INTRODUCTION

Leonardo da Vinci is worldwide considered to be one of the greatest geniuses in human history. The famous frescoes and paintings that we can still admire today are only a tiny fraction of what constitutes the gigantic heritage of Leonardo da Vinci’s significance. Part of his heritage is an incredible amount of sketches that survived the total dismemberment thanks to vicissitudes that comprehend legacies, lootings, millionaire purchases, and thefts.

On the occasion of the 500th anniversary of the great master’s death a digital application has been launched: a tool that allows people to access the entire content of the artist’s sketchbook, the «Codex Atlanticus».

The book is the largest existing collection of original drawings and texts by Leonardo da Vinci and is preserved at the Biblioteca Ambrosiana in Milan. This codex comprises 1,119 pages dating from 1478 to 1519. Due to this wide time span, it contains a great variety of subjects: from architecture to engineering, from art to natural sciences. The complexity intertwined with the subject identified, highlighted the need for shaping a tool of digital humanities that helped to show, explore and analyze such vast and diverse content.

The database behind the application is based on a philological study done in the 1970s by Augusto Marinoni, then considered the greatest expert on the philology of Leonardo da Vinci. His publication «Il Codice Atlantico di Leonardo da Vinci: indici per materie e alfabetico»¹ contains a substantial critical analysis of this work. Furthermore Marinoni created a catalog of 140 topics present in the Codex Atlanticus and attributed each page to one of these topics, including an estimation of when each page was created. To sum up, the Codex Atlanticus is not only rich in content but also offers an incredible source of information that can be accessed when analysing and cross examining all the insights related to the single pages.

The use of technology and in particular the field of data visualization and information design have allowed The Visual Agency to create an application that makes this complexity and all the hidden insights visible and more accessible for users.

¹ The Codex Atlanticus by Leonardo da Vinci: alphabetical table of content and by subject
THE APPLICATION

This application is freely available online at the URL www.codex-atlanticus.it. The introduction addresses the general public, which might have no previous knowledge of what the Codex Atlanticus is. After this background information, the user is invited to explore the content of the codex. For the purpose of making the content accessible to everyone, the 140 topics identified by Marinoni have been grouped into five main subjects:

- Geometry and algebra with 1,141 occurrences;
- Physics and natural sciences with 1,004 occurrences;
- Tools and machines with 904 occurrences;
- Architecture and applied arts with 496 occurrences;
- Human sciences with 429 occurrences.

The general overview represents the visualization of these occurrences and consists of a matrix of 1,119 modules, one for each page. Each of these rectangles is a proportional area chart whose dimensions depend on the number of occurrences of each of these five subjects on that specific page. Thanks to this main visualization, users can get an idea of the occurrences of each topic in a single glance.

Surrounding the general overview, there are the subject and topic filters. This section allows users to select the subjects of interest and see all relevant pages in the general overview. The bars that represent each subject are proportional in size to the frequency with which topics occur on each page, visually and numerically displaying the results of the selection. A list of topics will be displayed below the subjects and each entry can be selected to view pages concerning that specific topic.

Another important feature is that pages can be ordered in two ways: numerical order organizes the pages in the order by which the pages of the codex are universally cataloged. The chronological order organizes the pages by the year of writing as attributed by Augusto Marinoni.

By moving the mouse pointer over the individual pages, a preview of the recto (front) of the page is generated with indicators relating to the page number and presumed year of...
writing. Clicking on any preview the application will provide access to the detailed view. The page view allows users to gain more in depth information about the content of every single page of the Codex Atlanticus. This section is headed by a zoomable picture of the front and back of the selected leaf and surrounded by the information about its content.

**THE TOUCH-SCREEN TOTEM**

The application is not only accessible online but exists also physically in the form of a touch-screen totem hosted at the Pinacoteca Ambrosiana in Milan. The totem is located beside the original pages of the Codex Atlanticus that are exposed in the famous Sala Federiciana.

This version of the application is designed specifically to be experienced through physical interaction between the user and the touch-screen. In addition to interaction design experiments it contains full resolution pictures also including the pages shown in the exhibition.

**CONCLUSION**

The cataloging and visual transformation of the Codex Atlanticus and the information it holds are unique and open new ways to study and experience this collection of texts and drawings and to dive into the work of one of the great masterminds of history. Applying technology, data visualization and information design to this artefact uncovers hidden insights that are invaluable for science.

Through the user centric design, accessibility and visual language these insights are not only reserved for the expert’s eye but can now be discovered and understood also by members of the wider public coming from different cultural backgrounds, age groups and with different levels of technological literacy. The application is a perfect example of how information design and data visualization create value which can be applied to the arts but also many other disciplines.

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**About the Author**

Matteo Bonera is Creative Director at The Visual Agency, Professor at Politecnico di Milano.

For more information: [www.thevisualagency.com](http://www.thevisualagency.com)