

Vertically Integrated Research Alliances: A Chrysalis for Digital Scholarship

A White Paper for Community Discussion

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CONTENTS

Executive Summary 1

Introduction 3

Defining the Problem and the Opportunity 3

 Instabilities of Scholarly Communication 3

 New Prospects..... 4

Vertically Integrated Research Alliances 5

 Key Elements of the VIRA..... 5

 VIRA Antecedents 6

 Observations about Stakeholder Groups 9

 The Chrysalis: Adaptation through Transformation..... 11

Prospective Research Alliance Case Studies..... 13

 Case Study: Texana Research Alliance 13

 Case Study: Southern Studies Research Alliance 15

 Case Study: Coerced Migration Research Alliance 16

Conclusions 17

Bibliography 20

EXECUTIVE SUMMARY

This white paper summarizes project findings about “Vertically Integrated Research Alliances” (or VIRAs for short), a prospective model for collaboration between scholars, libraries, and publishers to more sustainably produce and maintain works of digital scholarship. This white paper was produced in the course of a one year planning grant funded by the Andrew W. Mellon Foundation. The following are key summary points from the white paper.

1. The combination of longstanding instabilities in the current system of scholarly communication and the promise of new digital forms of collaborative scholarship have brought us to a critical transformative moment. Like the chrysalis transformation of organisms with a pupal life stage, reforming scholarship in particular subject domains into research alliances of scholars, libraries, and publishers could create more sustainable organizational forms.
2. Feedback from a broad range of stakeholders demonstrates that the idea of developing a closer collaborative model which includes subject-focused cross-sections of scholars, libraries, and publishers was compelling and shows promise, but implementing the model would entail working out many specific details in practice.
3. There are a wide range of antecedents to the VIRA (many of which have a long history) that we can learn from and build on. Examples of such antecedents include learned societies, research centers, and other collaborative research organizations. By building on these existing models, VIRAs may be easier to understand and better able to learn from best practices identified in operating these antecedent organizations.
4. If any particular prospective VIRA is to succeed, scholars must be committed conceptually to the subject domain under consideration, and practically to the effort required to mobilize and contribute to the ongoing operation of the alliance. The biggest risk factor involved in creating VIRAs may be that scholars are too divergent in motivations, level of commitment, and ability to collaborate effectively in this way with other stakeholders.
5. Libraries support scholarly outputs in various ways, as preservation repositories, funders (through both subscriptions, one-time purchases, and other mechanisms), and points of access and aggregation. The fact that library budgets are already overburdened with super-inflationary costs of traditional scholarly outputs (notably from for-profit publishers) means that libraries will have difficulty freeing up funds for experiments with new organizational collaborative models such as VIRAs. Libraries will have to find the wherewithal to transition from funding unsustainable forms of legacy scholarship to sustainable news forms of innovative scholarship.
6. As a stakeholder group, university presses understand both the market for scholarly outputs and the process of marketing publications better than either libraries or scholars. However, presses may be reactively focused on profitability of new titles to the detriment of experiments with new collaborative models.

7. To be viable, a VIRA must have a sufficiently critical mass of content, motivated scholars, and committed institutions. An “alliance” is inherently a community, and cannot be limited to a handful of individuals or a single institution. Without sufficient scale, VIRAs will not be healthy or even viable organizations.
8. We should not be disappointed in the pace of change in scholarly transformation efforts. Experimentation, change, and evolution of organizations happens within an extremely large system of institutions, established practice, and perceptions, all of which have a significant amount of inertia. The fact that experiments with VIRAs and other collaborative forms may take time to solidify and take hold should not dissuade the field from seeking to implement more sustainable forms of scholarship.
9. It may be better to develop a strong shared sense of community first and then use that sense of community to seek out revenue streams rather than the other way around. Counter-intuitively, even if it starts small and grows slowly, a shared and solid commitment of multiple stakeholders to a subject domain of scholarship may be a stronger foundation to build upon than a large up front infusion of funds committed to a proposition that is ultimately unclear.
10. The revenue streams that sustain a VIRA need not solely or primarily resemble those that have sustained traditional forms of scholarship. Rather than purchases and subscriptions, VIRAs might be sustained through combinations of other approaches associated with social entrepreneurship such as crowdfunding, memberships (both individual and institutional), fund-raisers, and donations.
11. Actual case studies surface the issues in implementing VIRAs. One or more of the three exploratory case studies undertaken in this planning project, or some other set of case studies should be carried forward to assess the VIRA model.

INTRODUCTION

This is a time of transitions for the extended system of scholarly communication. Efforts are underway to create, disseminate, and sustain unprecedented new forms of scholarly inquiry which utilize the innovative capabilities of digital technologies. This white paper and the associated planning project that led to it is an attempt to better understand this time of transformation and the path forward. The planning project used a focal metaphor for this transitional period: a caterpillar entering a chrysalis to reform itself for a different kind of life as a butterfly. Hence the name: the Chrysalis planning project.

The titular chrysalis of this white paper takes shape as a particular kind of quest: stakeholders engaged in scholarly communication today are now struggling to find new ways of undertaking their purposes in the digital age. The particular new organizational form studied in this project is something termed the “Vertically Integrated Research Alliance.” This white paper will set forth tentative claims regarding this organizational form, and how it might potentially be a better fit for sustaining new forms of digital scholarship. We do not claim that this is the sole new form of “butterfly” which will emerge from this transitional period, only that this form deserves some attention and experimentation. This white paper has been informed by a broad range of interviews with representatives from many different stakeholder groups that together comprise the system of scholarly communication, but rather than a final statement it should be considered a starting point for further discussions and experiments.

DEFINING THE PROBLEM AND THE OPPORTUNITY

There have been so many problems identified in the current landscape of scholarly communication that it can be difficult to articulate particular problems with enough specificity for useful discussion, or even reach an agreement on the current state of the field. Yet, most stakeholders involved in the scholarly publishing cycle can at least agree that the established order of academic publishing has for some time been shaken. [ARL, 1997] Although traditional models of scholarly communication continue to proliferate (e.g., print monographs, text-based journals, and pre-production peer review) the best summary statement that the authors of this white paper have encountered of the problematic aspects of the current situation is that the apparatus of production for academic publications has been in a “living dead” state for decades. [Fitzpatrick, 2011] What Kathleen Fitzpatrick means by this analogy is that the stakeholders who create scholarly publications today superficially go through the same motions and patterns they always have, but like zombies in film and other media they are not healthy or even fully vital in the same way they once were.

Instabilities of Scholarly Communication

The business models that enabled a variety of players to work together to support the production and dissemination of scholarship in the previous century are either failing or rapidly transitioning, as witnessed by the shrinking numbers and reduced output of university presses and the steady stream of mergers and buy-outs in the commercial marketplace. [Munroe, 2013] Whatever one thinks of the health of the traditional scholarly communication field, most stakeholders will likely agree that both large and small players within it are interested in actively seeking out new ways to advance the scholarly conversation, often through the use of digital technologies.

But if the traditional print or print-oriented field is now in a destabilized state, it must be admitted that the still emerging field of digital scholarship has never been stable. Although digital scholarship has existed for several decades, it remains largely a “fringe” activity, undertaken only

when grant funds and institutional subsidies permit. Digital publishing business models have not yet matured, and promotion and tenure practices are only just beginning to systematically reward digital publishing efforts. Promotion and tenure practices still do not routinely acknowledge the credibility of digital forms of scholarship for scholarly career progression. In the digital publishing landscape, there is a mix of old and new voices, including scholars, university presses, libraries, societies, and research centers. These stakeholder communities are experimenting with new roles and new relationships to meet the challenges of creating and disseminating digital scholarship in affordable and sustainable ways. The hope is that these stakeholders will provide a foundation for the next generation of scholarship—presuming that a next generation of scholarship exists at all, and that it is not a simple continuation of traditional print scholarship.

New Prospects

But which of the many pressing problem(s) in digital scholarship should be addressed first to enable new efforts to flourish? In the context of this project, we found it useful to start with an examination of the tensions between libraries and publishers. Relations between libraries and publishers have been challenged in recent years by a range of issues, including the cost of books and journals, the Open Access movement, and a host of copyright and fair use issues and claims. Libraries have a long history of objecting to publishers' actions, certainly pricing but also increasingly on new issues such as the conservative stance of publishers on fair use and their lack of willingness to experiment with digital dissemination strategies including various open access models. Publishers, especially commercial publishers, object to such critiques, maintaining that they are open to new models but as for-profit enterprises are obligated to maintain their profit margins. University presses convey concerns about libraries, both as purchasers (e.g., libraries' decisions to cut their monograph budgets directly impacted UP bottom lines) and increasingly as competitors (e.g., experimental "library publishing" activities, including open access publishing).

A growing number of university presses now report to their university libraries (e.g., Penn State, MIT, Purdue University, Northwestern, Stanford, Syracuse, University of North Texas, Oregon State, University of Arizona, University of Georgia, University of Utah), representing some tenor of change. However, traditional infrastructures and the isomorphic practices they represent are highly resistant to transformation, even when such change is encouraged through structural reorganization. These academic partnerships and mergers between university presses and libraries often are complex and fraught, and communication problems often hinder collaborative efforts. As noted by Kathryn Conrad, director of the University of Arizona Press, "You can't collaborate if you don't understand what each other does." [Howard, 2013]

There are signs that the time is right to foster a deeper set of conversations and collaborations between these two groups and the scholars they exist to serve. Many are now calling for a "repair" of the relationship between the university press and the library, including perhaps most importantly the 2014 AAUP President Philip Cercone. [Howard, 2013] Others have reminded both libraries and university presses to engage the voices of scholars, not just as authors, but also as partners in the publishing lifecycle. And some are demonstrating that multi-stakeholder alliances are further benefitted by cross-institutional participation. The challenge, particularly in the latter case, is identifying areas where these cross-institutional players can commit in ongoing ways to form a stable business model, rather than single (usually expensive both to create and maintain) projects.

There are many smaller examples of these cross-sector, cross-institutional partnerships that successfully collaborate on individual publication efforts. These include publication groupings that

deliberately pair print monograph publications with digital corollaries to demonstrate the different types of inquiry and production that are enabled by these two distinctive media forms (e.g., Southern Spaces' collaboration with University of Texas Press and Lynn Weber: "No Place to Be Displaced" or the Scalar-supported companion to "The Nicest Kids in Town" by Matthew F. Delmont and University of California Press). To date, these initiatives have relied less on a formal business model and more on informal relationships and subsidization by key players. They are a start, but they have not yet demonstrated their ongoing viability, including establishing stable revenue streams and formalized business models.

These examples are exceptions that mark the importance—and relative scarcity to date—of sustained alliances between university presses, scholars, and librarians. These three stakeholder groups have much to gain through collaboration: If the academy could invest in sustained cooperative alliances between these players, enabling each to bring its core strengths to the table, it could potentially reduce the cost of producing and disseminating scholarship by more efficiently aligning transactions. To accomplish this end, the scholarly communications field would need to both develop and broadly understand the advantages of sustainable alliances involving each of these three stakeholder communities. With better-defined incentives, use cases, relationships, and business infrastructures, such publication alliances might begin to transform the scholarly communications environment, moving the activities that currently thrive on the fringes closer to the center of the academic process.

If these three stakeholder groups were to become better aligned, what form might such alliances take? This was the central question that the Chrysalis planning project set out to examine.

VERTICALLY INTEGRATED RESEARCH ALLIANCES

In current publishing arrangements, researchers, libraries, scholarly publishers, and other stakeholders exist in relatively separate silos. In business theory terms, each of these stakeholder groups are for the most part "horizontally integrated"; in other words, they are each organized and managed around only one type of process in the scholarly communication "stack" or cycle of production. Researchers write the content, presses publish the content, libraries purchase and maintain it, etc. There has been some research that suggests that "vertically integrating" or aligning and organizing programs of creators, publishers, and distributors around particular thematic product areas, may be a more efficient business strategy than horizontally integrated approaches. [MacInnes, 2013]

Key Elements of the VIRA

The question of exactly which features comprise the VIRA model was a recurring issue examined in this planning project. There are many conceptual ways that researchers, libraries, and publishers could be brought into closer working alignment. For the purposes of this planning project, we broadly defined a vertically integrated research alliance (VIRA) as a collaborative effort entailing a commitment to shared goals and resources by a group of scholars, university libraries, and scholarly presses to achieve a more sustainable mode of production. We also had a focus on digital forms of scholarship (especially in the humanities), although we did not specify exactly what would be included or excluded from that focus beyond a general notion that it would be data-intensive. There are several additional speculative assertions embedded in this model that we sought to evaluate through discussion with others, the main ones being that a VIRA strategy would better leverage resources for aligned purposes and that this approach would more sustainably mobilize

actors concerned with the scholarly communication cycle for a unified purpose. A final assumption is that the VIRA strategy could achieve greater sustainability by gathering multiple topically related resources into a publishing space that enables common workflows, citation mechanisms, infrastructure development, fundraising efforts, and revenue aggregation.

Obviously this strategy is not exhaustive of all potential types of chrysalis transitions in scholarship; rather, this is one interesting way of bridging key stakeholder communities to “build a chrysalis” and use it to structure and inform action by the full community of scholarly communication stakeholders participating in the slow migration towards a digital future.

VIRA Antecedents

There are hundreds of organizations that have some aspects of vertical integration between stakeholders in scholarly communication. As a first step in the planning project we studied a variety of organizations and efforts that had similarities with our proposed VIRA model to see what might be gleaned from previous efforts. Such organizations can be examined as conceptual forerunners or antecedents to the VIRA. The following is a selective discussion of several VIRA antecedents (both categorical and specific), the relevant features that we examined in them, and questions raised by these examinations.

We began with observations and recollections about a successful project with which we had personal experience. The project principals had worked with Dr. David Eltis (emeritus, Emory University) and researchers at many other institutions to build the TransAtlantic Slave Trade Database (<http://slavevoyages.org>), a very successful project to organize in a single portal most of the extant records of the history of TransAtlantic slave shipments. The story of creating this database is recounted on the site itself and need not be reproduced here. What we found notable about this example was that it was a very successful collaboration between scholars, librarians, and publishers to create an entirely novel humanities information resource of a wholly digital and data-driven form that did not resemble a traditional humanities monograph, but which had enormous impacts in interdisciplinary scholarship in this focused subject domain. We noted that the project also attracted some interest by prospective donors who were willing to consider joining some hypothetical organization aimed at ongoing support for the site, including paying annual fees. The Voyages site informed our thinking about the VIRA model, although as it stands today it does not represent a fully featured VIRA. We explored the possibility of developing it into a VIRA in one of the case studies described later in this white paper through alignment of scholarship concerning coerced migration. Some of the main questions that this prototypical example raised included: replicability of its inter-stakeholder collaborative relationships, and revenue generation options to sustain its operations.

When we looked for other examples of existing organizations that embodied some variety of closer alliance between the roles and functions of scholars, publishers, and libraries we found several broad categories that seemed relevant to examine. One category of such organizations is learned societies. There are many examples of scholarly societies that incorporate both scholarly functions and publishing functions. Indeed this is a recurrent aspect of many learned societies dating back to the earliest examples from the 17th Century such as the Royal Society of London, and continuing up through contemporary societies such as the Modern Language Association and the American Chemical Society, all of whom combine scholarship and publishing. But learned societies do not typically collaborate directly with libraries or support ongoing innovations in digital scholarship, two key elements of the VIRA model that we set out to evaluate. Nevertheless, learned societies appeared to be the most well-established and widespread of the VIRA antecedents that we considered. The

question is whether or not the basic learned society model could be extended to encompass additional aspects to enable it to function as a VIRA; we will return to this basic question in the latter parts of this white paper.

Digital scholarship centers, digital humanities centers, and other similar inter-disciplinary digitally-oriented centers for scholarly collaboration and innovation are additional categories of VIRA antecedents we examined. The number of such centers has increased in recent years, and this trend is receiving a significant amount of attention. (Lippincott, 2014) Digital centers are the most frequent site of development for the kinds of digital scholarship products that we focused on in the VIRA model, and often offer various kinds consultation services or technical programming functions for interested scholars. While they may include a range of similar services and collaborative activities and may be based in either libraries or academic departments, one fact that we note is that they are virtually always hosted organizationally within a university rather than being free-standing incorporated entities. Learned societies are most often 501(c)3 membership organizations comprised of many individual scholars from many different universities. While many digital centers are comprised of university faculty and staff members who undertake grant-funded projects in collaboration with other universities, they are rarely made up of scholars from multiple universities. Could digital scholarship centers include scholars from many universities? Or could they be comprised of multiple institutional members in consortia arrangements?

The recent spate of digital scholarship centers can also be seen as a component of the older and quite prevalent trend of research centers hosted by universities and funded primarily through external research grants. We considered many such research centers and noted that many of them resembled our concept of the VIRA. A good example is the Inter-University Consortium for Political and Social Research (ICPSR), which maintains thousands of social science datasets. Founded in 1962, the ICPSR is hosted by the University of Michigan and is recognized as one of the most well-established and dynamic repositories of scholarly datasets. The ICPSR has a robust model for sustainability structured on tiered annual dues from its 740 members, various a la carte download fees, and significant support from federal agencies. The ICPSR is built around a well-understood and re-usable data-centric genre of scholarship: social science datasets. While ICPSR does not host experiments in new forms of digital scholarship representation, its focus on aggregating and providing access to scholarly data is notable.

There are many other national centers that focus on some particular type of scientific research, notably including the designated Federally Funded Research and Development Centers (FFRDCs) and the DOD-funded University Affiliated Research Centers (UARC). There are several different types of hosting arrangements in place for FFRDCs. Some FFRDCs are administered by corporations (e.g. MITRE, Leidos) or nonprofit research institutes unaffiliated with universities (e.g. SRI International, The RAND Corporation). Finally, there are a very small number of nonprofit corporations that are consortia comprised of member universities working together to fund a shared research center with shared infrastructure and programs (e.g. the University Corporation for Atmospheric Research, the Association of Universities for Research in Astronomy). FFRDCs and UARCs are typically far larger than digital scholarship centers in terms of funding and staffing, and typically focus on research in the hard sciences rather than the humanities. However, they do often combine scholarly research and publishing efforts, and they also often maintain digital scholarship resources (usually in the form of databases). FFRDCs and UARCs raise several questions. We wondered to what extent the VIRA model was based on humanities disciplinary assumptions. The kind of ongoing large-scale federal research grant programs associated with FFRDCs and UARCs are

typically not associated with the humanities. And there are challenges in sustaining organizations at the scale of FFRDCs and UARCs in a climate of declining federal research funding. Are there more efficient and smaller scale organizational community-based models that could form the basis of VIRAs which do not require large ongoing and pre-existing federal grant resources?

Finally, we examined two other specific organizations that appeared to have useful similarities with the VIRA concept. These organizations did not fit neatly into any of the categories previously identified, and each yielded particular insights.

BioOne is perhaps the best example that we found of an organization that includes most of the characteristics of the VIRA model as we envisioned it. BioOne is a “global, not-for-profit collaboration bringing together scientific societies, publishers, and libraries to provide access to critical, peer-reviewed research in the biological, ecological, and environmental sciences.” (<http://www.bioone.org>) Various characterizing itself as both a publisher and a collaboration between existing publishers and other stakeholders such as libraries and researchers, BioOne has experimented for fifteen years with a range of strategies for efficiently mobilizing collaborating stakeholders to support scholarly publications. [Alexander, 2000] The main divergence noted in BioOne from the VIRA model is the fact that publications supported by BioOne are primarily “traditional” research journals, rather than the nonstandard digital forms of scholarship upon which the Chrysalis planning project was chiefly focused. Nevertheless, BioOne is a successful arrangement for sustaining research publications through collaboration between organizations that are competitors in other contexts, or at least not well aligned in their motivations. The process of creating BioOne was well-planned and constitutes a model for developing consensus and buy-in from stakeholders in a formative process.

There were several issues that surfaced in considering BioOne as an antecedent or model for how a digital scholarship VIRA might work. One issue was scale. How big a subject domain is necessary to create a successful VIRA? How much research content must be assembled before a critical mass of content exists? BioOne encompasses both the BioOne Complete collection with “more than 180 high quality, subscribed and open access titles focused in the biological, ecological, and environmental sciences” and the new Elementa mega-journal which publishes “original research reporting on new knowledge of the Earth’s physical, chemical, and biological systems.” (<http://www.bioone.org/page/about/overview>) This content encompasses an enormous swath of scientific disciplines. The leadership of BioOne emphasizes the importance of attaining scale of useful content in order to motivate institutions to agree to pay relevant financial sums toward the support of a viable organizational effort. It is unclear to us whether or not there is some minimum (or maximum) threshold content scale required to establish a viable organization, but this is a noteworthy factor in considering the VIRA model.

The other organization we studied was the Worldwide Protein Databank (wwPDB). The wwPDB was originally founded as the Protein Data Bank in 1971 as a database of biological molecule structures. The database grew steadily over the years into a massive international database maintained by a consortium of four collaborating organizations in the United States, Europe, and Japan. Like BioOne, the wwPDB is a consortium comprised of subsidiary organizations (which are in turn made up primarily of universities). The wwPDB is a data-centric repository collaboratively maintained by researchers. Both BioOne and the wwPDB are focused on assembling large curated collections of data for research purposes, and to a lesser degree on written content and community tools such as related educational materials. These two domain-centered data repositories function

as scholarly communication hubs by organizing actors around common infrastructure development and content aggregation and are sustained financially by both memberships and sponsored funding.

Our environmental scan showed that there are a large number of VIRA antecedents worth examination. While none of them were an exact match for the VIRA model, there are clearly many existing organizational forms for collaborative alliance that could be extended to better align the three stakeholder groups we focused on: scholars, libraries, and publishers. In studying the ways that these organizations are structured, we noted some over-arching points about these three distinct types of stakeholders.

Observations about Stakeholder Groups

We note that scholars, libraries, and publishers have quite different characteristics and expectations which act as barriers to creating integrated alliances incorporating all three groups. The following are some of the most salient points. Our first broad point concerns the basic economic motivations of these three stakeholder groups.

While scholars must make money to sustain themselves personally, the overriding motivation of most scholars is not personal financial profit. While there are researchers in the private sector, we are concerned in this white paper with the majority of scholars who are employed in universities and other institutions that are part of the public sector, not private corporations. Reputation-based benefit (as manifested in perceived quality of scholarship) generally trumps private financial benefit (manifested as personal financial profitability) in the motivations of scholars. Further distancing scholars from the financial stakes of publishing, recent generations of scholars have not been expected to individually fund the costs of the scholarly communication cycle, and they have been relatively uninformed about such costs or super-inflationary cost escalations over the last three decades which have greatly concerned libraries.

While libraries have revenue streams and may occasionally make money through entrepreneurial strategies, their overriding purpose is not making a profit. In fact, most libraries are understood as inherently unprofitable, as centers for efficient expenditure (not generation) of funds for shared resources, services, and other purposes. Public benefit (as manifested in benefits to their identified clientele) generally trumps private benefit (manifested as institutional profitability) in the motivations of libraries. However, because libraries are the stakeholders in this triumvirate which to date have been typically expected to shoulder most of the costs of the scholarly communication cycle, they are sensitized to issues of affordability, efficiency, and cost inflation.

Of necessity, publishers (including university presses) diverge from both scholars and libraries in their profit-making orientation and motivations. While enormous shifts in the landscape surrounding the research enterprise have occurred in recent decades, the basic economic motivations of scholars and libraries described above have remained stable. Scholarly publishers, however, have been forced to change in significant ways regarding their focus on profitability. Decades ago most scholarly publishers were subsidized by parent organizations in ways that made them less concerned with direct profitability. This changed as scholarly publishing activities were financially ejected from the main academic enterprise, either by outsourcing directly to commercial publishers or by requiring university presses to be mostly self-funded. University presses of necessity became more focused on profitability in order to survive.

It is critically important to differentiate two very different senses of “profitability” in this discussion. On the one hand, “profitable” can simply refer to publications that generate enough

revenue to pay for their production by nonprofit presses. On the other hand, “profitable” can refer to publications that generate extremely large monetary surpluses above and beyond the cost of production by for-profit presses. Recent work by Paul Courant, Ted Bergstrom, and others demonstrates the distinction between these two situations; journals published by monopolistic for-profit publishers unaffiliated with academic institutions are roughly ten times more expensive than nonprofit journals published by university presses and other publishers affiliated with academia. [Bergstrom et al., 2014] While both university presses and for-profit monopoly publishers must publish titles that pay for the cost of production, it is only the monopolies that impose unsustainable cost structures on libraries and other buyers.

A VIRA environment seeks to align the motivations of stakeholders. Therefore, while private benefit (manifested as institutional profitability) generally trumps public benefit (as manifested in either quality of scholarship or benefits to their identified clientele) in the motivations of publishers, nonprofit publishers are an essential part of the VIRA model. While university presses have to publish works that are economically viable, the quality of scholarship or public benefit derived from publications are usually the most important motivating factors for these and other nonprofit publishers. For-profit publishers are a less compelling addition to the VIRA model, because they divert funding from the scholarly communication cycle into the hands of private investors external to the process, thereby reducing the amount of funding available for sustaining the cycle.

This discussion of public versus private sector motivations is central to understanding why and how different stakeholders are motivated to participate in collaborative ventures. If scholars and libraries do not understand the need that university presses have to produce profitable titles (or at least titles that show some promise of eventually being profitable) they will be unable to motivate such publishers to take part in a VIRA. University presses are already accustomed to thinking in terms of maximizing the scholarly quality and the benefits of their products for scholarly communities as part of their normal workflow, but they will not be able to compromise on revenue generation for the sake of sustainability. But libraries are also justified in demanding that they not be gouged on prices by publishers. Without a commitment by all three stakeholders to understand, compromise, and address the motivations of one another, it will likely be difficult for a VIRA to be successful.

These three stakeholders have different inclinations and aptitudes for collaboration on the work of maintaining large collections of scholarly outputs, especially digital scholarship and databases. Scholars are individual actors that may or may not have any interest or aptitude for working together with other researchers, much less libraries or publishers. As mentioned before, their general motivation is to conduct research to benefit society as a whole, but they also have particular motivations around their personal career progressions. Even if they work in collaborative labs, they typically focus on the creation of individual works of scholarship. They are primarily focused on producing new scholarly works and getting academic credit for such works. Historically, they have not had to provision for the ongoing maintenance or funding the maintenance of the scholarly works they produce; they have instead served primary drivers of research activities and the arbiters and judges of quality in scholarship through the peer review process.

Libraries are made up of individuals but they are not individuals, they are organizations. Further, they are service organizations focused on serving the needs of some identified clientele of information seekers. Even if a library reports to a single individual such as a provost, libraries fundamentally serve the needs of many individuals, and they focus on large scale aggregations of

scholarly works from many sources for many synergistic research and instructional purposes. Because libraries are also centrally concerned with funding and maintaining ongoing access to the large collections of scholarly works that they acquire, they are accustomed to negotiating many different kinds of system-wide group agreements to maximize efficiencies (consortial purchasing of shared resources, reasonable circulation rules for physical items, fair allocation of constrained collection development funds for multiple academic departments).

Libraries historically did not concern themselves with the creation of new scholarly works, but the new trend of digital scholarship centers (often embedded within or affiliated with libraries) has begun to change this. Libraries have now begun to focus on the entire lifecycle of scholarly information, including hosting some centers for the creation of new scholarship, especially in the humanities. Libraries understand the needs of their faculty clientele for academic credit to advance their careers, including faculty willingness to relinquish economic control of their scholarly outputs and their desire to hand off long-term responsibility for maintaining and preserving these works. These factors may become key motivators for the VIRA strategy of reintegrating the three stakeholders in the scholarly communication cycle. In order for VIRAs to exist, libraries are needed to act as both funders and maintainers, but they can only do so if scholars and publishers are motivated to ally with libraries as partners.

Publishers, specifically publishing houses focused on publishing scholarly works, are also organizations and not individuals. They are focused on the production and sale of large numbers of scholarly works that they are currently publishing or preparing to publish. Publishers are experts in orchestrating the creation of scholarly products, whether monograph or serial. They have a far better understanding of markets, marketing, and sustainability than either scholars or libraries have. But publishers are accustomed to acting in competition with one another, and are typically unwilling (or unable, due to antitrust laws) to collaborate in ways that could compromise their economic control of publications or sharing information about publishing workflows, tools, and costs. Yet, scholarly publishers also fundamentally believe in the importance of research for society and any model for ongoing scholarly communication must take account of the functions of publishers just as it accounts for the roles of scholars and libraries. The costs of publishing must be both understood and resolved in a manner that is fair and efficient for all parties. The tension here is that publishers, having been excluded from universities and academic subsidies once, may be unwilling to cooperate by compromising their profitability if they are approached to collaborate in prospective VIRAs.

The Chrysalis: Adaptation through Transformation

Traditional scholarship, in the form of monographs and journals, is paid for by the mechanisms of libraries purchasing this content or leasing access to it from publishers. In the traditional model, print copies survived through benign neglect on library shelves, which in turn were maintained through the sunk costs of general upkeep of library facilities. But as has frequently been noted, the nature of digital scholarship is quite different. Because databases and websites must be actively maintained over time, digital scholarship must have streams of revenue that will pay for ongoing upkeep of computer systems and (ideally) continued software and content development.

Digital scholarship, assuming it does become widely accepted for faculty promotion and tenure (admittedly a big assumption), might go the way of traditional scholarship and become hosted by publishers and sustained through straightforward purchases and subscriptions from libraries. But this has not typically been the case to date. Rather, digital scholarship resources are often created by scholars (sometimes in collaboration with librarians) in the course of grant funded projects

undertaken at research centers (whether in libraries or elsewhere). So far there has not been a trend of commercially selling such resources through publishers. It is unclear whether this is because publishers are uninterested in commercially publishing such resources, because the creators do not wish to commercialize these new forms of scholarship, or some other reason. There have been calls for university presses to embrace new forms of digital scholarship, but also acknowledgement that they are deeply invested in traditional products and reluctant to change. [Wittenberg, 2010] Research centers have difficulty managing legacy websites after grants are expended; such centers are primarily funded by research grants, and are primarily motivated (both academically and economically) to undertake new research rather than maintain old research outputs.

Research libraries are willing in theory to sustain digital scholarship resources; after all, their core mission is to preserve the scholarly record. The challenge is the lack funds for such purposes; libraries are already overburdened by the legacy of super-inflationary cost escalations in traditional scientific journals. [Panitch and Michalak, 2005] But the question of whether or not these super-inflationary cost escalations are equitable has been raised repeatedly and is highlighted by the previously cited research of Courant, Bergstrom, and others. There have been attempts to estimate the potential cost savings of publishing in open access journals [Van Noorden, 2013], and estimates that changing the fundamental structures of the current scholarly communication system could potentially result in billions of dollars of savings to research libraries. [Cambridge Economic Policy Associates, 2008] But it is difficult to model a hypothetical planned transition from the current situation in which funds currently expended on unsustainable subscriptions from for-profit publishers (the majority of the materials budgets of research libraries these days) are redirected into sustainable revenue streams for nonprofit publishers. Yet this transition may well occur through an unplanned transition, as follows.

The serials crisis discussed by Panitch and Michalak has been tracked for more than two decades starting with the seminal 1992 Mellon-funded study *University Libraries and Scholarly Communication* which charted the extent of rapidly escalating serials price increases and declining purchases of monographs by libraries. [Cummings, 1992] The cost of serials grew over the past two decades at super-inflationary rates in excess of 8% per year (sometimes much higher). While the trends constituting the serials crisis have been charted for years and accompanied by dire predictions, conversations in this planning project with directors of research libraries confirm that this trend is now cresting, with the result that virtually all research libraries are now of necessity commencing massive journal cancellation projects and other cost-cutting measures. For more than two decades library administrations have undertaken herculean measures to preserve acquisitions, but even the sometimes extreme strategies brought to bear in these efforts (consortial purchases, staff reductions, etc.) are no longer sufficient to avoid large scale reductions in the “big deal” journal bundles that Bergstrom and Courant analyzed. The question is no longer whether or not funds expended on materials budgets will be reduced, the question is what will happen now?

Libraries have engaged in serials cancellation projects before, but not on this scale. Because this is terra incognita, no one can definitively predict what will now happen; the following are our comments about this situation as it bears on the concept of VIRAs. If libraries simply use the mechanism of cuts as a reactive strategy to balance their budgets, then they will simply pay more and more for fewer and fewer items. An alternative scenario is that libraries proactively redirect collection development funds toward partnerships with their university presses and faculty to publish scholarship at more sustainable rates; in other words, create vertically integrated research alliances. Especially for new digital forms of scholarship, some permutation of this idea emerges

from many recent white papers and articles; examples include the *Strategies for Success* report [Mullins et al., 2012], the Ithaka S+R *Sustaining our Digital Future* report [Maron et al., 2013], and Bryan Sinclair's article on the topic in *Educause Review Online*. [Sinclair, 2014]

The strategy for generating revenue streams within the VIRA model may be very different than mechanisms such as monograph purchases and journal subscriptions that have sustained traditional forms of scholarship. The nature of digital scholarship on the web is less like a traditional passive publication consumption model, instead having aspects that resemble social media and creative artistic endeavors aimed at exciting and motivating a potential group of collaborators. Rather than recapitulate traditional pay-wall approaches, VIRAs could make use of approaches associated with learned societies such as memberships (both individual and institutional). More provocatively they might adopt the "crowdfunding" model which has become a prominent means of funding creative endeavors in recent years, a model which works on a very different dynamic than traditional purchase models. [Belleflamme et al., 2014] The success of the *Knowledge Unlatched* project using a model that essentially amounts to crowdfunding of institutions has been an illuminating success story. [Montgomery et al., 2014]

The VIRA strategy confronts the scholarly communication crisis head-on and calls for a transformation of our arrangements for producing scholarship; hence the metaphor of the chrysalis in the title of this planning project. We believe that the time has come for research alliances of scholars, publishers, and libraries to be convened with the explicit purpose of sustaining innovative scholarly communication efforts at affordable prices while maximizing public access to research results. But exactly what form such alliances will take is still an open question. They will likely build on established models such as the learned society and the research center. As a way to assess the VIRA model, we decided to explore it with three prospective case studies; these are detailed in the next section.

PROSPECTIVE RESEARCH ALLIANCE CASE STUDIES

The Chrysalis planning project studied three prospective research alliances as a way of assessing the VIRA model. These case studies were chosen on the basis of the following criteria:

1. Was there a unifying scholarly subject domain that could form the basis of an aligned research alliance?
2. Did the project principals have some personal knowledge of potential collaborators in the three stakeholder groups (scholars, librarians, presses)?
3. Did these initiatives demonstrate some capacity for vertical integration, i.e. were there potential groups of scholars, librarians, and publishers that could potentially be brought together to form a VIRA?

The Chrysalis planning project selected three case studies based on these criteria and convened a series of meetings to discuss the VIRA concept and garner feedback from potential collaborators.

Case Study: Texana Research Alliance

The idea of this research alliance focused on the inter-disciplinary cultural and historical study of the state of Texas. This regionally-focused alliance was in some ways the most straightforward of the case studies, and one that was uniquely well positioned for several reasons to explore in a single institutional context at the University of North Texas (UNT). Three synergistic

outreach efforts are based at UNT: 1) the primary scholarly association for the study of Texas history, the Texas State Historical Association (TSHA), 2) the UNT Libraries' *Portal to Texas History*, a collaborative statewide portal to historic digitized content from of 250 libraries, museums, and historical societies, and 3) the UNT Press, which has a major focus on Texas History. All three groups work together closely, and had discussed the possibility of a more ambitious outreach effort with stakeholders throughout the state and beyond to create a research alliance focusing on Texana.

There were a number of transformative possibilities to consider in the case of a prospective Texana research alliance. The administrative officials of the UNT Libraries, UNT Press, and the TSHA, were all interested in the possibility of exploring possibilities for repurposing the back files of the TSHA and the UNT Press for new scholarly purposes online. The rich corpora represented by more than a century's worth of content from of the Texas State Almanac, the Southwestern Historical Quarterly, and many other publications of the TSHA and UNT Press, together with more than a million pages of historic newspaper content in the *Portal to Texas History* could potentially be used to produce many new ad hoc publications on specific scholarly topics. Recent historical analysis software applications jointly developed by UNT and Stanford for large scale text mining and GIS analysis of the *Portal to Texas History* [Torget and Christensen, 2012] could be built upon to create new forms of interdisciplinary publications for historical regional studies.

Planning meetings were held at UNT to discuss the concept of a Texana research alliance, including inter-organizational agreements to be created that would enable collaborative interoperability of systems and conceptualize proceeds from subscriptions or other fee-based access to such systems. There was a great deal of enthusiasm and interest by all concerned in the possibilities of such a research alliance. An open brainstorming meeting was held at the March 2014 annual conference of the TSHA in San Antonio; the meeting was listed on the TSHA conference agenda and attracted 22 attendees (both scholars and librarians) who spent several hours discussing the idea of the research alliance. All of these discussions confirmed that the VIRA model was compelling to both administrative officials of the respective organizations and prospective users of the digital scholarship resources envisioned.

Although there was a great deal of enthusiasm for the idea of a Texana VIRA, upon reflection the project investigators began to question whether an alliance with such a limited number of institutional partners was actually a VIRA in the end. It is worth noting that discussions concerning the prospective Texana VIRA were put on hold when the TSHA executive director left for another position. TSHA was the lynchpin in the prospective research alliance, a key connector that could draw scholars together. It may be that the lesson learned is, in part, that one lynchpin is not enough, that a collective needs to be drawn together with neutral facilitation at its center in order to be successful through personnel changes. All relevant stakeholders should ideally be committed to the VIRA, with a degree of inter-institutional neutrality governing relationships in order to weather changes within constituent stakeholder groups.

While this case study validated many of the conceptual elements of the VIRA model and the relevant organizations may very well return to the discussions about a Texana research alliance, the most notable finding it revealed was an ironically cautionary tale about the criticality of a critical mass in the community that makes up a VIRA prospectively.

Case Study: Southern Studies Research Alliance

Southern Studies is another regionally focused example that we examined as a potential research alliance. This case study focused on the *Southern Spaces* interdisciplinary online journal (<http://www.southernspaces.org>) based at Emory University, which has served as a productive and influential resource of new scholarship utilizing digital research evidence and presentations for a decade. This research alliance would build on the success of *Southern Spaces* to seek out new opportunities through the collaborative group of scholars and curators who have been working together for a decade to publish the journal. A large body of digital content was created and archived during the past decade of publishing the journal, including both the published pieces and the digital content that scholars submitted and archived, but ultimately was not used, in the course of creating *Southern Spaces* articles. This unused but archived content is composed of a wide variety of content types, including digital photographs and video footage. Reusing this archive of content for collaborative purposes with publishers is a potential means of generating funding for the support of the journal. An example of such a collaborative effort was a recent partnership with the University of Texas Press for their Katrina Bookshelf Series. In this partnership, *Southern Spaces* presented selected essays and excerpts from the series with text linking, maps, images, charts, and other media that does not appear in the associated printed books. This experimental collaboration successfully showcased the contributions that a digital scholarly publishing venture like *Southern Spaces* can make to an essay's argument. There are various benefits of this kind of co-publishing arrangement, in that the publication also helps the press by drawing attention to the series and the edited book from which the essay was adapted.

A series of discussions with the *Southern Spaces* editors took place during the Chrysalis planning project. These discussions explored the notion of a broader Southern Studies research alliance that could generate revenue from co-publishing arrangements, including the quite different possibility of re-using the very robust Southern Spaces publishing platform for other scholarly publications. In this case study, *Southern Spaces* would grow to function as the nexus of collaboration for scholars, libraries, and publishing operations interested in Southern Studies. This conceptual research alliance would seek out means of capitalizing on both the published and unused content of a well-established digital journal to create a broader agenda for fostering research, publishing, and sustaining catalytic activities in the larger community of Southern Studies scholars. Many of the conversations in this case study took up the question of publishing tool re-use, centering on the robust *Southern Spaces* publishing platform. Conversations on these topics culminated in a meeting of the project team at Emory University in April 2014. This meeting featured a deep dive into the production processes of *Southern Spaces*, and the discussion highlighted the ongoing strength of the journal as a training ground for young scholars. In some ways *Southern Spaces* is already a miniature VIRA, and this case study ended up elaborating other prospective strengths of the VIRA model that we had not considered in terms of instructional and training value for graduate students. The discussion also highlighted the challenges of transitioning existing digital scholarship efforts into revenue generating operations. As discussed elsewhere in this white paper, scholars are motivated by academic values, not profitability. From its inception *Southern Spaces* has been an Open Access journal, and it is difficult to envision transforming it into a subscription-based resources after a decade of publications. We realized in these discussions that other academic models for revenue generation based on the long-standing notion of endowments and donors might be more appropriate and compelling for digital scholarship. The ten year history of *Southern Spaces* made this case study both more specific and less prospective in many ways, as it built on a great deal of past practice that structured and constrained the conversations. However, it did surface a much greater degree of

nuance in the discussion about the need for financial support of the ongoing operations of the journal, the junior scholars that made up the majority of the editorial team, and the practical considerations of a publishing platform for non-traditional scholarship.

Case Study: Coerced Migration Research Alliance

This prospective research alliance of scholars, libraries, and presses would study the broad topics associated with coerced migration, including slavery, refugees, and economic displacement. This topical framing (“coerced migration”) has been articulated and advocated by scholars noted for their work on several innovative digital scholarship projects in this topical area, notably Dr. David Eltis, who led the creation of two major digital scholarship resources: the *Transatlantic Slave Voyages* database (<http://www.slavevoyages.org>) and the *African Origins* database (<http://www.african-origins.org>). Dr. Eltis and various other scholars involved in the study of either slavery or refugee studies articulated the possibilities in creating a cooperative research alliance focused on coerced migration. During the planning project they were interviewed concerning the production of secondary source publications and other services that might be created as superstructure on top of existing resources such as the Voyages and Origins databases, all of which relate to the broad topic of coerced migration. The concept of a coerced migration research alliance was discussed during a meeting of prospective collaborators assembled for this planning project at the 2014 Organization of American Historians Conference. This meeting and the conversations that led up to it were exhilarating.

Creating a meaningful research alliance for this subject domain would involve a broad range of activities such as comparative analytical use of coerced migration datasets, normalizing data, and the creation of standards for storing, analyzing, using, and disseminating such datasets. The tremendous power of collaboratively assembling such datasets in portals has been demonstrated in projects that the various historians and sociological researchers brought together for this discussion, notably including the Voyages portal previously mentioned, the *Social Conflict in Africa Database* [Salehyan et al., 2012], the *Texas Slavery Project* (<http://www.texas-slavery-project.org>), and others. There are many challenges associated with these kind of coerced migration projects centering around the complexities of adapting traditional historical modes of inquiry into machine-actionable databases and the previously mentioned issues in sustaining such websites over time. The scholars who were brought together for these discussions highlighted the difficulty that their respective projects had encountered over the years. However, of the three case studies, this one seemed the most broadly based in an emerging community of new research methods aligned in methods and the importance of its subject domain: the large-scale coerced migration of human populations in both historical and contemporary times.

A number of issues in creating a coerced migration research alliance were noted during the planning project discussions. There would be many practical challenges to overcome in order to get multiple high-profile organizations and individuals to collaborate on an alliance of this kind. Developing standards for the exchange of data in ways useful for research purposes was a technical issue noted. Points were raised about the challenges of junior scholars getting credit for promotion and tenure files from such projects. However, there was an overall strength in these discussions founded on the importance of this emerging category of research methods and subject domain.

A number of the discussions involved the issue of revenue generation, and the most compelling models again seemed to be based on the notion of donations or memberships in a research alliance. Such contributions might come from institutions, individuals, or both. Key

questions continue to revolve around value propositions. How would contributions be rewarded? Would resources produced be gated behind toll-walls or open access? How would the question of free-riders be addressed, if at all? While this case study generated far more questions than the other two examples, it also seemed to generate the most scholarly and collaborative energy.

CONCLUSIONS

The problems with the sustainability and viability current system of scholarly communication are longstanding and serious. Networked digital resources such as websites and databases offer dynamic new alternatives to traditional scholarly products such as narrowly focused print monographs and super-inflationary journals. The focus of this white paper on a new collaborative model termed Vertically Integrated Research Alliances would bring together relevant stakeholders in closer working relationships to create and sustain promising new forms of digital scholarship. The strategy of creating VIRA organizations intentionally reframes the need for a fundamental transformation as an opportunity, rather than a challenge, barrier, or intransigent financial problem. This organizational strategy would incorporate stakeholders from key communities—scholars, publishers, librarians—in order to foster better ongoing connections between these groups, vertically assimilating different parts of the academic publishing process through concentrated alliances. Organisms with a pupal life stage experience a key transformative moment when they reorganize themselves internally to better adapt to changing lifecycle circumstances. Like the chrysalis, restructuring the activities of scholarship in particular subject domains into research alliances of these key stakeholder groups could create more sustainable organizational forms.

Consultations with a broad range of such stakeholders during this planning project demonstrated that the concept of cultivating a stronger collaborative arrangement that would include subject-focused cross-sections of scholars, libraries, and publishers was a very compelling model. Most individuals consulted felt that the model shows promise, but all the project conversations also circled around the unknown aspects and practical challenges of implementing the model in actual research alliances. It was important to understand the VIRA model in the context of existing collaborative research organizations that could be considered as antecedents to the VIRA. A large number of such conceptual antecedents to the VIRA exist; antecedents such as the learned society have a long history and serve as potential examples that could be organizationally extended to create VIRAs. The many permutations of the inter-institutional research center model also serve as existing examples to build on. Understanding the VIRA as an extension of these existing models to include additional stakeholders in the scholarly communication cycle is a way of incrementally broadening our collective thinking about research collaboration strategies. VIRAs may be easier to understand if framed in terms of modified versions of existing antecedent organizations.

Thinking in these terms highlights the centrality of scholars to any research alliance. Scholars must be strongly committed in terms of the research agenda of the subject domain under consideration in any particular VIRA, and must commit significant time and energy to the intellectual oversight of such an alliance if it is to succeed. The danger is that scholars are overburdened in their time commitments, and may be spread too thin to take on the additional responsibilities associated with a VIRA. They may not be willing to commit to a VIRA because they do not see the activity as sufficiently aligned with their personal research agendas or career progression paths. If this strategy is to be successful, the VIRA concept will have to be seen as something worthy of time commitments, much as learned societies and research centers are now seen.

Libraries are key supporting institutions in the scholarly communication system. Libraries sustain the output of scholars in many related ways. Libraries act as repositories to preserve knowledge creations; they house information and keep it in order. Libraries act as funders through mechanisms like subscriptions, one-time purchases, and other revenues that sustain the production of scholarship. Finally, libraries act as points of access and aggregation, storing very large masses of accumulated works and maintaining discovery systems in the form of catalogs and other finding aids. The biggest problem with envisioning libraries as contributing in similar ways to VIRAs is the fact that library budgets are already overburdened, especially by the super-inflationary costs of traditional scholarly products from for-profit publishers. It will be difficult in practice for libraries to free up funds for experiments with new organizational collaborative models such as VIRAs. Library administrations will have to understand and be able to articulate the need for their organizations to step up to the challenge of moving funds from unsustainable forms of legacy scholarship to sustainable news forms of innovative scholarship.

University presses have strengths in their ability to realistically assess the market for scholarly outputs and the most effective means of marketing such works. Presses are economically challenged in the VIRA model by their necessary focus on the profitability of new titles and endeavors. If university presses are unable to free up time and funds for experiments with new 7.

The question of sufficient scale must be addressed in thinking prospectively about creating a VIRA. A critical mass of content, motivated scholars, and committed institutions must exist if a VIRA is to be sustainable. This becomes obvious after considering successful existing research collaborative organizations. An “alliance” is of necessity larger than a small handful of individuals or a single institution. Gaining a better understanding of the issue of what constitutes sufficient scale will be an essential part of fleshing out the VIRA model.

During this planning project some stakeholders voiced disappointment with the fact that more progress had not been made despite being two decades or more into the scholarly communication crisis. We found it important to reframe the situation in terms of the human pace of change, rather than a technical development pace of change. Scholarly transformation efforts require human adaptations, not system upgrades. Experimentation, change, and evolution of organizations occurs at a much slower pace than technology. The system of scholarly communication encompasses many institutions, established practices, and perceptions, all of which have a great deal of inertia. Experiments with VIRAs and other collaborative forms will take time; this should not dissuade the field from engaging with such experiments in order to make progress toward implementing more sustainable forms of scholarship.

The process for creating a VIRA starts with the research community concerned with the subject domain. As a progression, cultivating a strong shared sense of community first and then using that sense of community to generate revenue streams emulates the strategy of founding a learned society. Many efforts to date have sought to emulate a traditional manufacturing corporate start-up pattern, with the notion of attracting a large initial investment and using this to capitalize a kind of production line for scholarship. But scholars and the scholarly works they produce are not exactly like consumers and the products they consume. Scholarly works are a medium of communication between members of a community. These works do not have communicative value before the community exists. There is an initial activation energy to the system; telephones are not useful until there is a community of telephone users to communicate with one another. VIRA start-ups may more accurately be compared to social media corporations starting up; the important thing is to engage a growing number of participants in the activity. Counter-intuitively, even if it starts small and grows

slowly, a shared and solid commitment of multiple stakeholders to a subject domain of scholarship may be a stronger foundation to build upon than a large up front infusion of funds committed to a proposition that is ultimately unclear.

Another divergence from the past: VIRA revenue streams may not resemble those that have sustained traditional forms of scholarship. Rather than recapitulate the model of monograph purchases and journal subscriptions, VIRAs could make use of approaches associated with social entrepreneurship such as memberships (both individual and institutional), fund-raisers, and donations. The crowdfunding model for sustaining creative endeavors by mobilizing many individual interests may be a better match for research alliances that embody some aspects of social media.

The three case studies undertaken in this planning project were useful as a practical means of surfacing issues in implementing VIRAs. The interest generated by the discussions in these three prospective case studies illuminated both the strengths of the model as well as its challenges. The project research team believes that as a next step, one or more of the three exploratory case studies undertaken in this planning project, or some other set of case studies should be carried forward to assess the VIRA model more concretely.

The future of scholarship in the digital age will likely feature new organizational patterns. The Vertically Integrated Research Alliance model may or may not prove to be an effective strategy for improving the sustainability of new forms of scholarship, but our hope is that one way or the other the stakeholders making up the system of scholarly communication will actively engage with the challenge of experimentation with new forms.

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