

Building Effective Discovery Tools for Academic Promotion and Tenure Evidence: The Added Value of ETD and Institutional Repository Metadata, Citations and Access

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Abstract

In this discussion, we will explore the utilization of Electronic Thesis and Dissertation (ETD) and other institutional repository (IR) collection metadata, citations and access statistics as a means of providing effective discovery tools for university students and faculty. These resources can facilitate the administrative process of gathering evidence of scholarly activities for use in promotion and tenure performance evaluations. This value added approach to IR services is becoming increasingly important because the very transparent nature of open access collections creates a public record of research. Access can be accounted for in the quantity of downloads, inferring some sense of popularity. Further, citation analysis is becoming increasingly critical for an individual and/or institutional entity as an index of the dissemination, peer review, acceptance, success and ultimate contribution to the research cycle. This provides a foundation and means for the formation of the virtual social constructs surrounding these scholarly works. Historically, the scope of IRs has been about providing access to the research work itself. Ironically, the topic of metadata, access and citation analysis initially appeared to be ancillary to the research process, yet has revealed itself to be intrinsically linked with the research phenomena – the evolving processes and the ETDs and faculty e-publications themselves.

In digital library collections, the selection and incorporation of appropriate local metadata and statistical profile analysis applications along with the provision of a means to find that information is directly related to the facility or difficulty with which a client may seek and discover relevant results. With promotion and tenure workflows now moving out of paper and becoming electronic and universities beginning to mandate submission not only of ETDs but also faculty publications into IRs, the elegant solution is to collect and track this information electronically upon ingest and make it available and interoperable to support these new practices.

What kinds of information does our audience demand? Graduating students want to see hit counters; they want to know how many downloads their dissertation received last year / for all time. Faculty and administrators want an immediate list of how many committees did Professor X chair in the last five years. How many ETDs did his college produce in the past year? How many journal articles did I publish last year? Can I produce my citation lists on demand? Whose dissertation was the most popular last year? Which department is the most popular? The list goes on. This presentation will include examples of various existing and planned metadata standards, statistical analysis software and discovery tools presently in use or to be implemented in the West Virginia University Electronic Institutional Document Repository (eIDR).

In sum, the measure of scholarly output through the sensible use of metadata and the statistical analysis of peer access and citation linkage to a scholar's research works can provide a wealth of information to help advance and promote our scholars. By making informed decisions about the metadata and analysis framework and by developing appropriate system tools to make "easy button" solutions available to our academic clients, the discovery process becomes a truly powerful value-added IR service. Ultimately, this provides a cornerstone for the continued quality and success of our students, faculty, institutions and research – Priceless!

Introduction

This discussion will explore the utilization of Electronic Thesis and Dissertation (ETD) and other institutional repository (IR) collection metadata, citations and access statistics as a means of providing effective discovery tools for university students and faculty. These resources can facilitate the administrative process of gathering evidence of scholarly activities for use in promotion and tenure performance evaluations. This value added approach to IR services is becoming increasingly important because the very transparent nature of open access collections creates a public record of research. Access can be accounted for in the quantity of downloads, inferring some sense of popularity. Further, citation analysis is becoming increasingly critical for an individual and/or institutional entity as an index of the dissemination, peer review, acceptance, success and ultimate contribution to the research cycle. This provides a foundation and means for the formation of the virtual social constructs surrounding these scholarly works. Historically, the scope of IRs has been about providing access to the research work itself. Ironically, the topic of metadata, access and citation analysis initially appeared to be ancillary to the research process and resulting products, yet has revealed itself to be intrinsically linked with the research phenomena – the evolving processes and the e-scholarship works themselves. Our intent here will be to investigate the motivational factors for faculty submissions, the resulting impact and how the variables affect each other. This will provide a set of policy recommendations which although tailored to situation at WVU, many of the broader concepts can be applied to any given institution of higher learning.

Background and Support

In 1997, West Virginia University Provost Gerald Lang appointed a university-wide project team responsible for implementing an ETD program. By 1998, ETD submission was made a requirement. Since the early days in discussion about student intellectual property rights, the expense of requiring electronic format, and the ability to store and retrieve electronic documents, the WVU ETD program has grown into an extraordinarily successful program. Its special strength from the beginning has been the collaboration of various campus units with the underlying support of the Provost.

Today, the WVU collection of ETDs and other scholarly online research collections is one of the University's most forward-looking endeavors. From the start, the primary goals of the ETD project were to build a shared knowledge of digital libraries among students and faculty, and to develop expertise in the management of electronic collections. The early memoranda refer many times to the need to "unlock the potential" of scholarly graduate level work.

This summer WVU will participate in the Association of College and Research Libraries' *Scholarly Communications Institute*, which will yield a road map to foster faculty research contributions to our institutional repository. This project brings together the University Libraries, the academic Colleges and Schools, the Graduate Council, the Office of Information Technology, the Vice President for University Advancement and Marketing, and the Office of the Provost. West Virginia University has a decentralized Graduate School environment; responsibility has been delegated to the various schools and colleges at WVU. Central policy issues on graduate study are coordinated through the Office of Graduate Education in the Provost's Office.

Collaboration among students, faculty, librarians and administrators has been a hallmark of the WVU ETD program since its inception. Students have learned about electronic publishing as they build and submit their ETDs; faculty have learned about digital libraries and increased accessibility to scholars throughout the world. The Provost's Office has provided funding, leadership, and workshops to achieve this. The next steps will be to unlock the potential of WVU intellectual property and products as a whole, particularly where our faculty are concerned.

In this environment of campus-wide collaboration and support, the WVU team represents our strength and mission. Academic interests, entrepreneurship, and marketing are all present. The team will be able to assess the needs of research faculty, market the IR and build support, place the new IR in WVU's priorities, and develop future partnerships across the campus. We know faculty do not welcome campus meddling with their research. We believe our focus must be our ability to communicate the benefits of the IR to the individual researcher. The team members are all experienced in strategic thinking about the future of WVU. Their accomplishment will be awakening the faculty to new dimensions of academic excellence and creating openness to new ways of functioning as a teacher and a researcher.

The Libraries have formed a collaborative partnership with faculty on campus. Together they are engaged in teaching, creating knowledge, and helping students succeed. The WVU 2010 Strategic Plan has two goals directly related to the Institute agenda: Promote Discovery and Exchange of Knowledge and Ideas, and Improve West Virginia's Health, Economy, and Quality of Life. Quoting from the Strategic Plan:

Discovery and intellectual exchange define the purpose of any university ... The exchange between faculty and students sparks innovations in engineering, health care, and physical sciences; it sparks new creative works and new interpretations in performance and literature. And it sparks new perspectives on local, national, and global issues.

A University that understands the nature of permeable boundaries looks simultaneously inward and outward as it considers ways to foster a vital intellectual climate. Permeable boundaries value the influx of new ideas and new people, invite collaboration across disciplines, and extend knowledge and ideas beyond the walls of the institution. Such sharing and exchange of ideas and the people who possess them are important to advance learning and foster innovation.¹

It is from this grounding that WVU seeks to participate in this endeavor. The WVU administration has chosen to be active in developing and sharing new forms of scholarly communication as part of the land grant mission. The WVU faculty, librarians, information technologists, and information professionals have a history of successful collaboration and understanding.

We are moving much closer to our goal of unlocking our scholarly work. We have just completed the evaluation of vendor responses, campus demonstrations and selection process for a Request for Proposals; we are seeking commercial IR software to replace our local system and we will be migrating to a new system (Ex Libris' DigiTool) in the coming year. We have established a strong foundation and we are ready to develop an outreach plan. We believe this path will help us clarify the objectives, audiences, and activities required to

implement a scholarly communications plan for WVU with the most impact and the widest applicability.

Justification and Goals

Our initiative will be to develop and implement the WVU *Scholarly Communications Outreach Program for E-Documents*, AKA “Project SCOPE”. We now have an IR system and programs in place to serve the entire university population; yet voluntary faculty participation is low, even in the face of recent reports from Harnad et al indicating vastly increased citation counts for faculty who publish in open access IRs ([Figure 1](#))². In 1998, WVU became the second institution in the world to require ETD submission. We have experienced tremendous success since that time. For example, during the first two of years following ETD program implementation, the access level of electronic over print theses and dissertations increased by 145,000% ([Figure 2](#)). Presently with over 3,500 documents ([Figure 3](#)), the collection is accessed millions of times per year ([Figures 4, 5](#)); WVU graduate research is truly known around the world. We believe the student successes experienced from ETD program implementation will apply equally to our faculty; they are just beginning to realize the notoriety that their former graduate students are experiencing because of electronic submission and open access, yet even this has not provided sufficient momentum for acceptance at the faculty level ([Figure 6](#)).

What kinds of information does our audience demand? Graduating students want to see hit counters; they want to know how many downloads their dissertation received last year / for all time. Faculty and administrators want an immediate list of how many committees did Professor “X” chair in the last five years. How many ETDs did his college produce in the past year? How many journal articles did I publish last year and what were the titles? Can I produce my citation lists on demand? Whose dissertation was the most popular last year? Which department is the most popular? The list goes on. Whatever practical discovery tools we can make available to our students, faculty and administration will make the WVU Electronic Institutional Document Repository (eIDR) system a truly useful and enterprise-wide solution.

Our first goal is to promote enhanced scholarly communication of faculty publications through the utilization of the IR. We envision an initial voluntary pilot for submissions in conjunction with the development of a promotion and tenure (P&T) tracking service, followed by phased-in required submissions policy, over a one-year period. We have concluded based on our graduate student experience with ETD program implementation, as well as supporting evidence from Harnad² that the best solution is to mandate open access and deposit in the University IR.

During the implementation phase, we will launch a major informational and public relations campaign geared toward faculty development. Extensive use of branding, logos and imagery will facilitate the message. For example, we will utilize the “Easy Button” concept derived from Staples Inc., to ease the “fear factor” that faculty may associate with online distribution in the IR or additional layers of bureaucratic confusion they may anticipate ([Figure 7](#)). Another example we will utilize is the “Survivor” concept, based on the hit CBS television series ([Figure 8](#)). The University mottos “WVU – Where Greatness is Learned” and “WVU – Success – Expect It” are reminders of our commitment to promote WVU through our research endeavors ([Figures 9, 10](#)). The Open Access Seal, from the Open Archives Initiative, tells us that by providing unrestricted access it breaks down the barriers, contributes to, and enhances the research cycle ([Figure 11](#))³. Additionally faculty

development workshops will be held and literature will be delivered by campus mail and via online portals to make the information as widely available as possible. We have also assembled a group of exemplary faculty, each of whom have a plethora of electronic works that they are eager to deposit in the IR. We will strategically coordinate the timing of the submission / release of these works to coincide with our PR efforts. Faculty will have local peer champions to inspire further contributions and show that the University values the research efforts of its faculty.

Our second goal is to enhance the record keeping process through use of the IR as a tool for P&T reporting and tracking. One prime example is the fact that our faculty often use the ETD system to document their P&T reports regarding ETD committee activity and citation / access analysis, which can be derived with a few strings of search query. This project can provide an exciting online venue that will make use of the IR as a means of deposit, peer review, citation-and-usage analysis, preservation and access-provision. We can develop promotion and tenure record keeping tools so that at a glance a faculty member may track his or her publication record along with dynamically produce hit and citation statistics and analysis information. The Dublin Core metadata standard with additional institution-specific data fields will be employed to achieve this. The service will greatly increase administrative efficiency, promote transparency and enhance the visibility of WVU faculty research, and ultimately enhance the research cycle itself in global fashion.

Our final goal is to provide the infrastructure for an integrated approach to digital collections on campus. This could include a variety of collections such as ETDs, Honors Theses, faculty publications (pre-prints, post-prints, conference proceedings, etc.), digital images, audio and video, learning objects, reserved / assigned reading, online and extended learning applications and institutional / academic records and reports - all under the IR umbrella. Included in this integrated mix are concerns for digital rights management and preservation.

Above all, we will advocate open access for all submissions while allowing a proper balance to protect intellectual property interests. WVU has a personal interest in promoting open access. In 1996 WVU organized a Haudenosaunee (Iroquois) Peace Tree planting ceremony at which Chief Jake Swamp of the Mohawk Nation proclaimed the following prophecy:

*And by the year 2000, I predict that it's going to arrive. People suddenly are going to understand the meaning of what they need to do. This means they are going to share information freely with one another. People who are now holding information to themselves [...] they're going to give it all because other people are looking for that information so that something can be developed to heal our world.*⁴

It is with this spirit that we will advocate open access to research. However, given the reality of commercial academic publishing, proprietary interests and the career stakes involved for faculty, we will allow a limited temporary "Campus Only" option for situations where publishers have requested restrictions in order to protect the intellectual property interests of all parties involved. Presently 80% of our graduate students choose open access for their ETD Web distribution; we would expect similar results with our faculty submissions as well.

Additionally we will promote new and more open forms of collaboration; protection and sharing such as the "Creative Commons" (CC) model ([Figure 12](#))⁵. CC defines the spectrum ([Figure 13](#))⁵ of possibilities between full copyright — *all rights reserved* — and the public

domain — *no rights reserved* ([Figure 14](#))⁵. CC offers freely available licensing, they organized the “Open Educational Resources” ([Figure 15](#))⁵ and other forums, and they have major supporters such as the Coalition for Networked Information’s “SPARC” movement and IBM’s “Building a New IP Marketplace” ([Figure 16](#))⁵. Another useful concept to promote open access and author rights is the Author Addenda; models developed by MIT, Science Commons and SPARC allow authors attach addenda to publishing contracts which specify author rights, for example, the right to self archive in an IR⁶. We will also provide easy-to-understand information about understanding and negotiating fair use, obtaining permission for use of third party copyrighted and use of public domain materials through the distribution of educational resources such as Duke Law Center’s “Bound by Law” ([Figure 17](#))⁷.

On the preservation front, WVU has recently signed a Memorandum of Understanding with the U.S. National Archives and Records Administration (NARA) for a 10-year commitment. The Electronic Records Archive (ERA) program under NARA is partnering with corporate and non-profit organizations such as WVU to develop working models for long-term archiving and retrieval systems and technologies to preserve the digital record “for as long as the Republic shall survive.” ERA will be a comprehensive, systematic and dynamic means of preserving and providing continuing access to any type of electronic record free from dependence on any specific hardware or software, created anywhere in the Federal Government. Roles for the University Libraries in this project include providing user interface development for information ingest and retrieval as well as providing a test bed system for cutting edge preservation techniques using the IR system. Present practices include local and remote daily backups of the entire system to tape and parallel servers as well as microfilming of the ETD collection. Hence, the thorough and thoughtful development of a comprehensive digital libraries vision will enable us to engage our entire intellectual output to its fullest potential and preserve it for generations to come.

Conclusion

In digital library collections, the selection and incorporation of appropriate local metadata and statistical profile analysis applications along with the provision of a means to find that information is directly related to the facility or difficulty with which a client may seek and discover relevant results. With promotion and tenure workflows now moving out of paper and becoming electronic and universities beginning to mandate submission not only of ETDs but also faculty publications into IRs, the elegant solution is to collect and track this information electronically upon ingest and make it available and interoperable to support these new practices.

Our vision is for the entire WVU scholarly output to be supported by our knowledge management systems and programs in a comprehensive fashion. We believe that the IR will increasingly become the preferred medium for publication of university research, as indicated in Harnad’s findings ([Figure 18](#))². Further, hit count and citation are intimately linked to performance indicators ([Figure 19](#))². In addition, publishers are increasingly willing to allow “self-archiving” of published materials ([Figures 20, 21, 22](#))⁸. Today about 90% of journals and 72% of publishers allow self-archiving of pre-prints and post-prints ([Figures 23, 24](#))⁹, which includes deposits into institutional repositories. However, it is incumbent upon the individual faculty member and ultimately the institution to see this process through to completion through the act of making deposits into the open access IR. We cannot just wait for this to happen by itself, we must be proactive. Says Harnad, “Open Access should not be the tactical tool of a few, elite, established scientists that want to enhance their careers and

little else”¹⁰. The implementation team and plan we have assembled will ensure our success. We will empower our campus to harvest the full potential of our IR investment - our intellectual property. In this way, we will truly become digital scholars of the twenty first century – astronauts of this brave new universe we call academia. The IR communities that we will establish represent a renaissance and return to the traditional non-profit scholarly publishing societies that once ruled academics. Ultimately, we’re talking about a new paradigm of publishing that we’re responsible for creating, and we must equip our faculty with the tools necessary to understand and navigate this new realm.

On a final note, Clifford Lynch offers some sage advice about the future of digital libraries. He begins his article with the following statement.

The field of digital libraries has always been poorly-defined, a “discipline” of amorphous borders and crossroads, but also of atavistic resonance and unreasonable inspiration. “Digital libraries”: this oxymoronic phrase has attracted dreamers and engineers, visionaries and entrepreneurs, a diversity of social scientists, lawyers, scientists and technicians. And even, ironically, librarians – though some would argue that digital libraries have very little to do with libraries as institutions or the practice of librarianship¹¹.

As academics and academic professionals, we feel it is our responsibility to take charge in the development and proliferation of the IR; it is our small contribution to humanity which when applied collectively will radically change the nature of science and discovery; the evolution and changing face of scholarship. Ultimately, it will change the world – access to knowledge is the great equalizer. Lynch concludes the discussion with the following passage.

Perhaps the overarching theme here, and it is one that may point to a major direction for research that follows on the last decade of progress in digital libraries, is connecting and integrating digital libraries with broader individual, group and societal activities, and doing this across meaningful time horizons that recognize digital libraries and related constructs as an integral and permanent part of the evolving information environment. The next decade for digital libraries may well be characterized most profoundly by the transition from technologies and prototypes to the ubiquitous, immersive, and pervasive deployment of digital library technologies and services in the broader information and information technology landscape¹¹.

Our aim is to provide a foundation and the means for the formation of the virtual social constructs surrounding these scholarly works. We want to provide ubiquitous, immersive and pervasive technologies and services to our students and faculty that enrich their lives and connect to the broader information and information technology landscape.

In sum, the measure of scholarly output through the sensible use of metadata and the statistical analysis of peer access and citation linkage to a scholar’s research works can provide a wealth of information to help advance and promote our scholars by contributing to the research cycle. By making informed decisions about the metadata and analysis framework and by developing appropriate system tools to make “easy button” solutions available to our academic clients, the discovery process becomes a truly powerful value-added IR service. Ultimately, this provides a cornerstone for the continued quality and success of our students, faculty, institutions and research. Priceless!

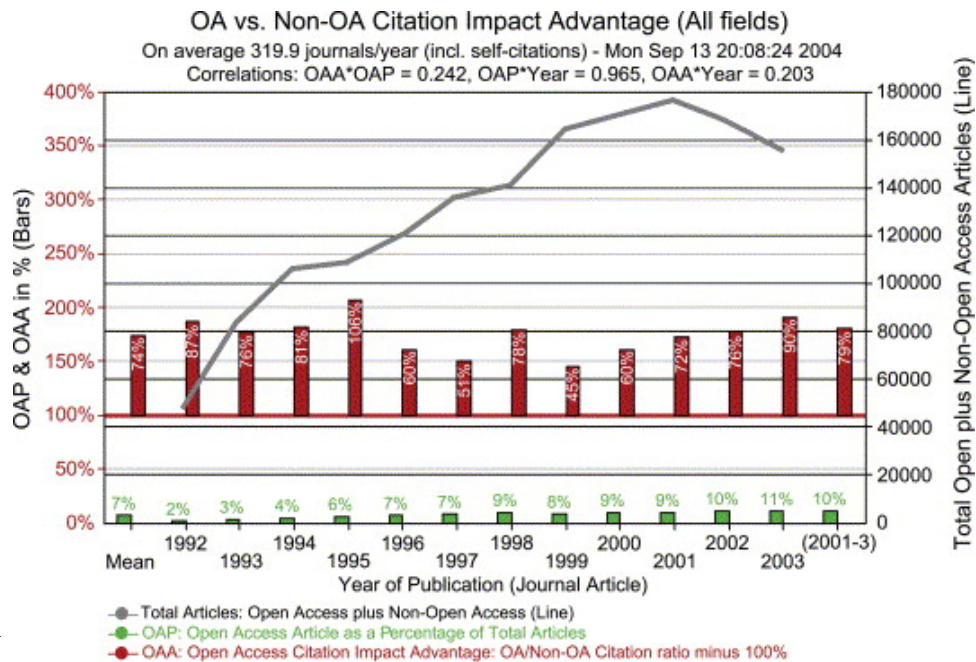


Figure 1

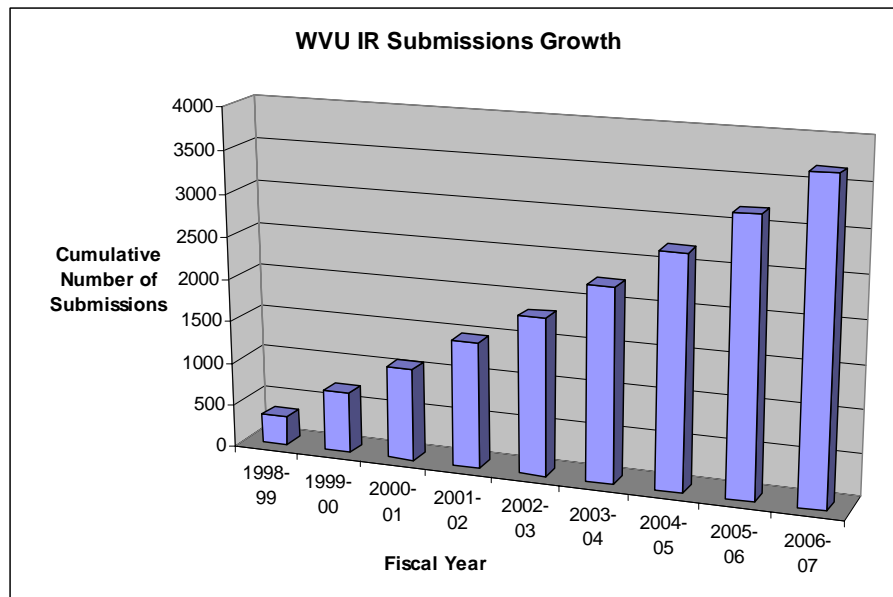


Figure 2

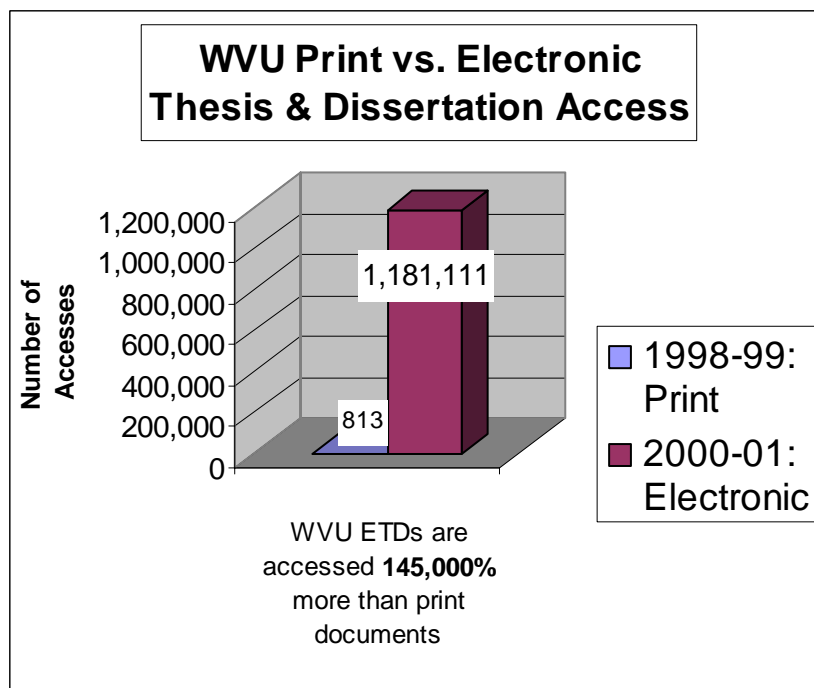


Figure 3

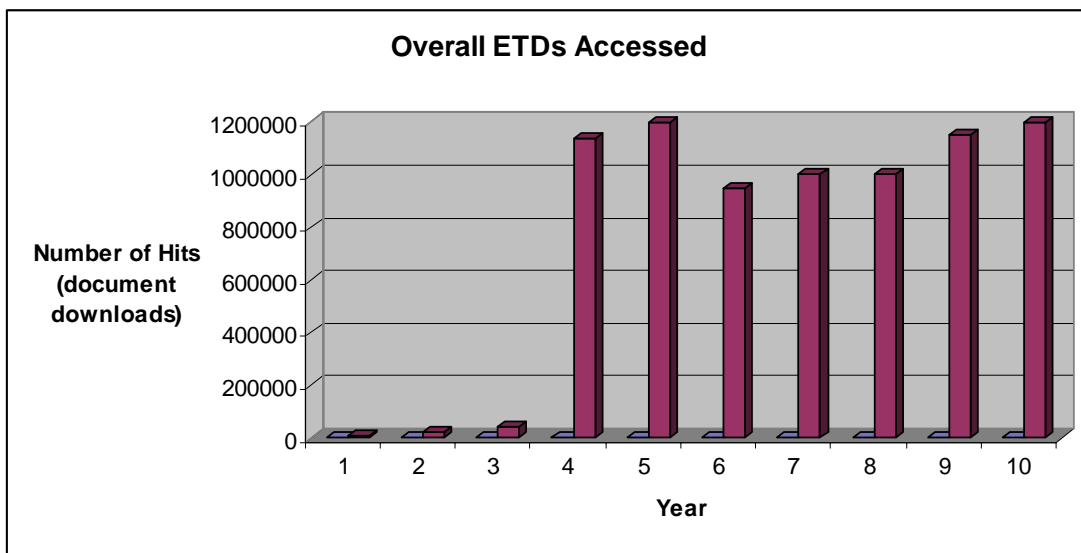


Figure 4

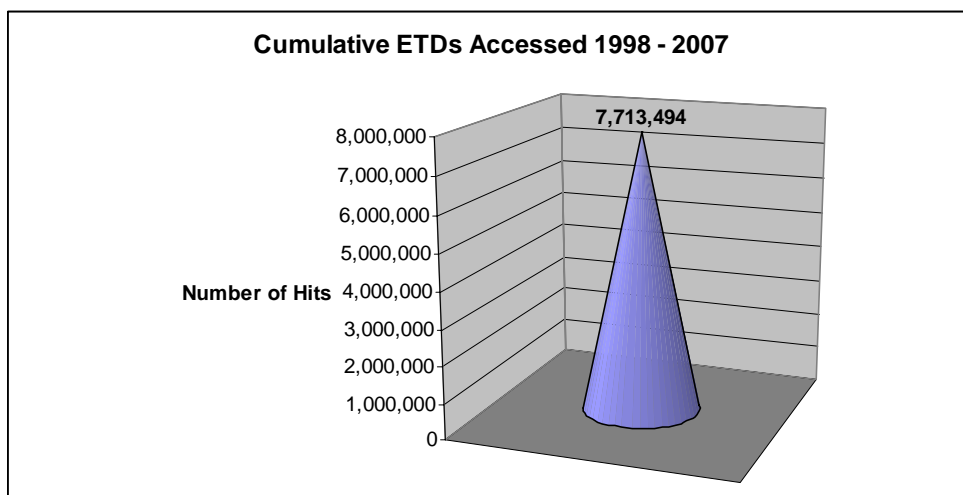


Figure 5

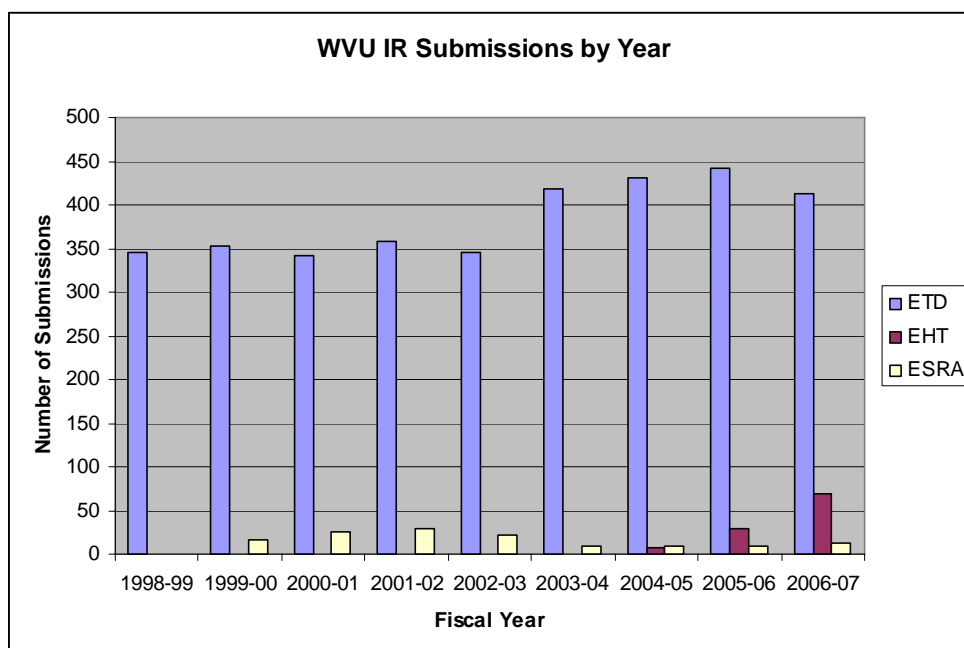


Figure 6

ETD = Electronic Theses & Dissertations (Graduate)
 EHT – Electronic Honors Theses (Undergraduate)
 ESRA = Electronic Scholarly Resources Archive (Faculty)



Let us promote your academic career!
Electronic Scholarly Resources Archive
- We've made it...



Figure 7



Academia can be a real jungle!
Electronic Scholarly Resources Archive
- With our help, you can be a...



Figure 8



Figure 9



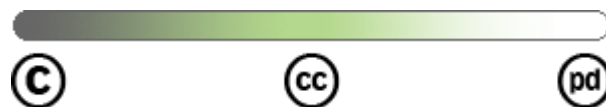
Figure 10



Figure 11



Figure 12



Creative Commons defines the spectrum of possibilities between full copyright — *all rights reserved* — and the public domain — *no rights reserved*. Our licenses help you keep your copyright while inviting certain uses of your work — a "some rights reserved" copyright.

Figure 13



Figure 14



Figure 15

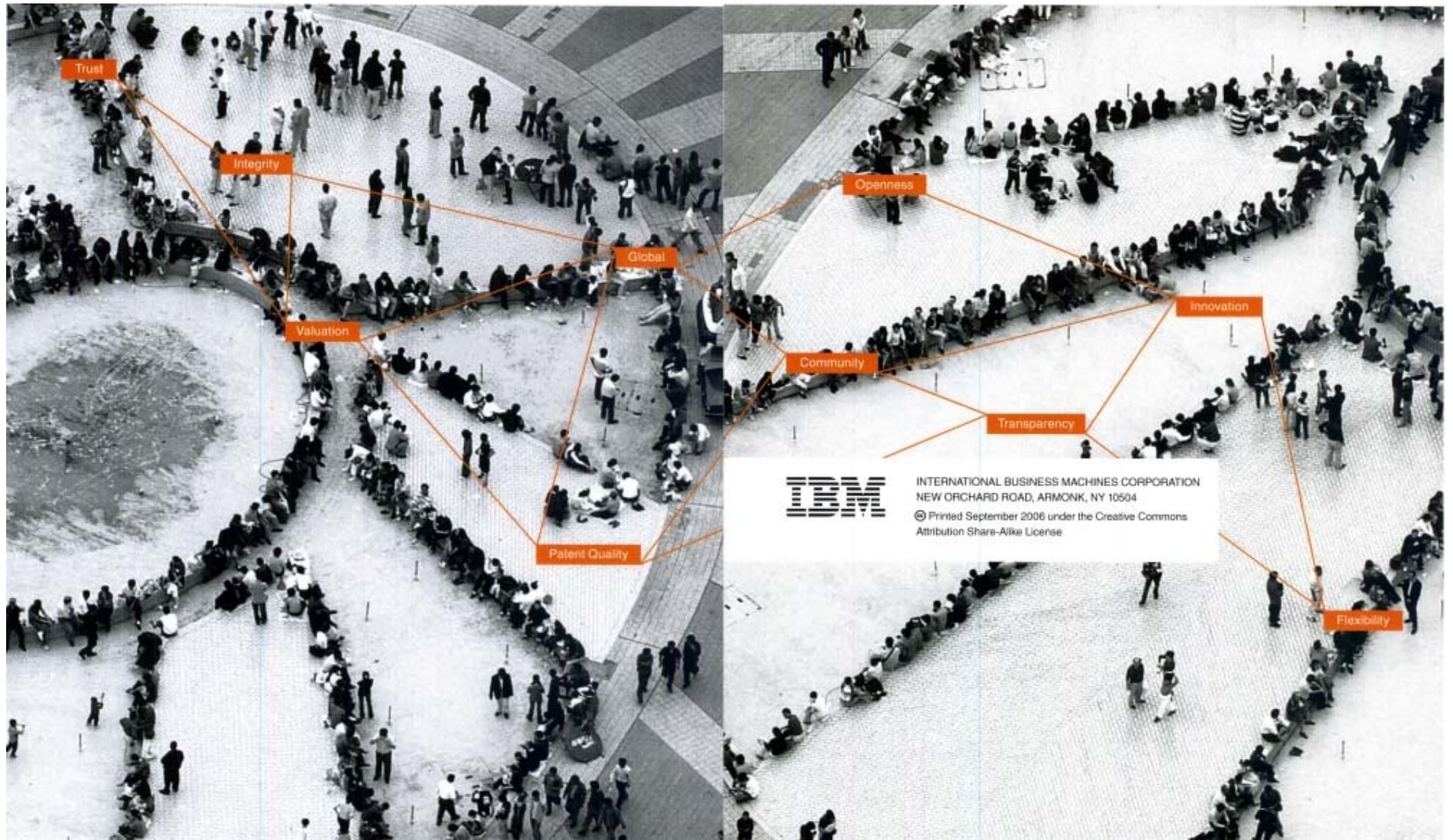


Figure 16

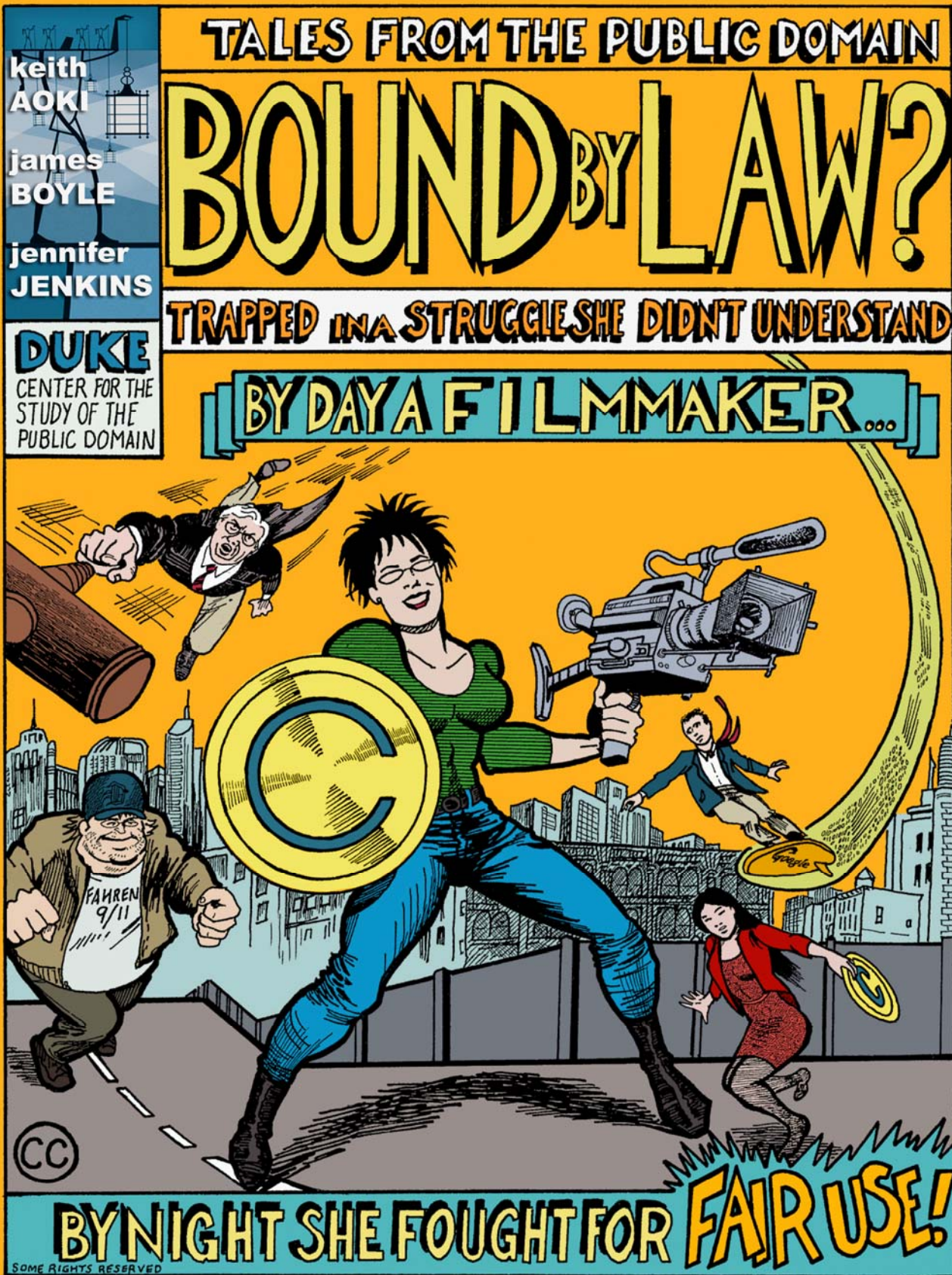


Figure 17

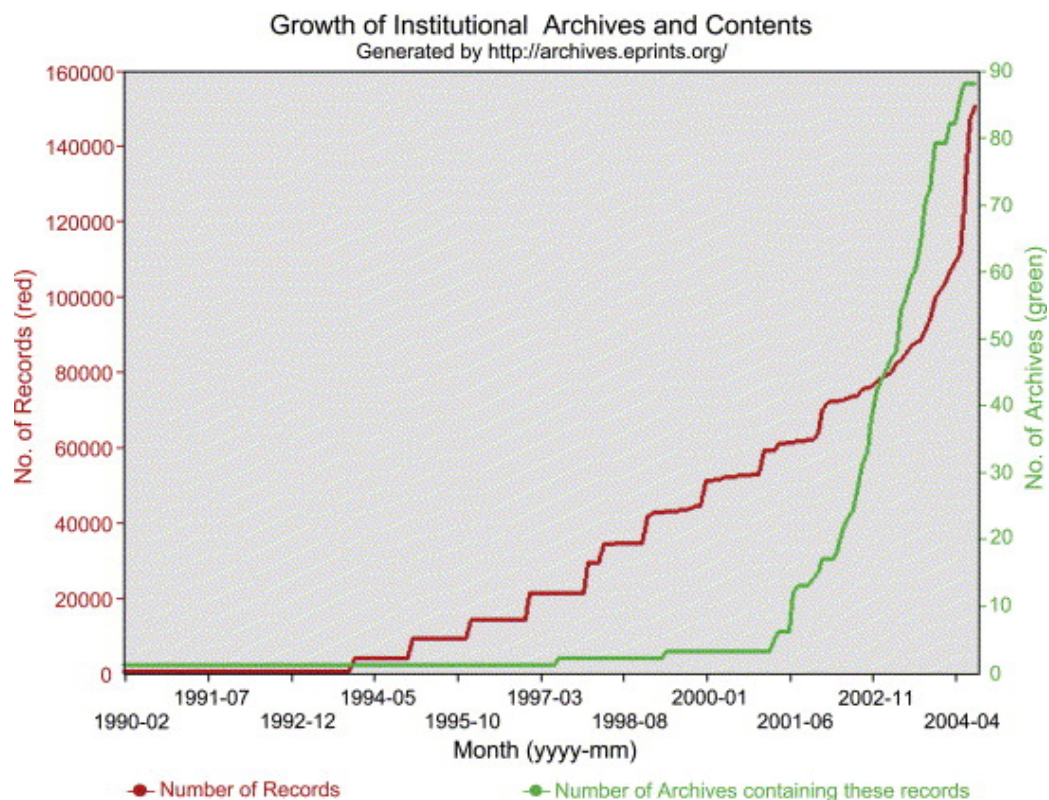


Figure 18

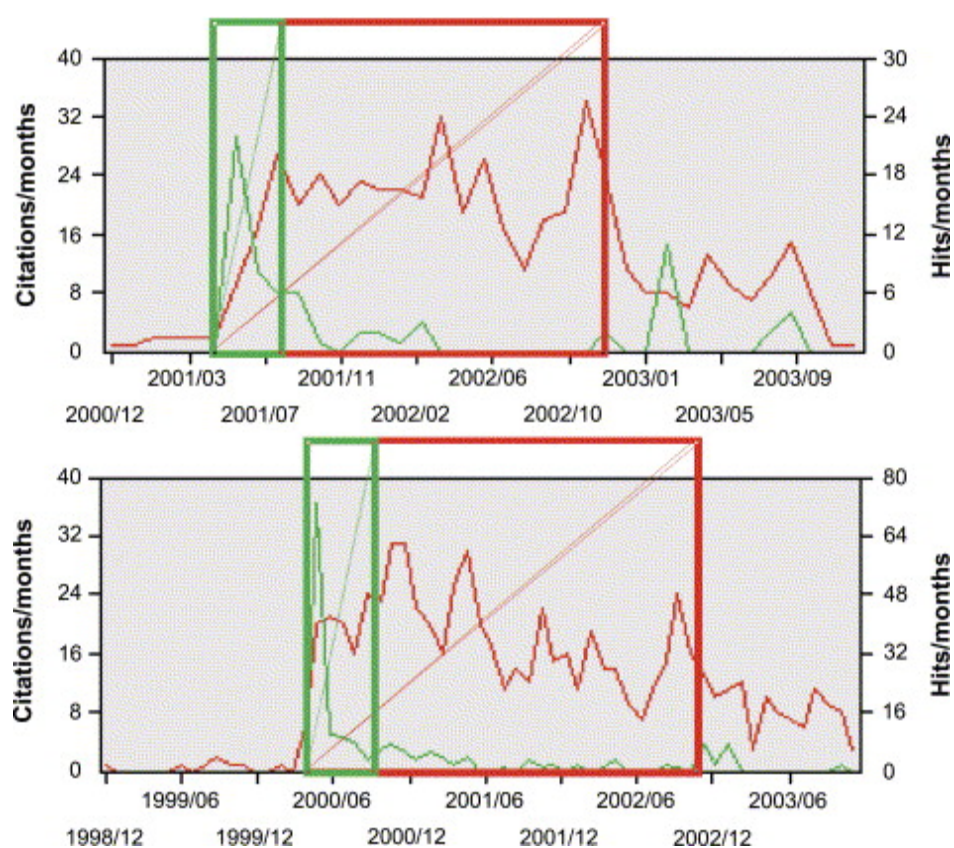


Figure 19

Green light to self-archive:	Journals	%	Publishers	%
	10,673	(100%)	88	(100%)
Neither yet	1,793	17%	37	42%
Preprint	3,253	+30% (=83%)	7	+8% (=58%)
Postprint	1,772	+17% (=53%)	14	+16% (=50%)
Postprint and Preprint	3,855	36%	30	34%

Figure 20

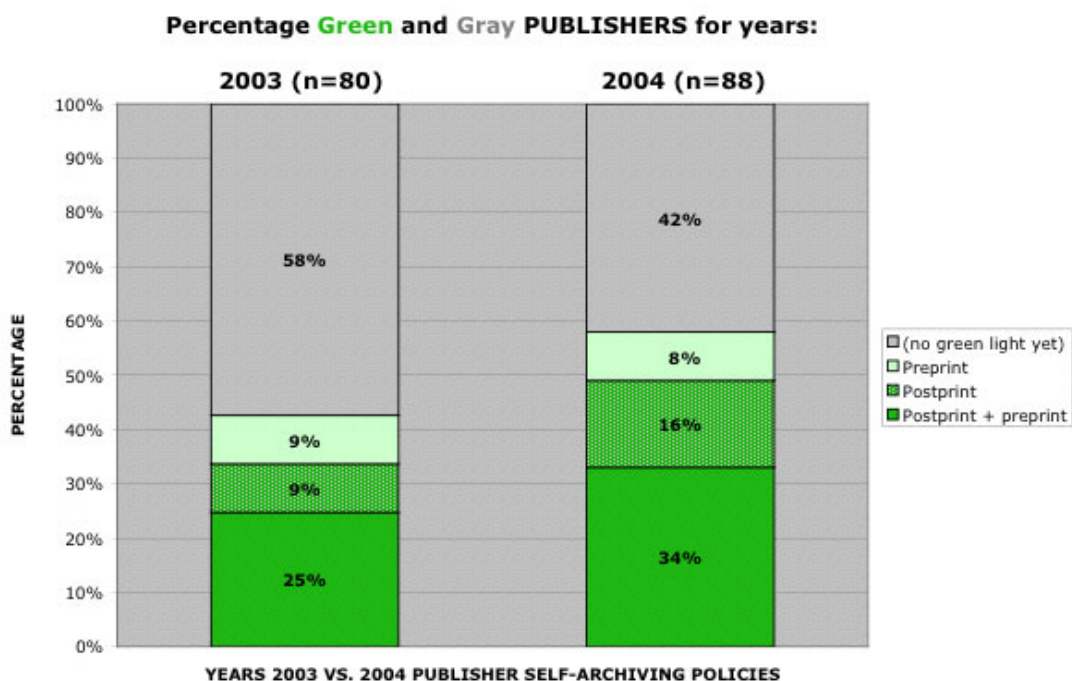


Figure 21

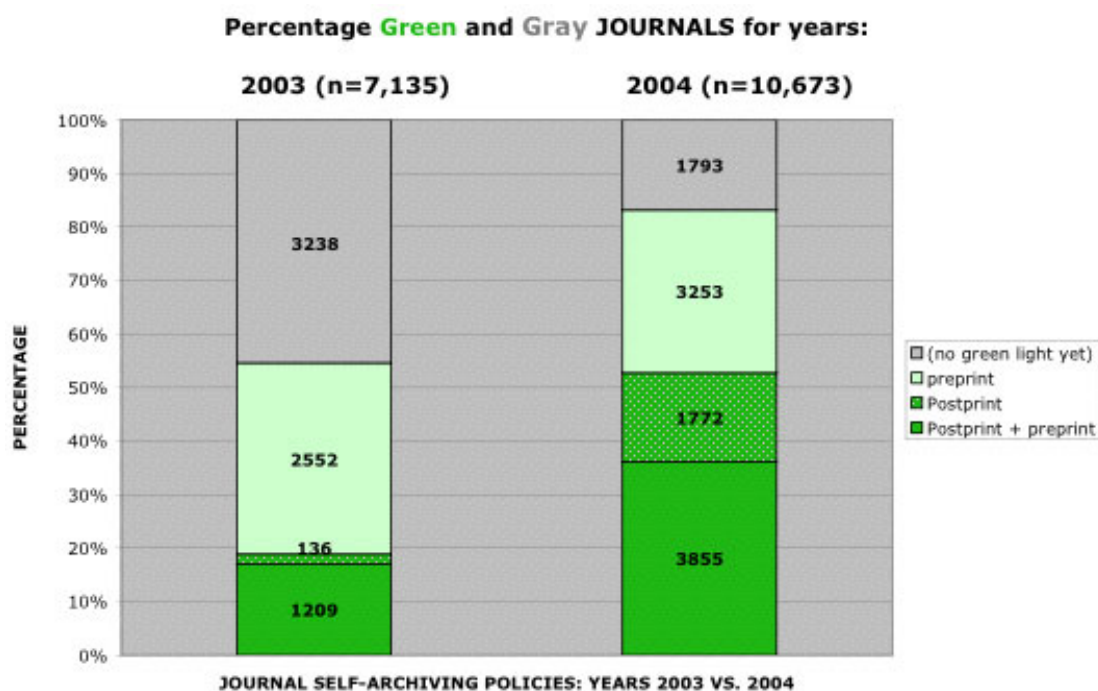


Figure 22

Journal Policy Chart

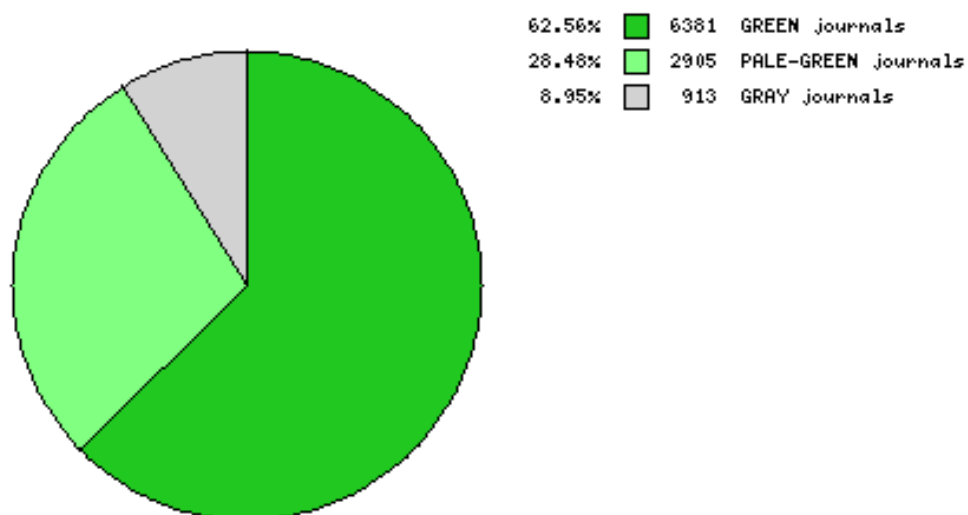


Figure 23

Publisher Policy Chart

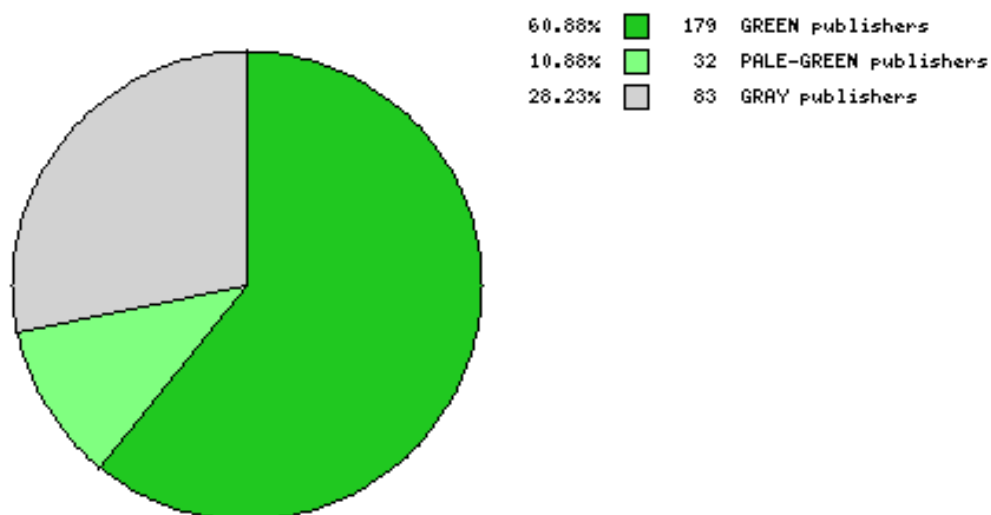


Figure 24

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