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Book Reviews

Edward Tufte (2006). Beautiful Evidence, Cheshire, CN: Graphics Press.

"The Galileo of Graphics has done it again": that is how Business Week welcomes the last book by Edward Tufte. Decorated as best book on Design and Business in 2006 by Business Week and ZDNET, this fourth book in his series on information visualization has, however, received mixed views. From a prolific and popular writer (this is his ninth book), Professor Emeritus at Yale University, and possibly the world's most well known author in the field of information visualization, the readers were expecting a new masterpiece on the display of information. Yet, it does not seem that Tufte has fully met the expectations this time, as the book can be judged to be abundant regarding the "Beautiful," but short on "Evidence."

The book's main contents are in essence case studies. From these often highly appealing examples, Tufte is extracting general rules. In the nine chapters, fascinating concepts are brought to evidence through beautiful and carefully chosen or re-designed images. The subjects discussed in the chapters include: images as explanation, sparklines (a neologism introduced by the author to designate text-sized time line charts), causality and ambiguity, principles of analytical design, corruption in presentations, a critique of Power Point and sculptural pedestals.

The highlights of this work include beautiful translations of Leonardo da Vinci, remarkable improvements of specific designs, such as the brain-body mass graph, and copious historical examples including Galileo's representations of the moon. Tufte is a pioneer of data visualization and here again we find beautifully mastered cognitive and optical relationship between words and images. He advances his argumentations through historical examples and a few innovative guidelines in chapter five, at the heart of the book. He stresses both the perspectives of the producer and the consumer of an information visualization, never forgetting the relevance of context. A distinctive quality of all his works is his crusade against the evil in data display: be it Power Point, manipulation, corruption, evasion of responsibilities in the aftermath of 9/11, or war in general (i.e., the Miniard anti-war poster, the pull down of Stalin and Shahs of Iran statues, Iraqi weapons of mass destruction, etc.). He advice us, as visualization producers, to preserve "quality, relevance and integrity," and as consumers, to "maintain open mind, but not empty head."

As he often does, Tufte also introduces several neologisms, such as

sparklines and economisting. Sparklines are "small high-resolution graphics" that he recommends using to represent great quantity of information embedded in text. Economisting refers not only to information visualization, but to the broader context of research and is defined as "the act or process of converting limited evidence into grand claims." The book is mainly descriptive through positive and negative examples, but it also contains prescriptive advice in chapter five, where the author elaborates on six fundamental principles of analytical design: (1) comparison, (2) causality, mechanism, structure, explanation, (3) multivariate analysis, (4) integration of evidence, (5) documentation and (6) "content counts most of all." The chapter on The Cognitive Style of Power Point contains an hilarious parody of an imaginary Power Point presentation of Abraham Lincoln based on his most famous speech (converted into Power Point by Peter Norvig), and argues against the merit of bullet point lists, even holding Power Point responsible for NASA's Columbia shuttle disaster. The last two chapters are dedicated to Sculptural Pedestals through the analysis of negative examples and the description of the tearing down of political figure statues. The last fourteen pages of the book depict Tufte's garden sculptures as positive examples of creations without pedestals (i.e., stands or bases).

The first half of the book is full of relevant and (more or less) novel concepts – in original Tufte style – while the second half is somewhat disappointing: having a look at comments from blogs and Amazon reviews confirms this sense of disappointment. At first sight, the affectionate Tufte readers will notice that this last book is filled with repetitions from previous publications, such as Minard's Russian campaign visualization (already presented in two of his previous books) to which he dedicates almost a full chapter. The "Guide for Visitors to Ise Srine" was already published in Envisioning Information, as well as Galileo Galilei's "Istoria e dimostrazioni intorno alle macchie solari." Also the concepts of chartjunk and manipulation were already discussed in previous works. Finally the seventh chapter on The Cognitive Style of Power Point is almost an exact reprint of his previous pamphlet with the same title.

More in general we find that the concepts are expressed in a non systematic way, through an inconsistent aggregation of semi-related essays, hardly converging to a point. In the sixth chapter the author continues his crusade, this time against cherry picking "as presenters pick and choose, select and reveal only the evidence that advance their point of view"; but just a few pages later the reader might suspect that he does not take his own advices, with his fierce accusation of Power Point carried on for several pages without providing any detail on evidence or method. The last two chapters on statues are disconnected from the previous part of the book and could have been omitted, as statues pedestal were never supposed to be about evidence. In particular, the last chapter is a showcase of pictures – often blurry and of ambiguous quality – of Tufte's own hobby, abstract statues (in his garden).

Additionally, when we consider that the cover of this book Beautiful Evidence is Tufte's dog going for a swim, we must ask ourselves again: Beautiful (maybe) but where is the Evidence? This work shows the danger of over-enthusiasm of a giant regarding his own work in self-published books that lead him to a dilution of content and inappropriate inclusions and repetitions in this long expected book (it was announced to be published in 2004), that the review of an external publisher could possibly have prevented.

Nevertheless it is a fascinating book, sold at a reasonably fair price for 214 full color pages, where once again the author elegantly puts in practice his own recommendations on the integration of picture and text, of which he was a precursors and is a master still today. In conclusion, it seems that the target of Tufte's books has shifted with time from specialized statisticians (in the 70s and 80s), through information visualization experts (in the 90s), to the general public (in this decade). For Tufte's fans who already have read the majority of his previous books, only the first half of this last work is relevant. For the specialists in the area of visualization, his masterpiece "The Visual Display of Quantitative Information" is still the book to read. Paradoxically for the general public who has never read any of Tufte's books and is interested to have an overview on the information visualization field, Beautiful Evidence might be the most interesting and accessible of all his works, as it presents a summary of key points of previous publications. This book might also be valuable and fascinating for all those involved with the creation or consumption of presentations, as it encourages reflection for both sides.

In the beginning of this fourth book Edward Tufte declares that "at least a quintet is expected": we thus look forward to the completion of the quintet and wish that, for the fifth book of the series, the author will venture into new information visualization territories.

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David Weinberger (2007). Everything is miscellaneous: The power of the new digital disorder, New York: Times Books.

Qualcuno l'ha chiamato un eroe del nostro tempo. Altri, tra cui The Wall Street Journal, lo hanno definito un «marketing guru». Lui è David Weinberger, PhD in filosofia all'Università di Toronto, ex professore a Harvard, ex collaboratore di Woody Allen, commentatore e giornalista presente su diverse testate tra cui The New York Times, Harvard Business Review, The Guardian, Wired, Newsweek, The Economist, The Wall Street Journal, Il Sole 24 Ore e molti altri. Da alcuni anni si occupa di internet e dei cambiamenti che le tecnologie digitali stanno portando nel mondo degli affari e nelle nostre vite.

Su questi temi ha scritto tre libri. Il primo, di cui è co-autore, è uscito nel 2000: The Cluetrain Manifesto: The End of Business as Usual (Perseus Publishing) è il primo libro che ha

spiegato chiaramente alle aziende cos'è questa cosa chiamata web. In Small Pieces Loosely Joined: a unified theory of the Web (Perseus Books Group 2002, trad. it. Arcipelago web, Sperling & Kupfer 2002) ha affrontato gli effetti del web su spazio, tempo, perfezione, interazione sociale, conoscenza e materia. Nell'ultimo, Everything is miscellaneous, a passare sotto la sua lente esperta non sono più solo il web e internet, ma tutte le tecnologie digitali che oggi usiamo per l'informazione e per la comunicazione. Gli effetti di queste tecnologie non sono più limitati al mondo degli affari o al nostro modo di fruire l'informazione. Le conseguenze, «ora che tutto è andato in digitale», incidono profondamente sul modo di organizzare le idee e la conoscenza e sul modo di condividere il sapere.

Con un ottimismo quasi eccessivo, Weinberger ci presenta un attacco diretto ad alcuni concetti che noi diamo per scontati: l'ordine e le classificazioni ci sono sempre sembrati necessari per dare un senso alla massa di dati e informazioni di cui disponiamo, per esercitare il nostro controllo. Pensavamo che senza un minimo d'ordine non fosse possibile costruire dei ragionamenti razionali. E invece nel mondo digitale non è così. Come lui stesso ammette, il suo è un attacco ad Aristotele e all'idea che ci sia un unico ordine corretto del mondo, composto da definizioni chiare. Idea che deriva dalle limitazioni fisiche proprie degli atomi, che hanno impedito di vedere altri modi di organizzare oggetti e informazioni e che, sostiene Weinberger, hanno consentito a qualcuno di acquistare potere grazie al controllo del sapere.

Il libro si sviluppa in una decina di capitoli che affrontano vari aspetti della conoscenza, rapportandoli ai tre ordini delle cose. Il primo ordine delle cose è quello delle cose stesse: la merce sugli scaffali di un negozio, i libri sui ripiani delle biblioteche. Il secondo ordine delle cose è slegato dagli oggetti stessi ma è sempre fisico, fatto di atomi. Per esempio, le schede cartacee usate nelle biblioteche prima dell'avvento dell'informatica sono più maneggevoli, più comode per cercare qualcosa e possono essere organizzate in modo diverso dai libri stessi. Hanno comunque dei limiti imposti dall'essere fatte di carta.

Il terzo ordine delle cose invece è digitale. I bit non occupano spazio e quindi non hanno i limiti imposti dagli atomi. Le informazioni possono essere organizzate in mille modi diversi, a seconda delle necessità e dei desideri di chi le organizza. Una classificazione non ne impedisce un'altra e gli oggetti – digitali per loro natura oppure rappresentazioni digitali di oggetti fisici – possono occupare più di un posto contemporaneamente. Non solo: a un oggetto possono essere aggiunti tutti i metadati desiderati, compresi i commenti (per esempio le recensioni a un libro su Amazon) e i tag, sorta di etichette aggiunte liberamente dai fruitori, non dagli editori, che permettono di creare delle folksonomie, una novità ancora da esplorare (ottimi esempi sono Flickr per le fotografie e del.icio.us per le pagine web).

Le tecnologie digitali rovesciano altre certezze sulla conoscenza che noi abbiamo dato per scontate. Esse abbattono i costi di stampa e distribuzione; l'abbondanza diventa un valore

senza costi. Se fino a pochi anni fa la cultura era basata su filtri all'entrata (si decide quali libri o film o dischi pubblicare), oggi possiamo filtrare in uscita: lasciando che circolino un numero infinito di libri o dischi o film, un esemplare non toglie spazio a un altro esemplare. Saranno i fruitori a scegliere, portando una diversità nelle conoscenze individuali di ciascuno di noi, perché non guarderemo più gli stessi programmi tv e gli stessi telegiornali.

Weinberger non nasconde il suo entusiasmo ed è difficile non esserne contagiati. Da osservatore attento e competente, coglie il vero senso del cambiamento che le tecnologie digitali potrebbero portare. Il suo non è un elenco di ipotesi più o meno strampalate che si basano su questo o quel gadget tecnologico. La sua analisi va alle radici della conoscenza e affronta le convinzioni più profonde, di cui nemmeno ci rendiamo conto. La sua sicurezza è quasi esagerata e probabilmente deriva dalla sua abitudine a parlare a esperti di mercato, più che ad accademici. Ascoltandolo, infatti, sembra che il mondo sia già cambiato. La strada invece potrebbe essere ancora lunga e, se il percorso che Weinberger ci illustra sembra essere quello giusto, dobbiamo temere probabili deviazioni e ostacoli che rallenteranno qualsiasi cambiamento.

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(su www.everythingismiscellaneous.com i primi capitoli da scaricare)

Riccardo Mazza (2007). La rappresentazione grafica delle informazioni. Milano: Apogeo.

Information Visualization studies how to visually represent information to make sense of it and to allow the discovery of new facts from exploration. The work of the visualization designer is to find the best visualization and interactive techniques to support these activities and to make them natural and effective for people who need to dig into their data. Riccardo Mazza with his book introduces us to this world where text and numbers magically turn into meaningful images and where our eyes are instantly engaged and eager to learn new things from what they see.

I am pleased to receive and review this book because Information Visualization is slowly turning into a mature field, with several examples and products reaching the large public, but yet with few good reference books to teach to people how to do design good visualizations. Other books exist. Among the most known, the classic *"Readings in Information Visualization"* by Shneiderman, Card, and Mackinlay is a (rather aged) collection of papers, which is difficult to read and intimidating for a person who wants to approach the field from scratch. *"Information Visualization – Perception for Design"* by Colin Ware is a great book but very specialized on perceptual issues and therefore not very practical for novices. Robert Spences's *"Information Visualization – Design for Interaction"* is a little book similar to this one but with a different style and yet less accessible to the large public in my opinion.

Teaching people how to do this work is a fundamental goal of our field, I would say even more important than usual, since it is often far too easy to develop "a" visualization, but extremely hard to develop the "right" visualization. And as this discipline reaches more and more individuals in the large public, it is extremely important that visualization designers are trained properly. This book is one more step towards this direction: easy to read and informative.

Chapter 1 introduces the reader to the basic concepts, providing useful examples from the very beginning and highlighting the different roles visualization can have in communication, exploration, and confirmation of ideas and hypothesis. The chapter provides useful generic guidelines on how to produce effective visualizations that can be learned once and applied over and over in any kind of visualization projects.

Chapter 2 describes the basic conceptual and scientific tools available to the visualization designer: a framework to reason about the different stages of a visualization system, from data extraction to their representation, and the rules to appropriately map data features to visual features. These are the building blocks of every visualization and a proficient designer must be able to manipulate them appropriately to construct more complex representations. It is a good thing to have them explained here in the early chapters of the book, so that they can be learned once and used in the numerous examples available in the later chapters of the book. The chapter contains then a set of guidelines on how to follow a proper design process, which is especially useful given the lack of guidance on the subject in other books or resources. To the best of my knowledge none of the most known books in the field teach it.

Chapter 3 and 4 can be regarded as the core part of the book, where all the most traditional visual techniques developed so far in the field are presented; both for multi-dimensional and network/hierarchical data. Each technique is described in sufficient details and discussed in terms of both benefits and limits. A reader looking for information on how to design a visualization for a specific case here will find enough material to, at least, get inspired on potential solutions and be warned on major limitations. In a fairly limited amount of pages the reader can obtain a view on the whole spectrum of techniques available and understand when and why they are appropriate for a given task.

Chapter 5 describes techniques specific for the web: website maps, visualization of logs, and visualization of search results. Here it is possible to see Information Visualization in action and thus to have a grasp on what are the capabilities and limits of visualization in practical terms. Thousands of visualizations are developed *on* the web and *for* the web today, this can be definitely regarded as one of the major trends in the field. Having a whole chapter dedicated to it is clearly useful and practical. The reader will find compelling examples and ideas that can work as starting point for people specifically interested on visualization in this domain.

Chapter 6 is entirely dedicated to interaction, that is, how people can

manipulate a visualization through interactive tools to allow the exploration of the data it contains. The real power of Information Visualization lies in the possibility to manipulate the medium and thus to build a continuous feedback loop between the *external* representation and the *internal* mental model of the data. Natural, appropriate, and well-designed interaction make all the difference between plain presentations of data and the rich interactive manipulation that allows deep reasoning. The chapter introduces all the basic techniques available in the field (e.g., dynamic queries, focus + context views, magic lenses, etc.) and so does a good job in presenting a complete list of techniques. However, given the centrality of the topic, I would have liked to see more space devoted to it, and a deeper discussion of the challenges faced by a designer when confronted with the problem of designing interaction. This is often the real bottleneck for developers and where most visualizations fall short in providing a real support to the end-users.

Chapter 7 is a pleasing surprise to me because it deals with the problem of evaluating visualizations, that is, how to know if the developed visualization is good enough for the purpose it was designed for. This is an often neglected topic and it is remarkable that this book contains at least some information on it. The chapter explains how the techniques used in Human-Computer Interaction can be applied in this specific area to ensure that the tool is appropriate and effective. The challenges and needs of evaluation are explained in practical terms, without the excessive abstraction that often surrounds the subject. I really hope that readers who will develop new visualizations will really take care of this part; too often interactive software systems are designed without taking into account the real needs of people. The same problem is present and amplified in Information Visualization, where it is harder to distinguish between pretty images and useful tools, and this is why I am particularly in favor of this chapter.

In these seven chapters Riccardo Mazza does a good job in providing the necessary material for prospective practitioners and students. The book can be used as an introduction to the field, by people who want to discover the beauty and intricacies of it, and also as a textbook by teachers who are looking for a good reference book for their students. The book is concise and still very informative at the same time; in few more than one hundred pages it presents all the basics: techniques, tools, and methodologies necessary to understand and design information visualizations. The book has plenty of examples, figures, and useful links to web pages that help the reader to understand the content and readily explore the idea described in it.

Information Visualization is a relatively young field and it is extremely fragmented; organizing all this information and presenting it with such unity and clarity is a daunting task. I personally thank Riccardo for having spent such an amount of his time and energy in writing it for all of us.

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