. Hyperdocumentation as hypertext**

First of all, if we think about indexing and Otlet, we will think about classification and thus about the famous UDC (Universal Decimal Classification) that he created with La Fontaine as an improved version of the Dewey. A kind of "fork", if we want to have fun with computer vocabulary.

So it is not enough to accumulate, it is necessary to organize and very quickly we need specific documents:

The document, like the instrument at B. Latour (...) is therefore stable, mobile and combinable. It can also itself be the object of an accumulation process: it thus generates a set of documents that can be called a hyperdocument. (Robert 2010, p. 37, author's translation)

If Pascal Robert sees in Paul Otlet's hyperdocument a form of binder (Robert 2010, p. 59), it is because he understands the stakes of the fusion between the instrument and the document. The binder serves to link the physical sense and the thematic sense. It fits into logics that are hypertextual at several levels in Otlet.

Boyd Rayward (Rayward 1994) has devoted several works to demonstrate the hypertextual nature of Otlet's thinking. Hypertextuality is found from the monographic principle and the need to link units together, the *bibliions*, to form larger ones. It can also be found in classificatory logic, and in particular in the Universal Decimal Classification, whose objective is not only to be able to classify works, as Dewey's decimal classification has essentially become in practice. The UDC is an instrument for managing hypertextuality by qualifying the links that exist between different documents. Within this framework, classification produces metadata that ultimately becomes more important than the documents themselves. The UDC as it is thought and developed by Otlet and La Fontaine is a new type of language, whose symbolism allows us to express and designate the contents of a document. According to Rayward, the flexible system of the UDC was limited in its possibilities of searching for information by the context of the time, whereas computer tools could have made better use of it. According to Rayward, while the dominant discourses retained Bush's influence, Otlet's work formed an important basis for the history of hypertext.<sup>11</sup>

Although the study of Paul Otlet's hypertextual thinking experienced a revival of interest in the 1990s and early 2000s at the time of the success of the web and hypertextual devices in everyday practices, we are tempted to think that Paul Otlet's hypertextual vision goes much further, so much so that it is a question of thinking about hypertext in the "hyperdistant" and the hypercity (Le Deuff 2019a) and places us in the current stakes of remote reading and other means of seeing corpuses and sums of data in a different way thanks to the computer tools that allow us to study the occurrences and co-occurrences of a text, but also to study web corpora as well as external links to produce cartographies in order to offer a renewed vision of our ways of examining realities. For Otlet, the issue at stake is not only that of distance reading, but also the fact of being able to play on changes of scale

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<sup>11</sup> On this point, we refer again to our chapter on the history of hypertext in our book on the digital humanities (Le Deuff 2018) where we show the forgotten legacies of Otlet, but also of Goldberg.

and to envisage “hyperdistant”, which is in line with Alan Liu's phrase with regard to the digital humanities “*not tools but lens*” (LIU 2009). Hypertext as “hyperdistant” is then based on games of scale, which are as much those of “distance reading” (Moretti 2013) as of “distance reframing”.

Even more so, hypertext in Otlet's work appears to be a means of becoming the “master of knots”,<sup>12</sup> the one who gathers the scattered elements to give them a greater meaning in a logic of globalization of knowledge and organizations.

#### 1.4. Hyperdocumentation as a new world order

From the outset, Paul Otlet's project is clearly a hyperdocumentary project whose visions can be considered utopian, potentially dystopian and even totalitarian:

Paul Otlet is a 19th century man. He attended the Collège Saint Michel in Brussels and received a humanistic education there, bathed in the heritage of the Ancients. For him, the world comes from an Order and all his intellectual effort will be marked by the will to bring it to light. He belongs to the lineage of Linné, Buffon, Mendeleïev, of those tireless taxonomists who brought science to adulthood, that of Reason and organization. However, the obsession with classification led Otlet to frightening social visions. The Order allows Knowledge, which itself generates Good. Starting from these premises, he will end up persuading himself that there is only one just society and that scientists hold the key to it. (Füeg 2003, p. 29, author's translation)

On this point, Füeg's warning can only echo other perspectives developed by what Suzanne Briet calls the “mage”.<sup>13</sup> We find in Otlet's work this will

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12 In the cosmologies studied by Mircea Eliade, the master of knots produces elements of imprisonment rather than freedom. In Otlet's work, the logic seems to be the opposite, but it is questionable insofar as it is clearly a question of fighting against the temptations that tend to split humanity into multiple nations and communities, while knowledge is constantly subdividing.

13 One might be tempted to compare this word by Briet with the definition of magic according to Bruno Latour: “If ‘magic’ is the body of practice which gives certain words the

to synthesize everything to confer a form of meaning on humanity, in accordance with the logic of progress. This is the objective he tries to achieve in writing *Monde, essai d'universalisme* (Otlet 1935) as well as in his atlas and encyclopedia projects.

It is probably necessary to go beyond the sole vision of Paul Otlet, bibliographer and classifier, and to consider him rather as an architect of information, of information that cannot be separated from its documentary forms. This is why the RBU projects and the collection of the widest possible documentation that is taking place at the World Palace (which has become the Mundaneum) aim to gather knowledge as well as sapience, that is, knowledge as well as wisdom. The project therefore aims in the long run to develop an international university and similar pacifistic institutions. One cannot separate Mundaneum, RBU, the encyclopedic projects from the pacifist and international projects led with Henri La Fontaine around the UAI (Union of International Associations) and even less from the architectural and urban projects to build a world city. These documentary forms are in essence more and more diverse and almost unlimited, because the world city is in fact only an extension of the map:

Also, its entire architecture would be such a function of the idea. The World City will be a colossal Book, whose buildings and their layouts – and not only their contents – will read like the stones of cathedrals were ‘read’ by the people in the Middle Ages. And so truly an immense edification would rise over time: ‘from the card to the World City’. (Otlet 1934, p. 420, author’s translation)

The Otletian project is in fact the same from the library to the more complex architectural forms, the declination of the same idea that spreads and amplifies to reach all sectors of society and allow the development of peaceful and learned societies. The objective is then to decline the Mundaneum and to unite all its different specificities in a network (Figure 1.2).

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potency to act upon ‘things’, then the world of logic, deduction and theory must be called ‘magical’: but it is *our* magic” (Latour 1988, p. 180).

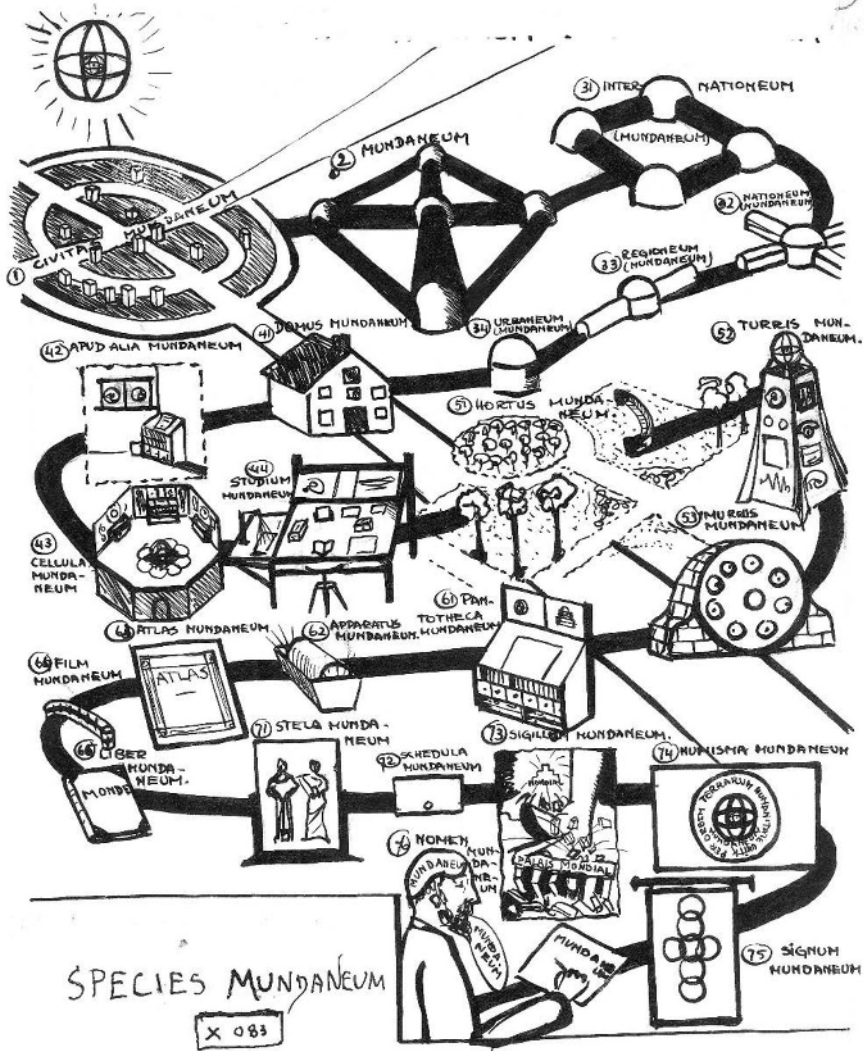


Figure 1.2. Paul Otlet: "Species mundaneum".  
The different declinations of Otlet's Mundaneum

The fact that everything becomes potentially fileable and searchable raises some obvious concerns that we will return to in particular in Chapters 5, 7, 9 and 10.

If we return to the idea of reducing the world to a searchable device, this raises questions about the reversal that this produces in the person who then possesses the power of contemplating the world, like Gulliver at Lilliput:

From one end of the empire to the other, there was an infinite dizziness of the most lively admiration; in the land of Lilliput, fame, by walking, makes everything bigger. There was no hut or palace where no one spoke of *my greatness*. (Swift 1879, p. 41, author's translation)

This sense of greatness and power in a world reduced in size may also be rooted in Otlet's early observation of micro-worlds, such as the one he made in his early youth when his father bought the *Ile du Levant*. The young Otlet had moreover managed to write his first book (Otlet 1982), acting as both analyst and compiler in a spirit not devoid of adventure. The work ended with a sentence that announced the author's desire to pursue precisely this spirit: "Qui vivra verra" ("Who will live will see").

#### **1.4.1. A hyperdocumentation between utopia and dystopia**

The project of a hyperdocumentation then resides in a tension between the institutions of knowledge and truth. How far should they pursue their mission, not to say their "evangelization"? Otlet seems to have set no real limits to the forms of governance of his ideal world. Otlet's organization presupposes international and probably supranational political extensions. From then on, we can move from micro-organization to large groups, from microcosm to macrocosm, from the card to the world city. Indeed, to fully understand Paul Otlet's documentary work, and in particular the *Traité de Documentation*, which constitutes a sort of sum and synthesis of the work he carried out during the preceding decades, one must also read his synthetic enterprise of thinking about the world through his work fittingly entitled *Monde* (Otlet 1935).

We find in it a will to understand the world as Paul Otlet sees it and lives it through his various readings, particularly scientific. The documentary project is therefore fully in line with the scientific and technical advances of

his time. Paul Otlet goes further, however, and the connection of the documentary project takes on its full meaning with *Monde*. The same coherence can be found in the numerous diagrams available at the Mundaneum, but in *Monde*, Otlet shows visionary aspects that finally oscillate between utopia and dystopia, as his description of a networked world seems to have no limits.

The basic articulation lies in the book unit, which is that of the *biblion* rather than that of the book as understood in the current edition. The book as a written and descriptive entity is fully articulated with human work, especially intellectual work. The book is the possibility of an augmented man.

There are three functions to consider: A. Information (data); B. Documentation (fixing in documents); C. Communication (transmission). > Work – Book. – Book as an instrument of thought. –Thought, essence of the human being and also instrument of the creation of the environment that extends, enlarges, amplifies the human being. (Otlet 1935, p. 388, author’s translation)

However, there is an augmented thought of man, described here as “amplified”<sup>14</sup> thanks to the book as an instrument of thought. Within this framework, it is documentation that constitutes the link of a networked world. A network based on three essential functions: data, documentation, communication, which is reminiscent of the words of Tim Berners-Lee in his presentation of the web and who considered that the objective was to share *data, documentation and news*.

According to Otlet, however, the network can only be universal and orderly:

In order to preserve and use this formidable mass of documents, the company is continuing to create the Universal Documentation Network through international cooperation. The operations of documentation refer to the intellectual

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14 It is also a reference to Van Houtte’s (1872–1948) theories of amplification which describe and envisage a continuous development of humanity with the development of a new phase for Europe which would become uniform again after a phase of crumbling. Otlet considered that it was necessary to go further and therefore evoked “globalism” (Otlet 1908).

composition of works, their reproduction, distribution, cataloguing (bibliography), criticism; to the formation of collections, to the work of codification (elaboration of treaties, encyclopedia, universal codes). The network is conceived on five levels: (1) organization of the multiplicity of graphic and intellectual data to constitute the unity of books and documents; (2) organization of the multiplicity of books and documents of the same category into specific collections; (3) organization into institutions (libraries or offices) of the various collections or funds; (4) organization into a network of all local, regional and international institutions, some special, others general; (5) correlation with the organization of intellectual work and, beyond that, with the world organization in general. (Otlet 1935, p. 388, author's translation)

Otlet has designed his classification project to meet precisely this dual objective of increase and reduction.

#### **1.4.2. *Between classification and synthesis***

The classificatory project is based on the Universal Decimal Classification, conceptualized in tension with its related classificatory possibilities. It is coupled with all other scientific methods:

Classification. – In the Classification must be found, as in the intellectual instrument of supreme synthesis, the systems of thought and the order of action, and the harmony of sensibility. But to exist in the realm of conceivable realities, the Classification must express itself. This expression itself can only be synthetic, and consequently it must in turn achieve the progress to which our poor languages and old writing can no longer aspire. It must combine at the same time the best of what scientific terminology, notation, schematic representation, measurement and standardization, and mathematics (algorithm, formula, calculation) have brought. (Otlet 1935, p. 389, author's translation)

The classification here goes beyond the tree logic of traditional classification to borrow from all scientific methodologies that allow rationalization and measurement. Otlet's synthetic position finally joins later

attempts to mix combined approaches between social sciences and mathematics. We find examples of this in his statistical vision of the social sciences and humanities, notably around the concept of bibliometrics. Otlet can thus be considered as a kind of tutelary figure of the digital humanities, as Martin Gandjean was able to affirm.<sup>15</sup> A sort of mixture between different currents, whose forms may also recall the attempts around Otto Neurath (1882–1945) to create a unified science. The evoked project reminds us that language gives form to the mind and that it is therefore necessary to go beyond old languages to produce new ones: we find in Otlet the long inscription in the lineage of universal languages (Esperanto and IDO in particular) and the new intellectual possibilities that it could develop:

The form of language has a major influence on the form of the mind. Language unconsciously directs our mentality because it is the essential element of thought. To create a synthetic Classification with concise notation of ideas is to endow the mind with a true universal written language capable of acting powerfully on the form of Thought itself. (Otlet 1935, p. 389, author's translation)

Here we are again on the subject of amplification or augmentation with a language that opens up extended mental perspectives, but which produces a reducing effect to facilitate exchanges with obviously the risks underlined by Borges in the analytical language of John Wilkins (Borges and Bénichou 1992). But what interests Otlet lies in standardized actions that make it possible to generate convergences in the processing of information, and in the possibilities of representation and understanding that then become possible. Classificatory logics must be understood in broad perspectives that also take into account mathematical and statistical potentialities, as is the case in the field of accounting, a field that interested Otlet both for practical reasons (it was necessary to keep Otlet's accounts and to take stock of his father's unsuccessful investments) and for organizational and mundialist reasons, because Otlet saw the possibility of having compatible accounting balance sheets that allowed for real-time statements of accounts from the smallest firm to the global level:

If we envisage a General Technique of Action, we can also, from that moment on, design a general instrumentation

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<sup>15</sup> Statement during a training day on October 13, 2017 in Lyon.

(whatever name we want to give it) that merges and coordinates in a single unit all the auxiliary instruments of the five operations recognized as fundamental to any company or administration: Accounting, Statistics, Documentation, Continuous Recording of administrative and technical data specific to the organization under consideration, and Controls, all of which are related to the General Program and the particular programs of the company, to the General Study on which it is fundamentally based, to the Reports and Minutes concerning the operations carried out and the facts that have occurred, to the Forecasts, Estimates and Budget that consider the future, and this in accordance with the rational methods recognized as the best. Such instrumentation is becoming more and more necessary for the management of large businesses, for the management of large communities. Only it will allow the conductor to have the analogy of what the Scores are for the leaders of multi-part orchestras, it will bring real efficiency making everything that can be automatic, and thus freeing the brain for new work and reflection. (Otlet 1926, p. 7, author's translation)

Otlet's synthetic approach not only gives a better understanding of the situation, but also makes it easier to envisage the changes that can be made.

### **1.5. The ultimate perspective of the documentation**

The ultimate perspective of documentation (Le Deuff and Perret 2019b) and of science proposed by Paul Otlet allows us to glimpse the ultimate goals of science and technology and more particularly of documentation:

Ultimate documentation problem. In each science, in each order of activity, it is worth seeking to define its ultimate problem, a state which is certainly far from being reached, but which is likely to stimulate and coordinate particular research by setting a general direction for it. The ultimate problem of scientific knowledge: to know so well all reality, its beings, its phenomena and its laws that it is possible to disintegrate everything that exists, to reconstitute it, to order it in different ways. The ultimate problem of technology: One man having only to push a button so that all the factories of the world,

perfectly adjusted to each other, start to produce all that is necessary for all humanity. The ultimate problem of Society: Freedom creates divergence. In a borderline state, there would be no need to have recourse to others. Everyone could obtain everything he would desire by appealing directly to things alone, and by dispensing with men. Thus the machine would have become the liberator of each one, its functioning being done by one and things being arranged in the order suitable for that one. (Otlet 1935, p. 390, author's translation)

Otlet proposes a relationship to the ultimate and total truth that places man in the position of demiurge insofar as it is no longer a question of knowing the truth, but of proposing a new order, which is not without recalling the work around genetics and transhumanist tracks. It is no longer just a question of studying and understanding, but potentially of changing and improving. This passage is not insignificant; it shows that Otlet imagines a scientific pursuit that can be based on manipulations of what already exists. His proximity to the physician and Nobel Prize winner eugenist Charles Richet may explain this. More astonishing finally is the description of the ultimate problem: that of documentation which becomes that of access to knowledge in its totality or its specificities. Documentation allows access to a form of divine status in its ultimate objectives:

And now here is the ultimate problem of documentation (technical and organizational). Man would no longer need documentation if he were assimilated to a being who has become omniscient, in the manner of God himself. To a less ultimate degree would be created an instrumentation acting at a distance that would combine at the same time radio, Röntgen rays, cinema and microscopic photography. All things in the universe, and all things in man, would be recorded remotely as they happened. Thus would be established the moving image of the world, its memory, its true double. Everyone at a distance could read the passage which, enlarged and limited to the desired subject, would be projected onto the individual screen. Thus, each in his armchair could contemplate the creation, in its entirety or in some of its parts. (Otlet 1935, p. 391, author's translation)

It is in fact hyperdocumentation in its most accomplished form that Paul Otlet describes. Everything is now consigned or recorded, one can play with

the ways of accessing knowledge, ideally from one's armchair. It is this possibility of operating a "regulated" proximity with respect to knowledge: this is what is at stake in the reduced distance chosen by the observer. Here we find Borges' paradoxes with the idea of a double of the documented world.

*Qui scit ubi scientia sit, ille est proximus habenti* – "Whoever knows where knowledge is, the latter is close to possessing it." This is the formula found in certain documents of the Mundaneum and which appears as an exergue of the *Traité de Documentation*. It is here that the interpretation of this quotation can take on several meanings. It has often been thought that knowledge is power, but in Otlet and his vision of hyperdocumentation, knowledge is having it as possession and not only as potentiality. After his description of the ultimate problems, Otlet continues in *Monde* to argue for documentation as the only response to a disturbing phenomenon: hyperseparatism, which resonates here as anti-universalism, a point to which we will return in the last chapter. One might be tempted to make a current reading of it, but the context is that of the succession of conflicts, particularly European ones, at the beginning of the 20th century:

From the train on which the world travels, on its way to hyperseparatism, there will soon be nothing but documentation to establish regular and benevolent contact between men. (Otlet 1935, p. 388, author's translation)

The reading of *Monde, essai d'universalisme* proves to be rich, glimpsing several questions essential to scientific organization and the organization of societies while showing Paul Otlet's frameworks of thought. The final chapters will examine the risks of "total" thinking. However, the conditions for establishing documentation remain to be questioned, since hyperdocumentation resides in a relationship to "documentarity", posing the essential issue of the relationship to truth and the qualities of documents. In the context of Paul Otlet, it is strongly linked to the quality of information, an essential mission of documentation:

The aims of organized documentation consist in being able to offer documented information in any order of fact and knowledge: (1) universal as to its purpose; (2) safe and true; (3) complete; (4) quick; (5) up-to-date; (6) easy to obtain; (7) gathered in advance and ready to be communicated;

(8) made available to the greatest number. (Otlet 1934, p. 6, author's translation)

But it is also a question of having quality data to better understand the lived reality. It is understandable that there are currently confrontations between the reality that emanates from experience, or even personal experience and perceptions, and that of figures and statistics, which very often differ. To the personal feeling that everything seems to be going wrong, statistics can be opposed. Better still, the desire to have precise overall visions of the situation in statistical terms appears to be essential for decision making. The pandemic context shows this need, but it is consubstantial with government logic, which needs to have up-to-date summaries to make planning decisions. For this reason, it seems necessary to develop methods and logics of capture to be able to benefit from a hyperdocumentation that allows the generation of a hyperreality that is the condition for easier decision making.

It remains to be seen how far these questions of truth and informational quality go, since, in the final analysis, the stakes are as much about knowing the universe through scientific progress as they are about knowing individuals and their actions through the progress of investigative methods. Perhaps there is still a middle way to be defined that would place us in a form of sapience, in a balance between wisdom and knowledge. A way of understanding that our so-called informational or data societies are above all societies increasingly based on documentality.