

# The ELMCIP Electronic Literature Knowledge Base: Project Report


by Scott Rettberg with Eric Dean Rasmussen

## 1. Introduction and Summary

Developed as part of an international, digital-humanities project, *Developing a Networked-Based Creative Community: Electronic Literature as a Model of Creativity and Innovation in Practice* (ELMCIP), the ELMCIP Electronic Literature Knowledge Base is an open-access, online database tracing activity in and around the field of electronic literature and the digital literary arts. Inspired by Ted Nelson's vision of literature, broadly understood as "an ongoing system of interconnecting documents" (Nelson 1981: 2/9) the Knowledge Base is collecting and connecting bibliographic information and archival materials about the literary production in this field. As this information is linked and cross-referenced in various fields in the Knowledge Base, the relations between objects and actors in the field of electronic literature become explicit, perceptible, recognizable, and communicable. Together these relations comprise the field. In the Knowledge Base, they are defined through content types that include *authors*, *creative works*, *critical writing*, *events*, *organizations*, *publishers*, *teaching resources*, and *databases and archives*. The Knowledge Base now includes more than 7,000 cross-referenced records in these primary content types.

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## Electronic Literature Knowledge Base

### Contribute to the Knowledge Base

The ELMCIP Knowledge Base is a research resource for electronic literature. It provides cross-referenced, contextualized information about authors, creative works, critical writing, and practices. Contributors should [log in](#) to the knowledge base to enter new records.

The ELMCIP Knowledge Base depends on the active participation of a community of international researchers and writers working on electronic literature. To join us in building the Knowledge Base, email [kb\\_editor@elmcip.net](mailto:kb_editor@elmcip.net) a brief message. Include a brief description of your background and interests in electronic literature so we can set you up with a contributor account to add and edit records. The Knowledge Base is developed in Drupal 7 by the University of Bergen Electronic Literature Research Group as an outcome of the ELMCIP project.

### Browse

See all tags used in the Knowledge Base by [frequency](#) or [alphabetically](#).  
See the latest [videos](#) and [multimedia](#) content in Knowledge Base.

### Creative Works

1963 records

Title	Author	Year	Updated ▾	Tags
The Golden Lion	John Cayley	1994	03.07.2013	
The Unfortunates	B. S. Johnson	1969	03.07.2013	loose leaf, narrative, non-linear, novel, print
The Transborder Immigrant Tool	Jason Najarro, Brett Staulbaum, Micha Cárdenas, Richard Dominguez	2007	03.07.2013	immigration, activism, application, GPS, mobile phone
En anarkist er død	Kaja W. Polmar	2006	03.07.2013	anarchist, obituary, remembering, non-fiction, death, Flash, hypertext, interactive, narrative
Traces	Megan Heyward	2006	03.07.2013	bluetooth, mobil, experience, geography, locative, map, narrative, personal

[Add a new creative work.](#)

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[See all creative works](#)




Fig. 1 Front page of the ELMCIP Electronic Literature Knowledge Base

The Knowledge Base is intended to document the electronic literature as a dynamic field of practice, one whose cultural import becomes more comprehensible when the activities of authors, scholars, publications, performances, and exhibitions can be related to each other, in multiple configurations. We have designed the Knowledge Base as a platform in which this complex web of relationships can be made visible and available for analysis. Researchers can begin to trace the activities generated or enhanced by a work as it circulates among different reading communities. When a record of a critical article is documented in the Knowledge Base, all the creative works it references are noted, and cross-references then automatically appear on the record for the work itself. Similarly, cross-references are made to every other type of record it touches—when a work by a particular author is entered, a reference

automatically appears on that author's page, likewise for works published by a publisher and so forth. The Knowledge Base makes perceptible interactions between human and nonhuman actors, and it documents the diverse range of artistic, scholarly, and pedagogical practices in the field of electronic literature.

The Knowledge Base is an *open-access* online research resource. The majority of the information in the database can be accessed by anyone with an internet connection, without a log-in. The main constituency of the Knowledge Base is researchers and scholars who are serious about literary production in digital environments. The Knowledge Base serves both as a platform for research about electronic literature and as a site for self-reflexive research community formation. To that end, the Knowledge Base is a *participatory* online database. While a team working mainly in University of Bergen Electronic Literature Research Group has been responsible for the development of the platform itself and for the development of a great deal of the content in the database, contributors to the Knowledge Base also include many writers and researchers who are practicing artists and scholars in the field, contributing remotely in many different parts of the world. The writers who create, critique, perform, and respond to works of *e-lit* can shape the digital literary field by documenting the actants and activities they deem significant within the Knowledge Base, which is designed to be a collectively authored, networked research environment.

The idea of developing research infrastructure in the service of creative literary communities is at the core of the ELMCIP project, which was initially funded by a three-year grant (2010-2013) from Humanities in the Research Area (HERA), under the Joint Research Project call for Creativity and Innovation. Each of the seven European ELMCIP partner organizations is studying how transnational and transcultural creative communities form, evolve, dissolve, and reassemble in distributed networked environments that make innovative use of digital-communications technologies, from a number of different angles and perspectives. As the ELMCIP acronym spells out explicitly, these studies focus on creative practices developed within electronic-literature communities, and they are intended to provide a model that can help facilitate better understanding of the interactions, both interpersonal and intermedial, that facilitate scholarly, artistic, and literary community and, in turn, further creativity and innovation.

## 2. Project background

**Problem:** The ELMCIP Knowledge Base was designed to address a problem: how can one best document and make visible creative and scholarly literary practices that may appear disparate but comprise a dynamic and growing field? Electronic literature is a field that has been developing for more than two decades, yet it is still only beginning to find a clearly

institutionalized position within higher education and research environments. One reason for this is clear: Electronic literature has until now lacked a sustainable research infrastructure.

**Challenge: Build institutional infrastructure to secure memory and develop context**

An enduring research infrastructure is required if electronic literature is to develop as a field of writing practice, rather than existing as a potentially infinite series of ad hoc writing experiments too often identified with ephemeral technical innovations derived from the use of particular platforms or software. While novelty—ranging from fiction made in early hypertext systems to kinetic poetry produced in Flash to writing in three-dimensional immersive CAVE environments—has been a hallmark of this creative field of practice, a field cannot be built on novelty alone. From the standpoint of researchers and teachers, *memory* is more important than novelty. If we cannot understand present experiments and innovations in the context of those that have come before, we have very little context for teaching or indeed for new innovation. And because of the particular contingencies of the field of electronic literature, memory has posed some very specific problems. Researchers in the field of electronic literature deal with artifacts that exist in media and technical platforms that have shorter life-spans than printed books. The majority of digital literary artifacts electronic literature researchers encounter are both literary works and computer programs. Because of the pace of technological advancement, platforms very quickly become obsolete, so over time works of electronic literature become increasingly difficult to access and study. Further, traditional institutions of literary culture, such as libraries, publishers, and university curriculum committees, have struggled with practices of documenting, disseminating, evaluating, and preserving these types of literary artifacts, which are materially distinct from printed literary artifacts, offering complex archiving challenges.

In many established disciplines, research infrastructure has been in place so long that it might seem to be transparent. Everything from research databases to academic presses to scholarly and creative journals and conferences at which to present current work have long been in place for print-based literary studies. In most arts and humanities disciplines, young artists, academics, and researchers can be initiated into an already existing infrastructure, which, even if it is changing, remains stable enough that most pedagogic energy can be devoted to passing along relatively established methodologies. Authors and scholars of electronic literature, however, have had to address the fact that the field's institutions, organizations, and methodologies have not had an a priori existence: they must first be invented and then attended to, so that innovative work will continue to bear fruit. The Electronic Literature Knowledge Base is both a manifestation of this field-building process—providing a better means to document and preserve creative and critical practices—and a platform through which other aspects of the developing infrastructure can be made more visible and accessible.

**Challenge: Map the context to understand and facilitate a literary ecology**

There is a need for tools to both provide access to creative works and to scholarship and to provide a clear context for understanding the relationship between creative and critical work. Compared to other art-and-critical practices, the field of electronic literature has developed in an atmosphere of close symbiosis between critical and creative practice. While, for example, if one were to examine the institutional structures of contemporary print creative writing and contemporary literary studies, one would likely discover that writers and critics operate in separate milieu, the “writer’s workshop” set off in separate wing of the university from the critical apparatus, as an emergent field electronic literature has more often found the critics and the writers present in the same rooms: presenting creative work and critical work at the same conferences, publishing work in similar venues, and participating in the same discourse networks. Another important contextual difference is that the spread of the field of electronic literature has been broadly interdisciplinary: so it is not merely a matter of writers and critics working in close quarters, but that people of diverse backgrounds including visual and conceptual arts, communications and design, and programming and computer science have also been engaged. Further, the publication venues in the evolving field diverge in substantial ways from traditional modes of literary publication. A work of electronic literature might be published on a CD-ROM or online journal, venues that might map roughly onto print publishing practices, but it might also be exhibited in a museum or art gallery, or presented as a live performance. There is a need to understand how work is presented by these diverse cultural actors in similarly diverse cultural arenas. By documenting and mapping out not only creative works and critical writing, but also the diversity of cultural venues, and most importantly by making the connections between visible, we provide new avenues of understanding creative, critical, and cultural practices as existing within a dynamic ecosystem, a literary ecology.



## windsound

## CREATIVE WORK

**Author:**

John Cayley

## Year:

1998

**Appears in:**

## State of the Arts

Electronic Literature Collection, Volume One

**Publisher:**

## Electronic Literature Organization

**Web URL:**

windsound (Electronic Literature Collection, Volume One)

**Language:**

English

**Publication Type:**

Published on the Web (online journal)

**Exhibited at:**

2001 Electronic Literature Awards  
Interactions: 2001 Electronic Literature  
Awards Winners at the Chicago  
Humanities Festival

## Record Status:

Approved record

**Tags:**

ambient poetry generative algorithmic text generation appropriated texts soundscape synthetic  
voices transliteral morphing text movie

**Description (in English):**

John Cayley's "windsound" is an algorithmic work presented as a 23-minute recording of a machine-generated reading of scrambled texts. The cinematic work presents a quicktime-video of white letters on a black screen, a text written by Cayley with a translation of the Chinese poem "Cadence: Like a Dream" by Qin Guan (1049-1100). As a sensory letter-by-letter performance, the work sequentially replaces letters on the screen, so that what starts as illegible text becomes readable as a narrative, and then again loses meaning in a jumble of letters. Cayley calls this technique "translitteral morphing: textual morphing based on letter replacements through a sequence of nodal texts." Sequences of text appear within up to 15 lines on the same screen, thus presenting and automatically replacing a longer text on a digitally simulated single page-a concept Judd Morrissey also applies in "The Jew's Daughter." Unlike Morrissey's piece, Cayley's doesn't allow the user to interact with the work. Instead the work appears as a self-sufficient text-movie with ambient sound, murmurs of voices, windsound and synthetic female and male voices reading the non-readable to the viewer. As with the shifting letters, narrative perspectives also morph and switch fluidly between the lyrical-I, Christopher, Tanaka or Xiao Zhang. Thus, the sentence: "We know," Tanaka had said in English/"Tomorrow if we meet/I will have to kill you myself/" is, in the algorithmic process of the work, later spelled out by the I-narrator. At the very end of the work, John Cayley dedicates "windsound" to the memory of Christopher Bledowski. What remains after the black screen and a re-start of morphing letters before they vanish conclusively, is windsound. At a certain point in the movie the text says "you have to be/to stay/silent/to hear it," and it seems like the reader has to be silent, too, listening to what he cannot understand, patiently waiting for the moment of legibility.

(Source: Patricia Tomaszek)

**See also:** [Electronic Literature Directory entry](#)

**See also:** [I ♥ E-Poetry entry](#)

**See also:** [NT2 entry \(français\)](#)

**Critical writing that references this work:**

Title	Author	Year
Destination Unknown: Experiments in the Network Novel	Scott Rettberg	2003
Electronic Literature Publishing and Distribution in Europe	Markku Eskelinen, Giovanna Di Rosario	2012
I Love E-Poetry	Leonardo Flores	2011
Letters That Matter: Electronic Literature Collection Vol 1	John David Zuern	2007
Memory and Motion: The Body in Electronic Writing	Maria Angel, Anna	2010

Fig. 2 Records of creative works include both standardized bibliographic meta-data and cross-references to records of critical writing that reference them, as well as links to records in other databases that document the work.

## Challenge: Identify networks of relations to better understand literary community

One model of understanding literature and literary culture is a series of *works* produced by authors—individual expressions produced variously talented or inspired individuals working in isolation and best experienced in an immersive, contemplative mode. The ELMCIP project as a whole has, however, presupposed a different model, one which both literary community and the literary artifact itself can be understood as networks of relations. A conception of a work of electronic literature as a network can be derived from the formal and material qualities of many

of the works themselves: a hypertext novel is a literary work built of links and nodes, offering multilinearity and branching paths in place of narrative arc; a kinetic Flash poem is built of timeline, sprites, and assets rather than stanzas and lines; a poetry generator is an algorithmic structure that assembles poetry from arrays of possible verse. In studying these types of works, we understand them as networks of relations between different parts, producing contingent literary experiences on the computer and network. Likewise, the literary ecology that results in the creative practices of electronic literature can be understood as a network of networks, encompassing human and machine intelligence, social practices and affiliations, ad hoc alliances, and formalized institutions. Core to the conception of the Knowledge Base is the idea that those networks should be acknowledged, made visible, documented, and made accessible for study. This is not just a theoretical concept but one which, for instance, has consequences for bibliography and institutional placement of electronic literature as a field. One goal of the ELMCIP project has been to bring database methods and an archival sensibility to types of artifacts and practices that are not often documented in a bibliographic fashion.

### **Environmental scan—Related work in the field**

While the ELMCIP Knowledge Base brings some new documentation methods and research infrastructure to the field of electronic literature, it is important to acknowledge the fact that it is itself only one element in an increasingly dynamic network upon which the field is built. Indeed its purpose is in part to bring a number of other resources, organizations, and communities into productive engagement with each other. The Knowledge Base is not the first or the only online database working to document the field of electronic literature. In fact, the ELMCIP Knowledge Base is now part of the CELL (Consortium for Electronic Literature) initiative (addressed later in this paper), which includes a number of different electronic literature database projects that are working together. An understanding of the diversity of actors and sites of activity has been important to the concept of the ELMCIP Electronic Literature Knowledge Base.

Founded in 1999, the USA-based literary nonprofit Electronic Literature Organization has played a significant role in shaping the institutional identity of electronic literature, through its website, online directory, publications and Electronic Literature Collections, conference, and highly engaged community of critical and creative practitioners. With a large and nationally distributed board of directors, including international representation, the ELO has for more than a decade been a driving force in establishing and growing field. The SUNY-Buffalo based Electronic Poetry Center has also played an important formative role since the late 1990s, both via the EPC—an early index of links to works and authors and some archival materials related to E-Poetry—and most importantly via the E-Poetry Festival. In Quebec, the Montreal-based project NT2 (Nouvelles Technologies Nouvelles Textualités: Le Laboratoire de

Recherche sur les Oeuvres Hypermediatiques) has also played an important role since 2002. The well funded initiative is the most developed French-language initiative in field, including an extensive online directory of works, the “Répertoire des Arts et Littératures Hypermédiatiques,” a bibliography of critical writing, an online journal focused on digital literature, and periodic events and conferences. In France, a group centered on the Laboratoire Paragraphe at Paris 8 University has been active in developing projects related to electronic literature including publications and conferences since the 1990s. The Barcelona-based Hermeneia research group has included representatives from a number of European countries, and since the early 2000s has organized a number of conferences and publications, including an index of links to electronic literature works.

There are a number other significant actors responsible for building the field of electronic literature, including commercial publishers such as Eastgate Systems and online journals such as the *New River Quarterly*, *Hyperrhiz*, the *Iowa Review Web*, *Poems that Go*, *BeeHive*, and others. A number of major academic presses, such as the MIT Press, the University of Minnesota Press, the University of Alabama Press, the Computing Literature series at West Virginia University Press, and others have published monographs and collections of critical writing focused on electronic literature. In addition to conferences, such as the Electronic Literature Organization conference and the E-Poetry festival, which are focused centrally on electronic literature, a number of other conference series, such as the Digital Arts and Culture conferences, the ACM Hypertext conferences, and the International Society for Electronic Arts conferences, have featured e-lit as one of their concerns. A number of one-off conferences, museum and gallery exhibitions, individual readings, and smaller seminars are also sites of activity in the field. Electronic literature has found a place within the academy per se, as it is increasingly featured within curricula in language, literature, rhetoric, communications, and media courses. Some particular centers of academic electronic literature activity, such as Brown University, the University of Bergen, and Paris 8 University, and others, now feature electronic literature as part of their curriculum. In libraries, there are also some special collections and library archives, such as the Michael Joyce Collection at the Ransom Center, the Deena Larsen collection at MITH, and the Archive-It Internet Archive collection established by the Electronic Literature Organization in cooperation with the Library of Congress. Finally and perhaps most importantly, the field has been built on many Internet-based communication channels, such as listservs, weblogs, and increasingly in social media.

While online indexes of links, such as the EPC or the Hermeneia guide to online digital literature, have long been useful resources, the two resources most directly related to the ELMCIP Knowledge Base are the Electronic Literature Directory (ELD) developed by the ELO and the NT2 “Répertoire des Arts et Littératures Hypermédiatiques.” The ELD, released in its first incarnation from roughly 2000-2004 and reimplemented in its current form from 2009, was



the first open-access relational database—as opposed to a web portal or index of links—to document works of electronic literature. At the time, the goal of the developers was to develop a Yahoo-style index site to electronic literature, including short blurbs and pointers to creative works of electronic literature. More than a decade ago, the conception of what categories of entity might constitute electronic literature were quite different from what they are now. The first ELD featured categories like “Long Fiction” and “Short Fiction” and “Hypertext” and “Audio” but did not for instance have any facility to tag works using an unstructured vocabulary. The first version of the ELD soon suffered from both a problem of link rot—with a couple of years the majority the links gathered in 2000 did not work—and problems related to the fact that it was custom programmed on a bespoke database platform, so when the original developers were no longer available to the project, the maintenance path went with them. The first two *Electronic Literature Collections* (2006, 2011) established a new convention for documenting work in more detail, including detailed descriptions, artist statements, technical instructions, and keywords, which provided a way to quickly tag works with different concepts, themes, platforms, and techniques, thus providing a diversity of approach patterns to the material. This represented both a break with the approach of categorizing in the first ELD, which was both more hierarchical and more tied to genres and approaches derived from print literature. The current ELD, directed by Joseph Tabbi, has taken as its mission the detailed description of individual works. The production of the current ELD is a critical writing activity, aiming to establish short canonical descriptions of works. The ELD also includes other resources, such as critical writing, though the two record types are not tied together. The NT2 Répertoire is a very extensive French-language collection of works of electronic literature and digital art, which includes more than 3800 “fiches” providing descriptions and bibliographic information about the work. NT2 has done particularly good work in developing structured taxonomies addressing media, genre, interactivity, and other aspects of the works in the Répertoire.

Each of these projects has a different focus and goals with the same zone of cultural practice. The fact that there are multiple actors engaging in the work of large-scale documentation of Electronic Literature is to the benefit of the field. There are two particular areas in which the ELMCIP Knowledge is distinctive in comparison to its peers. The first is that, situated within a European research context, it has been in a better position to represent that context and bring the work of European writers and researchers into visibility alongside Anglo-American work. The second grows out of the challenges described above. In bringing in documentation not only of creative works, but also of critical writing, events, teaching resources, and other types of objects, and most importantly by mapping the relations between all of them, the ELMCIP project can develop a richer context for understanding the work in the context of a whole field.

### **3. Project Development, Evolution, and Workflow**

## **The Context of the ELMCIP Project**

Focusing on a particular creative community, of electronic literature practitioners, the central research question of the ELMCIP collaborative research project is **how creative communities of practitioners form within transnational and transcultural contexts, within a globalized and distributed communications environment**. We have sought to gain insight into and understanding of the social effects and manifestations of creativity. Our research tried to exploit the characteristics of electronic literature in order to inquire into how a broader range of networked creative communities could develop.

In pursuit of purely objective research goals, it would have been possible to frame such a research project externally to the field itself, for example, by limiting the study to ethnographic research conducted by disinterested social scientists. But ELMCIP did not pretend to a false sense of objectivity. Our researchers are active as scholars, writers, and artists in the field that is the subject of our research. Our interest is not simply to study a field that has already been established and understood as completely formed, but rather to better understand the conditions for the formation and advancement of network-based creative communities by actively engaging in the work of better developing a field in which we as researchers are already actively engaged. The research outcomes of ELMCIP were, therefore, not limited to cultural analysis, but included the development of research infrastructure for electronic literature.

The collaborative research project included seminars, workshops, a conference, an exhibition, an anthology, and diverse forms of scholarly publications. Linking all of these outcomes together and the central work package of the University of Bergen team is the ELMCIP Electronic Literature Knowledge Base (<http://elmcip.net/knowledgebase>).

## **Original Intent of Knowledge Base and Evolution of Project Scope**

The ELMCIP Electronic Literature Knowledge Base as originally proposed would have included a narrower scope than the resulting project. In the original ELMCIP project proposal, the Knowledge Base was described as: “a central web resource for the CRP, keeping participants and stakeholders informed about progress on the project, events, and deliverables as the CRP proceeds, and will serve as a open distribution mechanism for research generated by the project. The knowledge base will also serve as a centralized, searchable archive of information about European electronic literature and other related creative communities, which will be maintained by the University of Bergen beyond the grant period. The knowledge base will not simply serve as a set of information pages about the CRP, but will also be a research outcome and distribution platform for the CRP, serving to widen the audience of the CRP and to increase the impact of the research conducted by the CRP.”

An important distinction between the scope of the original proposal and the model that eventually evolved was that the project was initially focused mainly on the research produced directly as a result of the ELMCIP project, the project that eventually evolved is scoped out to the entire field of practice. For instance, while the ELMCIP Knowledge Base includes extensive records produced as a result of the ELMCIP seminars and the Remediating the Social Conference, there are also very extensive records of many other events in the field over the course of the last decade. And while we initially proposed a primary focus on European work, as we produced the ELMCIP seminars, we realized that it no longer makes a great deal of sense to limit scope to any particular geographic area, given that the field of electronic literature is evolving on an international basis: the interplay of critical and creative actors in a network-based environment includes great deal of cross-cultural work and transnational interaction. So though it entailed a significant broadening of scope, fairly early in the process it became clear that rather than the working with a narrow selection of work and practices, it would make more sense to try to document the dynamic field of practice as a whole. Another example of productive scope creep in the ELMCIP project has been that while our central focus was and has remained to develop the Knowledge Base metadata / bibliographic resource (documentation database), as the platform has developed the project now also has certainly elements of an archive, such as the hosting of full-text PDFs, source code of some creative works, images, audio files, and other media assets.

Beyond taking on a bigger chunk of the field than initially intended, however, most of the technical objectives originally stated for the Knowledge Base have served as our guidelines since. These proposed objectives included:

- Breadth: The knowledge base will be as comprehensive as possible, including presentation materials from all of the seminars conducted under the CRP, downloadable versions of articles produced as a result of the research, downloadable versions of the reports, exhibition catalogue, and ethnographic study, online versions of the works or documentation included in the exhibition DVD and the anthology, information about active and historical network-based creative communities, information about individual works of electronic literature, information about scholarship about electronic literature, and resources specific to the CRP itself.
- Granularity: Rather than simply redistributing PDF files of research and reports conducted as part of the CRP, the knowledge base will extend the bibliographic usefulness and searchability of the research conducted by the CRP. Structured data about individual works, important critical and theoretical articles, individual authors, institutions, and events will be harvested from the research on an ongoing basis as individual records, thus resulting in a useful searchable bibliographic resource.
- Open Access: Once vetted and reviewed by project PIs, all information entered into the knowledge base will be available on a free open access basis. Whenever possible,

knowledge produced by the project will be released with a permissive Creative Commons license or into the public domain.

- Sustainability: In order to make the knowledge base as durable as possible, we will use widely supported open source CMS and database platforms. UiB will further commit to host and support the knowledge base for a minimum of five years beyond the project period. Additionally, we will take steps to insure that the project is archived in its entirety by the Internet Archive (archive.org) and by the Norwegian National Library, and it will, therefore, be freely available for the foreseeable future.
- Usability: The knowledge base will be designed and implemented according to Web usability best practices, emphasizing clarity, searchability, and accessibility.

### **The Project Team**

The ELMCIP Electronic Literature Knowledge Base has been the primary deliverable of the ELMCIP research team at the University of Bergen. Since 2010, the team working on the Knowledge Base has included researchers, technicians, and librarians at UiB. University of Bergen graduate and undergraduate students have also made significant contributions to the project. The team working at UiB has included both researchers whose time was funded by the project and several who were not funded directly through ELMCIP.

The team working on the development of the Knowledge Base has included:

- Associate Professor Scott Rettberg, Project Leader
- Professor Jill Rettberg (Co-Investigator)
- Eric Rasmussen (Funded Researcher for 18 months, Knowledge Base editor)
- Patricia Tomaszek (UiB Ph.D. student, developing content)
- Elisabeth Nesheim (UiB Ph.D. student, work on design aspects)
- Stein Magne Bjørklund (Contracted Drupal developer)
- Thomas Brevik (Librarian)
- Aud Gjersdal (Librarian)
- Meri Raita and Helene Helgeland (Student assistants, developing content)
- Quinn Dombrowski (Digital humanities Drupal consultant based at UC Berkeley)
- Fulbright researchers Davin Heckman and Leonardo Flores; Fulbright Specialists Mark Marino and Rita Raley; and guest researchers Luciana Gattass, Melissa Lucas, and Natalia Fedorova (Developing content and testing research and pedagogical applications),
- UiB Digital Culture undergraduate students.

In the past two years, the development and use of the ELMCIP Knowledge Base has been integrated into the UiB Digital Culture curriculum. Students have contributed to various aspects of the Knowledge Base in UiB courses, including DIKULT103: Digital Genres, DIKULT203:

Electronic Literature, and DIKULT303: The Graduate Seminar in Digital Media Aesthetics. In the Fall of 2012, we developed a new course, DIKULT207: Practical Projects in the Digital Humanities, in which a small group of students all learn about research and projects in the Digital Humanities more broadly and develop practical projects in the environment of the Knowledge Base. Some of these projects have included working on user interface design, working on documentation, working with taxonomy, and working to develop records in collections on specialized topics. In 2012-13, visiting post-doc researchers Luciana Gattass and Natalia Fedorova were also funded by the University of Bergen's SPIRE program for three-month stays at UiB to develop research collections in the Knowledge Base specifically focused on Brazilian and Russian electronic literature.

While the research team at UiB has been at the core of Knowledge Base development, a very important aspect of the project has been that it is an open contributory framework, and many writers and researchers in the field have now contributed to, developed records for, and shared resources with the Knowledge Base, including the majority of the other PIs working on the ELMCIP project, in addition to many other writers and researchers who have no formal affiliation to ELMCIP. If the Knowledge Base is to be sustainable as a collectively developed resource, the development of this pool of contributor artists and scholars must continue and increase.

### **Workflow, Improvisation, and the Inductive, Agile Method of Development**

Many digital humanities projects are developed and tested for a long time before they are (if ever) made available online, on a march through milestones to completion. The workflow of the ELMCIP project has been different. The project was made public at a very early stage of the development process—in August 2010—and development work has proceeded on a nearly continual basis ever since. Members of the team working the project gather for meetings most Friday afternoons that bring together those working on the technical development of the project with those who are working on developing the content. As we have encountered specific documentation challenges, we have discussed the structure of the content types and field, as well as improvements and revisions to the structure have been made on a regular basis.

Another important aspect of the workflow of the database has been that we have made the choice to allow for and even welcome incomplete *stub* records. Because of our relational reference model, in the course of creating a new record for a critical work, a contributor might also have to create several new creative work and author records, an event, publisher, or organization record, etc. Our general principle is that stubs are to be thought of as seeds that can be revisited and made to grow at a later time. New entries typically then establish a branch from which other entries eventually grow.

Our guideline is “Document what you can, while you can, with the information you have at the time.” We further consider any given record to be open to revision and improvement from any given contributor. That is to say that contributors can not only create new records and document those they have already produced, but can also edit a record produced by another contributor. The record is not conceived as a fixed canonical description, but as a dynamic resource, which can and should develop over time. Further, because we are documenting a dynamic field as it is unfolding, the coverage of the Knowledge Base will always be incomplete. We accept this state of incompleteness as a condition of our field and of our practice.

While the Knowledge Base is a documentation project, it is also an *improvisational* project. One of the great pleasures of building the Knowledge Base has been the discovery that A) We can and will make it up as we go along, B) As we realize that we are missing important aspects of the field we can add them to the model, and C) As we gather all of this information and see it in front of us, new applications reveal themselves to us, and we can build those in. To provide a few examples: We realized about halfway through our development process that this would be an excellent platform in which to both share and develop teaching resources—given that many of the creative works and critical writing that are core to a syllabus are already there. Later we were discussing the fact that while we were spending so much time discussing databases and archives, we had no way of accounting for those, so we added them. We are currently in the process of adding a Platform content type to describe specific authoring systems and archives and cross-reference those to works in the same manner as we cross-reference the other content types.

The vital content types and essential elements of the field have only become apparent to us as we have worked on the database. Developing research infrastructure *is* research.

We are developing ways that individual researchers and teachers can use this platform as a research and teaching tool. For example, individuals can create private notebooks for their individual research and link to multiple items, or public research collections to gather resources on a specific topic, such as Brazilian electronic literature, or e-lit for the iPad. We are also developing teaching tools and other applications within the Knowledge Base. The platform is flexible enough that we are able to engage in a continual process of reinvention.

#### **4. Platform and Technical Development**

The Knowledge Base has been developed in Drupal—a free and open source content management system developed by a worldwide community of volunteer developers who are developing and using the platform in their own projects. Drupal has a very large installed user base. The project site reports that 993,458 people in 228 countries “power” Drupal, and the CMS is used by a number of high-profile public sites, including for example the *Economist* and

the White House.

On its own, Drupal is a powerful system with standard content management (CMS) features and online community functions. The reason why the ELMCIP team chose Drupal over other alternatives such as Wordpress or Joomla is that it offers highly customizable database functionalities. The system allows for the design of custom content types and fields, so that fields describing different types of objects can be structured to be semantically meaningful for both human and machine users, and so that the use and display of media assets and other file types can also be customized for the situation at hand. The system also scales fairly well in comparison to other systems.

Drupal is a highly modular system. Like many other open source projects, this has benefits and drawbacks for users of the system. While the main Drupal system—Drupal core—is developed on one schedule, the modules are developed separately by separate teams of volunteer developers on a schedule that may or may not cohere well with the development of Drupal core. Some of the functionalities first offered by modules are *rolled into core*—a prominent example is the Content Construction Kit module—CCK—which enabled the highly customizable content types that made Drupal so attractive to the ELMCIP project. CCK was a module up to Drupal 6 but was rolled into Drupal 7. In 2011, about one year into the process of developing the ELMCIP Knowledge Base, we upgraded the system from Drupal 6 to Drupal 7. While with some systems a version upgrade might have been trivial, in this case it was major migration that took many development hours, and it took almost another full year before all of the modules we were using were ready for use with Drupal 7 or that we were able to find a suitable replacement. We were able to keep the system online and functioning while all of these changes were being made. Ultimately this made for a better and more flexible system, but we had not anticipated when we began the project how much *care and feeding* the platform itself requires. In comparison to many other types of projects, a database such as this one must be understood as an evolving ecology more than as a project that can ever be understood to be completely finished, or even completely stabilized. Even as the funded project ELMCIP is drawing to a close in 2013, we are still maintaining, modifying, and changing the system, bringing new capabilities to it and fixing bugs as they appear. In some respects, an active online database is more like a race car than it is like a book. It must be maintained and fueled, and parts must be changed over time or the system can and will break down. Of course, unlike an automobile, a system like this does not come with any sort of coherent repair manual. Perhaps a Frankenstein's monster would make a better analogy. At some point, it might occur to us that the creature would function better with a new limb or sensory apparatus. We never clearly know how attaching that new appendage will affect the system as a whole until the surgery is completed and we observe the creature adapting to it. It is not a linear development process but a recursive one.

The ELMCIP Knowledge Base makes use of a number of non-core modules. More than 100 modules in total are installed and enable and enhance various aspects of the system. This discussion will not details all of the modules use in the ELMCIP Knowledge Base, but a few should be highlighted. Among the most important of these for the particular Drupal implementation in the ELMCIP Knowledge Base are the **References** and Entity API modules, the **Views** Module, the **Media** module, and **RDFx** modules.

The **References** module allows us to create fields that are node references to other existing nodes. This allows for the approach to cross-referencing that is fundamental to the model of the Knowledge Base as a whole. When a contributor is entering a record using a reference-based field, the field is manifested as an autocomplete field—as the user begins to type, the field is querying the database for an existing record matching that title. If the record exists in the database, the text will complete; if not, the user first needs to add the other record. While this makes for some interruptions in the workflow if a user is entering a new work by a new author published by a publisher that is not yet in the database, etc., it ultimately improves the workflow, since so many authors, publishers, and so forth are already in the Knowledge Base, and most importantly it captures the relationships between different objects and actors in the KB that are semantically meaningful both to readers and to the system itself. Once these node reference relationships are established, the system can display the relation on both the node that the contributor is currently editing and the node being referenced. For instance, when a piece of critical writing references a creative work, that reference will appear both on the critical writing and on the creative work. The References module is what enables us to create those automatic cross-references.

The **Views** module has also been essential to the development of the Knowledge Base. Views is a module which treats all of the nodes and fields in the Drupal installation as elements of a database. A view is essentially a particular window on the database, structured according to contextual rules. So a view can include any set of fields of any content type, and those fields can be filtered based on the particular context of the user and of the view. Views can have multiple iterations and can display differently in different contexts. A great deal of the information in the Knowledge Base is displayed in table formats. Each of those tables are actually a separate view. Views are where the power of References are harnessed to display the contextual cross-references within the Knowledge Base. Using Views and Entity attachments, we are able to create views that automatically display cross-references. On the Author/Person content type, for instance, all of the creative works and critical writing an author has written, along with other activities, such as events organized by the person, are displayed on the given author's page. None of this information is directly entered on the Author page, but instead is generated by the system as attached views triggered by the references to the



record.

Modify the display(s) of your view below or add new displays.

#### Displays

Entity content

+ Add

edit view name/description

▼ Entity Content details

Display name: Entity content

clone Entity content

TITLE

Title: Critical writing published

FORMAT

Format: Table | Settings

FIELDS

Content: Title (Title)

Content: Author (Author)

Content: Appears in (Appears in)

Content: Year (Year)

Content: Publication Type (Publication Type)

FILTER CRITERIA

Content: Published (Yes) AND

Content: Type (= Critical Writing) AND

Content: Publication Type (exposed) | Settings

SORT CRITERIA

Content: Title (asc)

ENTITY CONTENT SETTINGS

Entity type: Node

Bundles: Publisher

Arguments: Id

Show title: Yes

Access: None

HEADER

FOOTER

PAGER

Use pager: Mini | Mini pager, 50 items

More link: No

Advanced

CONTEXTUAL FILTERS

Content: Publisher

RELATIONSHIPS

NO RESULTS BEHAVIOR

EXPOSED FORM

Exposed form style: Basic | Settings

OTHER

Machine Name: entity\_view\_1

Comment: No comment

Use AJAX: No

Hide attachments in summary: No

Hide contextual links: No

Use aggregation: No

Query settings: Settings

Field Language: Current user's language

Caching: None

Link display: None

CSS class: None

Theme: Information

Fig. 3 The dozens of cross-reference tables in the ELMCIP Knowledge Base are delivered via configured views. A sample configured view above determines how works of critical writing will appear on the records of their publishers.

The **Media** module and a cluster of other helper modules, such as Media: Flickr, Media: Vimeo, and Media: YouTube, help us to both manage a media library of attachments that are included in the Knowledge Base itself and to embed videos and photosets in the records so that they can display inline. Because the ELMCIP Knowledge Base includes and links to so many different forms of documentation, this module is used heavily on our site. For instance, many of the event records include photosets and video documentation, and a number of work records include attached video interviews with the artists. The Media module allows both internal and external media-rich content to display directly on the page, making the Knowledge Base a richer multimedia experience than it otherwise would be.

**Research Collection that references this entry:**

Title
Nordic Electronic Literature Research Collection

Add new [research collection](#).

**Multimedia:**



**Attachment:**

 [Electronic Literature and Communities in the Nordic Countries \(PDF\)](#)

The permanent URL of this page: <http://elmcip.net/node/3831>

Record posted by: Eric Dean Rasmussen

Fig. 4 In addition to locally hosted attachments such as PDFs, audio files, and source code, the Knowledge Base displays external multimedia resources such as videos of talks and performances hosted on Vimeo and YouTube.

The **RDFx**, **RDF UI**, and **Schema** modules specifically enhance the way that the information in the Knowledge Base is presented to the outside world, and enrich the way that the information in KB records can be utilized by other systems. RDF—Resource Data Framework—is a framework for representing information on the Web. It is a syntax for representing relationships between objects according to agreed-upon semantic schemas. These schemas can be read by different agents and systems, making information that is labelled with RDF metadata more useful to other systems. Drupal 7 has some built-in RDF capabilities for core fields and content types. The RDF modules we have installed in the ELMCIP Knowledge Base allow us to extend these capabilities, both so that we can attach RDF metadata to the custom content types and

fields we have defined, and so that we can use multiple RDF schemas. To put it in simple terms, these modules allow us to attach multiple metadata definitions to records and fields, making them accessible to other systems in semantically meaningful ways. For example, because we have used a Schema RDF mapping, Google Rich Snippets and Google Scholar can access the records in the Knowledge Base in a more meaningful way than simply accessing them as web pages with generic text. Critical writing records in the Knowledge Base with PDF attachments are now almost immediately indexed by Google Scholar. We are using multiple RDF schemas, and we continue to develop this aspect of the system. The goal is to make the Knowledge Base highly functional both as a system in its own right and as an *extrinsic database* of open data that can be harvested by other systems, making the work that is done on the Knowledge Base portable to other systems.

## **5. Field Definitions and Politics and Ideology of Defining a Field**

While a map is not a territory, the type of territorial mapping the ELMCIP Knowledge Base and other related databases are doing defines and delimits an academic and creative field in a powerful way. Our realization has been that with this power comes responsibility. As we have developed the Knowledge Base platform, our research group has met most Friday afternoons during the Fall and Spring semesters. We discuss various technical and content issues related to the database. Almost inevitably, we leave the meeting with a list of new fields, and new views of information we have decided to add. Among the reasons for this are that as we discuss what types of entities compose the field of electronic literature and what type of material should, for instance, appear on an author record, we realize that we are also discussing the politics of academia, which highlight and value certain types of work and obfuscate others. So for instance, deciding that editorial work, development of teaching resources, and curatorial work should display on a person record along with critical writing and creative work authored is not trivial. This goes for nearly every field and every content type in the database. Including or excluding items from a form is a political decision, with consequences. To build a database is to realize the power of bureaucratic forms, and then to realize that you are building the bureaucracy. Insofar as it has been possible, we have strived to remove the cloak of invisibility from aspects of academic work that are often kept hidden from view: to make the many sorts of work that go towards building a field visible. We try to give credit where credit is due at every opportunity, and we try to make all of the various forms of work that contribute the development of the field evident.

There are two other aspects of the Knowledge Base that are both about the sustainability of developing a Digital Humanities resource and the politics and ideology of the process. We have already described some of the logical reasons why we chose to use a free and

open-source platform. There are ideological reasons as well. The technologies that we use should match our philosophy about the disposition of knowledge we hope to achieve. Likewise, we choose to license the work that we do on the Knowledge Base with a Creative Commons Non-commercial Share-alike license, which then expressly allows other scholars, other creators, and for that matter other databases to re-use the information we share, and the information models, and the adaptations of the platform we are using to further knowledge and develop new resources, provided they agree to do the same. If there is a core ideological position that guides our work on the Knowledge Base, it has been that knowledge that is shared and used never dies, but finds new utility as it moves through different communities of interest.

## 6. Content Types and Fields in the ELMCIP Electronic Literature Knowledge Base

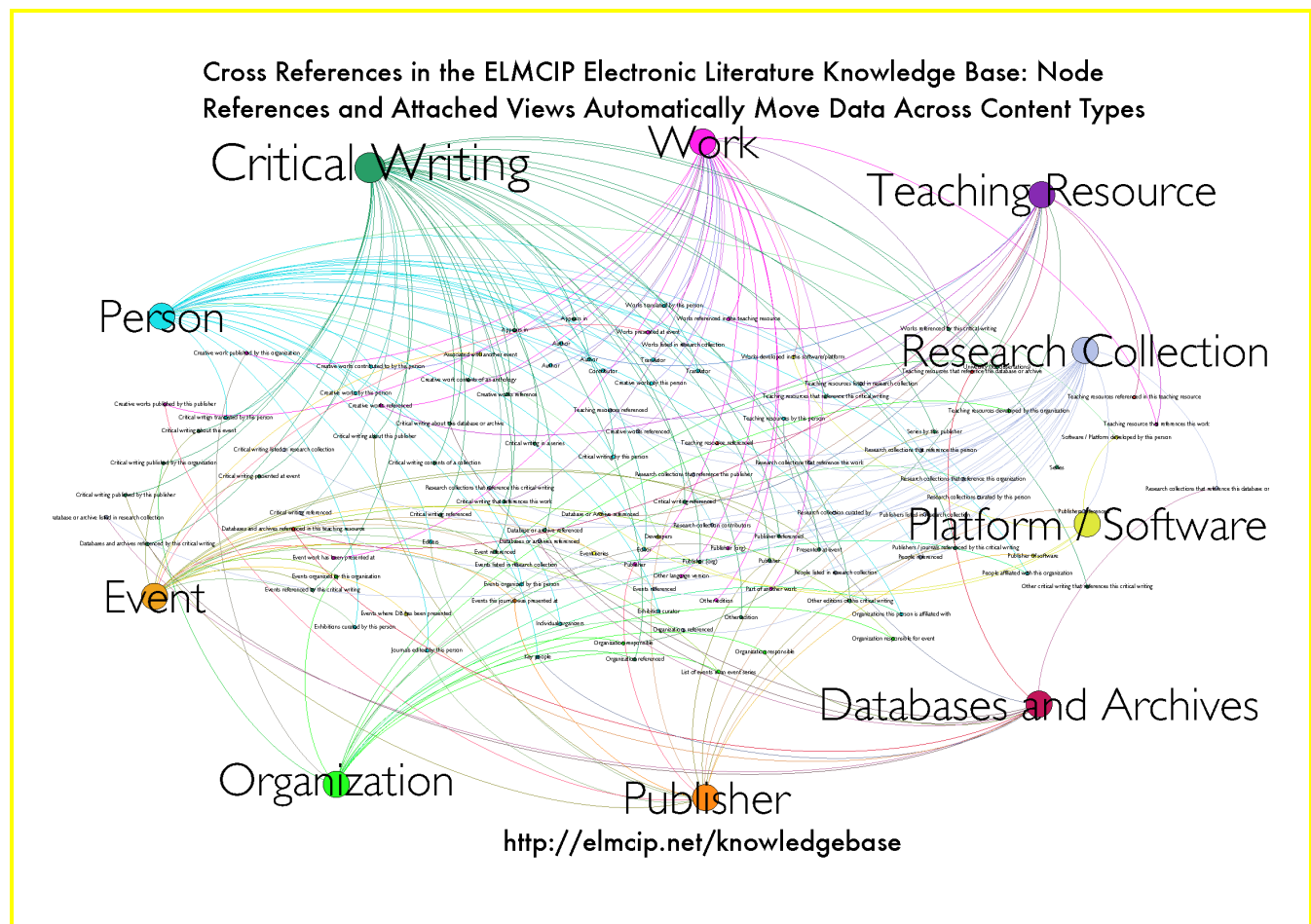


Fig. 5 Cross references between content types in the ELMCIP Electronic Literature Knowledge Base.

What follows is in this section a brief description of the content types and fields in the ELMCIP Electronic Literature Knowledge Base. Each record in the Knowledge Base is produced within

a given predefined content type. At present these content types include Author (Person), Work, Critical Writing, Publisher, Organization, Event, Teaching Resources, Databases and Archives, and Software/Platform. Each content type is defined by a set of fields. While some of these fields are open text fields, the majority of them are either node references, structured or unstructured taxonomies, links, or attachments. Defining the core objects and actors / content types of the field of electronic literature and defining the information that we as documentarians and archivists believe to be most important aspects of those objects to capture and document has been an important outcome of our work on this project. These content types and fields are by no means set in stone, and in fact are revised and expanded on a regular basis as we use, edit, and modify the Knowledge Base. For each field we indicate what type of information can be entered and indicate if the field allows multiple entries. Where it is not obvious how the field is used, we also provide short textual description. We also indicate what attached views appear with each content type: these views provide information from other records that reference a given record that are not necessarily recorded in fields on the record itself: for example, creative and critical writing by an author will appear when her/his author record is displayed. These attached views only display when the type of material referenced is present in the database.

## **Author (Person)**

### Basic Information

#### Title

*The node title of a person record is constructed automatically as First name + Middle name + Last name*

#### First name (Text)

#### Middle name (Text)

#### Last name (Text)

#### Alternative spelling of name in original language alphabet (Text)

*This text field is used to indicate when a person's name is spelled differently in a different alphabet than its spelling using the English alphabet. We added this field after we began adding Russian authors to the Knowledge Base, whose names are included both in English spelling and in Cyrillic.*

#### Personal website (Link)

*Many electronic literature authors and critics maintain personal websites. This field is used to link to them. It is also used for links to other biographical sources, such as faculty websites*

*at universities or Wikipedia biography pages.*

Author email (Email)

*The Knowledge Base collects but does not display author email addresses. These may be used by KB editors to correspond with authors about their record in the Knowledge Base.*

KB User ID (User reference)

*When an author has a contributor account in the Knowledge Base, this field is used to tether the author record and the user account together, so that when contributors log into the Knowledge Base and check their user account, they see all the records related to their work, both those they created and those created by editors and other contributors.*

Residency (Location)

*A distinction is made between residency (where a person lives) and nationality (passport country).*

Nationality (Location)

Affiliations - Organizations (Node reference to organization)

*This node reference field is used to indicate when a person is affiliated with an organization, such as a university, department, professional organization, or writing collective.*

## Biography

Born (Year)

Died (Year)

Author photo (Image)

Short biography (Text)

*This text may be in English or another language, or both may be included in the same field. Most of the short biographies in the Knowledge Base are sourced from author's pages, faculty pages, or similar.*

Attachment (File attachment)

*This field is used to attach PDF versions of CVs or similar biographical materials.*

## Editorial

Record Status (Structured taxonomy)

Record Status Options:

Not yet reviewed

Incomplete record (stub)  
Duplicate record (aggregate and delete one)  
Revisions required  
Approved record

KB editor notes (Text)  
*Text field for internal editorial notes.*

**Views attached to Author (Person) records:**

Creative works by this person  
Creative works contributed to by this person  
Critical writing by this person  
Works translated by this person  
Critical writing edited by this person  
Journals edited by this person  
Events organized by this person  
Exhibitions curated by this person  
Teaching resources by this person  
Research collections curated by this person  
Organizations this person is affiliated with  
Research collections that reference this person  
Software / Platform developed by this person

**Work**

Core Information

Title (Text) (Required Field)  
*Used to provide the title of the work, this also becomes the title of the node.*

Author (Person node reference) (Multiple)  
*Node reference link to the person record of the author or authors of the work.*

Contributor (Person node reference) (Multiple)

Translator (Person node reference) (Multiple)

Year (Number)  
*Year the work was first published.*

Publisher (Publisher node reference) (Multiple)

Work Publication Type (Structured Taxonomy) (Multiple) (Required Field)

Publication Type taxonomy options:

- Application
- Exhibited at gallery or event
- Installation
- Locative narrative
- Non-linguistic digital art
- Performance
- Presented at conference or festival
- Print publication
- Print publication (antecedent)
- Published on disc, CD, or DVD
- Published on the Web (individual site)
- Published on the Web (online gallery)
- Published on the Web (online journal)
- Published on the Web (social network)
- Published on the Web (virtual world)
- Other venue

URL (Link) (Multiple)

Download URL (Link) (Multiple)

*As opposed to URL for web-based resources, this field is used to indicate that an application or resource can be downloaded at the URL.*

Archive URL (Link)

*A separate field for Archive URL is used to indicate where a resource is linked to an archived resource, such as an Internet Archive URL.*

WorldCat (Link) (Multiple)

*A field to the WorldCat library database record or records for the work, where applicable.*

ISBN (Number) (Multiple)

*A field to provide the ISBN or ISBNs of the work, where applicable.*

Language (Structured Taxonomy) (Multiple)

*A list of human languages the work is written in, displayed a pull-down select list.*

License (Select List)

License Options:

- Public Domain
- GPL
- CC Attribution
- CC Attribution Share Alike



CC Attribution No Derivatives  
CC Attribution Non-Commercial  
CC Attribution Non-Commercial Share Alike  
CC Attribution Non-Commercial No Derivatives  
All Rights reserved  
Other

Event (Node reference) (Multiple)

*For creative works, this field is used to indicate events where the work has been presented or exhibited.*

## Description

Tags (Unstructured Taxonomy) (Autocomplete)

*Tags are an unstructured taxonomy. The idea is that each contributor provide a list of keywords they may arrive at independently to quickly provide an impression of the content and form of the work. Terms that are already the tag list will autocomplete, or new terms can be provided.*

Description (in English) (Text)

*An abstract-length description of the work in English.*

Description (in original language) (Text)

*An abstract-length description of the work in the original language, if the original language is not English.*

Language of description (Structured Taxonomy)

Contributors note (Text)

*A field to describe the roles that different contributors have played in creating a work.*

Other language version (Node reference)

*Node reference to cross-reference a version of the work translated in another language.*

Other edition (Node reference)

*Node reference to cross-reference another edition or version of the work in the same language.*

Part of another work (Node reference)

*Node reference to indicate that a work is part of a larger work, such as one-third of trilogy.*

Pull Quotes (Text) (Multiple)

*Text field to provide brief written excerpts from a work.*

Technical notes (Text)

*Text field to provide technical notes about a work.*

Appears in (Node reference)

*Node reference to indicate a work is published in a collection or anthology.*

## Documentation

Screen shots (Multiple)

*To attach screenshots and other images of the work that will appear on the record page.*

Multimedia (Multiple)

*For Vimeo and YouTube videos, flickr sets, and other multimedia assets.*

Attachment

*For documentation PDFs, source code in a .zip file, or other attachments.*

Electronic Literature Directory entry (Link)

*Direct link to specific record for the same work in affiliated database.*

I ♥ E-Poetry Entry

*Direct link to specific record in affiliated database.*

NT2 entry

*Direct link to specific record in affiliated database.*

## Editorial Status

Record Status (Structured Taxonomy)

KB Editor Notes (Text)

## **Views attached to Work records:**

Critical writing that references this work

Teaching resource that references this work

Research collection that references this work

## **Critical Writing**

## Core Information

Title (Text) (Required field)

Author (Node reference to Person) (Multiple)

Editor (Node reference to Person) (Multiple)

Translator (Node reference to Person) (Multiple)

Year (Number)

Critical Writing Publication Type (Structured Taxonomy) (Multiple) (Required field)

Publication Type options:

- Anthology of creative work
- Article in a newspaper
- Article in a print journal
- Article in an online journal
- Article on the author's website
- Article or chapter in a book
- Book (collection)
- Book (dissertation)
- Book (monograph)
- Conference paper or presentation
- Conference panel or roundtable
- Exhibition Catalog
- Event review or trip report
- Forum
- Interview
- Invited lecture
- Issue of a journal
- Keynote address
- Notes and Drafts
- Report or White Paper
- Review
- Series
- Video essay / documentary
- Weblog
- Other

Presented at Event (Node reference to Event) (Multiple)

*Node reference used to indicate that critical writing was presented at a given event.*

Publisher (Node reference to Publisher) (Multiple)

University (Node reference to Organization)

*This field is intended only for academic theses and dissertations to indicate the University the author is associated with.*

URL (Link) (Multiple)

Archive URL (Link) (Multiple)

Language (Structured taxonomy) (Multiple)

License (Structured taxonomy) (Multiple)

#### Book or Journal Information

ISBN (Text field) (Multiple)

WorldCat (Link) (Multiple)

Edition (Text)

*A text field to include edition information about a work published in multiple editions.*

Other edition (Node reference to Critical Writing) (Multiple)

*An autocomplete reference field to cross-reference multiple editions of a work.*

Series (Node reference to Critical Writing)

*This is a node reference field to indicate that an item of critical writing is part of the series cross-referenced.*

Journal volume and issue (Text)

*Text field to include journal issue number information.*

Page Numbers (Text)

*Text field to include page number information.*

Appears in (Node reference to Critical Writing)

*Node reference to indicate that the item is part of another work (e.g. an essay in a collection).*

ISSN (Text)

*ISSN number for serial publications.*

eISSN (Text)

*ISSN number for electronic serial publications.*

#### Description

Tags (Unstructured taxonomy)

Abstract (in English) (Text)

Abstract (in original language) (Text)

Language of abstract (Structured Taxonomy)

Other language version (Node reference to Critical Writing) (Multiple)

Pull Quotes (Text) (Multiple)

## References and Attachments

Creative Works referenced (Node reference to Creative Work) (Multiple)

*We encourage contributors entering items of critical writing to indicate what creative works of electronic literature the critical writing discusses. Cross-references are then automatically displayed on both the record for the critical writing and for the creative work.*

Critical Writing referenced (Node reference to Critical Writing) (Multiple)

*This node reference field is used to indicate a cross-reference when one item of critical writing comments substantively on another.*

Event referenced (Node reference to Event) (Multiple)

*Node reference to indicate when an item of critical writing is about an event.*

Organization referenced (Node reference to Organization) (Multiple)

*Node reference to indicate when an item of critical writing is about an event.*

Publisher referenced (Node reference to Publisher) (Multiple)

*Node reference to indicate when an item of critical writing is about a publisher.*

Database or Archive referenced (Node reference to Database or Archive) (Multiple)

*Node reference to indicate when an item of critical writing is about a database or archive.*

Electronic Literature Directory entry (Link)

Images (Image) (Multiple)

*Image attachment field used for book covers or other images.*

Multimedia (Multiple)

*For Vimeo and YouTube videos of lectures, flickr sets, and other multimedia assets.*

Attachment (Multiple)

*File attachment field used to attach full text PDFs and other attachments.*

## Record Status

Record Status (Structured Taxonomy)

KB editor notes (Text)

## **Views attached to Critical Writing records:**

Other editions of this critical writing

Critical writing contents of a collection

Creative work contents of an anthology

Critical writing in a series

Works referenced by this critical writing

Publishers / journals referenced by this critical writing

Databases and archives referenced by this critical writing

Events referenced by this critical writing

Other critical writing that references this critical writing

Teaching resources that reference this critical writing

Research collections that reference this critical writing

## **Publisher**

### Basic Information

Name of publisher (Title)

Location (Location)

URL (Link) (Multiple)

Editors (Node reference to Person) (Multiple)

*The Publisher content type is used both for print publishers and for journals. While the names of individual editors are not typically included for publishers, journals often feature the editors in their colophon.*

Email (Text)

*Contact email for the publisher.*

ISSN (Text)

e-ISSN (Text)

Events (Node reference to Event) (Multiple)

*Node reference field to indicate events where this publisher or journal was showcased or exhibited.*

Short description (Text)

*Description of the publisher, typically sourced from the publisher's website.*

## Record status

Record Status (Structured taxonomy)

KB editor notes (Text)

## **Views attached to Publisher records:**

Critical writing published by this publisher

Creative works published by this publisher

Critical writing about this publisher

Series by this publisher

Research collections that reference this publisher

## **Organization**

### Organization Information

Name of Organization (Title) (Required field)

Location (Location)

Email (Text)

URL (Link) (Multiple)

### Description

Short description (Text)

Images (Image) (Multiple)

*Used to display images related to organization (e.g. logo, screenshot of website, etc.)*

Attachments (Multiple)

*Used to attach PDFs or other files related to the organization.*

## Editorial Status

Record Status (Structured taxonomy)

KB editor notes (Text)

## **Views attached to Organization records:**

Events organized by this organization

Critical writing published by this organization

Creative work published by this organization

Teaching resources developed by this organization

People affiliated with this organization

Research collections that reference this organization

## **Event**

### Event Information

Name of event (Title)

Event type (Structured taxonomy)

Event type options:

Awards

Conference

Event Series

Exhibition

Festival

Performance

Reading

Seminar

Workshop

Date (Date)

*Start date, end date optional.*

Organization (Node reference to Organization) (Multiple)

*Node reference to indicate what organization or organizations are responsible for organizing the event.*

Individual Organizers (Node reference to Person) (Multiple)

*Node reference to credit individuals responsible for organizing the event.*



Curator (Node reference to Person) (Multiple)

*Node reference for the specific case of an exhibition, used to credit curators.*

Email (Text)

Location (Location) (Multiple)

URL (Link) (Multiple)

Archive URL (Link) (Multiple)

Associated with another event (Node reference to Event)

*Node reference to associate one event with another event (e.g. an exhibition or reading connected to a conference).*

Event series (Node reference to Event)

*Event series is one of the event types. This field is used to associate an event with its series (e.g. the Electronic Literature Organization conferences).*

## Description

Tags (Unstructured taxonomy) (Multiple)

Short description (Text)

*Descriptions of events are typically sourced from the event website.*

## Event Documentation

Attachment (Multiple)

*Attachment field typically used for PDFs of documents associated with an event, such as a printed conference program or poster.*

Images (Image) (Multiple)

Multimedia (Multiple)

## Editorial Status

Record Status (Structured taxonomy)

KB editor notes (Text)

## Views attached to Event records:

List of events in an event series  
Works presented at event  
Critical writing presented at event  
Critical writing about this event

## Teaching Resource

### Basic Information

Title of Resource (Title)

Type (Structured taxonomy)

Teaching Resource types:

Syllabus

Exercise

Bibliography

Video tutorial or lesson

Other Teaching Resource

Author (Node reference to Person) (Multiple)

Organization (Node reference to Organization)

*This node reference field is generally used for the university or department within a university that the teaching resource was produced for.*

Year (Date)

*The year in which the teaching resource was first produced. For syllabi we ask that information about the specific term in which the course was taught is included in the title and/or description.*

Language (Structured taxonomy)

URL (Link) (Multiple)

### Description

Tags (Unstructured taxonomy)

Abstract (in English) (Text)

Abstract (in original language) (Text)

Language of abstract (Structured taxonomy)

## References and Attachments

*Node references in the Teaching Resource type allow for direct links to the Knowledge Base record for creative works, critical writing, and other items that might be taught. This enables the Knowledge Base record for instance to be quickly developed as a very useful resource, with most of the reading for a course made instantly available from the moment the teaching resource record is created.*

Creative Works Referenced (Node reference to Work) (Multiple)

Critical Writing Referenced (Node reference to Critical Writing) (Multiple)

Teaching Resource Referenced (Node reference to Teaching Resource) (Multiple)

Database or Archive Referenced (Node reference to Database or Archive) (Multiple)

Image (Image) (Multiple)

Multimedia (Multiple)

*In this content type this field is most often used to attach video lectures or other multimedia resources.*

Attachment (Multiple)

*In this content type the attachment field is most often used for PDFs of syllabi and other resources.*

## Record status

Record Status (Structured taxonomy)

KB editor notes (Text)

## **Views attached to Teaching Resource records:**

Works referenced in this teaching resource

Critical writing referenced in this teaching resource

Teaching resources referenced in this teaching resource

Databases and archives referenced in this teaching resource

Research collections that include this teaching resource

## **Databases and Archives**

### Core Information

Title (Title)

Project Type (Structured Taxonomy)

URL (Link) (Multiple)

Organization (Node reference to Organization) (Multiple)

*A node reference field to allow for links to the organization or organizations responsible for creating, developing, and maintaining the database or archive.*

Key People (Node reference to Person) (Multiple)

*A node reference field to credit individuals key to the development and maintenance of the resource.*

Contributors' notes (Text)

*A text field to describe the different roles that key people play in the operation of the database or archive.*

Contact e-mail (Email)

Year Initiated (Date) (Select list)

Language (Structured Taxonomy) (Multiple)

License (Structured Taxonomy)

## Description

Tags (Unstructured Taxonomy)

Description (English) (Text)

Description (Original Language) (Text)

Technical Notes (Text)

*Notes about the particular platform of a database or access restrictions can be entered in this field.*

## References and Attachments

Events (Node reference to Event) (Multiple)

*Node references to events where the database or archive has been presented.*

Image (Screenshot) (Image)

*Used to provide screenshots of databases, etc.*

PDF Attachment

*Used for PDF resources, such as a user's manual for a database.*

Multimedia

*Most often used for screencasts or other instructional videos about a database.*

Editorial Status

Record Status (Structured Taxonomy)

KB Editor Notes (Text)

**Views attached to Database and Archive records:**

Critical writing about this database or archive

Teaching resources that reference this database or archive

Research collections that reference this database or archive

**Platform / Software**

*This is a new content type that is being added to the ELMCIP Knowledge Base in 2013. Because works of electronic literature are most often authored using specific platforms and software, it is important to account for this in a technical description of the work. While this was initially addressed using the technical notes field and unstructured tags in the Work content type, the Knowledge Base team decided that a more structured approach is necessary. Making Platform / Software a primary content type will also allow for new ways of entering and searching the database. For instance, educators teaching people how to write and design using a particular system will be able to access a list of works created using that system from the individual Platform/Software record in the Knowledge Base.*

Basic information

Developers (Node reference to Person) (Multiple)

*This field will be used to credit individuals who have played particularly important roles in developing a particular platform.*

Publisher or organization (Node reference to Publisher or Organization) (Multiple)

*Field to reference publishers / organizations responsible for developing and maintaining the software.*

Year initiated (Date)

URL (Link) (Multiple)

*Web addresses where the software or platform can be downloaded or purchased, and to tutorials, etc.*

## Description

Description (Text)

*A short description in English and/or another language of the platform or software.*

Version history (Text)

*Most commercial and open source software is successive, released in a number of different versions, and each version has important material effects on projects produced using the software. Rather than creating individual records for each version of the software, which we think would be untenable, this field will be used to provide a version history of the platform.*

License (Structured Taxonomy)

## References and Attachments

Image (Image) (Multiple)

Attachment (Multiple)

*The attachment field will be used for PDF documentation, and possibly .zip files of other documentation of the platform.*

Multimedia (Multiple)

*This field will mainly be used for screencasts and tutorials.*

## Views attached to Software/Platforms records:

Works developed in this software/platform

## 7. Applications of the Knowledge Base

As the Knowledge Base has developed and been adapted since its initial release in August 2010, we have realized that it can serve broader applications than those originally conceived and that the project can have significant unanticipated research impacts both within the field of electronic literature and within other knowledge domains. The applications of the Knowledge Base include:

**Basic research functionality:** The core functions of the Knowledge Base are to make locating works and critical writing in the field of electronic literature easier, to show how the different objects and actors in the field interoperate, and to represent the critical ecology of a knowledge domain.

**Bibliographic/Information Science functions:** The Knowledge Base provides one model of a method to comprehensively document digital literary artifacts. In the field of electronic literature, this is particularly important given that libraries have struggled with ways to catalogue and collect works that are both works of literature and computer programs. Work on developing RDF and other metadata in the Knowledge Base should lead to better integration with LIS systems and use of electronic literature in libraries. The CELL initiative, described below, is an international attempt to standardize documentation fields for works of electronic literature that could have broad applicability.

**Archival functions:** Although it was not initially conceived as an archive, to some extent the Knowledge Base provides a repository of resources and assets, such as documentation/paratexts of works that may no longer be accessible, PDFs and full text attachments of papers, conference programs, etc., images and photographs of works, events, people, and source code attachments of work. One important example of archival work being done in the Knowledge Base is the work that has been done to extensively document important events in the field, such as the ELMCIP and ELO Conferences and exhibitions, thus making them accessible and useful years after they take place. This helps keep the discourse of the field in circulation and allows us to observe its evolution within a temporal frame.

**Digital Humanities platform research:** One function of the agile development method used to produce and continually modify the Knowledge Base is that the development of the system itself can be understood as ongoing experimental research in the digital humanities. Even some of the functionalities of the Knowledge Base that seem completely elementary, such as the idea that the critical writing references to a work should be cross-referenced and made visible on the record of the work itself, have been rarely implemented in other digital humanities database projects. While the Knowledge Base is rooted in the knowledge domain of electronic literature, it can serve as a platform model for other research fields and subspecialties, particularly those that are newly emerging or that fall between existing classification systems. As the project has proceeded, we have also realized the importance and value of considering the project as being in conversation with other research disciplines in the digital humanities more broadly conceived.

**Pedagogical applications:** The Knowledge Base has been developed by the Electronic Literature Research Group in the Digital Culture program at the University of Bergen, a research and teaching environment where different aspects of electronic literature are taught in several of our undergraduate and graduate courses, including DIKULT 103: Digital Genres, DIKULT 203: Electronic Literature, and DIKULT 303: Seminar in Digital Media Aesthetics. Because we have been teaching electronic literature even as we have developed the Knowledge Base, its pedagogical applications have become readily apparent to us. About a year into the development process, we added the teaching resource content type. This can be used both to document courses, assignments, syllabi and other resources, and as a platform to simplify the production of new courses and syllabi. We have also added several other features specifically aimed at enhancing pedagogical uses of the Knowledge Base including:

- a **Class** feature which allows for creation of groups by teachers whose classes are using the

Knowledge Base, giving teachers and other students in the class access to an overview of all records created by anyone in the class

- a **Notebook** feature that allows for researchers to create pages linking together different types of records in the Knowledge Base (e.g. creative works and critical writing) and to add their own notes in a page that is not publicly accessible to other users. This could be very useful for instance for students doing a research paper on a particular topic
- the **Research Collection** content type that allows for researchers to create publicly available collections different types of resources within the Knowledge Base focused on a specific research theme (for example Russian electronic literature or e-lit for the iPad).

In addition to implementing these content types and features, we have made active use of the Knowledge Base with several of our courses for the past two years. Students in our courses may for instance have an assignment to develop records about the work of a particular author, or to create a Research Collection that addresses the particular topic of their research paper. In 2012, we also introduced a new course, DIKULT 207: Practical Projects in the Digital Humanities. We have taught this course twice as a small hands-on workshop-style practical course. Students learn about the digital humanities and debates surrounding it in reading and writing assignments, but the bulk of their work consists of individual projects that develop aspects of the database ranging from specific areas of content development, editorial practice, interface design, taxonomy, or other *under the hood* aspects of the platform. Students involved in the course have reported their satisfaction that their work is not only appreciated in the course, but by other users of the Knowledge Base as well.

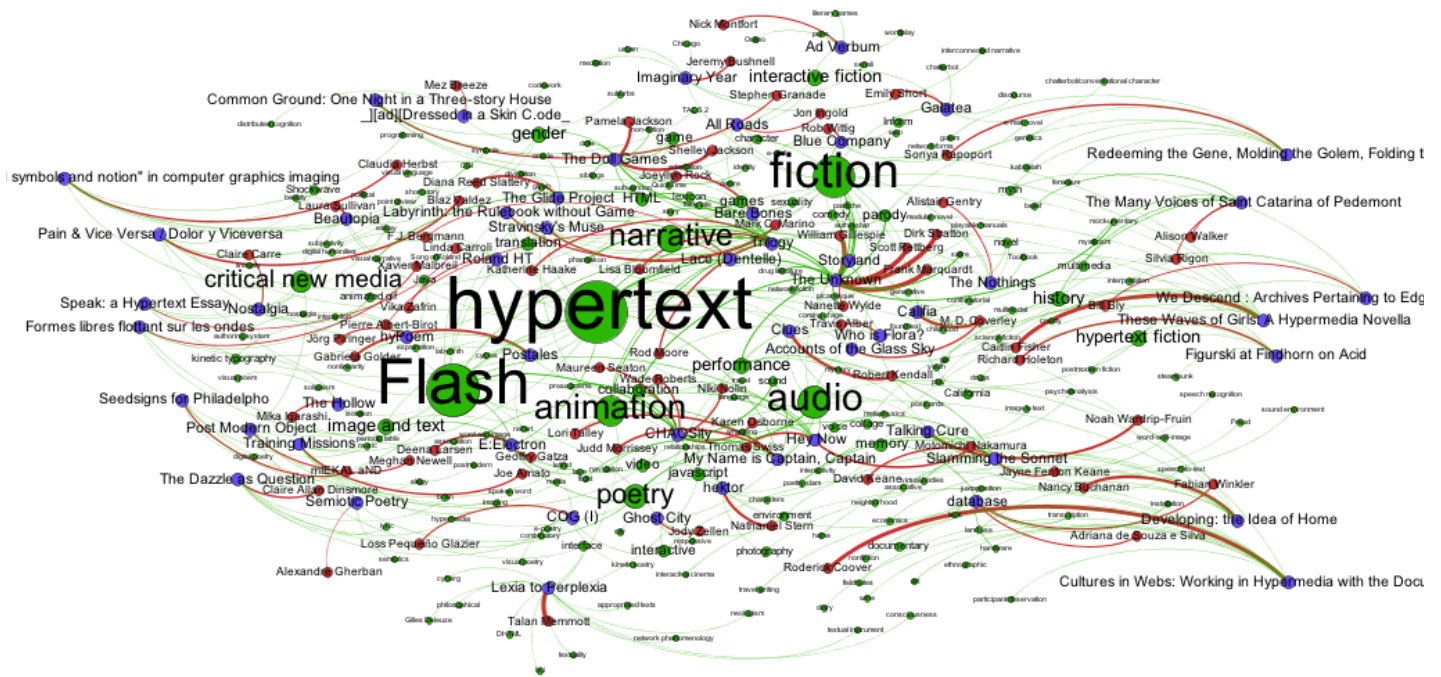
**Internationalization and opening discourses between communities:** Compared to other databases in the field, the ELMCIP has a broadly international focus. While the project is based in Europe, the coverage of the database includes work produced in the Americas, Europe, Australia, Russia, and to a limited extent Asia. The Research Collection content type has been developed in part to serve the need to develop collections of resources within the Knowledge Base that focus on a particular country or language. An aspect of our development strategy is an initiative to recruit curators to develop resources in particular underdeveloped areas of knowledge about electronic literature. Through the University of Bergen's SPIRE guest researcher program, we have been able to fund three-month visits of postdoc researchers to work with the development of specialized research collections. To date, two of these collections are in development: a Brazilian electronic literature research collections curated by Luciana Gattass and a Russian collection curated by Natalia Fedorova. Collections of Spanish and French language electronic literature are also planned. In general, we see building connections between diverse international communities at work in the field as an important aspect of the work of the Knowledge Base.

**The “Extrinsic Database”:** As previously mentioned in the discussion of RDF, it is important to realize that by making the information in the Knowledge Base machine-readable and accessible to other systems, we enable that information to circulate and reach audiences who are not necessarily interfacing directly with the database itself, but who either arrive at it via other systems—the vast majority of the visitors to the site arrive there not via the ELMCIP front page but as the result of a Google search for a particular author or work—or who encounter information from the Knowledge Base that has been harvested and interpreted by other systems. For instance, all articles of critical



writing posted in the Knowledge Base with PDF attachments are now indexed by Google scholar. As we have developed the project, an important aspect of our work has been considering how the information we publish can circulate and be made useful in systems outside of the platform itself. This is also an important consideration for the sustainability of the knowledge developed by the project. Most digital humanities projects have a limited lifespan, so it is very important to consider how the work put into a DH project and the information developed within it can be made portable and accessible to other systems in the future. This involves both technical and ideological concerns. We strive to make our data as open as possible, in part because we think this is the best way to insure its long-term survival.

**“Distant reading” and visualization-based analytic research:** An additional application of the Knowledge Base is that as it has been used to aggregate a great deal of information about various objects and actors in the field of electronic literature, it becomes increasingly useful as a resource for doing other types of research based on digital methods. In the University of Bergen Electronic Literature Group, we have begun to do *big data*-style research based on comprehensive reading of changes in trends, themes, technologies and platforms, genres, etc. over time. Using the Drupal Views Bulk Operations module, we are exporting specified sets of information from the Knowledge Base and then pulling them into visualization tool-sets including Gephi, Wordle, Google Fusion Tables, and Many Eyes in order to spot and visualize trends. While this type of research, which Stanford-based scholar Franco Moretti describes as “distant reading,” will never be a replacement for close humanistic analysis of literary works, we believe it will be very useful to develop some perspective and context for a field which has developed and evolved as quickly as electronic literature has in the past several decades.





we continue to develop new features, the core elements of the *knowledge model* we have developed for documenting the field are in place, the platform is stable, more than 7,000 records have been developed, and new records are added daily. Our primary challenges going forward with the project are related to the maintenance and sustainability of the platform, the writing and editing of new and existing content, the continued development of new research outcomes from it, and the integration and sharing of content, methods, and standards with other related projects and databases. A challenge underlying this, and one familiar to anyone who has developed a digital humanities project of similar scale, is that it is a great deal more difficult to find funding to bring a well-developed project to its next stage than it is to fund a new project. The University of Bergen has committed to supporting the project at a minimal level for at least the next five years, but to continue the development of the Knowledge Base at the same level of activity we have for the past three years will be difficult without a further infusion of external funding to support paid editorial and development staff.

Our plans for the future development of the ELMCIP Knowledge Base include:

**Working with the CELL (Consortium for Electronic Literature) Network to develop documentation standards for electronic literature and to share data** and best practices across related electronic literature projects: The Consortium for Electronic Literature is network initiated by the Electronic Literature Organization, including a number of projects focused on documenting various aspects of electronic literature. In addition to ELMCIP, the network includes ELO, NT2, the Po.Ex Archive of Portuguese Experimental Literature, the Brown University Digital Literature Archive, the Australian Creative Nation electronic literature project, and others. This network is already working to produce a basic documentation standard for electronic literature, to create a name authority for the domain, and to implement cross-platform search that will allow users of any of the participating databases to search all of the databases simultaneously.

**Working to make the Knowledge Base sustainable over the long term:** We have secured some support to maintain the Knowledge Base from the University of Bergen and from Norstore, a Norwegian research infrastructure entity, to assure that the technical infrastructure of the Knowledge Base will be supported after the conclusion of the ELMCIP project. We also plan to work with CLARINO (Common Language Resources and Technology Infrastructure Norway) to integrate the Knowledge Base with/in Norwegian and European research infrastructure and to make our metadata portable and accessible to other researchers. The integration and use of the Knowledge Base within the curriculum at UiB is also important for the sustainability of the project.

**Continuing to develop new research and development partnerships:** We plan to work with research groups at other institutions and other partners who have an interest in specific projects in which the Knowledge Base can be a resource to develop mutually beneficial projects. For instance, the Knowledge Base can be used to set up collections of resources with a specific subdomain of the field—for instance on Spanish-language electronic literature or locative literature. Rather than rebuilding a platform from scratch, these partners can use our infrastructure even as they develop their own research collections, while simultaneously improving the records in the Knowledge Base.

We also plan to work with partner research groups to exchange researchers, resources, and knowledge.

**Developing a scalable model** that can survive on very little resources or thrive with better funding: Although the University of Bergen Electronic Literature Research group and the other ELMCIP partners will continue to apply for national and European grants to develop the Knowledge Base in a robust way, we are also planning for less-than-ideal scenarios. There are some basic technical needs for the maintenance of the platform that need to be met for the project to continue at all, and we have confidence that those can be managed locally. The growth, development, and refinement of the content, however, with or without funding, will depend on the increased participation of an engaged user community. The Knowledge Base has been conceptualized and developed as a collective knowledge system, so it depends on a participatory community to add, edit, and improve records.

**Knowing that any platform has a lifespan, it is important to assure that the knowledge developed within that platform can be ported and endure:** We are taking steps to assure that the data collected in the Knowledge Base will be archived in portable formats, so that if the project should at some point cease operations, it can be ported to other platforms and harvested by other open research platforms. There is no danger in the near term that the ELMCIP Knowledge Base will go away—on the contrary, signs are very positive for its continued successful development. But we want to make sure that all of our metadata is easily ported in formats that can work in other platforms. This is why the work of mapping fields to RDF frameworks and other under-the-hood work with metadata are so vital to the project.

**Finding a long-term home for the Knowledge Base in a major research library or archive:** In a research project such as ELMCIP, there is a tendency to think in terms of outputs and deliverables or in terms of a time-span that correlates to the span of a funded project. But in a project such as this, which is capturing and making accessible core aspects of a scholarly field, we need to be able to think and operate in longer time horizons. The ELMCIP Knowledge Base is very much still in an active research and development stage, and should be central to at least one more well-funded research project to reach its full potentiality as a platform for documentation, archiving, and research. Beyond that next stage, however, it should eventually be *owned* and maintained by an institutional entity that specializes in long-term archiving and preservation, one that can commit not to time horizons of three to five years, but decades, or even centuries. Eventually it will be our goal to place the project in the hands of a well-resourced research library or archive, so that the present period of experimentation in digital literary forms we have strived to document can be preserved for posterity.

## References

Nelson, Ted. Literary Machine 93.1: The Report On, and Of, Project Xanadu Concerning Word Processing, Electronic Publishing, Hypertext, Thinkertoys, Tomorrow's Intellectual Revolution, and Certain Other Topics Including Knowledge, Education and Freedom. Sausalito, Calif.: Mindful Press,

1981.

### **Electronic Literature Databases and Archives**

The Electronic Literature Directory. <http://directory.eliterature.org>

The ELMCIP Electronic Literature Knowledge Base. <http://elmcip.net/knowledgebase>

NT2 Répertoire des Arts et Littératures Hypermédiatheque.

<http://nt2.uqam.ca/observatoire/repertoire>

The Deena Larsen Collection at Maryland Institute for Technology in the Humanities.

<http://mith.umd.edu/larsen/>

Po.EX: Arquivo Digital da Literatura Experimental Portuguesa. <http://po-ex.net/>