



DPN Final Report

Submitted by DPN Staff Members, February 2019

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Project Background and Description

The launch of DPN and Organizational Development

The Digital Preservation Network (DPN) was established in 2012 by a group of library leaders, chief information officers (CIO), and university presidents to respond to the fear that a large amount of the digital content produced and acquired by research institutions was not being preserved and would not be available to future generations of scholars.

A small group of library leaders and CIOs, led by James Hilton and Karin Wittenborg (both at the University of Virginia), determined that the best course of action to combat this problem would be to design a system that would provide the dark replication of content into heterogeneous, geographically separated nodes that would be regularly audited for fixity and supported by succession agreements that would guard against institutional failure.¹ It was the intent of DPN initially to start with digital works that were well understood (i.e., digital things that looked like “texts”) and then start working up to different forms of content. In the beginning, it was anticipated that there would be different nodes specializing in different types of content (e.g., text, data and moving images) and providing replication, audit, succession etc. at the bit level across the nodes; and 2) relatedly, the goal was to start at the most basic level (i.e., bit-level preservation with audit and succession) and then start working up the stack of services that are involved in full-blown digital preservation

A pitch for membership was made to members of the Association of Research Libraries (ARL) and to the Association of American Universities (AAU) presidents and the organization was founded. A Board of Directors for DPN was recruited and included presidents from AAU institutions, ARL deans/directors, and CIOs from research institutions. DPN needed an organizational home and became affiliated with Internet2. DPN was governed by the independent Board of Directors and during the first two years had one contracted employee,

¹ EDUCAUSE Review, vol. 48, no. 4 (July/August 2013) <https://er.educause.edu/articles/2013/8/the-case-for-building-a-digital-preservation-network>

business officer, Steven Morales. Internet2 managed services such as finance, human resources, technical support, legal services, grant support, etc. and DPN paid Internet2 a set fee for those services.

In December of 2014, Dave Pcolar was hired as the Chief Technical Officer and with his leadership and direction, a consensus was reached on the best approach to develop the network. Concurrent with the technical work the board determined that the organization needed a Services Manager to develop and implement services to support the membership. Evviva Weinraub was hired early in 2015 as DPN's Services Manager. In the fall of 2015, the Services Manager resigned, and Mary Molinaro was hired to fill the position of Services Manager and Chief Operating Officer.

Over the course of 2016, the DPN Board increasingly wanted to pursue changing the status from being a project of Internet2 to being more autonomous. The board explored various types of organizations where DPN could make more independent decisions on products and services. Eventually, it was determined that DPN would become a single member LLC with Internet2 as the single member. This meant that Internet2 would form DPN LLC and would have the ability to disband, but DPN would be governed by the DPN Board. DPN officially became DPN LLC in January of 2017. As an independent entity, DPN then arranged for the services to manage the business functions that had previously been handled by Internet2, such as banking, legal, insurance, expense reporting, etc. In order to effectively manage the human resource functions of salaries and benefits, DPN contracted Indiana University to manage those functions.

Establishing DPN as an LLC required operational and policy changes, which prompted a change in the role of the Executive Director. After considerable discussion with the Board and the Program Directions Committee, it was decided to create a new position of Director of Member Services. Emily Gore was hired into the position in June of 2018. A member survey was conducted to better understand the state of member satisfaction and use of the DPN core services. This coincided with the final development stages of the Exanode. The express purpose for the creation of this new position was to develop a marketing plan to increase deposits and align services with changing member needs.

DPN Board of Directors

DPN was committed to aligning the governance with the various constituencies it serves. Those constituencies began with University President/Chancellors and include Provosts, Librarians, Chief Information Officers, Industry, Researchers, and Legal Counsel.

Governance Principles:

- The DPN Board was constructed to reflect the key constituents that DPN serves.
- The DPN Board voted annually to fill open Board seats.
- The majority of the DPN Board should at all times be comprised of Presidents/Chancellors, University Librarians, and CIOs (Executive Leaders) of DPN research university members.

Board members served 3-year terms with a maximum of 2 consecutive terms (or 8 years in the event that someone is first elected/appointed to complete a vacated position).

2015 Board Members

- **Michael McRobbie**, President, Indiana University, Board Chair
- **Gene Block**, Chancellor, University of California at Los Angeles
- **Richard Brodhead**, President, Duke University
- **Paul Courant**, University of Michigan
- **Bradley Englert**, The University of Texas at Austin
- **John Evans**, founder of C-SPAN
- **Bernadette Gray-Little**, Chancellor, University of Kansas
- **James Hilton**, University of Michigan
- **Paula Kaufman**, University of Illinois
- **Steven Morales**, DPN Founding Director, and Chief Business Officer
- **Jim Neal**, Columbia University
- **Brian Schottlaender**, Chronopolis
- **Bob Schwarzwald**, Stanford Digital Repository
- **Dan Stanzione**, TACC
- **Abby Rumsey**, University of Virginia
- **Winston Tabb**, Johns Hopkins University
- **Satish Tripathi**, President, University at Buffalo, SUNY
- **Karin Wittenborg**, AP Trust

2018 Board Members

- **Satish Tripathi**, University at Buffalo, SUNY, President, Board Chair
- **Gene Block**, University of California at Los Angeles, Chancellor
- **Mike Furlough**, HathiTrust Digital Library, Executive Director
- **Sam Gustman**, University of Southern California Shoah Foundation, Chief Technology Officer & Associate Dean
- **Damon Jaggars**, The Ohio State University, Vice Provost and Director of University Libraries
- **Carol Mandel**, New York University, Dean, Division of Libraries
- **Maurie McInnis**, The University of Texas at Austin, Executive Vice President, and Provost
- **Martin A. Philbert**, University of Michigan, Provost and Executive Vice President for Academic Affairs
- **Brian Schottlaender**, University of California, San Diego, University Librarian (retired)
- **Bob Schwarzwald**, Stanford University Libraries, Associate University Librarian and Director of Library Technologies
- **Winston Tabb**, Johns Hopkins University, Dean of University Librarians and Museums
- **John M. Unsworth**, University of Virginia, Dean of Libraries, University Librarian
- **Carolyn Walters**, Indiana University, Dean of University Libraries

During the Spring of 2017, the Board of Directors established the Program Directions Committee as a committee of the board. This committee was made up of the board members who were not provost, presidents, or chancellors. This committee was more intimately engaged with the discipline of digital preservation and was able to work with DPN staff on specific directions for the organization.

DPN Membership

DPN initially recruited membership from the ranks of ARL libraries and from the AAU presidents. James Hilton and Michael McRobbie were strong evangelists for the idea and were convincing in their call to action. They were asking for a three-year commitment from the initial charter members. The case was convincing, and also spoke to the pressure within the community to *do something* to prevent the future loss of scholarship. Sixty-four institutions committed to supporting DPN with an annual contribution of \$20,000 per year. Some institutions joined via the library, some as a shared cost between the central IT organization and the library, and still others at a university administration level. Over the first few years, on most campuses, nearly all of the responsibility for paying for DPN had been moved to the library. While membership in DPN was initially to explore the possibility of a robust digital preservation system for valuable collections, by the time development on the first rollout of DPN services was realized and the system was ready for deposits, the landscape and expectations for the system had significantly changed.

When DPN was envisioned in 2012 the concept of true digital preservation was limited on many campuses. Knowledge about the difference between digital preservation and backups was often limited to a few experts in the library. Trust in cloud-based services was not generally accepted by member institutions. The need for regular fixity checking and preservation metadata was emerging as a topic in libraries and archives. DPN services reflected these values and were marketed as a core preservation system for most members. During the period that the DPN architecture was agreed upon and developed, the situation changed dramatically for many institutions. Campus IT organizations invested heavily in systems to manage enterprise and research data (either on-premise or in the cloud) and libraries were encouraged to use the systems that campuses provisioned and supported. Libraries also began looking critically at memberships and were asked to justify maintaining membership in an organization that was offering a service that seemed duplicative on the surface.

In 2015 several membership committees were established in order to engage the membership and enable DPN to add value beyond the basic deposit. These included Technical Advisory, Membership, Preservation Metadata Standards, Services, and Heavy Users. Some of these committees were very productive. The Preservation Metadata Standards group produced a book chapter and did presentations at conferences. Some others had good conversations that advanced understanding of issues but moving from discussion to action proved difficult. With so many competing local needs and different local environments, most members did not become strongly engaged in DPN activity.

Because individuals were not fully engaged and because institutions were not using the storage (that was seen as the primary aspect of DPN), membership started to decline. There were some research data organizations that joined during this period of time, but generally, there were not many new members recruited. There was a gradual loss of membership through 2017, but in 2018, an additional twelve members dropped their membership bringing the DPN membership unexpectedly down to 31.

Technical Development

Node technical staff assembled in 2013 to determine the best way to develop infrastructure for the long-term preservation of digital content. The technical team included representatives from the University of Michigan, the University of Virginia, Stanford University, the University of California San Diego, and the University of Texas, Austin. Several conceptual ideas and approaches were explored, and despite many different views, the group finally reached a consensus.

Implementation Compromises:

In early 2015, the nodes had not agreed on a common interoperable framework that could be universally implemented and certified. There were two major competing models:

1. A messaging framework, run under RabbitMQ, which would queue requests and actions to be completed by other nodes
2. A RESTful API method which required node peer polling to retrieve requests and actions.

The majority of development team members voted for the RESTful implementation, as a common code base with node-specific deployment. This decision facilitated coordinated development with implementation details that would conform to individual campus IT policies and processes.

Ruby on Rails would be the primary language, with all work committed to GitHub repositories. A JIRA hosted instance at DuraSpace, was used as the work management platform. Automated build and unit testing upon commit are implemented via Travis-CI, Codacy checking for style compliance, and Github dependency vulnerability assessment.

The code base is freely available in public repositories, under GPL and University of Michigan licenses. (<https://github.com/dpn-admin>)

Over the course of 2015, the technical team designed the network to utilize established repositories with geographic separation (Chronopolis, APTrust, HathiTrust, and the Texas Preservation Node) with a registry system to record preservation events, metadata, etc. Two nodes were designated to serve as ingest nodes - APTrust (for APTrust members) and Chronopolis. There was not a supported ingest method for members to deposit content into Chronopolis so DuraSpace was contracted to develop an ingest portal that would facilitate deposit of content by members. All of the nodes were designated as nodes to replicate content. It was determined that to meet preservation standards all content was to be replicated at three nodes and the locations would be recorded in the DPN registry.

Design Goals for DPN architecture

Inherent in the original design of DPN is the desire to eliminate, as practicable, all single points of failure. This is reflected in the loose nature of node-to-node relationships and in the heterogeneity goals of implementation. A further consideration is a robust trust model where registration recording of deposited content is immutable and provenance metadata checking is tightly controlled by the originator.

- Establish a network of heterogeneous, interoperable, and trustworthy digital repositories (DPN Nodes) providing preservation services under a common technical, service, and legal framework.
- Nodes will operate in a secure manner to protect the integrity of the processes, transport, and content that DPN holds.
- DPN will develop a threat model and monitor for threats on a continuous basis.
- Nodes will provide facilities to ingest content from existing repositories with minimal repackaging effort, and replicate the content to multiple, geographically and technically diverse, Replicating Nodes.
- Subject to SLA requirements, a node may leave the DPN federation without the content being deleted from the network
- DPN will provide the option to brighten content preserved in the Network for long-term re-use by the Academy if the original Depositor and Archive has discontinued operations or divested the information.
- Each node will develop and certify an independent instantiation of the DPN specification.

The Node Managers group assumed a central role in the conceptual design of the transactional components of the preservation system. Core goals of the design are the independence of technology implementation, resiliency over time, robust threat assessment, and provenance of deposited content. During the implementation phase, the group's role shifted to an advisory capacity. Once production services were fully available the role shifted again to a service provider and advisory focus. The Node Managers met continuously starting in mid-2014.

Business Model Development

During the first years, Steven Morales worked with various experts in the field to develop a business model to support DPN for the long-term. The business model that was developed was quite complicated and took a twenty-year view of the landscape. The model included estimations on the drop-in storage costs per year, estimations of deposits into the network year-by-year, the establishment of an endowment to support the long-term preservation of deposits, and growing membership. With this model, it was predicted that DPN would be financially secure over the twenty-year period and beyond.

Business Model Working Group Members

Steven Morales (chair)	Bradley G Englert (co-chair)	Brian Schottlaender (DPN Board)
John Evans (DPN Board)	James Hilton (DPN Board)	Barbara Pralle - JHU
Carole Meyers - Dartmouth	David Minor - UCSD	David Lewis - IU
Debra Hanken-Kurtz - TDL	Gail McMillan - VT	James Simon - Stanford
Jeff Rubin - Tulane	Jeremy York - UM	Katherine Skinner - MetaArchive
Kimberly Douglas - Cal. Tech	Martha Sites - UVA	Micah Altman - MIT
Michele Kimpton - DuraSpace	Oya Rieger - Cornell	Preston McAfee - Microsoft

Research and Development Costs

<ul style="list-style-type: none"> • DPN paid \$2,782,693 to support research and development through 2017 • Dramatic reduction in development costs in 2017, as Version 2 of the production software was released <p>(See Appendix A for charts)</p>	<ul style="list-style-type: none"> • APTTrust - \$375,097 • Chron - \$414,882 • DuraSpace - \$581,610 • Hathi - \$314,018 • Stanford - \$657,534 • Texas - \$439,552
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Operational Costs

<ul style="list-style-type: none"> • Node payments included a fixed overhead/startup fee and a cost per TB/Year • The cost for DuraCloud Ingest Services was based on billable hours • The node per TB storage costs were relatively minimal to overall node expenditures. <p>(See Appendices B and C for charts)</p>

Deposits of Content

In January of 2016, the DPN was prepared to accept content for preservation. The system was developed and tested, and members were notified that they could start depositing content. DPN staff and nodes fully expected that deposits would start flowing in and were, in fact, worried that the system would be overwhelmed.

One of the requirements for deposit was a signed Deposit Agreement from the member. Over the previous year, DPN staff worked with attorneys representing DPN as well as those from the various nodes and members. This proved to be a laborious process. Initially, it was conceived as a very light agreement that would be easy for members to sign. After the attorneys finished including standard language that would protect both parties, it was a multi-page document that would require significant review from the counsel at member institutions before signing. This was immediately recognized as a problem and eventually, the template document was reduced to two pages. The template document, which required renewal each year, obligated DPN to preserve the deposited content for twenty years, after which the content would either be retained for another period of time or passed to another member of the community to steward should the original depositor be unable to do so. The passing of stewardship to another community member was known as a “quit claim.”

As members started examining the Deposit Agreement, the notion of the quit claim became a sticking point for many institutions. Both archivists and attorneys had difficulty with the terms. In order to arrive at an agreement that institutions could sign compromises were made, making the process of signing the agreements slow and expensive - both for DPN and for the institutions. Because the agreements were tied to the year in which content was deposited this process was to be repeated annually.

By the end of the spring of 2016, only a few members who had signed Deposit Agreements had actually made a deposit. This was of concern to the node managers and DPN staff. As staff started talking to members about the lack of deposits, three reasons stood out.

- First, members had the idea to put their most valuable content into DPN and they had difficulty deciding what that would be. Many members said they were unprepared to make that decision. The staff who would ultimately be making the deposits were not empowered to decide what to deposit.
- Second, institutions repeatedly stated that they did not have a good workflow for digital preservation. Many institutions said that they did not have sufficient in-depth knowledge of their digital collections to manage them for long-term preservation. Local systems for managing content did not have a built-in “export to DPN” function and this presented a problem of how to prepare and move the content for deposit into DPN.
- Finally, many institutions stated that they were understaffed, did not have anyone whose job it was to preserve digital content and that this was an “add on” duty that was not made a priority over other work.

Even if these issues were resolved many institutions found that the bandwidth coming out of the library where the collections were processed was insufficient for large uploads to DPN. All of these factors in various combinations created delays for institutions that wanted to deposit content into DPN.

The first deposits did not start coming onto DPN until May 2016 and it wasn't until September of 2016 that more than a TB was deposited (see Appendix D - Member Content Deposits). Because the decision had been made to include 5TB of storage annually with membership, institutions *limited* themselves to just 5TB per year. This presented a problem because the business model assumed large deposits. It was thought that once content started flowing, institutions would automate production workflows that would result in the purchase of additional storage beyond the included allocation.

In 2017 it became obvious that institutions were not making large deposits into the network. The members of the Heavy Users group discussed their need to accommodate large transfers of content at lower cost. Making a large deposit via DuraCloud Vault was not feasible from technical or financial perspectives. A Peer-to-Peer pilot was designed to address issues of scale and several institutions indicated they wanted to participate, but financial issues were complicated (i.e., the increased storage needs of taking on another institution's content) and commitment from the campus staff that would need to manage the process proved to be difficult. After many months of meetings and discussions, there was not a critical mass of member institutions that believed they could overcome issues and develop the technical, policy, and cost frameworks needed.

At the same time, an idea surfaced for a separate DPN service to handle very large datasets at a substantially lower cost. Discussions with the University of Southern California Digital Repository (USCDR) began and a preservation vendor, LibNova, was brought in to develop a scalable ingest service. The Exanode was designed to streamline the deposit of large digital objects. In terms of workflow, data aggregation, and deposit, the Exanode was not aligned with the DPN traditional design. These differences were intentional, to address member needs that were not necessarily compatible with the DPN core model. LibNova and USCDR were given wide latitude to implement the proposed large deposit scenario model. The intent was to pilot a standalone system, which would eventually crosswalk provenance metadata with the DPN registry, but not be confined to the traditional service model.

Unfortunately, the timing was problematic. There were insufficient resources to develop the Exanode service in the same distributed manner as the original DPN network had been designed. The Exanode service was developed and tested in the spring and summer of 2018, just as it was determined that DPN as an organization was not financially sustainable. Further, the established group of node managers was not brought into the discussions about the development of the Exanode, and in hindsight, this was a mistake. The lack of communication with that group created ill will and made the service even more difficult to launch. Between February and July of 2018, the Exanode system underwent acceptance testing and was ready for production data submission. Final financial and service level agreements were under discussion as DPN's financial status worsened.

Why did DPN close?

What are the reasons that contributed to DPN being unsustainable? It was not a single cause, but rather the convergence of many things - a perfect storm, so to speak. Listed below are some of the factors.

1. From the conception of the “big idea” of DPN to the actual development of a workable system that could preserve content was a difficult challenge and took several years. It was a **difficult challenge that required a great deal of discussion to reach a consensus** about the best approach to address the technical issues involved. The efforts forged new ground in distributed preservation models but were challenging to address and the gap in timing likely had an impact on eventual use of the system.
2. At the start, DPN benefitted from a hope that this would be a winning idea for a difficult problem among the library community. The support of AAU presidents and provosts encouraged libraries and their allies on campuses to join DPN even though DPN premise was unproven, and the services did not exist. The issues DPN sought to address were seen to be important, and ones that the community were willing to fund for a period of time while they waited to see if it would work.
3. By the time DPN launched services, the **community-wide needs perceived by the founders of DPN did not match those that the members of DPN recognized at its launch**. The initial concept of dark, diverse replication supported by audit and succession was not fully understood nor embraced by the community-at-large and at the same time various alternative solutions emerged (from partners and vendors), and more options became generally available.
4. **Community engagement was not at the level needed for success**. During the years leading to launch, DPN staff and contributing staff from the nodes focused primarily on the technological aspects of its preservation mission and did not have consistent staffing that could communicate with libraries and cultivate relationships that would lead to effective service development. It was not until 2016 that DPN had an employee who could focus on these relationships. Until 2016, DPN’s primary point of contact with member libraries had had no previous experience in the cultural heritage sector and did not recognize these needs. Subsequently, it was difficult with only two staff members to engage a large community at the level needed to have a flourishing organization. Some of the committees worked well and did very good work and others languished.
5. At the institutional level, the **members were not prepared to deposit** when the system came into production. Many institutions reported that they had no established workflow for digital preservation, some reported a lack of staffing, while others had little control over their digital assets making the curation of content for deposit difficult.
6. The **deposit agreements proved to be cumbersome** and expensive for members to negotiate. Members reported that signing an agreement annually was expensive in terms of legal fees, time, and effort, especially relative to DPN’s perceived value.
7. During the time that the DPN preservation system was being developed and released **no clear consensus on sufficient digital preservation models emerged among the membership of DPN**. Campus “archival” storage infrastructure became available and

confidence in the viability cloud-based solutions increased. Many central IT organizations invested heavily in robust storage on behalf of the institutions. Libraries felt pressure to use the systems that were in place and many found it difficult to justify paying membership and purchasing external preservation storage with DPN.

8. Because DPN included 5TB of “free” storage with an annual deposit agreement, members thought about depositing in 5TB increments. Institutions who deposited into DPN would limit themselves to depositing within the 5TB per year allocation. Given emerging campus storage options and concerns about where large investments for storage should be made, DPN members focused on this “free” storage rather than on **the large deposits** that were assumed in the business model.
9. Early in DPN’s development, the infrastructure to build DPN was managed by the nodes. This was effective in ensuring that each had a stake in DPN’s development, but the lack of a clear, central vision for the technology infrastructure led to a prolonged period of development. Cost for development at the nodes ran significantly higher than expected, and some of these investments yielded no usable solutions that were ever deployed into production. At least one node involved in early development never committed to coming online for production service, despite receiving DPN funds.
10. DPN was made up of existing repositories that served as the nodes. These **nodes were trusted partners, but DPN and some of the nodes failed to articulate a distinct set of services that did not compete with each other**. The original vision was for these nodes to charge DPN only the marginal costs for DPN services and planned to offer value-added services to DPN members for additional revenue. This was not a realistic expectation, because it would have required existing nodes to substantially alter their service models with some financial risk to their own organizations.
11. While the nodes served as partners, with technology staff at Chronopolis and HathiTrust taking ad hoc leadership roles until full time DPN staff could be hired, some also eventually offered repository services that looked like DPN services to new customers - essentially offering a competing service to DPN. The Texas Preservation Node and Chronopolis established a relationship to offer services that would provide the same protections to content as a deposit into DPN would - but without the DPN membership. While APTrust initially was limiting deposits into their service of 10TB, over time that limit was removed. The fixed overhead cost needed to support node operations at startup was not significantly renegotiated during operation and was tiered assuming an increasing volume of deposits.
12. The business model included the establishment of an **endowment** to support the long-term preservation of deposited content. This was seriously explored and options for this were examined, but with large initial startup costs and declining membership dollars, there was not enough money to invest after covering the overhead (salaries, benefits, and node expenses) required for operations.
13. **Membership fell off** after the first few years. There was a steady decline in membership after the initial three-year commitment. Members began to see DPN as a storage solution rather than as an organization pursuing solutions for long-term digital preservation. Members decided not to renew for a variety of factors, including: they were using campus infrastructure; they did not have a good workflow and were not depositing; they were exploring other solutions for preservation; they were not fully engaged; etc.

There was an unexpected, precipitous drop in membership in the renewal period for 2018-19 which made the organization financially unsustainable.

14. Various options were explored for making changes to make the organization financially sustainable, but upon review, it was determined that there was **not enough time to pivot**, or even to develop a fully vetted plan that might attract interim external funding.

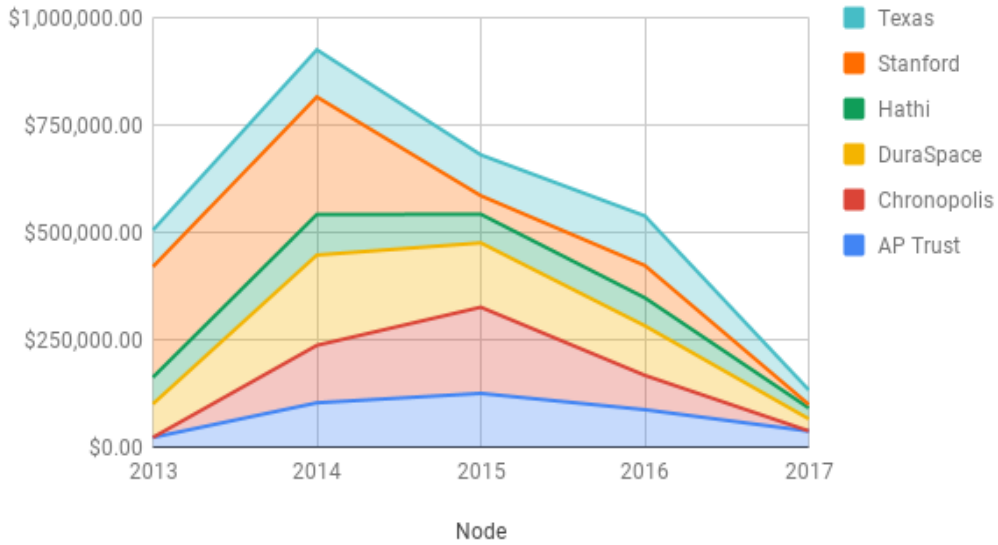
Lessons Learned

1. Realistic and adaptable financial modeling was needed. The model placed too much reliance on potential deposits and payments.
2. Product time-to-market was slow at the same time that member service needs changed rapidly
3. Development with distributed team members proved difficult and costly; central technical leadership would have been valuable earlier in the process.
4. Coupling storage with membership did not incentivize large deposits
5. More DPN involvement with services for members and a focus on member engagement was needed. A focus on member governance should have been sought from the beginning.
6. Policies and service offerings were not agile and did not track quickly enough on changing needs
7. Increased transparency in all directions among all partners including DPN Central staff, the Nodes, and Duraspace, would have improved communication and trust as the network developed.
8. Selection and recruitment of a board that is the correct fit for the organization are essential. The board should be engaged in the mission and program of the organization.

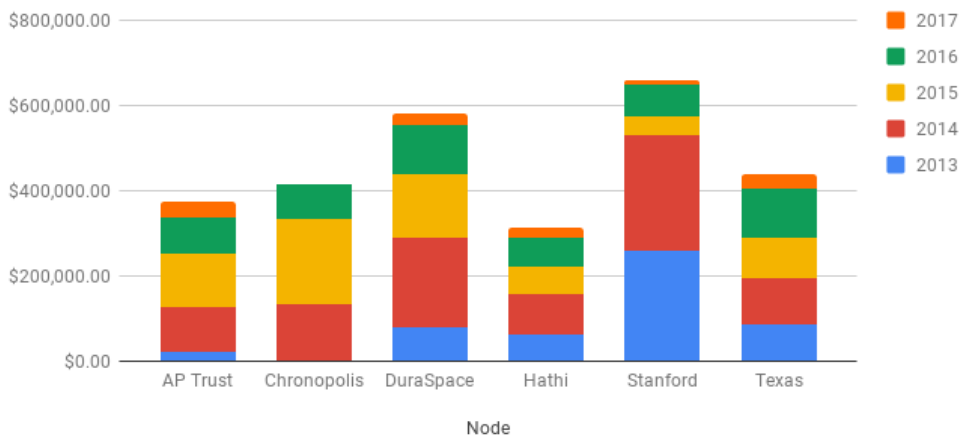
Appendices

Appendix A: Development Costs

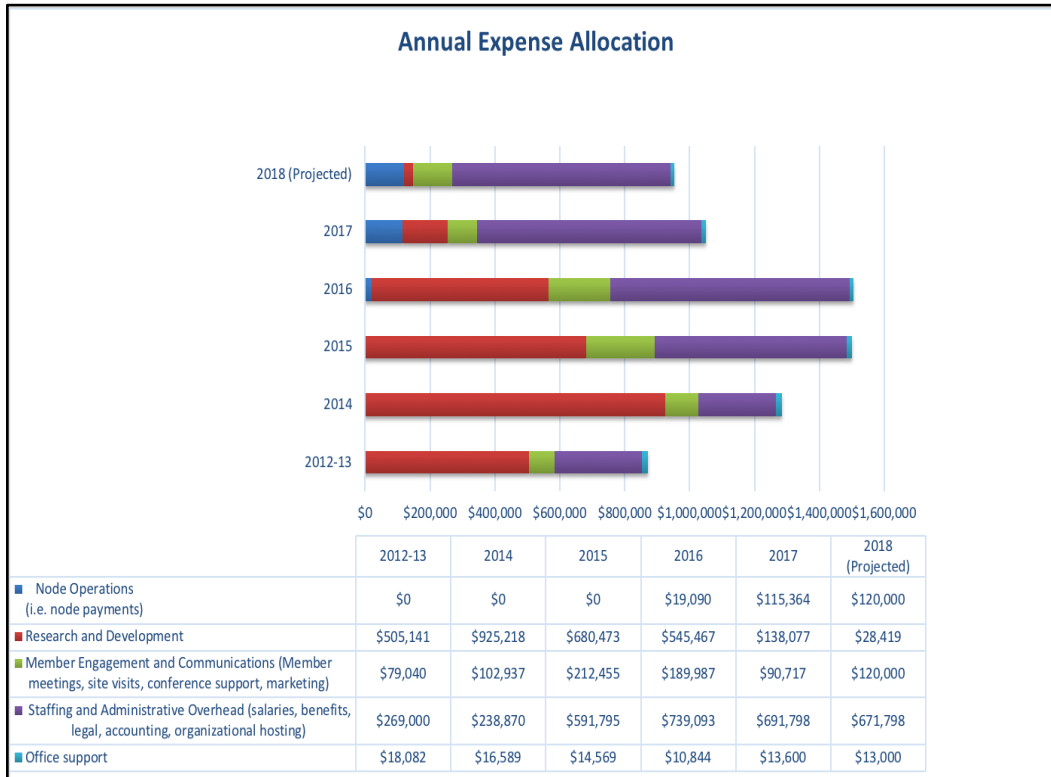
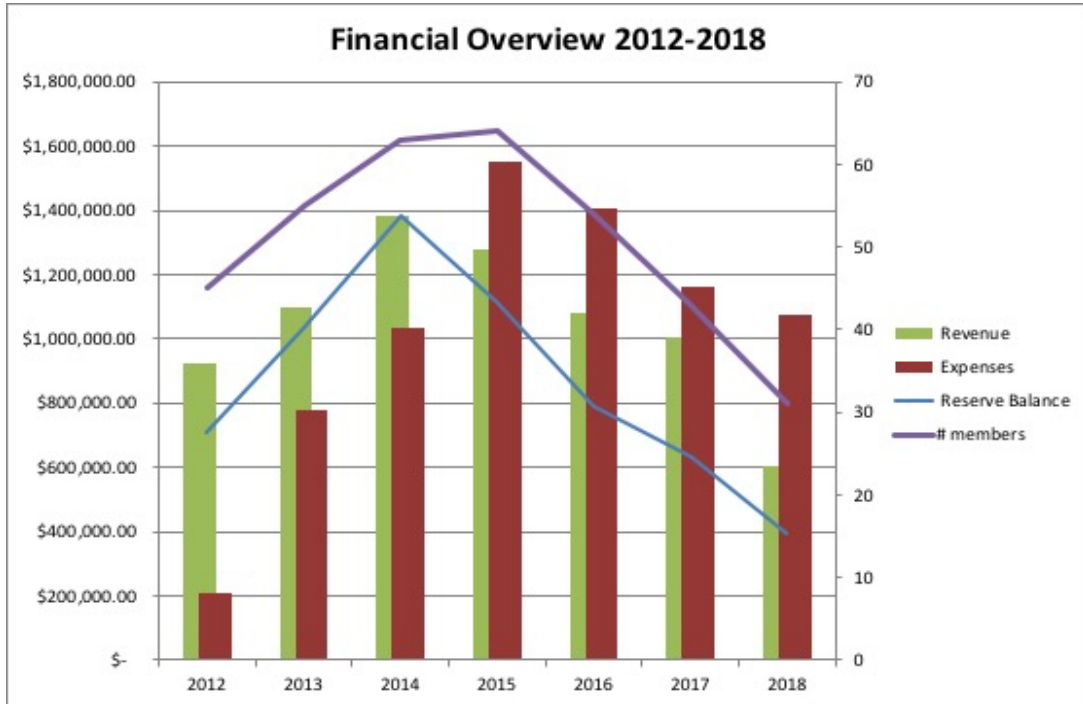
Total Expenditure by Year - Development



Total Expenditure by Node - Development

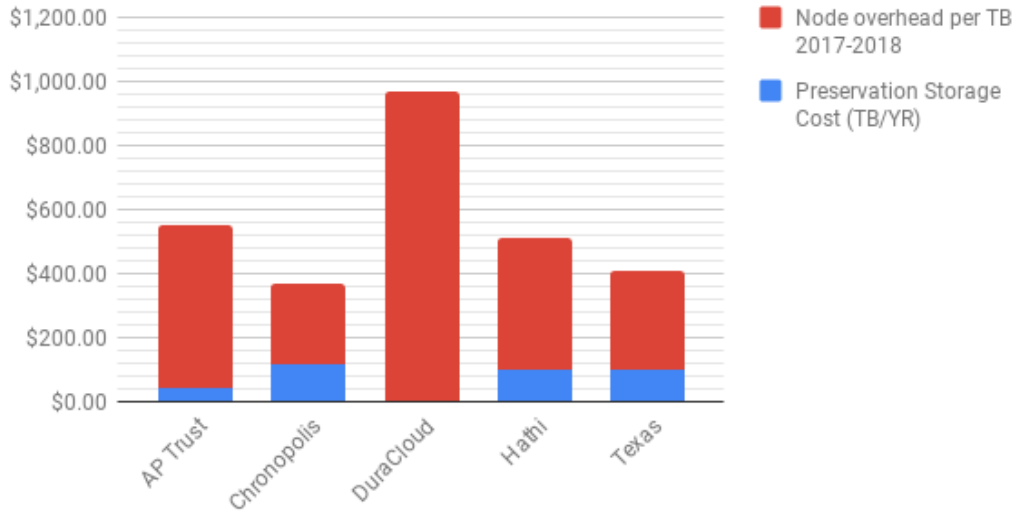


Appendix B: Financial Trends

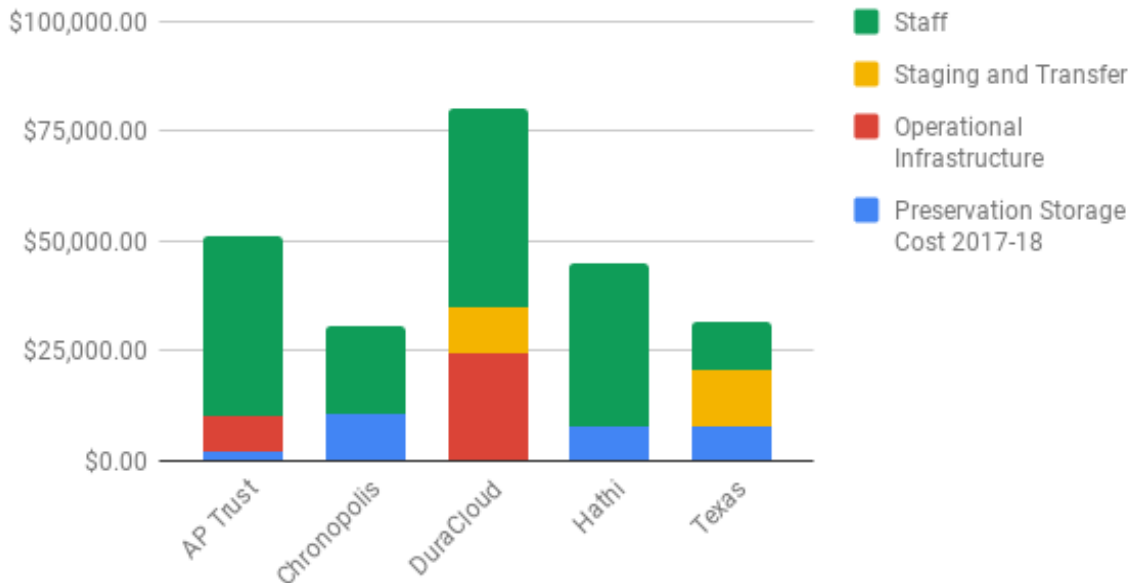


Appendix C: Operational and Storage Costs

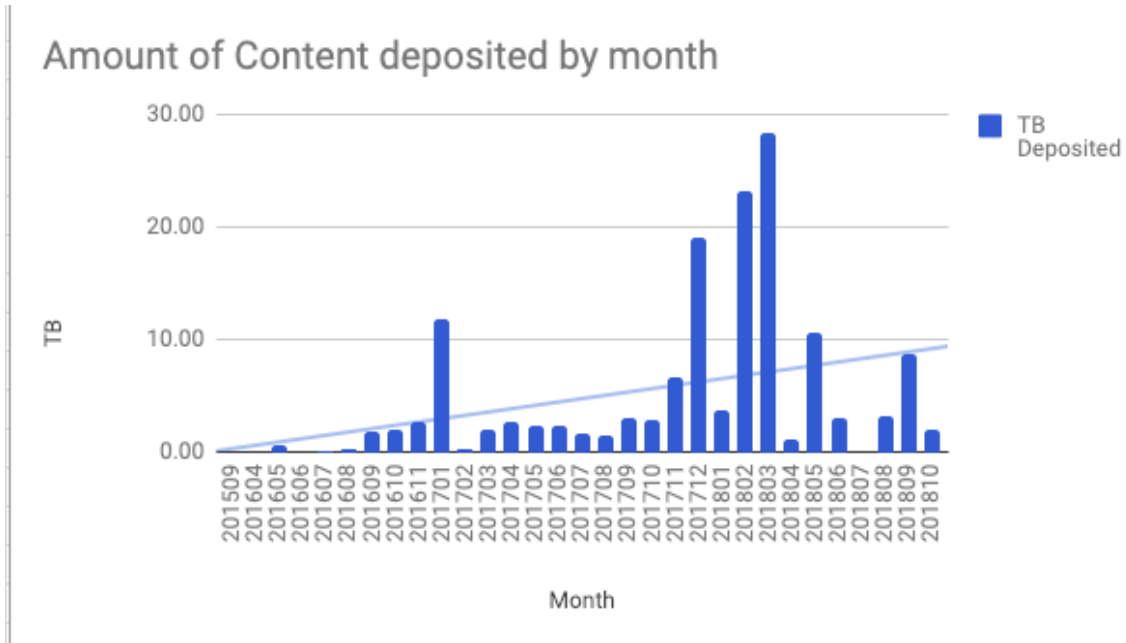
Storage & Overhead Costs (per TB) 2017-2018



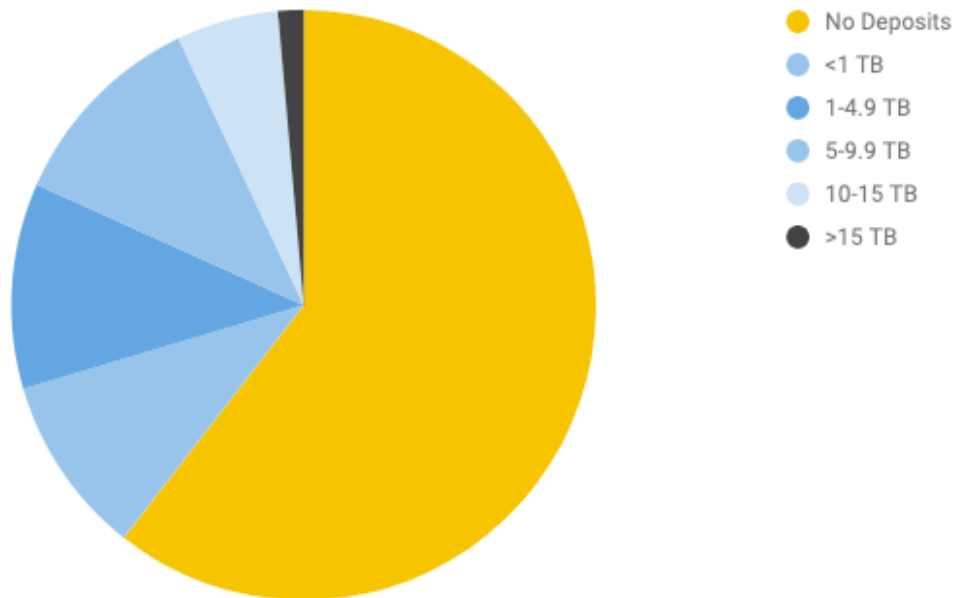
2017-2018 Node Costs (non-development)



Appendix D: Member Content Deposits



Member Deposit Totals (2015-2018)



Appendix E: Technical & Membership Timeline

2012-2015

- Inception
- Vision
- Specification
- Development
- Implementation
- Deposit and Ingest testing
 - Early Testing Institutions Identified
 - U Kansas, Ohio State, Emory, SUNY Buffalo, Yale, UCLA, Dryad, UTenn Knoxville, U Iowa, U Florida, Northwestern, UCSD

2016

- Production Services in place
 - **Ingest Nodes Operational**
 - AP Trust
 - DuraCloud Vault (DuraCloud & Chronopolis)
 - **Replication Nodes Operational**
 - AP Trust
 - Chronopolis
 - Hathi Trust
 - Texas Preservation Node
- Heavy Users Peer-to-Peer Investigation
- AVP contracted to do an environmental scan and to develop a curriculum for teaching a group for how to develop a digital preservation workflow.

2017

- Production services were fully operational but underutilized. Most deposits were made at the very end of the year creating a log jam of content and pressure on infrastructure.

2018

- Production services fully operational but underutilized
- EXANode Development & Acceptance

Appendix F: Member Snapshot 2018

<p>Current Members:</p> <ul style="list-style-type: none"> • 31 members <p>Retention/Renewal of Members:</p> <ul style="list-style-type: none"> • 33 members canceled membership since inception (12 canceled in 2018) <p>Member Satisfaction:</p> <ul style="list-style-type: none"> • Survey respondents (18 out of 31 members) report being generally satisfied with the current DPN services. Four of the 18 respondents indicated that they were unsatisfied or that DPN services need improvement. 	<p>Member Deposits:</p> <ul style="list-style-type: none"> • 26 members have deposited content • Of those 26, only 20 remain current members • 11 current members still have yet to deposit content into the DPN network. That currently represents 35% of the network. • Of the 33 members who have canceled membership, 25 of them never made a deposit.
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Comments from the Members - Summer 2018 Member Survey

- A wider array of options/costs for different needs. More out-of-the-box tools for integration with common repository platforms.
- By providing services that reduce work or other resource needs for the depositing institution. For example, providing an access platform as part of DPN or to use in conjunction with DPN has the potential to reduce the member's local labor and infrastructure costs.
- Value as DPN moves from establishing itself and building out infrastructure to becoming an ongoing service. DPN appears expensive for the amount of data we deposit.
- Need more pathways to deposit, need the ability to interact/improve content once deposited, more flexible business model (tiered or modular services).
- finalize the reporting framework for depositors - ensure member agreements are up to date
- The current service is not useful to our organization because it is dark, does not provide an interface to retrieve deposited data and it does not integrate at all with our repository. It is too cumbersome to use and impractical.
- DPN needs a Dashboard displaying real-time information about the location (what DPN nodes?) and health (when last digest verification?) of deposited content
- I think DPN has done a fabulous job in raising the awareness of the need for robust digital preservation and in creating a reliable, comprehensive preservation option.

- DPN needs to Re-address the value proposition questions. The service works as advertised, but people struggle to understand the value.
- DPN needs an easier-to-use deposit and reporting tools. Provide less costly options for both large data (such as the Exanode option) and smaller users (e.g. consortial option).
- I do worry about DPN member pricing and sustainability: While my management is happy with DPN now while our budget is stable, I do worry how that perception will change if we have another terrible budget year in the near future. DPN is important to us, but I don't think it is as of yet indispensable to our senior management. As such, the best service that DPN can provide is to ensure competitive pricing for subscribers and continue to expand its subscriber base. In short, sustainability is the best service that DPN can provide us.
- DPN needs to engage with the members more – there is no voice for members who are doing the digital preservation work at the member institutions in DPN governance. This is a problem. The Board is more of a figure-head board and does not work in daily operations of digital preservation. If the Board was more active, they would be working to retain membership and engaging with the community about needs. Instead, the Board appears to be more passive.
- APTTrust is a better option for us. After completing a review of services, we get more for our money with APTTrust. The lack of ability to access our content after it is deposited is a challenge for our workflows. In our opinion, DPN should have made changes to its service model and corresponding membership model years ago. We think at this point, it may be too little, too late. We do not need the deposit guarantee – we don't think that far in the future and it is not a selling point at my institution.
- I am very pleased with the Exanode option and the possibility for future less expensive storage options at DPN. Two copies of my data, geographically distributed is enough for me, and with dark preservation, it does not matter to me if it is spinning disk or tape.