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Lasting Connections

Tools to Enhance Organizational Community and Productivity Through Collaborative
Contribution to Multimedia Collections

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Executive Summary

Lasting Connections is a content management and development tool that provides a streamlined process for tracking an organization's members, cataloging the assets they create, and developing multimedia materials using these assets. It is designed to minimize the effort and complication involved in generating promotional materials while fostering extended organizational communities in which members can share their creative excitement with one another. The project employs metadata not just to preserve assets for easy retrieval and repurposing but to facilitate design with automated layout capabilities that anticipate the intentions of developers. This allows for expandable publications that encourage members of an organization to contribute to shared multimedia databases in order to convey a group narrative over time while preserving a record of individual endeavors.

To demonstrate effective methods for implementing design tools that create flexible collaborative publications, I developed a prototype for *Lasting Connections* that describes my experiences and those of my classmates while studying for our Master's Degrees in Information Design and Technology at the Georgia Institute of Technology during the years 2000-2002. The prototype I designed facilitates a process comprised of three stages. These are collection of multimedia assets, design of promotional materials, and preview of the finished publication.

Introduction

Observing the process of promotional material creation at an organization that has not instituted an effective procedure for generating these materials is rather like watching the climactic moment in an IBM commercial for the company's large-scale enterprise solutions. It rapidly astonishes everyone involved to realize how poorly prepared the organization is to meet the challenge. Even though someone with a camera can be spotted snapping away at every public and community event, no one can locate the products of these efforts.

Members of the organization have been doing remarkable and exciting work all year round, but only members of the discrete groups who work on specialized project teams know the specifics of these labors or have access to any of the projects' content. When someone is put in charge of the tasks involved in gathering possible content, she realizes that she does not know who to talk to or where to begin and often ends up recreating materials that could already have been prepared and available with a more streamlined collaborative process.

Applications

Software's reason for being is juggling. Whether the data are words, facts, or numbers, software finds new ways to compare, sort, order, merge, separate, and connect it—all an impressive juggling act.

*Ron White
How Computers Work*

Lasting Connections is designed to minimize the effort and complication involved in generating promotional materials while fostering an extended workplace community in which members of an organization can share their creative excitement with one another. The project provides a content management system for thoroughly cataloging assets with minimal workflow intrusion and smoothly translating these materials into multimedia publications that promote community awareness both within and outside the organization.

The project distinguishes between marketing materials, which exclusively advertise the products a company wishes to sell, and promotional materials, which for the purposes of this project are defined as publications that describe the overriding character of an organization by depicting its social structure or public persona through a concentration on the driving force behind an organization's productivity, the people whose efforts, choices, and aspirations make the organization successful. Examples of such publications include

intranet staff directories, electronic recruitment brochures, digital yearbooks, and perhaps multimedia supplements to annual reports which commonly devote content areas to shoring up shareholder confidence in the key personnel and public image of an organization. In these types of documents, there are significant opportunities for conserving effort by automating repetitive and predictable tasks without restricting originality. Lasting Connections is particularly useful for multimedia developers, who generate content for such publications in the course of their regular work routine.

Software such as Apple's iPhoto and Intermedia Organizer have recently been introduced to address similar needs for home users, but these products encourage too much separation between types of media to be practical solutions on their own in today's multimedia computing environment. They do not provide retrieval and design mechanisms that are flexible enough to meet the needs of organizations, and they assume that all the media the software will encounter is created and owned by an individual on a single machine. On the opposite end, large-scale content management solutions are expensive and require specialization for each organization and publication, making the systems too unwieldy to provide solutions that are broadly applicable or easily implemented.

To a multimedia developer, distinctions between types of media can become inconsequential except in so much as an asset's particular advantages contribute to the ascetic or rhetorical effectiveness of a design project. Having to use multiple programs to build multimedia publications in a linear design model makes it difficult to repurpose materials, discourages knowledge conservation, and wastes creative energies.

Lasting Connections coordinates the effort involved in creating promotional materials by guiding work practice to include comprehensive preservation that is less a chore than a routine stage of the creative process. Automatic layout of repetitive actions takes advantage of both computer and human supplied metadata to allow the machine to handle those aspects of the design process that require unnecessary effort and little imaginative input. The project also provides elastic solutions for developing publications which can be both archived in static versions and continually updated to reflect the changing nature of an organization and its members' relationship to it.

Lasting Connections assumes assets involve people, their work, their recreation, and their relationships to one another. It strives to provide solutions for preserving important moments and expressing the evolving social culture of an organizational community.

Intentions

Visionaries may paint a fantastical future driven by technology, a wired planet of cyberspace and virtual worlds with unprecedented access to information and knowledge. But cyberspace and virtual reality will offer no escape from the problems of the human heart.

*Philip Toshio Sudo
Zen Computer*

One goal for building quality technology is to make it efficient. Another is to design technology that actively promotes worthwhile goals. Bonnie A. Nardi, a proponent of activity theory which encourages interface designers to take into account organizational culture, surrounding environment, and the tremendous influence tools can have on mediating users' thought processes, eloquently appeals to designers to create responsible technologies with the words, "If we wish a different world, it is necessary to design humane and liberating technologies that create the world as we wish it to be."

It becomes reasonable then to ask if fostering a pleasant social atmosphere in the workplace is a desirable objective. A multinational survey carried out by the European career-consulting firm Penna Sanders & Sidney determined that employees and employers in nine different geographical locations, including the United States, believe workplace community is enormously important. 46% of employees believed that workplace community influenced their decision to join an organization, 67% said that it encouraged them to stay with their organization, and 62% said that they commit themselves more fully to work because of the social atmosphere of their workplace. The large majority of employers who took part in the survey also agreed that promoting workplace community is an opportunity to motivate staff, improve teamwork, elevate staff loyalty, and enhance employee quality of life.

Productivity may also be increased when members of an organization become familiar with one another. According to a study by two management professors at the University of Minnesota and the University of Pennsylvania, workers who have attained a level of social comfort that they consider friendship perform manual and managerial tasks both more quickly and more reliably than workers who are merely acquaintances. When asked to assemble Tinkertoy models according to strict specifications, groups of workers who considered themselves friends put together an average of 9 Tinkertoy models correctly compared to acquaintances, who averaged 2.45 in the same time interval. In a collaborative decision making test in which groups were told to rank M.B.A. candidates according to

predetermined criteria, despite their not having experience with the task, friends accurately matched the decisions of an actual admissions board in an average of 3.1 out of 5 cases, while acquaintances averaged 2.44 matches. Encouraging members of an organization to communicate openly and exchange ideas not only makes the work process more pleasant, it smoothes its course by promoting honest interactions between people which can result in more constructive and creative decisions.

The social component of people's lives, especially that of their work lives, where others can affect profound intellectual and emotional influence over their professional and personal growth, should not be ignored. While Lasting Connections is not an all-purpose solution for promoting organizational unity, it attempts to facilitate communication, collaboration, and cooperation rather than simply processing numbers as inadequate representations of artists and their creations.

Basis

All acts of building are governed by a pattern language of some sort, and the patterns in the world are there, entirely because they are created by the languages which people use.

*Christopher Alexander
The Timeless Way of Building*

Lasting Connections manages content effectively through a combination of metadata, hypermedia, and preprogrammed structures. It combines the strengths of a database with some desirable features of a free-form multimedia environment and considers the ideals aspired to by open-hypermedia systems.

Comprehensive and Flexible Metadata to Facilitate Design as Well as Preservation

In *Sorting Things Out: Classification and its Consequences*, Geoffrey Bowker and Susan Star liken the process of information gathering and classification to the widely accepted model of communication in which there must be a receiver as well as a transmitter. They make a forceful statement when they declare "information is only information if there are *multiple* interpretations." The choices system developers make in creating an ontology to describe information can have complex implications on these interpretations if the system does not

make an extensive effort to describe the information space thoroughly or if it draws boundaries that are too rigid to accommodate modification.

COMPREHENSIVE METADATA

Lasting Connections uses the metadata type divisions the Library of Congress advocates for creating complete records of catalogued digital assets. These recommended categories are descriptive, administrative, and structural metadata. Descriptive metadata is used to describe the narrative or visual content of an asset, such as who or what is featured, the topic an asset addresses, or background commentary on the events that prompted the asset's creation. Administrative metadata tracks the life of an asset by recording managerial information such as who created it, whether permissions have been granted for reproduction, and where the file is spatially located in the system. Structural metadata lists the facets of an object that establish how a digital environment manipulates and presents it, including such characteristics as file type, dimensions, and composition. Tracking all of these asset attributes optimizes developers' ability to access an asset for a variety of purposes and maximizes the potential that the asset will outlast specific incarnations of a technology.

Members of an organization are associated with both professional and more personal metadata. This allows for multiple design scenarios in which members of an organization are introduced professionally in publications meant for public access, but are allowed to become more personal if they choose to do so in publications meant to facilitate social interaction within the organization.

Because human beings are more sensitive to the intrusions of privacy that rigorous monitoring introduces than are inanimate objects, the system does not encourage tracking potentially volatile information such as salary or medical history. It also provides for secure levels of access to information and encourages group members to manage the more personal aspects of their profiles themselves.

FLEXIBLE CLASSIFICATION

Thomas A. Malone in his essay, "How Do People Organize Their Desks? Implications for the Design of Office Information Systems," undertook the difficult task of examining what factors impede effective organization of information in a physical workspace. He concludes that a major obstacle to maintaining a well-structured information space is "[t]he difficulty of deciding how to classify something", especially when it does not fit into the previously established organizational system.

No classification scheme is perfect, especially when it comes to prescribing subject matter that must fit the needs of a variety of organizations and use scenarios. This process becomes even more difficult when a classification system is meant to survive over an extended period of time. Lasting Connections uses the hierarchical database model which provides effective structures for dealing with such problems. The project takes advantage of lookup tables to associate category designations with numerical keys. This allows categories to be arranged so that they can be renamed and added to as growth and change necessitates restructuring content. While the project prescribes a default set of categories which encourage developers to create robust and coherent content collections, developers are not constrained by a static classification scheme and can therefore readily create additional or altered classifications when new items do not fit the original data structuring model.

Targeting, Linking, and Binding: Hypermedia Usage in Lasting Connections

The most common usage of hypermedia in online applications creates a metaphor much like meandering through the branches of a winding and intricate path. This recognizable feeling of traversal when one clicks on a link may owe as much to inadequate screen space, one-dimensional browser limitations, and the lengthy scientific reports that the Web was originally created to accommodate as it does to intention. Yet, as larger monitors become more widely available, design tools give developers the ability to make use of the z-axis, and multimedia elements such as audio and video, which depend on temporal observation, become more central to design, developers must begin to examine more closely the rhetorical purpose of the metaphors which hypermedia makes possible.

TARGETING

The icon that is generally used to represent tools for creating links is a target symbol. This imagery of an arrow in flight toward a bull's eye evokes the metaphor of motion which links are so often used to suggest. In Lasting Connections, there are no target symbols. Yet, the metaphor of motion is preserved in the form of navigational buttons which are automatically created for the developer's convenience.

Navigation buttons, which have become as much a staple of the digital environment as the target symbol, cue users to recognize that they may manipulate them in order to change modes or view fresh pieces of content. Because navigational buttons are expected to divide significant areas of content, the traversal metaphor of separate screens was appropriate for

Lasting Connections when developers switch between modes or users pass through areas of the publication. The metaphor notifies users of significant change, much like section dividers alert users to new topics and significant content changes when they flip through a manual.

LINKING

Presumably, links are employed to give users access to additional content, whether it be information on another topic or information that follows along a common topical thread. The use of links to associate content is perhaps the foremost purpose for which links were originally intended.

For such a context, a traversal metaphor is not the most appropriate one available. With enough screen space and compact representations of elements, the action of viewing associated content can translate to a metaphor in which it feels as if information is being pulled into focus by users as they call it to forth.

Lasting Connections' interface separates the content association function of hypermedia from other uses by allowing developers to create bonds between pieces of media that have some perceived similarity. The icon used to represent content association in Lasting Connections is an illustration of two intertwined links in a chain, emphasizing that "linked" media share common characteristics or notable similarities.

BINDING

When I began manipulating the interface tools that I created for Lasting Connections' interface, it became clear that hypermedia can provide yet another function and another accompanying metaphor. Assets could have an action in common. The metaphor for this I began mentally referring to as "binding" after the process of amassing multiple works in a reserve area at scholarly research sites in order to intellectually process them later. The difference between binding and linking may not be immediately clear from the practice's namesake, but the collection is not the bind, it is rules that do the binding. Binding, as I began thinking about it, is the act of declaring that multiple items should be instructed to follow the same set of regulations in order to produce a combined result. This is extremely useful in the advance planning of a large project and provides a means to facilitate more intelligent layouts.

There is some precedent for using the term in this context. The term binding is used somewhat interchangeably with the term linking in another computing context involving

programming. Binding, as it relates to a computer program, is the assigning of a value as a symbolic placeholder. Binding occurs when the exact details of the addressing information for a variable or set of instructions is not determined until compilation or runtime.

While the line between binding and linking in Lasting Connections' interface is not as clear as it should become as the project progresses, the process can be observed in the prototype. When multiple graphics are bound and one of the graphics is dropped into a "magic" (intelligent) box, the others immediately follow and become a part of the same slide show. The example is a relatively simple incarnation of the concept and does not fully demonstrate the effort that could be conserved by implementing structures that recognize binds. **Future Directions** provides additional possibilities of what binding might allow and further addresses the need to make a distinction between the concepts of linking and binding within the context of the project.

Blueprints: Building Materials and Plans for Multimedia Construction

In the *Language of New Media*, Lev Manovich discusses the convergence of computational structures and legacy media in determining how the interfaces we recognize today were developed. He maintains that "HCI already represents a powerful cultural tradition, a cultural language offering its own ways of representing human memory and human experience." Conventional, reusable base units of a media are discovered and adapted over time, but some standard constructs have already begun to emerge in the digital realm. Many of these constructs are inherited from other media but have been tailored to take advantage of the affordances specific to electronic media. These constructs occur widely in multiple contexts, already demonstrating their flexibility and utility in allowing for an infinite variety of end designs.

STANDARD CONSTRUCTS

Of particular importance to the multimedia designer, who does not generally have total control over the operating system or larger context in which a product will operate, are those elements which are readily available for controlling how graphics, video, text, audio and any additional multimedia are displayed and interacted with while still allowing for customization. Examples of such elemental constructs are the slideshow, the movie player, and the scrolling text box. Not only is the content which these constructs hold variable, but the graphics representing controls and to some extent the number and function of the

controls themselves are variable. As ubiquitous as these constructions are, it would seem counterproductive for multimedia developers to have to build them from scratch as often as they do.

Kaj Grokbaek and Randall Trigg send out a call for developers to consider such constructs in *From Web to Workplace* when they describe concepts that were introduced by the Dexter model of hypermedia and which the authors term “wrapping material”. They define a wrapping material as a “hypermedia entity that refers to or wraps a body of online material.” While the authors use the term to apply to an open-hypermedia system where the constructs are maintained across multiple software applications, the concept can be applied more locally to a single application in the form of code that binds multiple media together in order to make the items work in similar ways to comprise a single elemental construct.

In *Lasting Connections*, developers can create constructs simply by choosing the appropriate box and dragging media into it. An example exists in the prototype which creates slideshows with captions when users choose contents and labels for the container.

STRUCTURE

The empty box is a powerful metaphor, often used in teaching computer concepts to describe processes in which the contents of a space in memory are variable. *Lasting Connections* consciously employs the metaphor with a simple square and pictographic icon because three or four boxes to accommodate specific types of media and the same number of available constructs will not always be enough for developers to accomplish their tasks. An empty box type with no exact specifications of media content or predetermined behavioral regulations might be developed to allow developers to customize their own reusable constructs. **Future Directions** covers the possibility more thoroughly.

A box metaphor is important because with imagination the box can be envisioned to hold anything; yet, implies a self-contained whole. This appears to be a good metaphor for reinforcing what could be expanded and seen as an object-oriented space in which boxes act as objects to be labeled, populated, and organized – all with the intention of filling the larger development area. The box remains stable and central, but functions depending on how it is used in organization and construction.

Square outlines as placeholders are by no means an original concept in design interfaces, nor are boxes for that matter, but the significance of the pattern language they create for manipulating information is worth examining. The practice of placing square dummy

graphics that are the same size as missing graphics or copy on a page is well-established for print layouts. In an interactive media, however, a placeholder is no longer a passive empty space but takes on new dimensions as a container anticipating the accumulation of content and ready to work upon that content within the confines of function rather than physical limits.

Implementation

If both people and information objects inhabit multiple contexts and a central goal of information systems is to transmit information across contexts, then a representation is a kind of pathway that includes everything populating those contexts.

*Geoffrey Bowker and Susan Star
Sorting Things Out: Classification and Its Consequences*

The prototype for Lasting Connections takes its experimental content from my experiences and those of my classmates while studying for our Master's Degrees in Information Design and Technology at the Georgia Institute of Technology during the years 2000-2002. It was this group's successfully cooperative nature that prompted me to begin exploring ways to use technology to facilitate the productive interactions that lead to cooperative inspiration, capture a record of the notable enterprises members of the group undertake, and find ways to make the friendships and creative partnerships I have found with members of the group last beyond our brief time spent acquiring degrees. Capturing the essence of this organization was not an easy task, but the implementation process only added to my appreciation of this rare community.

Tracking People and Their Assets

The digital environment can afford many advantages over print. Computers are wonderful, for instance, at keeping track of information. They never forget. If programmed correctly, computers can perform extremely reliable and complete searches on all that they hold in memory. They can use the same capabilities to index all the information contained in a publication. These wonders can only happen, however, if developers give computers enough information at the proper level of granularity to create a pseudo-language through which the computer can come to understand what is being looked for. Computers are not – however often I use the term “magic” to describe the constructs and behaviors of Lasting

Connections – mind readers. Files must be thoroughly cataloged, in a language that anticipates the needs of users, in order to ensure that the machine and the human being can communicate.

To this end, I endeavored to compile a complete set of tags for accomplishing the tasks that Lasting Connections would have to accomplish in order to create quality promotional materials while taking advantage of computers' facility for following strict rules exactly. The greatest overriding need for users of the system was to be able to locate both people and assets and to associate them with one another. Both information about assets and people had to be catalogued thoroughly.

I decided to use the system prescribed by the Library of Congress for delineating metadata, after an examination of the Dublin core system used by the library at Georgia Tech revealed that the other popular system was likely too rigidly structured and not comprehensive enough to generate the sophisticated instructions involved in performing automatic design tasks. These design tasks include automatic portrait layout, subtitling of photographs, and indexing of which people are featured or are responsible for the creation of an asset in the controlled context of a known organization. The Library of Congress system broke metadata into the three general categories of descriptive, administrative and structural metadata with no specific tags defined within the categories, only guidelines for creating them, while the Dublin core prescribed fifteen specific tags of which many did not correspond to what needed to be known in the context of an organization's promotional materials.

Descriptive metadata was generated based on the information that is usually required for journalistic promotional materials. These journalistic tags describe such information as who is featured, what they are doing, and where an asset was gathered or produced. **Appendix C** depicts the descriptive tags I chose, with examples of information that might be provided under their auspices.

Large projects can quickly become unwieldy, with information about where an asset came from lost in the fray. Aside from making sure that an asset could be physically located, one of the most important administrative goals of Lasting Connections was to make sure there are mechanisms for recording who owns assets, whether permissions had been granted to use them, and who can be contacted if permissions have not been granted. This would help to avoid possible liability, and is especially important if there will be any financial gain from the release of a publication. Cataloging this information when an assets is first being gathered is often not much of a problem while the information is fresh in mind if there is a

quick and comprehensive way to do it as part of the collection process. **Appendix C** also depicts a comprehensive listing of administrative tags.

Recording structural information about how an asset should be accessed by the machine is an important means of preserving them for long-term future use as technology continues to evolve at an amazing pace. Since, the machine knows what this information is now, there is no reason for the human being to have to be bothered with that part of the process.

Structural tags in Lasting Connections provide a slot into which the computer can enter the information it has already gained from accessing the file, but which future technology, which might not operate exactly the same way, may need to have explicitly stated and manipulated by a human intermediary. **Appendix D: Structural Metadata** enumerates these tags and list some possible contents that might be inserted into each field based on file type.

Categorizing Contributions

Believing that any method for implementing an ontology for describing the people of an organization and the assets they produce should be flexible, fluid, and expandable did not absolve me as a designer from exploring which categories would be most useful for structuring the content that was likely to appear in promotional publications. An ontology that leaves room for change does not translate to the lack of one. **Appendix F : Narrative of Process for Devising Classification Scheme Encompassing Student Experience** describes the research and card sorting processes I used to reach a default system of topical classification for the assets generated by students at a university while keeping in mind broad distinctions about might translate well to other organizations. **Appendix E: Topics and Subtopics** provides a taxonomy of how the categories I chose relate to one to one another.

Structuring Data

In order to accommodate modifications, the database structure for Lasting Connections employs a system of lookup tables to match specific categories with a numbering system so that terms can change but assets will always be marked with a number that corresponds to whatever the label evolves into. There are two central tables – people and assets. Other tables exist to allow tracking of information that may be different for subgroups of people or assets or to provide for content flexibility. The main tables employ foreign keys to access the information contained in separate tables. **Appendix G: Underlying Database Structure**

diagrams the database structure as it exists now and suggest changes for how it might be expanded to fit the larger structure outlined in **Future Directions**.

Building the Interface

It is a difficult balance to try to keep the organization of the underlying machine process transparent while making a necessary transition to metaphor in order to visualize the information space. Hutchins, Norman and Draper term the success of such metaphors semantic directness in “Direct Manipulation Interfaces”. Lasting Connections strives to minimize semantic distance by echoing many of the interface elements already familiar to users who produce print publications with desktop publishing systems, but it adds some powerful new constructs that promote good work process and effort conservation when producing multimedia materials. The interface consists of three modes: collect, design and preview.

Collect appears first in the list because adding the right tracking information to the database is the first step in an effective design practice. This mode both allows for repurposing and gives the program the information it needs to perform routine tasks for the developer.

Adding assets and people is process driven. A filmstrip viewer at the bottom of the screen provides a window into the contents of the database. First, users choose the asset they want to add information to by putting it into a centrally located space. Then they apply information to the asset by dragging metadata tags onto it. The system guides entry by popping up necessary fields or menus as each type of metadata is added or edited. If the default information made available by a menu does not provide an appropriate categorization for the asset, developers can choose to restructure. In order to locate already catalogued assets, developers can perform complex searches by several types of metadata.

Appendix H: Collect Screen details the collection interface with **Appendix K: Add People** depicting the process for adding member profiles and **Appendix L – Alter Categories** illustrating the process of changing and adding categories.

Design mode separates master layout and specific content sections in much the same way that desktop publishing systems with sophisticated style definitions do. Master layout allows for consistency across sections. Developers can add constants, such as navigational buttons, by choosing the background layer to indicate that the objects should be available to users at all times. Design sections correspond to the main topics used for classifying assets, although developers can choose to use as few or as many of the available sections as they deem necessary for a particular publication. “Magic” boxes automatically create common

constructs for developers. Simply add a slideshow box to the stage and put multiple graphics into it. The system automatically provides buttons for flipping between graphics. Dragging asset descriptions onto these boxes asks the system to find the assets' corresponding metadata and produce captions, titles, and listings of who is featured in them. Design mode also provides an intermediate workspace which is an area for designers can to make comparisons, plan for future layouts, or define relationships between assets. **Appendix G: Design Screen** describes the design interface, and **Appendix M – Master Layout** demonstrates the content separation allowed by a division between section and entire publication layout.

Developers can choose preview mode in order to see how their publication will work as a whole. Intelligent layouts and navigational buttons then begin working to allow developers to experience what their users will interact with after publication. **Appendix H: Preview Screen** describes the preview interface.

Future Directions

Modernity is the transient, the fleeting, the contingent; it is one half of art, the other being the eternal and the immovable.

*Charles Baudelaire
The Painter of Modern Life*

Interface Refinements

Links perform two very different tasks in the current version of Lasting Connection's prototype. They both associate and bind assets. Making a distinction between the two would reinforce the difference between creating long-term associations for content that should be viewed in association by developers and that which assists in document planning to create an experience for end users. The distinction would also allow for more complete tracking of links. Links could then be defined to have different directionalities, keep track of who created them, and reveal why they were created. **Appendix L: Immediate Future Directions** provides a mockup of how this distinction might affect the interface.

Additional boxes should also be developed to accommodate various types of media and the display mechanisms they commonly lend themselves to. An empty box type that allows users

to create their own functions for boxes would make the project more robust and ensure that many constructs could be accommodated without cluttering the interface or restricting designs to too few automated mechanisms. To create such flexible constructs, the project would either have to implement a macro model, in which developers could record incremental actions, or a language model, in which developers could code their own actions. **Appendix L: Immediate Future Directions** illustrates what such an addition might look like.

Smoother mechanisms for adding information need further exploration. **Influences** details how Intermedia has successfully implemented easy methods for data entry and suggests that Lasting Connections might be improved by implementing similar processes. Mechanisms for indexing the contents of publications are also necessary in order for users to take advantage of a database's capacity for registering and locating the information contained in a large multimedia document.

System Expansions

Lasting Connections should provide publication methods in at least two formats. Developers should be able to create stand-alone applications that preserve the narrative as it was told at a particular moment and ongoing, online publications that give users ways to continually contribute to the narrative. To accomplish such publications, Lasting Connections would have to provide tools for both publishing to a PC installable media player and to the Web. This might be accomplished with a robust programming language such as Pearl or Java, which could be used for developing a self-sufficient media player and server-side scripting components that could allow users to search and add to the database via a web browser.

The asset and people tracking database should be implemented in a SQL and ODBC compliant format. This would allow Lasting Connections to interact with the existing databases already used by an organization. Developers could be given methods for linking to information already kept in an organization internal database outside the Lasting Connections system. **Appendix A: Integration of Permanent Storage and Online Updates** and **Appendix K: Illustration of Larger System and Publication Methods** detail the larger context in which Lasting Connections might be located.

Distant Horizons

In the distant future, mechanisms such as transcoding and the automatic generation of salient stills from video will make contributing digital assets to a database a transparent process, one in which the computer automatically analyzes assets for a combination of visual, auditory, and stylistic attributes, while reading the chronology of an asset's life from well-structured, encoded data. In the meantime, though, *Lasting Connections* tries to take advantage of the structures that are widely available, but underutilized, for streamlining work processes and adding value to people's lives by preserving the memories and creative labors that are so essential to understanding who they are as individuals and as a part of a community.

Influences

Each act of mediation depends on other acts of mediation. Media are continually commenting on, reproducing and replacing each other.

*Jay Bolter and Richard Grusin
Remediation: Understanding New Media*

Print Media

THE BLUEPRINT

Lasting Connections was inspired by the print yearbook. Georgia Tech's most recent yearbook from the 2000-2001 school year provided insight into the methods that are traditionally used in depicting the interactions and activities in which large groups participate.

THE YEARBOOK GAME

Endless Games distributes this board game that encourages teenage girls to answer trivia questions about their high school experiences. While the game is aimed at a younger audience than *Lasting Connections*, it provided useful insight into why people enjoy yearbooks for entertainment purposes, what people tend to remember about their personal and group experiences, and how a static print yearbook can be transformed into a dynamic, interactive experience.

Internet Sites

HARVARD GATEWAYS: AN ALUMNI COMMUNITY FOR HARVARD ALUMNI

<http://post.harvard.edu/>

Harvard Gateways provides former Harvard students with such services as an alumni directory, alumni update publications, career and networking resources, bulletin boards, chat rooms, email forwarding, and class and club web page hosting. The site was a valuable model for understanding how the alumni of an organization participate in ongoing interaction digitally.

CONTEXT

Glorianna Davenport's article *ConText: Towards the Evolving Documentary* was influential in understanding the factors necessary for cataloging media to provide for a successful narrative about events of real significance to peoples' lives when the narrator gives up linear control. The article describes the challenges involved in creating an ongoing storyline around the changes that occurred when a public works project revamped a major road through several urban Boston neighborhoods. Although I was not able to gain access to the actual digital artifact, her written advice on annotating content appropriately, preserving assets with a method that encourages progression of detail, and allowing for deliberate combinations was particularly relevant to the project.

Prepackaged Digital Content

ROYAL PURPLE

Royal Purple, produced by Kansas State University, was the Associated College Press' 2001 Award Winner for Yearbook CD-ROM. The CD was a successful model of digital media integrated into a narrative, promotional publication.

Software

IPHOTO

iphoto, which was released by Apple during the development of this project, seems to be a successful tool for the home user who only seeks to preserve memories of specific events

and family members. Although it has some well implemented organizational tools, it encourages a model that does not allow very well for abstraction over time because it indicates that such matters as what role of film a photo is located on should be a large factor in organization. Its publication tools are limited to personal web pages and photo albums, but it does include some image editing tools that are well suited to the home user. It also obviously operates under a model which assumes that digital assets are complete wholes and only need to be accessed discretely by only providing functionality for graphic assets and very little for text or audio.

INTERMEDIA ORGANIZER

Intermedia organizer is marketed as a multimedia organization tool for the home user. The program allows users to catalog digital video assets as well as graphics. It also provides a Flash viewer for making animated presentations, but there is limited ability to modify the viewing interface other than to switch between prepackaged theme graphics or “skins” in place of the default appearance. The software is unique in that it allows users to turn a directory on their home computer into a peer-to-peer network, but these servers are often very slow and cannot accommodate several users. The software is most useful for describing the appearance of graphic assets and so does not work well for truly varied multimedia content, but it does have some interesting features such as data injection which allows users to define metadata once and add it to several assets with simple mouse clicks rather than repetitive text entry.

Distributed Media Systems

MEDIAWEAVER

MediaWeaver attempted a grander research assistive function than does Lasting Connections, but its concepts of creating shared media bases across a network in order to aid collaboration addressed similar problems. Dr. Sha Xin Wei’s paper on MediaWeaver’s underlying form was a good introduction into the structures need to make a project like Lasting Connections work on the back end. The project influenced much of my understanding of the larger context in which Lasting Connections might be located.

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**Appendix A – Narrative of Process for Devising A Classification Scheme
Encompassing The Student Experience**

Appendix F - Narrative of Process for Devising Classification Scheme Encompassing Student Experience

I based my decisions about topic and subtopic classification for Lasting Connections on an examination of various print and electronic promotional materials that have traditionally been used to publicize and celebrate community behavior. I poured through various incarnations of yearbooks, combining the impressions I gained from them with my previous experiences designing such promotional materials as brochures, newsletters, websites, and invitations for departments at two separate universities.

Some of the best insights into what people remember about group experiences came from an unlikely source. *The Yearbook Game*, which is designed as a diversion for groups of middle and high schools girls, provides a set of cards designed to encourage discussions about the adolescent student community. Though many of the questions provided by the game more closely resembled what was called a “slam book” when I was in middle school than a yearbook and though many of the discussion questions were irrelevant to adults, having this information on cards gave me an effective way to begin deconstructing the information space. After I gained some initial abstractions from the game’s cards, I began devising my own cards on slips of paper and grouping snippets of information into larger categories which made distinctions between outside cultural influences, experiences shared by the overall group, behaviors that applied to subgroups, and interpretations made by an individual. This deconstruction method is a loose adaptation of one that is often applied by trained interface designers as they begin trying to understand users’ mental model of the tasks a piece of software is meant to facilitate.

The major distinctions I made in breaking topics into categories corresponded to a large extent the with time-honored sectional breakup of most print yearbooks, which generally distinguishes between the topics Student Life, Academics, Sports, Organizations, and Portraits. I decided to divide topics along traditional lines, but made adjustments for the material that a record of IDT members’ experiences was likely to supply, by relegating the sports category to a subtopic of Organizations and expanding Portraits to include the more robust content such as individual projects and statements that a digital yearbook could easily accommodate. I also created a new division between Student Life and Society because adults are more likely than younger students to take an interest in the outside cultural influences that shape their learning experience and because IDT curriculum follows a humanities model which encourages the study of significant events outside strict textbook reading or formula

memorization. In addition, during our time in school together, what the news media termed “war” had broken out, and no assessment of my and my fellow students’ time in school together would have seemed complete without purposeful and significant coverage of the forces that were shaping both the academic and social world around us.

The final topic list of Student Life, Society, Academics, Organizations and Individuals seemed to provide well for the content I had already acquired or would likely be able to acquire. Yet, it would still echo a familiar structure carried over from the established print medium.

I devised subtopics based on an examination of yearbook and alumni newsletter articles by abstracting into groups stories which covered similar aspects of institutional life and by working with divisions that the material seemed to naturally lend itself to. For instance, most yearbooks devote some space to listing the songs, movies, and television programs that dominate youth culture during the year so a subtopic for Entertainment seemed necessary. As for natural divisions, what looked like it would be the easiest category to provide an inventory of subtopics for was actually the hardest. Organizations are generally listed by each club or group’s name, but I needed divisions that would characterize the essence of the myriad organizations on a college campus. It took a great deal of reworking to decide on concise terms for organizations that performed such functions as providing various levels of religious guidance, minority ethnic support and recognition, and artistic and cultural community support.

The classification process for creating a controlled group of topics and subtopics for Lasting Connections was extremely difficult and time consuming even though there were many relevant and authoritative resources available for consultation about the structure of educational institutions. My experiences with classifying the assets I need to catalog reinforced the need to accommodate adaptability and expansion in Lasting Connections so that each organization could tailor its own classification system to the requirements and activities of its members.

Appendix C - Competitive Research Paper from Project Production Course