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## ORGANIZING WITHOUT UNDERSTANDING: LISTS IN ANCIENT AND DIGITAL CULTURES

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### A WEB OF LISTS

When algorithms talk to us, they do so in lists<sup>1</sup>—not always, but far more often than was the case before, in press or mass media communications. Algorithms seem to be retrieving an ancient way of communicating that societies had overlooked for thousands of years. Why is this happening? We will see that it is at least partly the result of the ways in which lists are a “natural” way for algorithms to communicate with us. And we will see that our common way of organizing information and dealing with news has become more and more affected by our communication with machines that do not think like us.

The web, labeled by Umberto Eco “The Mother of All Lists,”<sup>2</sup> apparently “thinks” in the form of lists.<sup>3</sup> In the digital world, the pervasive form of the list seems to be the preferred manner of organizing information, reproduced recursively at various levels of organization.<sup>4</sup> Lists multiply. The algorithms directing the web are lists of instructions; databases are lists of data that search engines process to provide further lists of websites; and services like Amazon and TripAdvisor deliver lists of products and restaurants, while News Feed constantly offers updated lists of friends’ Facebook activities. Forms of communication in traditional media are furthermore affected by this shift: articles are written more and

more often in the manner of a “listicle,” that is, as a list, and there are entire websites, such as Listverse, containing nothing but listicles.<sup>5</sup>

The web works on the basis of lists to produce further lists, and then a second order of lists helps to direct our search for information—also by way of lists: for example, BuzzFeed and other services manifest themselves as lists of newsworthy lists. Lists are managed through lists, with their ultimate form being the ubiquitous top-ten lists that seem to have become one of the primary forms by which newer generations are organizing information. A prophetic, though parodic, example of this might be found in the character of Rob Fleming in Nick Hornby’s novel *High Fidelity*, who reflects on himself and the world through the practice of compiling top-five lists of all of the elements of his personal life and self-image.

Why are lists multiplying exponentially in our digital society? Why does the web seem to have an affinity with the form of the list, which previously had a long history in ancient civilization, before being supplemented and then gradually replaced by other more efficient methods for data management?

In this chapter I explore the practice of using lists in digital societies, where this form of informational organization is not only on the web but, in the last few decades, has become a more general and ubiquitous mode of evaluation for objects and services. This phenomenon can be found everywhere in ratings and rankings: university rankings; financial ratings; ratings of restaurants, hospitals, and prisons; rankings of states; rankings of movies, books—of virtually everything, deeply affecting practices of observation and self-observation in all areas of society.<sup>6</sup> Is there something common to these forms, given their parallel ascent in contemporary culture—and do they all have the same effect? What are the differences (and relationships) between lists, ratings, and rankings? What is the specificity of the list compared to other forms of sequential organization?

To answer these questions, I first describe and distinguish flat, evaluative, and hierarchical lists. I then trace the historical evolution of the form of the list and its progressive generalization in Western civilization, which led to increasingly structured forms of content organization. In a subsequent step, I specifically address the web and digital data processing, and ask why the form of the list is spreading at this moment, especially

in the last three decades since algorithms have begun to become active participants in social communication. What is the relationship between lists, the web, and algorithms—the central tools of web information processing?

## LISTING, RATING, RANKING

Lists are everywhere, and occur in different forms: there are simple *lists* (friend lists on Facebook), there are *ratings* (lists of evaluated items like restaurants or financial assets with corresponding metrics—stars, alphabetic letters, hearts), and there are *rankings* organized as lists of objects in hierarchical order (the “100 Best Colleges in the US”). They are all lists, but not all lists are rankings, nor even ratings. Furthermore, not all ratings are rankings. What, then, is the difference?

*Ratings* have an evaluative component, in the sense that they attribute scores—about the solvency of companies, the reliability of nations, the quality of restaurants, wines, or movies, and so on—such as AAA, Ba2, three stars, or two glasses. In many cases, ratings are created without the intention of comparison—they only evaluate, assigning scores to individual objects in their specificity. The assessment is focused on single items, because every scientific article, every firm, every wine, every object is—strictly speaking—unique and distinct from every other one. What these raw scores offer is a multiplicity of singular judgments. In classic guides like *Michelin*, the various features of restaurants were initially dealt with separately: the quality of materials and preparation, for example, but also originality, atmosphere, view, and many other factors that cannot be sensibly aggregated into a single measure.<sup>7</sup>

*Rankings*, instead, compare the listed items. They establish a hierarchy, typically from first to tenth place (such as the items on the first page of Google search results), although they also may run up to the fiftieth or two-hundredth rank, and so on: the ten best restaurants in London, the top fifty universities less than fifty years old, the best two hundred sci-fi movies of all time. Each entry has a unique position that is higher or lower than the previous one, and this positional information is delivered by the ranking. One’s attention is focused on the comparison much more than on the characteristics of the items, which tend to disappear from

view. The users of rankings look at who's up and who's down, rather than their independent properties. The ranking primarily describes the mutual relationships between a number of entities, rather than the performance of each individual one.<sup>8</sup>

Simple *lists*, on the other hand, have no evaluative component, nor do they need to have an order—something clearly shown by the much-quoted list of animals in Borges's Chinese encyclopedia (animals that belong to the emperor, embalmed ones, suckling pigs, mermaids, fabulous ones, stray dogs, and so on, including “those included in the present classification,” and “others”),<sup>9</sup> but also by most of our daily shopping lists. Usually there is no reason why milk might be listed before apples or dishwasher detergent or eggs, and the list can be read from the bottom to the top without losing any information. Lists are extremely flexible and extremely fungible, and they usually require contextual or interpretive additions in order to become useful<sup>10</sup>—for example, the layout of the store where we do our shopping, or groupings by the user (dairy products, fruits, household cleaners).

When did these different forms (ratings, rankings, and lists) become such a fundamental part of the organization of society? What made them possible? What are the relationships between them? When and how do evaluative and hierarchical forms combine with the simple sequence of the list?

## WRITING, CONTEXT, AND ABSTRACTION

Flat lists are an ancient form, typical of civilizations in times of early writing practices, especially those practicing nonalphabetic techniques—in Mesopotamia, among the Sumerians, and in the archaic civilizations of Egypt and China.<sup>11</sup> While lists also exist in oral discourse, they are infrequent in face-to-face communication.

The conditions of oral communication do not favor the use of lists, because lists require an initial step of abstraction and decontextualization. The space of the list is not our immediate physical space. Participants in face-to-face conversations are, instead, always immersed in a context and in an ongoing situation. They share the same space and the same time—here and now. In primary orality, when all communications

were face-to-face, no awareness of contextual factors and their variability was required because there was no need to observe them: one only communicated with people who were simultaneously in the same place, knew it, and knew each other.<sup>12</sup> Context was taken for granted and communication was characterized by a low level of abstraction.<sup>13</sup>

Writing introduced a substantial intellectual break with the conditions of orality; it required writers and readers to distance themselves from the concrete context of an ongoing situation and to record content for a different condition in time and space—with the advantages and the freedom connected with this detachment, yet also with its related complexity. The form of the list helped in this move. Lists abstract their objects from the present situation and place them in a different frame, together with the other listed items. Lists break the “natural unity of the perceptual world”;<sup>14</sup> they require an act of distancing and introduce a discontinuity between the listed items and everything else, and of the listed objects from each other. Thinking in the form of lists supports the intellectual attitude introduced by writing and requires the support of written records.

Archaeological research shows that at the beginnings of writing, especially nonalphabetic writing, lists were very common.<sup>15</sup> Ancient written documents practically never had a narrative form and did not reproduce discourse—this would happen much later. These documents were rather drawn up in the form of lists. From the perspective of sociological communication theory, this is completely plausible. People did not write what they said, nor did they write in order to communicate with absent partners—they wrote for administrative and economic purposes. Lists were written to record sales and purchases, rentals, loans, marriage bonds, wills—not to communicate with someone but to define content and to remember it, just as we do with our own notes and shopping lists. But ancient lists collected the most heterogeneous of materials. Mesopotamian cuneiform lists include plants, animals, artifacts, professions, titles of officials, toponyms, body parts, and foodstuffs—each in an order about as adventurous as Borges’s Chinese list of animals. In Weinberger’s terminology, ancient lists were *miscellaneous*, including piles of items without a predetermined classification or categories defined in advance.<sup>16</sup> As with all flat lists, these ancient records could be read either downward or upward, since the order did not provide any additional information.<sup>17</sup>

Despite the lack of an unequivocal order (or because of it), the production of lists marked a significant step in the organization of knowledge.<sup>18</sup> Lists require that we abandon our implicit adherence to an immediate context and that we observe the recorded items in a detached way,<sup>19</sup> but do not necessarily imply the further abstract conceptual tools necessary to build an alternative context.<sup>20</sup> According to Goody, advanced abstraction and recontextualization were the consequence, not the precondition, of written lists; abstraction came later. When items are listed in a column (or in the multiple columns of a table), an observer can notice correspondences and similarities that escape the zoomed-in focus one has when absorbed in a context, or combine objects according to patterns and structures. They can be grouped, opposed, or rearranged. This can give rise to a deeper analysis of correlations and correspondences that can eventually lead to more abstract forms of conceptualization of content. As Doležalová observes, “An idea is not necessarily the driving force in compiling a list, but may emerge from it.”<sup>21</sup> To make use of a list, you don’t have to understand an abstract organizing principle—rather you develop one in dealing with the list.

The advantages of this nonabstract organization of content primarily concern forms of writing that are not completely phonetic. With accomplished phoneticity, that is, with the use of the alphabet since the eighth century BCE, detachment from context was perfected and new forms of abstraction became possible (and needed). While pictographic writing is only accessible to a reader who already knows the meaning of its signs, and syllabic writing requires the addition of vowels by a reader able to make the appropriate integrations,<sup>22</sup> reading an alphabetic text does not require such contextual information. With the alphabet, if a reader knows the rules of how a language should be read, it is possible to read texts about previously unknown topics and issues, because the texts themselves provide all the information required for communication.<sup>23</sup> In linguistic terms, the co-text takes the place of the context.<sup>24</sup> Only then could the context of the writer be fully uncoupled from the context of the reader. Time and space for the text do not coincide with the coordinates of the location of its readers, who must be able to manage this separation, while the writer must take into account contextual differences in order to produce an understandable text. Writers and readers must be able to

master a world of abstract references (a date, a toponym) independent from any reference to their immediate situation (yesterday, over the hill).

According to Havelock, these performances were the background of the beginnings of abstract thought in Western civilization,<sup>25</sup> which led to the progressive marginalization of lists as relatively concrete forms of ordering. Western consciousness, he argues, was born when a notion like “justice” became a universal concept and no longer coincided with a list of examples: Agamemnon is just, Hector is just, and so on. Eco claims that a rise in abstraction led to a switch from definitions according to properties (which Aristotle called definition *per accidens*) to definitions according to essences, which require a more detached analysis of an object.<sup>26</sup> Plato, who first defined concepts in terms of a thing’s abstract essence, despised lists, which he claimed merely enumerate a “swarm” of examples.<sup>27</sup> Aristotle then notoriously introduced an organization of ideas by abstract categories,<sup>28</sup> which provide a frame of reference that replaces immediate contexts. *Metaphysics* rejects the form of the list. An abstract understanding of the world comes before its observation.

Havelock’s interpretation might be controversial, but scholars agree that the form of the list, widespread in the ancient world,<sup>29</sup> became progressively less common after the introduction of alphabetic writing. Lists can still be found in epic poems like the *Iliad* (as in the famous catalog of ships),<sup>30</sup> or in many passages of the Old Testament—which in fact were composed orally before the introduction of the alphabet. In written texts of Western culture, the form of the list was gradually supplemented by more complex arrangements—tree structures or classification systems—producing an order that goes beyond the simple juxtaposition of objects and beyond the rhetorical forms of accumulation and enumeration.

Lists do not disappear in this process, but take on other functions, confirming the remarkable flexibility of their form.<sup>31</sup> The recording of data in lists was a prerequisite for their manipulation and for the development of forms of calculation, like divinatory arithmetic in Chinese and Mesopotamian civilization,<sup>32</sup> eventually leading to algebra and to other abstract computations. While ancient “miscellaneous” lists from the fourth and third millennia BCE did not have an order, since the middle of the second millennium BCE, more specific forms of organization came into being. These forms refer to the meaning of the words

(following the parts of the human body from the head to the feet, or according to spatial orientation), or to the form of the signs (e.g., according to the initial letter or to the acrographic principle—i.e., graphic similarity). Once data are objectified in writing, they can be observed from a distance and it becomes almost inevitable to identify other organizational criteria. With the increase in abstraction of social semantics, more and more complex classifications followed. Lists tended to develop toward organized series like ratings and rankings. In the form of Porphyry's tree,<sup>33</sup> eventually, the hierarchical arrangement in abstract categories remained for thousands of years the basic scheme for the organization of knowledge.<sup>34</sup>

## LISTING MACHINES

Jumping forward several centuries, the complexification of the order of knowledge introduces the next step of the argument in this chapter: why are lists multiplying in the digital world, and what is their relationship with the logic and the operational mode of algorithmic data processing?

As argued above, research on the ancient uses of writing shows that lists are an effective way to manage complexity with limited abstraction capability. Lists were very common in ancient cultures that started recording and organizing data. A big advantage of the organization of data into lists is that they do not need abstraction nor reflection about the sorted objects or the organizing activity. Miscellaneous lists make it possible to generate an order without a predefined ordering criterion, without going into the details of the listed items, and without really knowing them.<sup>35</sup> They yield an order almost automatically, even if one doesn't understand what one is ordering.

Modern societies, of course, are very capable of abstraction, but not ubiquitously. The algorithms that process data on the web do not work with abstraction, which is their main asset. Algorithms merely calculate. This has always been the case,<sup>36</sup> but the lack of abstraction becomes more and more relevant with the development of sophisticated procedures like self-learning algorithms working with big data, as with the recent machines that seem to be able to act as competent communication



partners.<sup>37</sup> In projects based on algorithms, lists are recognized as “very useful devices.”<sup>38</sup> And algorithms produce the pervasive lists we find on the web and in digital data processing. Why?

The power and the efficiency of algorithms depend on their ability to calculate without abstraction. The impressive accomplishments of self-learning algorithms in recent years have been achieved using programming techniques that explicitly give up on the idea or even on the ambition of artificially reproducing the forms of human intelligence. Algorithms do not reason the way we do in order to do what we do with abstract reasoning. This can explain, as in ancient prealphabetic cultures, the preference for the form of the list, which becomes informative without requiring abstraction in its production and in its use.

According to David Weinberger, the digital age is introducing a “new order of order,” changing the shape of our knowledge.<sup>39</sup> The system for organizing the world no longer coincides with the system for understanding it—as had been true for the human reasoning incorporated into the model of Porphyry’s tree. Instead of specifying organizational categories ahead of time in the form of structured trees, a revolution has occurred in tagging content that uses “piles of leaves” without a pre-defined order<sup>40</sup>—in practice, flat lists with no ordering principle, from which a previously unknown order can emerge. Self-organizing taxonomies, for example, emerge as “folks-onomies.” The order resulting from the miscellaneous collection of unselected, uncontrolled big data (and metadata) has no underlying principle and is flexible, dynamic, and inevitably ambiguous (and thus “messy”), yet still provides a frame that makes it possible to deal with the data.

Algorithms sort data and discover patterns without understanding the elements sorted, offering them up to meaningful interpretation—that is, algorithms “add context back.”<sup>41</sup> Meaning and understanding, if they arise, emerge from the algorithmic organization of the data, and are not its premise. Systems for image recognition, for instance, “discover” faces of cats in the materials they analyze, but not because they have a concept of “cat,” which would serve as a means of understanding and recognizing its instances.<sup>42</sup> These algorithms, used by Flickr and Instagram, instead work with piles of data and metadata, identifying patterns without any

humanly understandable reason.<sup>43</sup> The outcomes of algorithmic processing, however, can become meaningful to the users, with outcomes often presented themselves in the form of a list. Algorithms work with lists to produce lists.

From the perspective of the user, meaning must be produced out of an order that has been produced independently of meaning. That's why lists are so effective. Think, for example, of the success of listicles. With increases in the uses of automation and exorbitant availability of data, the role of algorithms in the management of materials in publishing and journalism is becoming increasingly important. All kinds of editorial decisions are outsourced to the algorithms—such as those guiding Facebook News Feed, Chartbeat, or others.<sup>44</sup> Their products are lists, which are deeply affecting the production of news. BuzzFeed was the first to realize and explicitly exploit this form of organization, cramming into its lists news items that were detected algorithmically within reports published elsewhere, and publishing them as such.

The outcome is the listicle, which is easy to write (being produced by machines), and is similarly easy to read. Readers are met with a sequence of topics with no connection to each other and no argumentative order. People like listicles. They read and consume them as they prefer, stopping when it suits them and freely building their own order—without in turn losing or distorting the sense of the list, given that it has no sense to distort. The sense can be produced as a consequence of the list. Poole attributes the rampant success of listicles to this ease.<sup>45</sup>

For this reason, when in March 2014 the *New York Times* decided to get closer to its readers, it started running more listicles. Not only book, restaurant, and movie recommendations,<sup>46</sup> but also political comments and takeaways from relevant events or inquiries are presented as sequences of points, in articles such as “Midterm Election Results: 4 Key Takeaways,” “Damage Control at Facebook: 6 Takeaways from the Times’s Investigation,” and “Five Takeaways from Our New China Project.”<sup>47</sup> This evolution is transforming the landscape of contemporary journalism with complex feedback loops.<sup>48</sup> Whereas traditional newspapers such as the *New York Times* are increasingly resorting to the algorithmic forms of the list, highly automated sites are discovering the need to take care of and monitor the workings of algorithms by approaching the practices and methods of

traditional journalism: BuzzFeed created BuzzFeedNews, Facebook introduced News Feed, Google offers Google News.

This has happened significantly in journalism, but not only journalism. Top-ten lists are multiplying on the web and becoming a specific form of information dissemination. In many cases they are not pure lists because a hierarchical ordering is involved: these lists not only include a set number of entries, they also ascend or descend in orders of magnitude (“1 to 10: The Best Vegan Restaurants in Trastevere”). But even these hierarchical orderings are produced by algorithms without understanding and without abstraction, drawing on indications and forming calculations based on the behavior and preferences of users (likes, retweets, and backlinks).<sup>49</sup>

## CONCLUSION

As in ancient Mesopotamia, in our digital civilization lists produce arrangements that can generate specific forms of information and information management, including the recent booming proliferation of ratings and hierarchical rankings. This poses a challenge to theoretical description. To investigate these developments we might need a revised version of the *Listenwissenschaft* (“science of lists”)<sup>50</sup> developed to deal with Babylonian lists and their evolution. A proper scientific observation of the organization of the web would need to be updated to fit the features of our digital environment.

This raises new questions. The discussion about information processing on the web would have to deal with the social effects of the organization of data in lists. One should explore what happens when our digital society observes itself and the observations of its members according to the processes of algorithms that do not think—as in current journalism. The selection and organization of news is guided not by human reasoning but by formal patterns computationally drawn by the behavior of the users. What does the form of the list make visible and what does it obscure, when its production does not use abstraction and merely reproduces, reorganizes, and amplifies the abstract processes and the selections of the users? How does an awareness of the features and consequences of lists contribute to properly describing digital information management?



This is a section of [doi:10.7551/mitpress/14189.001.0001](https://doi.org/10.7551/mitpress/14189.001.0001)

# Artificial Communication

## How Algorithms Produce Social Intelligence

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### Citation:

*Artificial Communication: How Algorithms Produce Social Intelligence*

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DOI: [10.7551/mitpress/14189.001.0001](https://doi.org/10.7551/mitpress/14189.001.0001)

ISBN (electronic): 9780262368865

Publisher: The MIT Press

Published: 2022

The open access edition of this book was made possible by generous funding and support from the MIT Libraries.



The MIT Press

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The MIT Press would like to thank the anonymous peer reviewers who provided comments on drafts of this book. The generous work of academic experts is essential for establishing the authority and quality of our publications. We acknowledge with gratitude the contributions of these otherwise uncredited readers.

This book was set in Stone Serif and Avenir by Jen Jackowitz. Printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Names: Esposito, Elena, author.

Title: Artificial communication : how algorithms produce social intelligence / Elena Esposito.

Description: Cambridge, Massachusetts : The MIT Press, [2022] | Series: Strong ideas series | Includes bibliographical references and index.

Identifiers: LCCN 2021013271 | ISBN 9780262046664 (hardcover)

Subjects: LCSH: Telecommunication—Social aspects. | Artificial intelligence—Social aspects. | Online identities. | Social intelligence.

Classification: LCC HM851 .E765 2022 | DDC 303.48/33—dc23

LC record available at <https://lcn.loc.gov/2021013271>

10 9 8 7 6 5 4 3 2 1