Book Reviews

Perspectives on Knowledge Management. I.V. Malhan and K. Shivarama Rao (Editors). Lanham Maryland: Scarecrow Press, 2008. 454 pp. $65.00. (ISBN-13: 978-0-81-086104-6).

Knowledge management (KM) has been called many things: a trend, a fad, a discipline, even a myth. Launched with great trumpeting in the 1990s, it has somewhat faded from center stage, but it has never gone away. On the contrary, the past few years have seen a number of texts and monographs on the topic, of which this is merely the latest.

The editors, from the Department of Library Science at the University of Jammu in India, present us with a book that comprises 28 relatively short chapters with 33 authors in addition to editors. The chapters are organised into five sections, but without any other form of linking or integration, apart from an editorial preface. This seems a recipe for a proverbial "curate's egg" of a book; good in parts. And, indeed, that is what we find.

The following sections of the book deal, respectively, with: conceptual framework and perspectives; information technology revolution and knowledge management; knowledge management and the corporate world; competencies and skills for knowledge management; and knowledge management tools, taxonomies, and terminology. The chapters are short, typically 10–20 pages, mostly written at a fairly basic level, and very varied indeed in nature. Some are reviews of concepts, some are case studies, and some are essentially opinion pieces. There is a bibliometric study of the KM literature, a discursive glossary of KM terms, a discussion on taxonomies, a look at digital governance models, a view on the competencies required for practitioners, a look at computer anxiety, and so on. The book is nothing if not wide-ranging. Some chapters would not, by most people's reckoning, I think, be regarded as KM in the usual sense. To take one example, an account of the situation of university libraries in the Punjab is an interesting enough account of the use of technology, and the move towards electronic collections, in this environment; but, it does not deal with what would normally be thought of as KM.

The editors, a considerable majority of the authors and of the case studies, are from the Indian sub-continent. This gives the book an interestingly different perspective from much of the KM literature, typically presented from the viewpoints of North America, Western Europe, or the Far East. Particularly interesting is a chapter from the editors dealing with KM in the rather traditional agricultural sector in Asia, generally, and India, in particular. That said, the book does have a genuinely international dimension, with authors from five countries outside the sub-continent, including Europe, Africa, and North America.

The publication date of the book is 2008, and some of the chapters have clearly been updated through 2007. Others, however, are of earlier vintage: A number of the studies reported seem to have been carried out in 2003–2004, one chapter is a reprint of a 2003 original, and another describes a 2003 item as "recently published." Although a historical perspective is no bad thing, this does give the book a slightly dated air.

One clear difference between this book and most other KM texts and monographs is its orientation, declared clearly by the editors and echoed by several chapter authors, towards the role of library/information professionals in the KM function. Ranganathan's Laws make an appearance as early as page 6. With this in mind, it is a pity that many of the chapters are written at a rather general level and do not give much insight into exactly how, and why, library and information science should have an involvement with KM.

I do not think that this book can be recommended as a main text in KM for a student or a practitioner; it is too wide-ranging, diffuse, and (to a degree) dated. It would be a useful resource for anyone wanting an overview of the very broad area now within the ambit of KM, particularly from an Asian perspective.

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Communities of Practice: Fostering Peer-to-Peer Learning and Informal Knowledge Sharing in the Work Place. Noriko Hara. Berlin: Springer, 2009. xii, 138 pp. $129.00 (hardcover). (ISBN: 978-3-540-85423-4).

In loose terms, a community of practice is usually considered a group of people who, though they do not necessarily work together on the same task, do similar work and can therefore usefully share ideas about how to best do it. The character of this discourse is well represented in the title of the book reviewed here. "Fostering," like other terms used in community of practice discourse about management roles, such as "cultivating" or "facilitating," implies a benign, light-handed rather nondirective approach. There is a focus on learning—seemingly equated with the sharing of knowledge between equals—for practical benefits. Thus, the tone of community of practice thinking tends to be friendly, consensual and voluntaristic, practical and informal, rather than directive, managerial, hierarchical, or formalized.

Those writing about communities of practice are fond of saying that they have always existed; however, they were only termed as such in the early 1990s. It does not take much thought to see why around that time there should be a shift in thinking about organizations in favor of such a concept. The notion would have little relevance to a factory run on Fordist lines, with the focus on minute control of work and instrumental expectations of work relations. In contrast, it seems highly relevant in the context of the main demands of post-Fordist work. The concept recognizes that more workers are said to have the technical knowledge base and autonomy previously seen as restricted to the professions. But, backgrounding professional cultures, such knowledge bases are seen as fluid, less formalized, and more inter-professional, so that an interest in the institutions of the profession is replaced by an emphasis on more ephemeral, local communities, often contained within one organization. The stress on work as learning reflects the focus in post-Fordist thinking about flexibility in work and the need for organizations to continuously respond to a changing environment. Rather than being subject to control, the worker in a community of practice is rather autonomous, their "passion" for work aligned with the needs of the organization. This raises issues for management around styles of facilitation, alignment with organizational objectives, and measurement of value. Information and communication technology (ICT) offers the possibility of linking

workers with similar tasks who are not colocated, although there is a doubt about whether this supports sufficient richness of communication and trust to produce the same depth of learning or identification hoped for in a fully realized community model.

Critics of how the idea has been conceived or used see such persuasive rhetoric of knowledge, learning, and community as potentially masking issues of power. Talk of "community" could be a management tool. If a practice is smooth enough to support a consensual community, perhaps that appearance of agreement might be the outcome of hegemonic control over practice, an ideological effect the more insidious and intolerant for being informal. What is the cost in the decline in the influence of the idea of profession, implying a locus of power and ethical practice independent of the organization, being replaced by a concept of groups run by the organization itself and run for immediate benefits of working more effectively? We should at least ask these questions, articulating an ambivalence about a concept that seems to generate consensus, without doubting that people like communities of practice and the deal for the employee in post-Fordist work is much better than before.

The idea of communities of practice has been very successful as one of the more distinctive applications of knowledge management (KM). It has been particularly successful in generating literature, much of it either advocacy or self-reported case studies. As the author of the book reviewed here herself suggests (p. 22), we are rather lacking in-depth empirical studies in the communities of practice field. For this reason Hara's book, as it is based on a substantial ethnographic study, is to be welcomed. Her focus is knowledge use and sharing among lawyers, specifically public defenders, who in the American legal system defend those who cannot afford to pay for a lawyer.

After an introductory chapter, chapter 2 reviews a range of interrelated theory, including that of situated cognition, community of practice, and organizational learning. Chapter 3 is a description of the work of public defenders in a particular office in the pseudonymous "Square County." This gives us a good sense of the nature of the work, but is perhaps rather long, given that it is essentially largely descriptive. Chapter 4 is more analytic, investigating the nature and character of knowledge sharing in the Square County office, which is around what Hara labels "practical" rather than "book knowledge." Practical knowledge is contextual understanding that enables theoretical book knowledge to be applied successfully in practice. The distinction is one made by the lawyers themselves and seems to explain behavior in this context. Previous work on the use of knowledge in the professions has already suggested that what professionals do is not simply to apply theoretical knowledge, as well as pointing to the symbolic role of abstract knowledge (e.g., Svensson, L.G. (1990) "Knowledge as a professional resource." In R. Torstendahl and M. Burrage (Eds.), *The Formation of the Professions*. London: Sage. Abbott, A. (1988) *The System of Professions*. Chicago: University of Chicago Press). But I do think it is a contribution of this book that such a conversion process is shown to be social, informal, and in situ. However, Hara never engages with the theory of the professions or previous studies of legal knowledge and how it is used, so misses an opportunity to show how her findings fit into previous understanding.

This chapter offers a convincing account of some of the key factors that produce an office culture favorable to sharing knowledge informally, such as commitment to the profession and a particular style of management, and including factors of adversity, such as public and client negative attitudes toward lawyers. I wonder, as my previous comments imply, if this model is complete, since it says relatively little about the law, its institutions, and its own culture, which surely must be a contributory aspect to the local office culture. Nevertheless, the model (or concept map as she calls it) Hara produces is a very useful contribution because I think work in the community of practice field often fails to acknowledge the importance of identifying the specific conditions under which community of practice-like processes occur. Orr's famous discovery of informal knowledge sharing among photocopier technicians, *Talking About Machines* (1996), does describe how this arises from a very specific set of conditions, such as the dispersed nature of the work, a hostile management posture, and lack of hierarchy among the technicians. Like Orr, Hara makes explicit some of the factors that enable informal knowledge sharing to occur in a particular context. Within such a model factors of adversity would surely, as she argues, be key, as would the impact of external attitudes to a practice or its practitioners. Community is often a label imposed by outsiders on a group or fostered by a sense of collective defensiveness to outside pressure. Community of practice literature rarely acknowledges this in its focus on the idealized view of internal dynamics of the group, as opposed to the conditions that give rise to it.

Chapter 5 moves on to look at another public defender's office, this time in "Circle County." The chapter shows how under different conditions knowledge sharing is more limited, due to, among other factors, lack of physical colocation, overload of work, and the very specialized character of the work. In this office lawyers rely more on information technology (IT) but this is not good for sharing practical knowledge or enculturation into professional identity, beliefs, and values (Hara calls this cultural knowledge). Indeed, Hara suggests that some of the young lawyers' interest in IT is actually an obstacle to acknowledging the importance of enculturation and so damages their long-term development as professionals. Again, this analysis potentially enhances our understanding of the conditions for community of practice formation. Specifically it is a contribution to the debate about how far communities of practice can work through IT. The idea that IT is not good for sharing tacit knowledge has long been a claim made in the literature, perhaps influenced by media richness theory, but the case study demonstrates the problem fully.

I do think, however, that an opportunity is lost here to integrate findings from this chapter into the model developed in Chapter 4. We do not get a concept map model for Circle County, as we did for Square County. And, for example, from the effect of the Circle County lawyers being dispersed physically, it becomes clear that physical colocation is a key factor in knowledge sharing. This was relevant to the Square County case, but passed unnoticed. The issue of colocation could now be added to a general model. Later, Hara comments on the importance of scale as another factor inhibiting knowledge sharing in Circle County (p. 115). Again, issues of scale were not integrated into the model. If all the factors had been put together the beginnings of a wider model of conditions under which community of practice-like processes will occur would begin to emerge, applicable generally, at least in the context of practicing defense law.

Chapter 6 goes on to examine the role of listserv-based online communities. Hara's data suggests that in the public defender context listservs are valued but contribute mostly to the sharing of "book knowledge." Hara then compares the types of knowledge shared among listservs for three other professions. This is interesting, but not fully integrated into the rest of the book, in the sense that it introduces another definition of knowledge types (all of which seem to be subdivisions of book knowledge). It is also not about lawyers. She herself is demonstrating the different types of knowledge needed or shared to perform different professional practices (figure 6.1), so should discuss how to link the results about listservs for other professions to the main body of a book about lawyers. She does not fully explore the implications of this. The author then goes on to look at factors in the sustainability of such online groups, but here the model is based mostly on the case of nurses. Again, I think one might expect the factors to be somewhat different for a different professional practice, such as the law. So, overall, although making useful contributions, I feel some of this chapter is not fully integrated into the primary project of the book. At the risk of demanding too much from one study, I would have liked to see a fuller exploration of the differences and connections between the online community and face-to-face relations among the lawyers. Where does knowledge shared on the listservs fit into the total knowledge usage of lawyers? Are those most prominent in local knowledge sharing also the key contributors online? We may also feel that with the development of richer platforms than listservs to support communities and more people having been habituated to the daily use of IT, the value of IT to communities of practice could have already changed.

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At times community of practice ideas themselves are used a little superficially. For example, practice is identified unproblematically with professional practice (e.g., pp. 3, 85) and usually seen as a pre-given structure. Yet the Circle County case suggests that even public defense law is itself made up of a number of practices. Some of the more interesting community of practice work sees practice itself as subject to an ongoing process of negotiation and contestation. We do not see that clearly here. Hara refers to "identity" as glue (p. 3), but this seems a superficial reading of Wenger and his concern with multimembership and trajectories in levels of participation in communities leading to a complex and changing identity. So sometimes when the theory is brought in I think it is being used to produce a rather too consensual picture and more to label things than to provoke thought.

It is too easy to criticize the work of another in a review, from the comfort of one's armchair. Given the dearth of substantial research in the communities of practice field, the book should be welcomed. It is readable, well organized, and well presented (apart from a couple of horrid proofing errors on p. 10. Hara is the author, not the editor, as implied on the cover of the imprint I have). The book is commendably short, and yet contains a lot of interesting empirical findings. The book contributes a number of very useful case studies, based on substantial research data, to a field rather lacking such studies.

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The Myth of Digital Democracy. Matthew Hindman. Princeton, NJ: Princeton University Press, 2008. $22.95 (paperback). 181 pp. (ISBN: 978-0-691-13868-8).
Digital Citizenship, the Internet, Society and Participation. Karen Mossberger, Caroline J. Tolbert, and Ramona S. McNeal. Cambridge, MA, London: MIT Press, 2008. $19.00 (paperback). 221 pp. (ISBN: 978-0-262-63353-6).

Last year two books about the perspectives of so-called digital democracy in the US have appeared and both are based on solid empirical research, one of them being skeptical and the other more optimistic about these perspectives. A comparison review of both could provide a good overview of current answers to the question of whether the Internet has democratized American politics.

Both books do not clearly define digital democracy, presumably implying that this term refers to the political uses of the Internet. Digital citizenship is defined as the ability to participate in society online by Mossberger et al. These authors not only investigate digital citizenship in politics but also in economic opportunities and in prevailing forms of communication in society.

Let us start with the master of debunking, Mathew Hindman. He questions and largely demolishes popular assumptions about the Internet that are taken for granted by too many average Americans, journalists, and even scientists. Popular views are that the Internet gives ordinary citizens more voice and that it gives them a degree of empowerment never known before. The second most popular idea is that previously inactive citizens are recruited in political activism on and by the Internet. Another common view is that blogs expand the social and ideological diversity of voices in the media. Some even suggest that blogging displaces the 'elite' or the 'old' media. The Internet as a whole is conceived as a narrowcasting medium that eliminates broadcasting as central production and dissemination of the news and political views and that vanishes the traditional gatekeepers in the mass media. Finally, it is often assumed that on the Internet everybody can find the information one is looking for and find an ear for one's own information.

Hindman opposes these views with an extremely extensive and laborious analysis of an own sample of almost three million American Web pages and existing traffic data of others to look for their producers, contents, links, and audiences. So, he concentrates on political discourse, on content, and on audiences. He does not focus on access, political motivation, and effects in the political system.

The first thing he observes is that political traffic is only a tiny portion of Web usage. In 2007 it was 0.12%, to be exact, while news and media sites covered 2.9% and adult pages 10.5%. Further, he discovers that liberals dominate the audience for politics online; they outpace conservatives by a wide margin. Strong Democrats are more likely to visit political Websites; so are strong Republicans, although by a smaller margin. Democratic-leaning independents and weak Democrats show significantly higher levels of political Web usage, while Republican-leaning independents and weak Republicans are not different from true independents.

While media have portrayed online politics as a youthful phenomenon, Hindman finds in Hitwise data that in 2007 only 11% of young people between 18 and 34 visited political websites as compared to 25% by people between 45 and 54 and 32% by people 55 and above.

However, the most conspicuous observation of Hindman is his exposure of *Googlearchy*: the rule of the most heavily linked. The link structure of the Web limits the content that citizens actually see. Search engines help to keep the attention of the public highly concentrated. The link structure of the Internet used by search engines puts the most popular on top of the list and average users only use the first hits on the list, in this way reinforcing the concentration and the winner gets all patterns on the Internet.

Users themselves contribute to this concentration by shallow and unskilled use of search engines for news and political information. They primarily seek familiar sites and resources. So, most opportunities of retrieving new political information the Internet offers in theory are annihilated in practice. The author accuses those who advocate the open, accessible, and peer-to-peer nature of the Internet to neglect this deeper linking structure of the Internet that works according to a power law: a few sites attract the vast majority of traffic while most sites draw almost no traffic.

These ideas of a power law and of the rich-are-getting-richer phenomenon on the Internet are not new in the scientific literature on network theory and analysis, but Hindman has given them a solid empirical basis. In doing so, he contributes to the advanced methodology of automated techniques for cataloging, categorizing, and classifying Web pages. He also applies four metrics of concentration and (in)equality of traffic and audience shares on the Internet, the famous Gini-coefficient being one of them.

Analyzing concentration of traffic and audiences on the Internet, the author draws the striking and alarming conclusion that online concentration is bigger than that of the traditional media. In 2006 news and media sites revealed a Gini concentration figure of 0.88, political sites of 0.85, and all Web sites of 0.76. Newspaper circulation had only 0.69, magazines 0.70, and radio audience 0.53. The Top 10 of political sites reached 31% of the audience share and news and media sites 29%, while the Top 10 of newspapers received 19%, magazines 27%, and radio 7%.

At the other side of political and news site supply Hindman observes a large number of less popular sites. For every interest there is some offer on the Internet. This is known as Anderson's long tail. Contrary to Anderson and others, Hindman asserts that it is simply not true that the smallest outlets taken together get most of the traffic. "They have made the long tail into the entire dog" (p. 135), exaggerating its significance. All of them attract some attention and they grow, but they remain fragmented and insignificant as compared to the top sites. According to Hindman the most striking phenomenon is 'the missing middle' (sites with a medium audience) between the concentrated head and the long tail. So, while many have worried about fragmentation on the Internet, Hindman is concerned about concentration.

Concentration also occurs in the expansion of political blogging. More than a million Americans have become political bloggers. Tens of

millions read them regularly or occasionally. Blogs have become one of the major resources of political information. Yet, "only a few dozen have more readers than does a small-town newspaper" (p. 128). More than 95% of blogs are read by almost no-one. And their creators overwhelmingly are well-educated white male professionals: politicians, business elites, technical experts, and journalists. Most of them certainly are not ordinary citizens. Hindman claims that they only speak for themselves. They do not aggregate information and opinion from a larger part of the population, as there is no middle range of political blogs and sites in terms of authorship and readership to derive from.

The most general conclusion of the book is in its last words. "It may be easy to speak in cyberspace, but it remains difficult to be heard" (p. 142). Does that also go for politicians and election campaigns? Hindman starts his book with an analysis of the primary presidential campaign of Howard Dean in 2004. He was one of the first to use the Internet for fundraising, volunteer recruitment, and advertising on a massive scale. The author continues with a comparable analysis of the Obama presidential campaign but unfortunately was not able to finish it because the book appeared before the end of the show. A comparison of both campaigns would have been valuable because Obama succeeded and Dean failed. Now he only suggests that the electability of the candidates, that Obama had and Dean did not, is still decisive despite all Internet aids.

Hindman's observation is that the Internet has changed campaigns more than votes. It has definitively changed the art of recruiting and organizing that has become more inclusive because a much larger part now consists of small donations. Additionally, it has turned the organization of campaign volunteers into potential 'grass-root' mobilization engaging more citizens than before.

Despite all these critical observations of the use of the Internet in political communication that are responsible for the title of his book, Hindman does not give a clear answer to the question of whether this medium has democratized American politics. He leaves the door open for a more positive answer, declaring that Internet politics is not just politics as usual. "The Internet has made campaign financing more inclusive, and allowed broad, diffuse interests to organize more easily. For motivated citizens, vast quantities of political information are one click away" (p. 142). The reason for this indecisive answer is not that the Internet is immature—it is in its adolescence according to the author—the main reason is that the book is not well organized. It lacks a systematic design, let alone a substantial framework or a model of causes and effects. As the book jumps from one topic to another it is not particularly clear for the reader that Hindman does not focus on the input of the democratic process (Internet access and participation), but on parts of the output: what information citizens actually get and whether their voices are being heard on the Internet. Neither does he concentrate on the effects on the American political system as a whole that would justify the general title of his book.

Compared to the first book, the focus of attention of the second is clear. Mossberger, Tolbert, and McNeal concentrate on the input of the democratic process in terms of access and participation. Although, similarly, their main title is very general: digital citizenship. The authors observations and conclusions are much more optimistic in terms of democratization than Hindman's. "The results clearly demonstrate that the Internet contributes to the development of civic engagement among individuals and fosters political participation" (p. 144). The results are derived from a secondary analysis of the 2000 American National Election Studies survey and of two Pew Internet and American Life surveys, one of the mid-term elections of 2002 and one of the presidential elections of 2004. The research aim was to investigate the effect of three modes of online participation on civic engagement and on traditional political participation, primarily on voting. The three modes are (1) reading news on the Internet, (2) sending and receiving political e-mails, and (3) participating in political chat rooms.

The authors find that respondents who took part in any of the three online activities were significantly more likely to report voting, controlling for other factors (age, income, education, gender, partisanship, and state contextual factors). For similar individuals who regularly read online news the probability of voting increases by between 16% and 26%, 16% for those who also rely on television and newspaper news, 21% for those who rely on newspapers, but not TV, and 26% for those who only read news online. E-mail has an even greater influence on voter turnout as it increases between 21% and 39%, depending on other forms of media consumption. The association between political chat room participation and voting is equally strong: between 21% and 39%. These positive effects only appear in presidential elections, not in the mid-term election of 2002. The authors explain this difference by suggesting "that the Internet may not be able to overcome a lack of interest associated with low salience political events such as midterm elections" (p. 82).

This brings us to the most important weakness of this study. Mossberger et al. have waged an admirable effort in controlling for spurious correlations by elaborate multivariate regression models, but the most important one, political interest or motivation, is weakly controlled for. First, the 2000 study did not include a political interest variable. In the 2002 study, political interest is only controlled by a single item/question: a 4-point ordinal scale for responses to the question "How much thought did you give to the midterm election?" This can hardly be considered a full and valid operational definition of political interest.

Control for political motivation is particularly important because a well-known statement is that the politically involved use the Internet more for political participation and that they increase their involvement as compared to the noninvolved in this way. It might be that political motivation causes both more political Internet use and more voter turnout with the positive effects summarized above. Mossberger et al. admit themselves that low interest remains a barrier for participation in U.S. elections, and that the Internet is unlikely to compensate sufficiently for such things as uncompetitive congressional races (p. 144).

These controls and the general aim of this study are generated by the drive to prove that the Internet *in itself* contributes to the democratization of politics. Equally, Hindman tries to demonstrate that particular characteristics of the Internet are detrimental for democratization. I think that this drive has haunted Internet research too much. It is very difficult to prove that a technology in itself has particular social effects. All too often it is thought that the Internet offers some kind of technological fix for basic problems of behavior and society, such as a lack of citizen engagement or political interest. It is *the use* of technology in particular social contexts that creates the effects.

Without defending an instrumental view of technology—as this view ignores the unexpected, so-called second-order social effects of technology—it can be argued that the Internet is an increasingly important tool for all kinds of activities in society. And that it has simply become necessary to reach particular populations, first of all young people. This is why Mossberger et al. are right in calling Internet access a vital part of contemporary citizenship. And why it does not surprise that it has become an important tool for political information and communication. Whether the Internet supports political participation more than traditional media is difficult to prove, despite all regression analyses in the *Digital Citizenship* book. The Internet has a number of enabling opportunities and drawbacks (cf. Hindman). Whether they are realized still depends on the social and political context, the motivation of users, and several demographics such as educational level, age, income, and ethnicity.

The importance of the tool also is the reason why the digital divide in terms of physical access, digital skills, and different use of the Internet is still one of the most important conditions of the democratization of American politics using digital aids. Hindman claims that "the online public sphere already is a de facto aristocracy dominated by those skilled in the high deliberative arts" (p. 139). Contrary to Mossberger et al., he scarcely pays attention to the solution of this inequality problem, which could be responsible for the most important myth of digital democracy.

Hindman and partly also Mossberger et al. emphasize the output of digital participation (audience shares and voter turnout) and pays insufficient attention to the input of political motivation and insight.

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It may be true that ordinary citizens have difficulties in being heard on the Internet, but it might be equally true that they learn a lot by reading online news, by participating in online discourse, and in being mobilized for online and offline campaigns. Perhaps these learning effects are the most important stimuli for democratization in the long run.

Has the Internet already democratized American politics? So far, the changes are small. I see no significant transformation of the American political system on account of Internet use anyway. The Internet era in politics is just starting. Hindman is right in his conclusion that changes are bigger in election campaigns than in voting. The political uses of the Internet have significantly changed fundraising, campaign recruitment, and organization and political advertising.

In Europe people think that the Obama campaign has revolutionized politics forever. In fact, I think Hindman is right in stating that the Obama campaign was hardly innovative. It was an almost perfectly orchestrated centralized campaign "while empowering the bottom to make a difference" (p. 37). The biggest expenditures were for broadcast advertising, campaign staff, and travel costs. Obama did not win the presidency by means of the Internet but by his personal quality as a candidate attracting many new voters. He was saved by his reaction to the credit crisis at the start of September 2008, just 2 months before the election, when he was at the losing end according to the polls. At that time his young volunteers, partly recruited on the Internet, were attracting votes by going door to door, handing out leaflets, and organizing political rallies. Just like they would have done in the 19th century.

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E-Collaboration in Modern Organizations: Initiating and Managing Distributed Projects. Ned Kock (Ed.). Hershey, PA: Information Science Reference, 2008. $180.00 (hardcover). 320 pp. (ISBN: 978-1-59904-825-3).

This book is a collection of 15 chapters focusing on collaboration across geographical distances within organizations. The types of organizations covered in the book are many, including international corporations, nonprofit theater groups, universities, government research labs, and terrorist groups. Issues examined in these various organizations include communication behavior, the impact of Web presence, user satisfaction with software, organizational sense of community, distributed information technology (IT) outsourcing, business process redesign groups, management of distributed projects, collaborative decision support, risk management, cyber warfare, leadership style, distributed knowledge management, and cohesion in distributed teams. Technologies investigated include E-mail, Web pages, listervs, asynchronous groupware, electronic meeting system, and collaborative knowledge management systems. Four chapters synthesize the existing literature and propose new frameworks to investigate aspects of E-collaboration. The remaining 11 chapters present results from empirical studies that involved case studies, surveys, focus groups, or an experiment. The book's broad selection of organizational settings, research topics, and methods may appeal to a broad range of readers.

One chapter, particularly well presented, is titled "Effects of Leadership Style and Anonymity on Arguments and Intentions Related to Acting Ethically." The authors, Kahai and Aviolio, conducted an experiment (2×2 factorial design) that examined whether transformational or transactional leadership styles in conjunction with anonymity or nonanonymity influenced study participants' discussion and conclusions regarding copying copyrighted software. Transformational leaders motivate individuals by encouraging high ideals and aspirations, and supporting individuals' development. In comparison, transactional leaders motivate by emphasizing contractual arrangements. In the experiment 200 undergraduate students were assigned to one of four conditions. In each condition a small group of four or five students led by a confederate leader (who acted either as a transformational or transactional leader) discussed (anonymously or nonanonymously) via an electronic brainstorming tool whether they would copy software a roommate recently purchased which the roommate said was okay to copy. Afterwards participants were asked privately to indicate their intentions regarding copying the software. Participants' comments during the (electronic) discussions were recorded and analyzed as well. Data analysis, including the coding scheme used to analyze participants' comments, and study limitations are nicely presented in the chapter.

The results of the data analysis indicate that small group discussions with a transformational leader contained more statements challenging copying copyrighted software than discussions with a transactional leader. In turn, participants in transactional leadership groups had a greater mean of intention to copy the software. Anonymity had no effect. The authors suggest that this may be due to the already high level of consensus among participants as indicated by pre-experiment questionnaire responses. Another possibility is that the electronic brainstorming system always afforded a quasi-anonymity, even when names were associated with comments. Study participants did not know each other before participating in the small group discussions. Therefore, seeing the name of a person you were introduced to 10 minutes ago along with their comment on a screen may not be so different from seeing a comment without a name.

These results illustrate that encouraging ethical behavior, even across distances using technology, appears to be influenced by leadership style. The authors suggest that in an age of many ethical scandals, organizations should consider leadership training in conjunction with ethical training.

Another interesting chapter, titled "Hacker Wars: Cyber Warfare Previews," is written by Baskerville. The author examines how E-collaboration has been used by groups for the purposes of warfare and terrorism. We often discuss Web 2.0 and other collaboration technologies solely in a positive light, and forget that other possibilities regarding the use of these technologies exist. Baskerville discusses two hacker wars, the 2000 Israeli-Palestinian Hacker War and the 2001 China-U.S. Hacker War in terms of the strategic model used by both sides, the strategic arena, E-collaboration, and the ethical and legal aspect of the war. He found no evidence to suggest that advanced collaboration technology was used in either war. Rather, E-mail, chat rooms, private Web sites, and perhaps an ad hoc intranet were used. Although to date hacker wars have not had serious consequences, the author suggests that advanced collaboration technologies might have a role in future wars, escalating the seriousness of hacker wars. As we design and evaluate these technologies we should consider their unintended consequences and uses in cyber warfare.

The majority of authors in the book work in business schools, and disciplinary differences between the information science and business disciplines manifest themselves throughout this edited volume. For example, many chapters did not provide details regarding their research methods that are considered best practice in information science. No chapter mentioned obtaining study participant consent. Only one chapter reported their coding scheme, gave examples of their codes, and/or discussed intercoder reliability. Only three chapters provided details regarding their data collection instruments or pointers to them. Information regarding the length and frequency of participant observation and interviews were often not provided. These types of details help readers evaluate the validity and generalizability of the research.

Another difference focuses on the literature cited. The chapters by and large do not include literature on collaboration published in psychology (in particular, human-computer interaction and computer-supported cooperative work areas), social science (social studies of science and sociotechnical systems areas), and information science (collaboration and collaborative information behavior), even when the same context,

such as software development teams, has been investigated. Thus, on the one hand, the book offers interesting overviews and syntheses of business management literature on E-collaboration. On the other hand, I wonder if the proposed theoretical frameworks and models would be richer if relevant literature from these different disciplinary areas was included. Synthesizing multiple types of literature is a challenge many of us face as scholarly publication increases in volume and scope, yet our research can be enriched from different literatures and the multiple perspectives they provide.

It appears that the publisher, Information Science Reference, a division of IGI Global, took a number of shortcuts when producing the book. The chapters total 259 pages but the index is only three pages in length, with fewer than 175 entries. No references to authors or research methods are provided in the index. Many topics discussed in the chapters, e.g., trust, learning, and shared culture discussed as key elements of distributed knowledge management in the chapter by Vaidyanathan, are not included in the index. The lack of index terms hinders quick, effective navigation of the book's content. Some of the index pages in my copy of the book are already falling out, but since I've criticized the index perhaps I shouldn't complain that the pages are falling out.

Adding to this problem is the publisher's practice of presenting some headings and subheadings in the same font style and size. To better understand some chapters, I demarcated heading and subheadings but usually had to read the sections at least twice to be able to do this. Figures and tables also present some challenges. In same cases, table headings are mysteriously hyphenated inline. In other cases different font styles and sizes are used. In general I found table font sizes annoyingly small, especially considering the physical size of each book page is 8.5×11 inches and larger font sizes are used throughout the text.

In sum the book provides a broad collection of research on E-collaboration primarily from a business management perspective. The chapters employ a range of research methods and approaches, and focus on collaboration in a variety of organizational settings. It is a collage of topics and studies. This is both a strength and weakness of the book. The broad range of topics can be of interest to a wide audience, yet there is a lack of cohesiveness or continuity among the chapters.

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Web Accessibility: A Foundation for Research. Simon Harper and Yeliz Yesilada (Eds.). Berlin: Springer, 2008. xix, 364 pp. $99.00 (hardcover). (ISBN: 978-1-84800-049-0).

The Web is arguably one of the most important technologies and media in our history. From its inception, the Web was envisioned as a universal medium accessible to all. As Tim Berners-Lee stated: "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect" (WAI, 2009). We are still a long way from realizing that vision: the Web is still a challenging medium for people with disabilities despite all the great efforts in the past decade to make it more accessible. There are at least two reasons why making the Web accessible is difficult for the disabled and why progress is usually incremental. First, the Web is a dynamic medium with a constant flow of new technologies (Web 2.0, flash, etc.), and each new technology introduces new barriers to accessibility. This is different from the more familiar accessibility of built environments such as buildings or homes, where the technology is not changing as rapidly. Second, the target users of Web accessibility are people with a wide range of disabilities. Persons with disabilities (PwD) are not a homogenous group, and the needs for one group of disabilities might be conflicted with another. For example, the needs for users with visual impairments who require an alternate text for images might conflict with the needs of people with cognitive disabilities who need graphical representations in lieu of text. To use the accessibility of built environments again as an analogy, its target user is relatively clear: users of wheeled mobility devices.

There have been numerous books written on Web accessibility in the past decade, almost all of them from the practitioners' standpoint. This book is different from previously published books due to its emphasis on the most current research progress regarding Web accessibility. It is a collection of 21 chapters written by researchers who are active in the field of Web accessibility. The book has four sections: understanding disabilities, evaluation and methodologies, applications, and specialized areas. The researchers' contributions provide readers with a first-hand perspective on the latest advances in the field. At times, books with chapters written by different authors will lack coherence. However, this book has tried to mitigate this problem by having common content in each chapter such as "Author's opinion of the field" and "Future directions."

Addressing Web accessibility cannot be done without first understanding the target users. Therefore, to its credit, this book appropriately starts the first section with discussions on "Understanding Disabilities." The types of disabilities covered in the first section include sensory disabilities (a chapter each on visual and hearing impairments), cognitive and learning impairments, physical impairments, and disabilities associated with aging. Each section provides a brief overview on Web accessibility for people with different disabilities. For example, sensory disabilities: the Web is increasingly visual in its format, and it is people with visual impairments who are profoundly impacted by inaccessibility to the Web. The solution to sensory impairments is usually to convert the Web contents from one mode of sensory presentation to another. For example, converting text and visual presentations into an auditory presentation for users with visual impairments; and conversely, from auditory to textual for users with hearing impairments.

To illustrate that a program is easy and user-friendly, one often uses a term like "as easy as point and click." Such fundamental actions to access the Web as point and click may sound trivial to nonimpaired users; however, for users with dexterity (physical) impairments such actions can be laborious and demanding. As the Web becomes more sophisticated, its activities are demanding increasingly higher levels of dexterity. The accommodations for people with dexterity impairments usually involve assistive input devices and adjustments for simpler navigation and input. Accessibility challenges for users with cognitive disabilities are less clearly defined and are more difficult to pinpoint. Improvements in the readability of the content and advances in representing the meaning are among the accommodations that can potentially make the Web more accessible for users with cognitive disabilities. Accessibility is increasingly more relevant as the world population ages, as the Center for Disease Control and Prevention (CDC) found that the number of people reporting a disability doubled for each successive age group (18–44, 45–64, and 65 or older), with more than half of the people age 65 or older reporting a disability.

There are three broad approaches to making Websites accessible for PwD: designing the Web contents to be accessible (the source), developing assistive technologies to help users with disabilities access Websites (the user site), and an intermediary technology that transforms existing Websites to be more accessible to PwD. The core content of this book follows this broad category, with the second section devoted to the issues of design and development of accessible Websites, and the third section dealing with assistive and intermediary technologies. Making Websites accessible is more economical if it is done as part of the initial Web design during the development stage. As in making built environments accessible, making a ramp as part of the initial design is usually easier and more economical than retrofitting an old building with a ramp. Important tools to help in the development of accessible Websites are accessibility guidelines and Website authoring tools. The most widely known accessible guideline is the Web Content Accessibility Guidelines (WCAG) 1.0, a standard developed by the World Wide Web Consortium (W3C). WCAG 1.0 has been fairly successful in the sense that it is widely adopted because the checkpoints can be

easily followed by authoring or evaluation tools. The newer guidelines, WCAG 2.0, are intended to address a wider range of accessibility issues than WCAG 1.0 (which targets mainly users with visual impairments). Guidelines in WCAG 2.0 are organized around four principles of Web accessibility: perceivable, operable, understandable, and robust. WCAG 2.0 applies more broadly to different types of Web technologies and to more advanced technologies. With the extensive support materials with guidance and examples, WCAG 2.0 is expected to be easier to understand and use; however, WCAG 2.0 has been criticized as being complicated and impractical.

In addition to addressing issues of developing accessible Websites, the second section of the book also covers the methodology of evaluating the accessibility of Websites, using automatic checking or end-user studies. The chapters on Web accessibility and end-user evaluations are extensive. They provide a brief overview of the methodological issues such as sampling, evaluation methodology, and testing procedures. Also discussed is the methodology for conducting end-user evaluations, both quantitative and qualitative. Although the book covers the methodology of Web accessibility evaluation rather extensively compared to other topics, it seems that it is just a beginning, as this area is very large and rarely covered in other accessibility books. The book falls short of its promise as a foundation for research in Web accessibility. Research foundation issues such as how to do sampling on the Web, how to measure accessibility, how to compare accessibility metrics, how to conduct user studies (measurement, sampling, etc.) are not adequately discussed in the book. This area can be further covered in subsequent academic books on Web accessibility.

The third section of the book is titled "Applications," which covers assistive technologies for accessing Websites and research on transforming a Website to formats that make it more accessible for PwD. For PwD, accessing Websites can be done either by using specialized browsers or by using a regular browser along with additional access technology such as a screen reader. A screen reader is an application program that converts text into voice and is a very important assistive technology for visually impaired users. A screen reader can be used to read text out loud from a Web browser as well as text in other computer applications. Specialized browsers, on the other hand, are designed to combine the functions of a Web browser and a screen reader into a single application, and, therefore, can only read text from a browser. The benefits of specialized browsers include enabling the user to efficiently navigate the contents of a page—it can navigate by paragraphs and sections, instead of the line-by-line navigation employed by screen readers. However, the technology of the screen reader has also been progressing, and it is currently using similar features. Research effort on specialized browsers focuses on advanced features that cannot be done by regular browsers. An example of such an effort is the interactive environment that creates the auditory equivalent of the graphical desktop.

Another important technology that can help users access existing Websites is intermediary technologies, also known as transcoding technology. A Web Transcoder is an information intermediary that acts as a broker between information consumers (Web users) and providers (Websites). The primary objective of transcoding is to transform Web pages in real time to adjust to the limitations of the user or the user's device. In a broader context, this technology has been used to transform Web content to fit into mobile devices. In the context of Web accessibility, transcoding is used mostly to transform a given Web page to a format that lends itself to be easily readable by a screen reader. Examples of transformation can range from simple text magnification, color scheme changes, and alternative text insertion to explain an image, to complex transformation such as page simplification or rearrangement.

The transcoding technology can be installed on the server side by the owner of the Website, on the user side to be used in conjunction with a browser, or as a true intermediary for many users to access various Websites.

Predicting the future is very difficult, and predicting the future of technology can only be done at our own peril. However, the future research and challenges of Web accessibility can only be addressed by identifying technologies on the horizon because current technologies will soon be outdated. The fourth section of the book, "Specialized Areas," examines these emerging technologies that are expected to bring significant consequences to Web accessibility. Seven top areas are examined to provide a glimpse into the future: education, specialist documents, multimedia and graphics, accessibility of mobile Web, semantic Web, Web 2.0, and universal accessibility. One thing certain about the Web is the constant arrival of new technologies that bring new challenges to Web accessibility. One example of such technology is interactive Internet applications that were found in Web-based E-mail and E-commerce. These types of applications are often developed using such technologies as JavaScript, Flash, and multimedia. These technologies present tremendous accessibility challenges since assistive technologies are designed mostly to handle static Web documents. The solution to the wave of new technologies seems to be patterned after an earlier approach: address the source of the Web application and the user site. Addressing the source has been done by developing standards and specifications to make the new technology accessible, while the effort on the user side is the development of more advanced assistive technologies.

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Spychips: How Major Corporations and Government Plan to Track Your Every Purchase and Watch Your Every Move. Nashville, TN: Thomas Nelson, 2006. 288 pp. $24.99 (hardcover). (ISBN: 978-0-641-96480-0).

Radio Frequency Identification (RFID) is rapidly changing the way corporations and governments conduct business. Simply stated RFID is an information collecting technology that uses electronic tags to store and transmit data. In response to this new technology, the market is becoming flooded with books on the subject. Unfortunately, most of these books are highly technical in nature and few books are written for the general public. The books that are published for the general reader are often highly biased; the authors either praise RFID for its potential benefits or discredit the technology due to its invasiveness.

The book *Spychips: How Major Corporations and Government Plan To Track Your Every Purchase and Watch Your Every Move* unfortunately is negatively biased. The authors, Katherine Albrecht and Liz McIntyre, see themselves as self-proclaimed RFID experts fighting against technological oppression. The first author, Katherine Albrecht, comes across as an academic turned activist. *Wired Magazine* even credits her as being "the Erin Brockovich of RFID" (McHugh, 2007, p. 2). Her co-author, Liz McIntyre, also seems to have a varied background; a former bank examiner and privacy expert. Both authors bring a unique viewpoint to the book, and by the last chapter the reader certainly understands their position on the subject.

Albrecht and McIntyre discuss many issues surrounding RFID. To present their case against RFID, they structure the book into four main sections. Chapters 1 to 3 introduce the history of RFID, basic components and technological determinism. Chapters 4 to 6 illustrate how RFID technology is affecting consumers. Chapters 7 through 10 describe RFID potential to change our privacy perceptions. Finally, chapters 11

through 15 address the role government will play with the spread of RFID. The last two chapters complete the argument, by promoting anti-RFID activism. The role of advocacy may in fact be the driving force behind the book.

The book sets the tone of the work early portraying RFID as a "threat" to society. This can easily be seen in the first sentence in chapter one when it asks the reader to imagine a world without privacy. Chapter 1 then continues by highlighting several issues surrounding RFID that the authors will touch upon in subsequent chapters. Overall, what this chapter lacks in content it thoroughly makes up in fear appeal. The authors continue use emotional of appeals throughout the book. In addition to attempting to persuade the reader that RFID is a threat, this chapter also features several instances where the authors attempt to establish their authority in this subject area. They explain their ties with the Consumers Against Supermarket Privacy Invasion and Numbering (C.A.S.P.I.A.N.) organization, as well as their academia qualifications.

Now that the authors have introduced the basics of RFID technology, the authors approach the first major issue, globalization and the corporate infusion of RFID. In chapters 4 through 6, the authors insist that the threat of RFID is not limited to the U.S., but other countries as well. The authors once again convey an alarmist agenda and a sense of urgency to the readers. In discussing the unpublicized corporate adoption of RFID, the authors' mention several prominent companies who have tested RFID in their products.

The companies (Gillette, Procter & Gamble, Target and Barnes & Noble) mentioned in this chapter could be considered "niche" markets and that those companies were only in testing phases with RFID. It should not be surprising that the authors inform the reader that these companies were simply early adopters and in the future there will be an almost universal adoption of RFID.

Chapter 5 introduces the reader to the practice of consumer spying and how RFID will improve the watchful eye of corporations and marketing strategies. As to help demonstrate the evils of companies employing RIFD the chapter includes various pop cultural references to dystopian futures as seen in the movie *Minority Report* or in George Orwell's 1984.

Chapters 7 through 8 shift the focus of RFID from a macro level (globalization and corporations) to a micro one (houses and privacy issues). Chapter 7 begins by describing a how RFID would interact with a "smart home". The authors attempt to present an effective argument, linking "smart home RFID technologies" to other repurposed technologies, such as frequent shopper cards. Unfortunately, the argument is faulty; it is difficult to compare a future type of technology that is still in R&D with a current technology.

Chapters 9 through 10 continue discussing personal privacy issues caused by RFID. The authors expand their examples to include both the healthcare industry and ethics. The perceived effectiveness of these chapters is only due to their subject matter and emotional appeal. By using a controversial topic, the failing healthcare system, the authors can efficiently bend the reader's empathy towards their anti-RIFD cause.

The next two chapters, 11 through 12, introduce the nationalization of RFID by the government. The alarmist agenda continues by casting a negative light on many RFID technologies that could improve rather than hinder society. A reader can possibly sense a hint of mistrust of the government in these chapters as well as others that follow. Chapter 12 is a natural progression from the previous chapter; now that the authors have informed the reader that the government plans on tracking your every move, they provide some helpful tips in disabling RFID tags. The authors include techniques such as hitting RFID tags to disable them or placing the tags in the microwave. Chapter 12 appears to be a primer or to be used in conjunction with the last two chapters addressing activism.

Chapter 13 is worth mentioning because it clearly identifies an issue of credibility. Throughout the whole book and specifically in this chapter, the authors promote an advocacy organization which they founded. Using such a lowbrow tactic to establishing self-credibility is questionable in this type of book. The reader should question whether the authors are an authorities on the subject.

Chapters 14 through 15 are simply an extension of chapters 11 through 12. The authors continue to highlight the governmental infusion of RFID. As in previous chapters, the authors begin with a sensationalist example in order to create another appeal to emotion. In this instance the authors cite a story concerning a Guantanamo Bay prisoner victimized and exploited by RFID. Once again, it appears as if the authors are taking advantage of a recent politically controversial topic to present their anti-RFID viewpoints. Afterwards, the authors continue to address issues concerning various laws and constitutional amendments that would be violated if RFID were implemented by the government. In concluding the chapter with such political and nationalistic overtones, the authors set the perfect stage for a call to activism.

This "call to action" begins in chapters 16 through 17 and includes the most striking examples of dystopian scenarios as a result of RFID. Chapter 16's title, "The Nightmare Scenario", introduces a modern day RIFD holocaust. They employ various tactics such as using emotional appeals and presenting weak cases of technological determinism to effectively rally the reader around their cause. The final chapter lists a myriad of ways to fight RFID technology. It is quite clear that the authors wish for the reader to become an anti-RFID activist.

The issue of RFID technology and its implementation within society has both advantages and disadvantages depending on the motivations of the parties involved. Unfortunately, this book only seeks to portray the most radical and worst-case scenario possible. The authors touch on some topics that are indeed noteworthy and thought-provoking, however, a critical reader will most likely disregard these points due to the biased viewpoint.

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Scholarship in the Digital Age: Information, Infrastructure, and the Internet. Christine L. Borgman. Cambridge, MA: MIT Press, 2007. 336 pp. $38.00. (ISBN-10:0-262-02619-8; ISBN-13: 978-0-262-02619-2).

Scholarship in the Digital Age addresses the complex interrelated social, technical, and institutional factors that have been the focus of debate, and often puzzlement, to both observers and practitioners of digitally enhanced scholarship. The strength of Christine Borgman's contribution lies in the interweaving of substantial empirical experience with key theory from the broad range of disciplines concerned with science, technology, and scholarly communication.

Borgman provides a comprehensive overview of ways in which networked digital technologies are shaping scholarship and scholarly communication, and will therefore be of interest to a wide-ranging audience. Most obviously, policy makers, research managers, librarians, archivists, publishers, and researchers engaged in the development, governance, or understanding of new forms of scholarship and scholarly communication. The comprehensiveness with which the topic has been covered also means that the book is relevant for anyone who wants to find out more about current transformations in scholarship and will be particularly useful to students.

Thorough in her analysis, Borgman offers an explanation for those fields of scholarship where maintaining the traditional status quo

between technologies, institutions, and stakeholders is the predominant trend. Indeed, this book is as much about constants as it is about change, which provides a much-needed balance to current debates and policy developments relating to scholarly communication.

The reader is introduced to the socio-technical affordances and challenges of the Internet, the rise of data-intensive scholarship, influences on scholarship and learning, and issues relating to structure in this emergent networked context (Chapter 1). Grand visions and national/international initiatives relating to the development of data grids, digital libraries, and related efforts are addressed in Chapter 2. In this chapter the terminology that has developed alongside these initiatives, such as e-Science, e-Research, and cyberinfrastructure, is explained and the various initiatives are illustrated by introducing the reader to exemplar programs and projects. These initiatives have not been without their skeptics, given the large amounts of government and industry funds that have gone into realizing them, and Borgman touches on the important point of what is new about the types of scholarship being described and the challenges faced when its uses have not yet been conceived.

Developing this discussion further, Chapter 3 explores the assumptions implicit in much of the technical and policy developments providing impetus for digital scholarship. This includes exploration of the potential tensions between pure and applied research fields and the communities that inhabit them. Exploration of pure/applied distinctions and the relationships between them is particularly relevant given that such research communities necessarily come together in novel and collaborative ways to build information infrastructures, yet their research priorities and incentive systems can vary greatly. The multiple perspectives that Borgman uses to untangle such complexity and guide the discussion throughout the book are introduced in Chapter 3 and include "computerization movements," "sociology of science," "socio-technical systems," and "open science."

Continuity is an important theme running throughout *Scholarship in the Digital Age* and Chapter 4 is devoted to the notion of continuity in the scholarly communication system. The delicate balance between informal and formal communication that has evolved differentially across disciplinary communities is illuminated and the various, often nuanced, functions of the multiple forms of dissemination established primarily in the traditional print-based paradigm and that have evolved and are evolving in the digital paradigm are contextualized within emergent information infrastructures. Notions of quality, legitimization, and trust are enduring in the narrative being told and particular emphasis is given to authors as social agents in shaping this narrative.

By way of contrast, Chapter 5 focuses on discontinuity in scholarly publishing and the shifting balance between stakeholders, e.g., researchers, publishers, and librarians, as new opportunities for self-publishing and self-archiving are created on the Internet. Borgman explores the relationship between traditional print and emergent digital paradigms in terms of dissemination, access to and curation of the expanding, and diverse outputs that constitute the body of scholarly knowledge, highlighting the changing concepts of "publication" and "stewardship" along the way.

Data-intensive scholarship has become a reality in many disciplines, yet as Borgman explicates in Chapter 6, data resources are in their infancy and no infrastructure exists that is comparable to that which supports scholarly publishing. Chapter 6 drives home the message that data are the foundation of scholarship and are increasingly important as outputs, as well as inputs, particularly in light of open science and open access initiatives and policies that have impacted on data sharing and re-use. Continuing the theme of quality, legitimatization, and trust Borgman details the challenges for researchers and other stakeholders as a consequence of this immaturity.

The emphasis in Chapter 7 turns to building information infrastructures as situated within research communities and research practice; collaborative practices in particular are emphasized. This naturally brings the discussion to divergence and convergence across disciplinary communities and the importance of professional identities in influencing practices. In keeping with recognition of the continuum between scholarly inputs and outputs, here the continuum between scholarly dissemination/publication and information-seeking practices is explored. Historically, there has always been an important temporal dimension to scholarship from the amount of time it takes to generate empirical results to the time taken for a manuscript to be published. Early informal discussions of e-Science, e-Research, or cyberinfrastructure often raised the question: Does it enable new forms of science or does it enable scientists to do the same things, but faster and better? Borgman draws in this temporal dimension as one of the many factors for consideration in building information infrastructures.

In Chapter 8 Borgman makes a significant transition for the reader, shifting the focus away from consideration of building information infrastructures to consideration of populating them with content. This is where understanding of disciplinary divergence and professional identities becomes pivotal. Borgman provides detailed evidence of the ways in which artifacts and practices, including information practices, vary across the sciences, social sciences, and humanities and the relative incentives and disincentives to contribute to and sustain information infrastructures.

The concluding chapter brings the evidence and discussion full-circle by coming back to focus on policy, issues relating to the coordination of individual efforts within research communities, and the need to invest in content, aka "information." Looking outwards from current initiatives and practices towards building the content for information infrastructures the potential role of information institutions, publishers, universities, and funding agencies are addressed. Opportunities and challenges for information institutions are laid out according to the enduring principles that have been a prominent feature of the preceding chapters and that are core to information science and its professions.

More specifically, in terms of the contribution of *Scholarship in the Digital Age* to current understanding, Borgman interrogates infrastructure from an "information" perspective, concluding that "the real value in information infrastructure is in the information." Enlivening the often neglected, but increasingly relevant, debate regarding what constitutes "information," in practice as well as in theory, and how it is distinct from other elements fundamental to the lifeblood of scholarship. In the context of "data and information-intensive, distributed, collaborative scholarship" Borgman seeks a redefinition of what is commonly perceived as scholarly communication by drawing on the very intertextuality inherent in scholarly artifacts and their representations. The notion of "document" is also subject to a much-needed reexamination and Borgman explains how digital documents have challenged the traditional status quo between stake holders in the scholarly communication system.

The evolving information landscape depicted by Borgman crosses institutional, geographic, and disciplinary boundaries and in her own words makes it "more difficult to apply singular standards for evidence, quality, value or truth." This is just one of the arguments made by Borgman that highlights the urgency to engage with and understand the full lifecycle of scholarship enabled and rendered visible by digital information infrastructures, from data and information practices to scholarly publication.

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