

BOOK REVIEW

Kim Marriott, *The Golden Age of Data Visualization: How Did We Get Here?*

Boca Raton, FL: CRC Press, 2025. Pp. 374. ISBN 978-1-032-83079-7.
£130.00 (hardback).

Jessica Carter 

Centre for Science Studies, Aarhus University, Aarhus, Denmark

In an age flooded with information, modern visualization theory provides methods for organizing and interpreting complex data. The techniques, however, have been developed over a period of thousands of years. Kim Marriott's *The Golden Age of Data Visualization* offers an engaging and comprehensive story about their origin.

The book presents in detail the fascinating history of information graphics from the earliest-known forms of presenting information visually to modern visualization tools such as graphs, charts and node diagrams. Divided into different chapters, the book takes us through how human beings, at various times and for different purposes, have used and developed visual representations such as drawings, scientific images, diagrams and maps as cognitive aids in different areas, including architecture and bookkeeping, and later economics, science and mathematics. The stories are accompanied by an impressive array of illustrations that showcase the diversity of available graphic representations and contribute to the vividness of the presentation.

One topic that I found particularly interesting is how graphics were used as part of rituals and to teach the culture of indigenous Australians. A later chapter deals with the very relevant question of how to present graphic information to blind people. With the development of new tools to produce material such as layered paper with different texture and 3D printers producing 3D models, we learn that it is in fact possible to construct graphic models that are helpful, although not exactly the same as the visual representations available for those who are able to see.

Mariott intentionally defines 'information graphics' broadly as representations if they are 'intended to show information and they are graphical' (p. 5). Because of this, information graphics also include tables, illustrations, technical drawings, scientific images and 3D models. Moreover, he regards information graphics as a type of notation. In other fields, there are debates about where to place diagrams – which are only a subset of graphics – in contrast to notations. In mathematics, for example, is a discussion about diagram-based proofs, including the important question whether proofs that rely on visual information are rigorous. The prevailing view is that at least certain kinds of diagram used in mathematics and logic function as a type of notation. But the variety of visual representations used in mathematics cannot all belong to this category. An important property of some visual representations is the lack of a fixed semantics, making it possible to read them in multiple ways, or even making them ambiguous. This is not a desirable property of a notation.

A valuable feature of the book is its sections explaining why information graphics are effective tools for communication. In many cases, we learn about different methods of visual presentation and how each type affects what we may be able to do with it. One case is the use of guides such as maps to help find our way. The first printed travel books would give detailed directions, mentioning locations to pass by, stops along the way, distances and, importantly, dangers to avoid. Later, graphic road atlases were produced. One of the illustrations shows a page from an early road atlas which consists of strip maps displaying symbols of various landmarks such as forests, streams and hills that one would encounter along the route. In other words, the strips can be viewed as visual representations of the former directions. In contrast, recent experiments have established that maps are invaluable tools to build and enhance our mental representations of space. Human beings have an innate ability for wayfinding through the use of cognitive maps. Marriott reports studies showing that individuals with access to maps are significantly better at finding their way (p. 172). Another mentioned benefit of graphic representations includes how they aid reasoning. It is clearly an advantage to draw the plan of a building or machine and experiment with that before constructing the actual thing. Moreover, diagrams hold the capacity to offer so-called free rides; that is, consequential pieces of information that can be read off from a graphic representation (p. 222). In addition, we learn that the effectiveness of modern information graphics stems from their capacity to reveal patterns in ways that align with our perceptual system, as governed by the so-called gestalt laws (pp. 243–5).

Although the book is generally of high quality, there are a few instances of hasty generalizations. One is the main claim that information graphics are one of the greatest inventions, and that our modern world would not exist without them (p. 5). In the conclusion we further learn that modern mathematics would not exist if it were not for diagrams (p. 346). This conclusion certainly is too strong given the available evidence. One could, perhaps, argue that diagrams have played a role in the actual development of mathematics. But who knows what might have happened if the ancient Greeks had not considered diagrams part of their practice? Moreover, as Marriott also is aware, diagrams were largely excluded from mathematical texts in a period between c.1850 and 1950. This was exactly the period when modern mathematics was developed.

Written in an engaging and accessible style, *The Golden Age of Data Visualization* is a valuable resource for anyone interested in the field of information graphics. As someone particularly interested in visual thinking in mathematics, I especially enjoyed the chapters covering areas with which I was less familiar. While the book does not provide direct instruction on how to use visualization techniques, it offers a much broader understanding of their significance and fosters an appreciation of their application. The references provided at the end of each chapter offer valuable resources for readers who wish to explore visualization techniques and related topics in greater depth.