

“The Web of Our Life is of a Mingled Yarn”: The Canadian Adaptations of Shakespeare Project, Humanities Scholarship, and ColdFusion¹

By Daniel Fischlin, Dorothy Hadfield, Gordon Lester, and Mark McCutcheon

(Canadian Adaptations of Shakespeare Project, University of Guelph)

I. An Introduction to the Canadian Adaptations of Shakespeare Project (CASP)

This essay presents an overview of some of the issues related to bringing a major research project on Shakespeare into a World Wide Web/IT context. Our purpose in writing the essay is to allow others thinking of undertaking large-scale, IT-based projects related to Shakespeare (or any other Humanities research for that matter that involves extensive database manipulation on the web) to understand and resolve some of the problems they will face: considerable energies would have been saved if we could have started out with the benefit of the experience we've gathered over the last two years. Hence, we have striven to

¹ *All's Well That Ends Well* 4.3.69. This essay, like the research project it describes, has been funded and made possible by both a Premier's Research Excellence Award (Ontario) and a SSHRCC Standard Research Grant (Canada). Additional support for the project has come from the Dean of Arts at the University of Guelph, Dr. Jacqueline Murray; the Director of the School of English and Theatre Studies (SETS) at the University of Guelph, Dr. Alan Shepard; and the Office of Research also at the University of Guelph. The authors gratefully acknowledge all institutional support the project has received. A key feature of the project was to enable the training of a range of levels of graduate student in a collaborative research context, itself a relatively unique endeavour in the Humanities. Thus a range of people have worked on the project, from undergraduates to first-year M.A. students through to PhD students and postdocs: co-authors Dorothy Hadfield and Mark McCutcheon are a postdoc researcher and a PhD student respectively, the former with extensive database management and editing skills and the latter with web architecture and production experience. Gordon Lester is currently the CASP project manager. We would also like to thank Katherine Weir

be candid about some of the critical tussles that have resulted in what we feel to be a compelling (though still-to-be-perfected) model of IT-usage in the management of complex arrays of data related to a major Humanities research project. Second, and perhaps more selfishly, we have used the opportunity generated by this Special Issue of *College Literature* to re-evaluate our own working assumptions and outcomes, a necessary, ongoing, and sometimes discomfiting process by which one takes the measure of a wide range of research activities in relation to desired project outcomes.

We cannot stress enough the importance of this self-critical mode of project evaluation. This importance is especially so in relation to IT-based projects where technological innovation, the jerry-rigging of extant software, and the ever-shifting possibilities of the creative deployment of web/IT-software in relation to research methodologies and the imagining of potential research outcomes, create possibilities that a research team such as ours must inevitably mediate and negotiate.² If anything, our experience has suggested that rigorous adherence to initial project conceptions would have been injudicious and severely limited potential research outcomes, despite the fact that the ongoing critical revaluation of the initial conceptions underlying the project has produced significant short-term increases in project-associated workloads.

The Canadian Adaptations of Shakespeare Project (CASP) housed at the University of Guelph under the direction of Daniel Fischlin is a multi-year investigation of the ways in

for her contribution to the success of the project. The CASP has employed over 15 people in a variety of functions since its inception.

² Though our rationale in this essay has been to outline some of the problems we have confronted in integrating IT-based technology into our research, and thus potentially to save others undertaking similar research several missteps, we realize that this essay cannot possibly substitute for more extensive discussions of the minutiae that inevitably become integral and incremental factors in shaping such a project. People interested in further discussion and information are advised to contact Daniel Fischlin, the lead investigator for the project, at dfischli@uoguelph.ca.

which Shakespearean influences permeate the cultures of theatrical representation in Canada. Initially and perhaps somewhat naïvely, the project was conceptualized in primarily literary and historical terms with typical project outcomes projected—a critical book, an anthology for use in pedagogy, a CD-ROM of relevant archival materials, and a comprehensive bibliography. Language from the grant application itself shows the kind of parameters initially imagined for the project:

Despite Canada's increasing prominence in the theatrical world as a place where Shakespeare is performed and adapted in a variety of contexts, little scholarship exists that details the ways in which Shakespeare has been adapted over the last several hundred years. The purpose of the proposed research is to gather the archival materials related to Shakespearean production and adaptation in Canada in a central archive. The archive would be housed with the largest theatrical archive in the country at the University of Guelph and would be a crucial element in helping define key elements in Canadian theatrical history, the dissemination of Shakespearean influence, and the relationship between theatrical culture and the formation of national identity. No other archive of this sort exists in the country and ... I would note that the project I'm requesting funding for involves the building of the archive virtually from scratch.

The proposed research activity is to embark on a comprehensive search of important theatre archives across the country (including the significant holdings here at the University of Guelph and the archives associated with virtually all the theatre companies in Canada) in which these adaptations are to be found. Also, a detailed archive of secondary, critical works will be produced in relation to the project that will gather audio-visual materials, authorial and biographical information, review and staging information, information pertaining to theatrical companies throughout Canada (large and small), and secondary scholarship. This information will be organized on a play-by-play, author-by-author basis into a searchable database as well as into files that will eventually be deposited in a major library holding (either here at the University of Guelph or at the National Library ...). The impact of the proposed program of research on the community will be significant in a number of ways: the archive will be an indispensable resource for scholars and pedagogues and will become the crucial source for information pertaining to Canadian theatrical history generally, adaptations of Shakespeare in Canada across its many regions and communities, and to scholars, performers, playwrights, dramaturges, and teachers seeking specific information about the long history of Shakespearean production in Canada.

Additionally, the archive will allow for the study of the use of adaptation, performance, staging and other theatrical and literary activities to reinforce and consolidate national identity. Finally, a third expected outcome would be the production of an archive of plays that reflects upon the enormous diversity and

creativity that has historically contributed to the fashioning of Canada, one that allows for study and comment upon the ways in which the history of the arts in Canada has played a crucial role in the formation of core community values apparently definitive of a Canadian national identity. Inevitably, such an archive would allow for the study of theatrical adaptation in the contexts of Shakespeare studies in a specifically Canadian national context (including understanding the role of such prominent cultural landmarks as the work of Northrop Frye, the Canadian Broadcasting Corporation, the Stratford Festival, and a burgeoning multiculturalism) and allow for study of the prominent role of Shakespearean theatre in constituting various Canadian identities.

(Daniel Fischlin, PREA Research Grant Proposal, 1999; updated with minor modifications 2002)

The project, however, quickly mutated into something quite different. This mutation was necessitated by the initial research, which produced a startling and somewhat unexpected result: preliminary research in the grant-writing phase of the project had identified what seemed to be a manageable archive of texts in the range of fifty to one hundred playscripts that actually met the *then* fairly rigid notion of adaptation that was being used to articulate the project. This manageable archive quickly transformed itself into a many-headed Hydra once initial funding provided for more detailed searches of relevant archives, including the theatre archives housed at the University of Guelph and currently the largest and most important such collection in the country. By the end of the first year into the project, the number of confirmed plays had doubled, with an extensive “new leads” list that numbered in the thousands.³

The realization that the project was likely to produce an unprecedented archive of texts numbering well beyond the initial expectations prompted a wholesale rethinking of the

³ Initial results of this research were published in a special edition of *Canadian Theatre Review* (CTR) co-edited by Daniel Fischlin and Ric Knowles: *Adaptations of Shakespeare in Canada*, (No. 111 Summer 2002). The specifics of the extent of the archive are fleshed out in Daniel Fischlin, “Theatrical Adaptations of Shakespeare in Canada: A Working Bibliography,” *Canadian Theatre Review* 111 (Summer) 2002: 74-77, which details the state of the archival research at the end of the initial phase of the project (some 160 adaptations ranging over three centuries). This work was recently added to the *World Shakespeare Bibliography Online* database (<http://www.worldshakesbib.org>) as an annotated entry.

project's research methodologies, especially in relation to dissemination outcomes. First assumptions had been that commercially available software of the *EndNote* variety would suffice for keeping track of the relevant bibliographical, theatrical production, and authorial data the project intended to collect. In fact, from the start the assumption was that each play would have a hard-copy office file that would gather playscript (including draft work where this was available), authorial information, production information and materials, secondary reference information, ongoing correspondence necessitated by research on the file, and a range of other materials including interview materials, multimedia (visual and audio materials), theatre programs and other performance-related materials. The entire archive would thus be based on hard-copy materials (eventually destined for the theatre archives at the University of Guelph) that would become available to scholars working out of that archive. As a adjunct to the hard copy of the archive, initial project planning suggested that an indexical/bibliographic-type program (like *EndNote*) might be appropriate for keeping track of project materials in a relatively searchable application that would give researchers a quick shorthand guide to the contents of the archive. (And, in fact, much of the early data gathered by the research team ended up archived on a customized *EndNote* database.)

When it became apparent that the dimensions of the archives were going to be significantly larger than initially thought, it became immediately clear that initial conceptions round the IT-dimensions of the project had to change dramatically. Furthermore, prompted by early negotiations with Oxford University Press over the possibility of doing a teaching anthology based on the research (and the possible formats in which that anthology might be disseminated), we recognized that neither traditional text nor CD-ROM versions of an anthology would provide the kind of flexibility of access and range of material that was envisioned as being truly compatible with the pedagogical needs of various levels of pre-

university, undergraduate, and graduate education. This lack was especially evident after the publication of *Adaptations of Shakespeare: A Critical Anthology of Plays from the 17th Century to the Present*, co-edited by Fischlin and Mark Fortier (London: Routledge, 2000). The book—the first to anthologize a range of Shakespearean adaptations from Shakespeare’s own time through to the present and produced in several national contexts—had been born of a series of compromises necessitated by financial, copyright, and market exigencies. As a way of addressing key issues around accessibility to a range of teaching play-texts, Routledge and the co-editors produced a web page linked to the book to facilitate alternatives to the plays printed in the book. This relatively primitive use of the web effectively allowed the book to be used as an open-ended basis for course designs through the list of “Further Adaptations” provided on the website

<http://www.routledge.com/routledge/shakespeare/adaptations.html>).

Though not ideal, the compromise, in tandem with the signals received from the Oxford editorial team, led to the imagining of a truly open-ended text resource fully linked to a database in which one could quickly derive relevant information, whether as a student, teacher, scholar, performer, director, or writer. Further, it became apparent that the possibilities of the web permitted a less market-driven approach to published information (as necessarily occurred with the Routledge anthology) and less of a fixed sense of text limited by the costs of producing books in first, second, and later editions. Using the web as the primary means of dissemination meant that it was possible to conceive of, for example, an online anthology that could ostensibly keep growing as the archives grew (and as copyright issues were resolved for those plays not in the public domain). Further, it meant that links between the flexible, open-ended anthology and the relevant information in the database could be tweaked on an ongoing basis as new resources and materials were found

and uploaded to the site. The online anthology, itself one of the most innovative features of the work undertaken by the CASP team, is intended to place many rare archival playtexts (in the public domain) in an accessible PDF format that can be searched and printed, used for pedagogical and research purposes, and linked to the database for further pedagogical and research purposes. The beauty of having such a web-based resource lies precisely in the open-ended, processual nature of the information flows that will determine the contents of the anthology—not to mention the rapid upgrading of new information as it is uploaded to the site.

A good example of the benefits of web-based dissemination relates to John Wilson Bengough (1851-1923), best known for his satirical cartoons (that often used Shakespearean subject-matter) and generally known as the “Father of Canadian Cartoon Art.” Bengough also wrote at least two adaptations of Shakespeare’s plays: *Hecuba, or Hamlet’s Father’s Deceased Wife’s Sister: A Comic Opera* (currently being sought by project researchers) and *Puffe and Co., or Hamlet, Prince of Dry Goods* (currently in the project archives). CASP researchers were able to locate the latter unpublished playtext in a handwritten script that is being transcribed and uploaded to the site, giving it its first publication for an international audience. The online anthology effectively enables the interlinking of authorial and secondary information on Bengough (including visual materials uploaded to the site) with the transcription and first publication of the *Puffe and Co.* play. Many other examples of similar rarities to be disseminated in an accessible and user-friendly context make the online anthology an important focus of the work undertaken by the CASP team. Moreover, the online anthology allows the publication of draft playscripts, not something even remotely affordable in a traditional print anthology, and the publication of a wide range of materials (such as audio-visual and production materials).

Furthermore, the online anthology permits the publication of so-called marginal or non-canonical works in an appropriately contextualized resource environment that again disseminates materials not normally accessible. A project related to the online anthology is a Spotlight page featured on the CASP home page that, when the site launches, will foreground aboriginal theatre. Again, the web environment's flexibility will allow for that Spotlight to change over time (with minimal expense) from aboriginal theatre to, say, regional theatres, Black theatre, fringe theatre, and so on—all the while allowing for the archiving of previous Spotlight pages to the larger site.

The obvious benefits of these factors, in conjunction with the size of the database that was going to be needed (and the obvious limitations of *EndNote* in such a context), led to a re-conception in the late summer of 2002. The re-conception addressed how best to make so much data available in an integrated site in which the substance of the database (itself conceived to be linked wherever possible to relevant web-based sources) could *itself* be linked to an online anthology and other multimedia materials that had been unearthed by ongoing research. Consultations with web designers and database programmers, coupled with the fact that the University of Guelph had undertaken to launch a server exclusively devoted to databases programmed in ColdFusion, quickly set the course for what followed: a period of mapping and imagining potential end-use function onto the information we had acquired and were seeking to disseminate in the most flexible environment possible. We understood flexibility of environment to entail not relying on client-based software that would require complicated schemes for updating and disseminating the software, but rather making all materials available on and fully compatible with the web: access to the information, in other words, would not be limited by restrictive software (specifically

designed for the database) that a user would have to acquire but would simply depend on the user having an operative web browser.

After having made this crucial decision, redesign of the database parameters was begun, a process that is ongoing as the team negotiates the complex range of research materials it has found. In consultation with a specialist programmer working out of the University of Guelph's Computing and Communication Services (CCS), Bob Creedy, and the College of Arts web designer, Michael Denny, the database design was coordinated with the website architecture we discuss later in this essay: it was decided that ColdFusion would be used only for the database administration site, which would later be linked to the publicly accessible web site. The administrative site was designated to resolve two key problems we were facing: to handle the expeditious flow of the kinds of information with which the team was working (and to facilitate the online searches that were a key research tool), and to permit the *simultaneous* entry of relevant information from anywhere on the web (a particularly important factor as the size of the research team grew and access to a limited number of computers became bottlenecked). Information for the database was divided into four key areas on the site: New Leads, Confirmed Plays, non-Canadian Plays/Stagings/Other (i.e., the trash bin), and a General Reference bibliography on Shakespearean adaptation. The Confirmed Plays field (see Figure 1) would hold the key information found by the team in a variety of fields related to authorial, bibliographic, and production information and would be fully searchable in a variety of modes (see Figure 2). As New Leads were added it became evident that a "Search All" fields function was needed to eliminate redundancies that had been created by the sheer volume of materials with which we were dealing—unfortunately this was only done as we neared the end of the first phase of major inputting, a design mistake we urge others not to make. New leads were then

carefully evaluated and placed either in Confirmed Plays (at which point all relevant field information was entered) or dumped in the trash bin (also necessary and searchable in order to keep track of any possible search redundancies). The General Reference Bibliography was created to handle the growing number of materials that did not relate to specific playtexts, but that nonetheless related to Shakespearean adaptation in general. The Confirmed Play fields were programmed in such a way that they automatically generate both a play-by-play bibliography and an Omnibus Bibliography, though tremendous difficulty surrounding some of the limitations of ColdFusion were had in accomplishing this, especially in relation to surmounting the way in which ColdFusion protocols dealt with the alphanumeric-ordering of database materials in a Humanities environment.

Programming and research efforts intensified as the project simultaneously gathered core research materials and went through the design and beta- or stress-testing process, not always the happiest of times as information frequently got deleted or misplaced or key Save, Search, and Print functions did not work consistently, or team members had trouble adapting to browser-based data input practices. The latter is a key issue in shifting from an offline, single-user database application to a web-based application, as popular browser functions impinge on data input processes: while it is easily possible to access the database in multiple browser windows or use the browser's "back" and "forward" navigation buttons, these practices can potentially compromise data integrity from one screen to the next if Save sequences specific to the database application are not followed correctly. Exemplary of the kind of backing and forthing necessitated by the conceptual switch from non-web-based software to a wholly web-based program are the following retrospective comments made by the project software developer, Bob Creedy:

... had I developed the system in a non web technology like C++, Powerbuilder, or Java, I could have constructed software that could give the control that [some

members of the team] want because I, as the developer, can then control everything through the programming language. The downside of that type of system is, that in order to use it, a person must receive the 'client' software from us, then install it on their machine. They couldn't go to another machine and use it without having to install the client software on that machine too. Also, if we did an upgrade to the software we would have to send the new software to every user who had the old version. This is a very labour-intensive and cumbersome way to manage the project.

The web on the other hand needs no distribution of software as everyone has a browser. Putting out new versions is as easy as just updating the code on the server—everyone sees the changes straight away.

It's a software management system to dream of, which is why people are moving to the web and away from client/server models (as described above) in droves. But the downside is that the developer has to work within the design of the web browser where there just isn't the same control as with C++ and so forth (although this will come over time).

Having said that, the web still provides a wealth of development opportunities and the system we have developed together is a good example of it. We have a flexible, easy to maintain, easy to modify and easy to deploy, system that costs much less to create than the old development model. (Email communication from Bob Creedy, project software developer Friday, Jan. 10, 2003 to Daniel Fischlin and Katherine Weir)

The problems and debates implicit in Creedy's comments, fully to be expected in as intense a process as we went through, were largely resolved, although further on in this essay we address some of the key aspects of the project where unresolved and ongoing issues remain to be addressed.

By early January, 2003 the initial phase of design and input had been completed with a functional, wholly web-based database application unique and specific to the project, close to 530 Confirmed Plays entered into the database along with all the current field information that had been gathered, over 1000 entries in the General Reference Bibliography, and growing lists of plays that had been cut from the New Leads listings, themselves an ongoing part of the project as research contacts with archives, playwrights, and theatre companies continued to yield information. To appreciate the magnitude of what had been accomplished in a four-month span and to place it in the context of scientific research that also requires

web-based database management software it may be useful for readers to know that although the actual physical files for the entire database are small by database standards (even miniscule), the computing power needed to manipulate the data as per our design specifications is significant—especially in “Search” mode. Furthermore, fifteen hundred pages of text were entered (and coded in HTML) along with a significant number of links to relevant sites—no doubt an ongoing source of work for project researchers as they strive to maintain up-to-date links (a major problem with this sort of database and one that we hope ColdFusion programmers can solve through some sort of automatic checking function that highlights active and inactive links on an ongoing basis).

Two concrete examples of the kind of findings this archival research has allowed for are worth mentioning (from among many more). In preparation for this essay we cross-indexed some of the project finds against the listings of the *2000 Canadian Encyclopedia World Edition* published by McClelland and Stewart and advertised as a “comprehensive” resource on Canadian culture and history. Of the 30 items randomly chosen from the archival files assembled to date, the *Canadian Encyclopedia* was missing 26. One of the missing entries had to do with Sister Mary Agnes, a Winnipeg nun who wrote 52 plays that had a significant impact on her local community at the turn of the century.⁴ The archival project has meant not only rediscovering her work, but understanding its importance in relation to regional culture and history at the turn of the century. An adaptation by Sister Mary Agnes was recently published in a special issue of *Canadian Theatre Review*—thus reaching for the first time a national audience of scholars and practitioners.

Another entry missing from the *Canadian Encyclopedia* is Charles Moyse, an English-born physiologist who emigrated to Canada in the latter part of the nineteenth century and

helped found the McGill English Department (Moyses Hall at McGill is named after him). Moyses's 1889 play *Shakespeare's Skull* condemns academic fanaticism promulgated in the name of researching the works of Shakespeare.⁵ In addition to teaching in the English department at McGill University in Montreal for more than forty years, Moyses served as Dean of the Faculty of Arts and Vice-Principal of McGill University from 1903 to 1920. He was appointed Molson Professor of English Literature at McGill in 1879, after graduating from London University in 1874 with a University Prize in Physiology, and *Shakespeare's Skull* appeared a good ten years after he had commenced his appointment at McGill, suggesting that it had its genesis after Moyses's emigration to Canada, itself a telling factor that problematizes any discussion of the play's "Canadian-ness."

Nary a word about Moyses is to be found in standard theatrical references let alone the *Canadian Encyclopedia*. And yet, like Sister Mary Agnes, Moyses had a significant (if unacknowledged) impact on theatrical and literary culture in this country. If anything, these examples of gaps in our cultural history (filled in part by the work enabled through the archival research undertaken by the project) tell us the extent to which our cultural memory is incomplete. That both Moyses's and Sister Mary Agnes's hitherto little-known works will be web-accessible through both the online anthology and the database links to the anthology indicates the significance of the decision in moving to a web-based dissemination environment. Access from anywhere with an internet connection will be possible, searches (by keyword, playwright, title, date field, and "adaptation of" field), downloads, and print-offs of relevant materials will also be possible as will course design and access to rare

⁴ See Daniel Fischlin, "Adaptation as Rite of Passage: *A Shakespeare Pageant*," *Canadian Theatre Review* 111 (Summer 2002): 78-87.

⁵ For a more complete discussion of this play see Daniel Fischlin, "Nation and/as Adaptation: Shakespeare, Canada, and Authenticity" in *Shakespeare in Canada: "a world*

archival, including multimedia, materials.⁶ The benefits of such a design are obvious and a direct function of the mixing of IT-technologies with the substantive scholarly materials that form the archive. In subsequent sections we detail specific issues related to the two key IT components of the project, namely the ColdFusion database programming and the web site architecture, followed by a brief concluding section in which we outline some of the key lessons to be learned from the experiences we've gained.

II. "Out of His Self-drawing Web, He Gives Us Note": The Databasics of CASP⁷

Information technology has so much more to offer Humanities scholarship than merely word processors, and the process of creating the CASP ColdFusion database has allowed us to bring the possibilities more clearly into focus, encouraging us to envision our future in an increasingly technologically-aware society. Simultaneously, it also forced us to experience first-hand the areas where conditions endemic to our research requirements and methodologies in the Humanities offer significant challenges to current conceptions of database design and function.

In its early stages, CASP chose ISI ResearchSoft's *EndNote*—a database-type program intended to compile and sort bibliographic references from online reference services—in large part because of its perceived strengths in the area of data integrity. While the *EndNote* database could be networked, it was impossible for multiple users to edit the database simultaneously on the network, ensuring that there was no chance of inadvertently

elsewhere?" Eds. Diana Brydon and Irena Makaryk. Toronto: University of Toronto Press, 2002. 313-38.

⁶ Rare documents with pedagogical uses will be PDF'd, as we have done with, for example, the first program ever printed for the Stratford Festival, itself a fascinating text relating to conceptions of theatre, nation, and the influence of Shakespeare thereon.

creating asynchronous versions of database records.⁸ Since editing access to the database could be tightly controlled, it was easily limited to only those researchers who understood the proper procedure and format for data entry. In this scenario, researchers reported the results of their searches on a paper form to be transcribed, in proper MLA format, into the database. The limitations of this system quickly became apparent as the number of potential plays soared towards 1000 and there simply wasn't enough time to write everything down, then have one person type it in. Since by then a website had entered the picture via the considerations outlined in the first section of this paper, it was a relatively simple decision to migrate the *EndNote* database to a ColdFusion application. Fortunately, it turned out to be easy to transfer the *EndNote* data into a format that ColdFusion could use, and a web-based database application was born, accessible for updates from any location by any project researcher with an internet connection.

While data integrity is an important factor no matter what the application, there are some considerations for database design and function that are more specific to Humanities scholarship, considerations that offer significant challenges to the more scientific origins of database programming. Chief among these challenges is the potential for long text fields that Humanities scholarship often generates: we traffic in narrative—words, scripts, histories—and neither our source texts nor the results of our researches usually take the form of formulas, calculations, or even short text strings. In its current state, database technology has no way to efficiently handle the large quantities of words that make up the backbone of what

⁷ *All Is True* (Henry VIII) 1.1.63.

⁸ “EndNote does not perform locking functions that would allow multiple users to *edit* one database at the same time. However, multiple users can *access* one EndNote database simultaneously as long as the database is restricted to **read-only** or **locked** status.” (ISI ResearchSoft. *EndNote* user documentation. EndNote5.PDF, 439.) The CASP team chose not to network *EndNote*, and ran the program only on a single PC.

we want to archive and report. Perhaps as database technology is adopted by more Humanities researchers, software companies will put more effort into accommodating longer text fields; in the meantime, however, it is incumbent on us to understand as much as possible about efficient database design and structure to maximize the potential that database software already has to offer.

There is a crucial, basic distinction in database design between “flat-file” databases and “relational” ones, yet this distinction can be difficult to grasp for those of us who traffic in linear narrative. Simply put, a “flat-file” database treats all the information associated with any one main entry (record) as one continuous chunk, like a single sheet of paper. The sheet may be very long, but it is still only one sheet. A “relational” database, on the other hand, breaks all the information down into meaningful categories that have been previously defined. The database can then be programmed to exploit the relationships between various types of information, to sort and display specific information according to any number of criteria. Instead of a long, single page, you now have a series of index cards, each containing a portion of your information, that can be easily assembled and reassembled according to whatever narrative trajectory you choose. “Determinism” is highly desirable in database structures, describing a database that gives the user maximum freedom to determine exactly what types of information she wants to see, and in what order. Using a relational structure also has significant implications for data integrity. When two or more records share specific information in common, that information only has to be entered on one “index card,” which can then be shared with all other cards that relate to that same information. In a flat-file database, when several records share common information, that information must be copied and pasted onto each of the separate pages that need it. Every time that common information changes, the change must also be copied and pasted into each and every record

that requires it. Every time you copy and paste between records you run the risk of forgetting a record, or changing the wrong one, or inserting the information in the wrong place. A relational structure is the key to maintaining “referential integrity,”⁹ which minimizes the margin for database corruptions caused by this type of inevitable human error.

The CASP sorts information primarily by playwright: files are arranged alphabetically according to the author of the adaptation. When a single author has several adaptations, the play files are arranged alphabetically behind the one author file. In database parlance, this is called a “one-to-many” relationship, because one type of information (playwright) applies to many other records (adaptations). This is exactly how the information should exist in a relational database: one author file that can be attached or related to multiple adaptation files. The file drawers do not contain a separate author file for each play, forcing us to make multiple copies of any authorial information, and neither should the database. Even though the original design did not exploit this relational structure, this change was implemented before any significant programming took place. Some data relations, like this one, are easy to spot; others, less so.

In the process of mapping the CASP database structure, team members tried to identify relationships between types of information stored in the project archives and anticipate how this information was likely to be accessed by researchers (end users). In the ideal course of database design, this stage can take days or weeks. According to ColdFusion designer Pete Freitag, “Database design is one of the most important parts of an effective web development project. Doing it right can save a lot of time and frustration when

⁹ Concordia University (Ann Arbor, Michigan). “Database Design Principles.” <<http://www.cuaa.edu/computing/helpdesk/access>>. 22 January 2003.

expanding, and during development.”¹⁰ Unfortunately, this was a luxury of time the project was ill able to afford in the race to take control of a burgeoning backlog of archival material. Certain key information types and relationships were identified, while others were overlooked. As a result, while the current database easily facilitates certain types of searches, it is limited in its ability to perform many of the refined production- or performance-specific searches that are of especial interest to theatre researchers.

The CASP database at the time of this writing covers information for well over 500 playwrights, scripts, productions and secondary or critical materials, many of them previously unknown and undocumented. Except for authorial information, however, all other data about the plays and their productions exists in flat-file format, that is, a single continuous page. Information about the first production is separated into individual fields (date, place, director, production company, crew, cast, etc.), but all information about subsequent productions is simply listed in one long text field, ordered as consistently and chronologically as humanly possible. The information in the separate fields can be easily retrieved through a targeted search: for example, if a user wants a list of all adaptations of *Measure for Measure*, the database can obligingly find all records with *Measure for Measure* in the “Adaptation of” field (Figure 3). If it would be useful to further refine the search to include only those plays that premiered in Toronto, it will be easy to program the search engine to

¹⁰ Freitag, Pete. “Database Design Tips.” ColdFusion Resource Center. 13 July 2001. <<http://www.cfdev.com/resources/discussion/messages.cfm/id/1006>>. 22 January 2003. Freitag goes on to outline “some pointers for achieving a good design” which offer some very useful information in language accessible to the non-IT specialist, but also, unfortunately, devolve into a more cryptic shorthand that requires a working knowledge of database design theory to understand, such as “Take each entity and follow normalization rules.” Anyone who finds that phrase incomprehensible would do well to consult a systems engineer or database designer before embarking on a project of this sort.

cross-reference the results with the “Place of First Production” field, and include only those records that list “Toronto” there.

Dealing with the information in the mega-text fields is much more problematic. Database technology is not yet optimally designed to handle long text fields, and their presence immediately places disproportionate strains on servers and ancillary technology. Those text fields, however, also provide significant challenges within the search parameters of the database itself. While it is possible to find any information entered in those fields through a “google-style” search, the process will be susceptible to all of the fallibilities that this method implies. In essence, while information about first productions is readily available, it will take significantly longer to find the same information about non-première productions.¹¹ Take, for example, the user who wants to find all Shakespearean adaptations directed by Jean Asselin. Typing “Jean Asselin” into a “Director” search field will return only the plays for which Asselin directed the premières. For a more complete listing, the search engine will have to search through the “Performance History” field for every play in the database. The list of results will point to every record that contains “Jean Asselin” anywhere in the performance history: it will not differentiate between Jean Asselin, director, or Jean Asselin, actor, or even “Salle de Jean Asselin.” Nor does specifying “Director: Jean Asselin” as the search criterion circumvent the problem, since the consistency of database listings relies entirely on human factors. Moreover, since production histories do not exist in a relational table structure, it is impossible to exclude irrelevant information: when the user performs this google-style “Jean Asselin” search, the search function will return *all*

¹¹ It should be noted that the database search function (see Figure 2) does not even currently support the search described here; however, based on the field structure in the main database table, it will be at least readily achievable. Subsequent refinements or additions to the search requirements as described will require a more labour-intensive rebuilding of the database table structure.

production information associated with every file that names Jean Asselin in any way. This is the online equivalent of looking up Jean Asselin in a book index, finding the pages indicated and having to skim them in their entirety to find the desired reference (Figure 4). Finally, the flat-file structure prevents the user from being able to specify the particular order for the display of her search results. Any requirement to view the search results in an order other than the one offered by the search function necessitates a manual cut-and-paste operation into a third-party word processor or notepad, similar, in terms of the analogy, to cutting each specific reference from its page and pasting it in a particular order onto a separate sheet along with the others. These data manipulations are all achievable with the right relational structure, and the future evolution of the CASP database will include such modifications to allow researchers more deterministic access to the particulars of theatrical production.

Many of these difficulties relate to generic database design, independent of any platform. However, the CASP team also encountered unexpected difficulties in the way specific features of a web-based program like ColdFusion interacted with the design of the input interface. Besides the issues outlined earlier with respect to web-based navigation protocols, we also fell prey to some navigation quirks within the ColdFusion application itself. While in some contexts it could be dismissed as a minor annoyance, the lack of a cursor recall function in ColdFusion, typical of web-based database programs, can present a major stumbling block in a Humanities application that uses large text fields. Unlike in most word processors, where clicking a cautionary “Save” in the midst of a long input session has no effect on the location of the cursor, performing the same function in ColdFusion deactivates the cursor and rolls the user back to the top of input fields—indeed, to the top of the entire input screen. In the long text input requirements for many of the CASP archival records, this quickly became a source of frustration as well as wasted time as we scrolled

through long text fields after every “Save” just to be able to continue where we left off. Midstream, Bob Creedy was able to program an “Expand Fields” feature that alleviated the problem somewhat by displaying larger chunks of the mega-text fields onscreen, but even this feature was not without its own limitations. Had anybody been able to foresee the implications of this web/ColdFusion feature, we would certainly have designed an input interface that minimized the length of the input screens and eliminated the need for excessive scrolling.¹²

Moving the database from the confines of its beginnings in *EndNote* to a web-based ColdFusion application put the advantage of web access at our fingertips, and allowed us to break through the bottleneck created by restricting database input to one user at a time, as well as opening myriad possibilities for end-user accessibility. CASP’s future includes a database rebuilt in a more relational structure that takes advantage of the currently-untapped search possibilities offered by the database technology, as well as an unprecedented potential for detailed categorical descriptions of the project’s archival holdings. These evolutions will be essential as the CASP archives grow and as more is demanded of the database by researchers in literary and theatre studies. In the larger context of Humanities scholarship, our experience has convinced us that database technology, particularly web-based database technology, has tremendous possibility for research tracking and dissemination, and the shape of our future will depend in large part on how well we employ creativity and ingenuity in harnessing the technological potential to our own advantage.

¹² Indeed, another strength of a relational database structure lies in precisely this ability to visualize data in shorter chunks rather than as one long page. In the terms of the earlier analogy, each of the “index cards” can logically and easily be programmed as its own subscreen.

III. “There’s Magic in the Web of It”: What’s in a Domain Name?¹³

The best web sites acknowledge the fact that they are forever under construction, works in perpetual process. As documents with multiple origins, collaborative sources and a tendency to trouble notions of easily attributed authority or definitive edition, web sites have at least this much in common with the Shakespearean oeuvre itself.

The design of a public web site for CASP—a front end, in industry jargon, to complement the back end represented by the database—must take into account not only the extant iteration of the database, but moreover the distinct probability that this iteration will be superseded. The negotiation of disjunctions between back-end database and front-end interface is hardly peculiar to academic development on the internet, but our team’s approach to designing the CASP web site is to proceed as though the database is more like the public web site’s heart than its spine—that is, much easier to transplant. This strategy results from an admittedly belated but critical recognition that the database needs significant tweaking; however, it affords us a great deal of freedom in blueprinting the web site architecture and generating its content.

While the database drives the web site’s most significant research tool for scholars, students, and theatre practitioners visiting the site, it is accompanied by a wealth of other pedagogical resources, editorial features, and curated content. These will be detailed after a brief consideration of web navigation and style.

User-friendly navigation, rapid download, multi-platform adaptability and stylistic clarity are the four most important elements in web site design. The CASP site includes an expandable navigation menu on the left side of every page for ease of use, as well as header

¹³ *Othello* 3.4.67.

and footer navigation buttons for scrolling pages.

The navigation menu, represented consistently on every page of the web site, directs the user to nine primary links (some of which expand into secondary menus of more specific links): Play Archive, where the site's database may be searched or browsed; Bibliography, where primary and secondary print sources may be searched or browsed; Links (that is, to other selected web sites); Online Anthology; Spotlight, a series of editorial features on selected topical or distinctive productions; Multimedia, where most of the site's streaming audio and video content is housed; Forum, where users may ask questions and conduct moderated discussions; News, for PR on site updates and other time-sensitive information; and Contact Us, for correspondence with the CASP project team.

Rather than permeate the entire CASP site with multimedia clips and design elements, the Multimedia link concentrates high-bandwidth content into one section of the site, in order to accommodate low-bandwidth users. The site remains free of frame-dependent browsing, gratuitous Flash or other multimedia-heavy design elements, to facilitate rapid navigation and to accommodate the variety of platforms—and levels of internet experience—with which users access the site; Flash applications run automatically, but require an additional plug-in, and we wish to keep the number of plug-ins to a minimum, for ease of use. All pages must be tested for quality assurance on PCs and Macs, using the most popular Microsoft, Netscape and open-source browsers (our vote goes to the open-source Mozilla).

Of the four aforementioned web design elements, stylistic clarity is perhaps the most important—and the hardest to implement for academic projects. Stylistic clarity begins with the URL itself: the domain name that becomes not only the site's official Internet address, but also one of its strongest branding strategies. *Pace* James Harner and the publishers of the

subscription-based *World Shakespeare Bibliography Online*,¹⁴ “worldshakesbib.org” exemplifies a needlessly and counter-intuitively abbreviated URL. Most browsers now save the URLs of previously visited sites, so the address in question would automatically appear on a clickable list as soon as a user begins to type “world”—provided that user is one who has been acquainted with the site. Given the scarcity of acronym-based domain names—and the URL-saving function of browsers—some brands have turned to full-text domain names. Consider, for example, “theglobeandmail.com”: it is consistent with the eponymous product’s brand; it is long, but as soon as a user begins to type the URL, most browsers will automatically complete it; and, most importantly, it is an easily remembered, intuitive phrase.

Taking these deliberations over URL style into consideration, the CASP site’s domain has been named—and branded—“canadianshakespeares.ca.” However, we have also acquired a related series of URLs to which users would be redirected in the event that they type a similar address or misremember the URL: *canadianshakespeares.com*; *canadianshakespeare.ca*; *canadianshakespeare.com*. This strategy requires some additional expense, but it means that close no longer counts only in horseshoes.¹⁵

At the level of design, stylistic clarity means maintaining a coherent brand strategy; at the level of content, it means packing the most punch and resonance into the least amount of words. Like television, the World Wide Web is not a medium known for its patience with

¹⁴ Harner, James, ed. *World Shakespeare Bibliography Online*. Baltimore: Johns Hopkins UP / *Shakespeare Quarterly*, 2002. <<http://www.worldshakesbib.org/>>. 28 Jan. 2003.

¹⁵ The registration of multiple domain names played a big part in the early struggles for e-commerce supremacy. Barnes & Noble, for a time Amazon.com’s only real competition, went so far as to register “amazom.com” as a URL redirecting traffic to bn.com, banking on the probability of user-generated typos. Similarly, after Indigo Books & Music approached the proprietor of “indigo.com” to purchase his URL, the disgruntled chemistry equipment vendor briefly featured a link on his home page that was rendered in Indigo’s trademark colours but directed users to Indigo’s competitor Chapters Online. Indigo threatened Chapters with litigation for trademark infringement and the link vanished; having since

the complexities of context or the subtleties of argument. To reconcile an instinct for uncluttered visual minimalism with an imperative to convey sophisticated professional knowledge poses an enormous creative challenge in writing descriptive and editorial content for *canadianshakespeares.ca*, and affects every editorial decision from the domain name (as mentioned above) to navigation menu links, and carries over into coding and programming decisions over the implementation of a “controlled vocabulary”: a thesaurus-like function that inserts keyword code into the database records to help users find precise and relevant results when using the site’s search engine to access database records.¹⁶

Nonetheless, the promotion of best practices in web writing style must not be read as a variation on the all-too-common proclamation that new media technologies harbour a perceived paradigm shift for writing, academic or otherwise. Conceptualized as a resource for scholars, students, teachers and theatre practitioners, this site’s design takes into account the need for most target users to work simultaneously with electronic and print media. As James Annesley points out, “what the internet offers is an accelerated and improved version of existing experiences, not a whole new experience in itself.”¹⁷ Contrary to predictions of the paperless office, a recent study suggests that digital information technology in fact contributes to an increase in paper use,¹⁸ and *canadianshakespeares.ca* presents no exception to this trend—its data is designed for use in soft- or hard-copy formats.

The online anthology exemplifies this multi-purpose approach. A virtual textbook comprised of historical, public-domain playscripts, presented as searchable, PDF-format text

acquired Chapters in a hostile takeover, Indigo Online has re-branded its operation with the rather inelegant URL “*chapters.indigo.ca*” (or is it “*indigo.chapters.ca*”?—*there’s* the rub).

¹⁶ Fast, Karl et al. “What is a controlled vocabulary?” *Boxes and Arrows* 16 Dec. 2002. <http://www.boxesandarrows.com/archives/what_is_a_controlled_vocabulary.php>. 28 Jan. 2003.

¹⁷ Annesley, James. “Netscapes: Gibson, Globalisation and the Representation of New Media.” *Forum for Modern Language Studies* 37.2 (2001): 218-29. 221.

files fully cross-referenced with the database, the anthology provides an easily accessible and relatively inexpensive resource for use in the classroom and on the stage. PDF has proven to be a preferred format not only for publishing fillable forms, but also for its simulation of (and ready translation to) print media, not to mention the fact that the application required to read PDF documents remains free. The focus on public domain texts has rendered the creation of the anthology relatively inexpensive; in addition, it has retrieved from history's dustbin some of the most interesting Canadian adaptations of the Shakespearean oeuvre. And "e-Books" just don't work for actors in rehearsal.

On this account, canadianshakespeares.ca may start to look deliberately old-fashioned, and to some extent it is. This low-frill, minimal interface, however, is being designed, and (it should go without saying) constantly updated, with an eye to attracting an extremely diverse cross-section of users that includes not only savvy surfers on the leading edge of hypermedia, but those reluctant techno-Luddites who may simply want to print a rare script.

A complement to the online anthology and an anticipated attraction for the curious, the Spotlight draws together production records, editorial content and multimedia in a feature that focuses on a particular trend, region, source play, or any other discourse around which a series of production records and details can be organized (such as the aforementioned feature on aboriginal adaptations). Like the Multimedia section, the Spotlight section is where high-bandwidth users may take full advantage of streaming media to see and hear audio and video excerpts of productions and interviews. To respect copyright and reduce the strain on university servers, canadianshakespeares.ca intends to house in these sections selected clips of productions, rather than full-length production

¹⁸Harper, Richard and Abigail Sellen. *The Myth of the Paperless Office*. Cambridge: MIT P, 2001.

streams; nevertheless, such clips afford high-bandwidth users a more immediate sense of the context in which the productions in question take place.

The Forum, News and Contact Us sections should for the most part appear self-explanatory. Whereas the Forum provides users with a message board where they can post questions for the Shakespearean and Canadian theatre communities in general, Contact Us permits users to communicate with the CASP team about project-specific matters (alerting us to new or previously unknown productions, reporting technical problems, etc.). One detail worth mentioning about Contact Us concerns the appropriate representation of CASP team member profiles as contacts. Although it's not uncommon for professional academics to follow the lead of the entertainment industry in publishing pictures, mailing addresses, personal email addresses or even personal telephone numbers on their web sites or online C.V.s, the compromise of personal privacy perpetrated by these practices—for instance, the vulnerability to unsolicited email (“SPAM”)¹⁹—needs to be recognized. To this end, the CASP Contact Us page provides users with one central point of contact (e.g. one email address) to which all email traffic is directed and subsequently delegated to the appropriate CASP team member(s).

In terms of brand strategy, consideration must also be given to what Phil Agre calls “networking on the network.”²⁰ For CASP, this networking means the establishment of synergies with other professional and reputable Shakespeare web sites, such as the aforementioned World Shakespeare Bibliography Online, in order to position our site prominently as an authoritative source for original and rigorous research amidst the

¹⁹Wagner, Mitch. “Spam costs \$11.9 Billion; Users Favor Legal Ban.” *Internetweek.com* 3 Jan. 2003. <<http://www.internetwk.com/story/showArticle.jhtml?articleID=6000048>>. 30 Jan. 2003.

sprawling congeries of online Shakespeareana. This is no mean feat. Consider the nearly six hundred Shakespeare sites indexed by the Yahoo search engine, directing users to Shakespearean insult generators, popular-culture parodies, and, of course, dozens of other sites purporting to be comprehensive guides to online Shakespeare resources. Consider, too, the almost eerie artificial intelligence with which the Google search engine filters out all but the most popular and reliable sites. Creating a site that can insinuate itself into the first few results generated by a Google search (without simply paying for sponsorship) poses a particularly rewarding kind of challenge for web designers, given Google's category-killing dominion over competing search engine technologies. Unlike the community-oriented networking that goes into developing relationships with the relevant web ring of Shakespearean and Canadian theatre sites and specialists, the keying and coding of *canadianshakespeares.ca* for optimal Google presence is an internal and technical operation that represents one of the project's top priorities.

Navigating between the Scylla of obsolescence and the Charybdis of fad gadgetry, the work-in-process that is *canadianshakespeares.ca* strives to leverage the best tried-and-true web technologies in delivering to a diverse audience a stylish, user-friendly site with multiple purposes and functions for developing research, teaching, and creative practice in this understudied field.

IV. Coda

²⁰ Agre, Phil. "Networking on the Network: A Guide to Professional Skills for PhD Students." 18 Aug. 2002. <<http://dis.gseis.ucla.edu/people/pagre/network.html>>. 28 Jan. 2003.

Given that that the concept behind the project is transferable to other national sites in which Shakespeare has had enormous influence (e.g., India, the United States, Great Britain, South Africa)—and given that similar databases can be conceived in relation to other major figures around whom aesthetic traditions coalesce, we wish to summarize some of the key issues we feel others may productively learn from our experiences good and bad. Perhaps the first is that pre-conceptions around premise terms such as, in our case, Shakespeare, adaptation and Canada, will inevitably be put to the test by the archive produced—especially in a web-based environment where serendipitous and powerful search functions combine to produce new knowledges that inevitably push the conceptual limits that underlie a project such as this.

What makes a play Canadian? How to define Canadian-ness? What are the limits of adaptation? Is a single line change sufficient to refigure a play as an adaptation? How to measure Shakespearean presence? How to define theatricality? Are stagings worth considering as adaptations? Numerous archival examples of work that put these questions to the test have become part of the daily routine for the CASP team. And, to be sure, a rigid and inflexible conceptual model for addressing these questions would have made the archival work a great deal simpler, if not less responsive to the range of materials that have become the archive. Profoundly related to the ability of the project to foster self-criticism that leads to productive results is the need to establish collaborative and equitable models in which team members operate. The breakthroughs in the project's use of IT only came as a result of extensive collaboration and networking within the project team and beyond: in short, it has been our experience, however much of a truism, that when human factors drive the IT-design factors, a successful marriage ensues. The only way to insure the kind of critical input necessary to constant testing of project assumptions is to work within a truly collaborative environment based on extensive sharing of information and a constant

openness to the implications of new ideas generated through the work of team researchers. These lessons, learned after considerable trial and error, have played a significant role in the unique IT applications developed by the project team.

The expected launch date for the Canadian Adaptations of Shakespeare web site, canadianshakespeares.ca, is the Spring of 2004.