

# Creating Trust Relationships for Distributed Digital Preservation Federations

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## Abstract

The authors outline a model for digital preservation federation based upon several existing models including the U.S. Federal Reserve Bank regional governance model and its similarities to successful large-scale redundant internet networks. In addition other trust models will be examined including Maister, Green, and Galford (2000), Holland and Lockett (1998), and Ring and Van de Ven (1994). These models provide key frameworks for understanding how trust can be enabled among federated but independent institutions.

## Introduction

As more research, educational, and cultural institutions come to realize the enormity and complexity of work required to store, preserve, and curate large amounts of their unique digital information, many will turn to establishing cooperative partnerships for leveraging existing mass-storage capacity or utilizing 3rd party data curation service providers to help satisfy their needs for a redundant and secure digital preservation system. The concept of trust and its manifestation between institutions as an essential element in designing digital preservation systems – both technical and organizational – is critical and appears in the organizational level needs of the CRL/NARA-RLG Trustworthy Repositories Audit and Certification (TRAC): Criteria and Checklist. Trust can be defined simply as “relying upon or placing confidence in someone or something...” (www.dictionary.com). With regard to preservation in digital libraries and archives, trust means that we rely upon the organizations or institutions maintaining the digital library or archives to sustain the information deposited in it, and that this information remains authentic, reliable, and unchanged over time and across technologies. We trust that the institutional actions taken upon the digital library and the content held can be

trusted to serve these goals. To achieve this, as we look at partner institutions who are participating in preserving our own institution’s digital content, we are seeking to answer whether or not their actions with our material are trustworthy. Trust is always an underlying, critical factor impacting the success or failure of inter-institutional relationships. The concept of trust is imbued in everything we do as digital library and archives professionals, especially in an inter-institutional, cooperative setting.

Increasingly, federations of institutions and organizations are being formed to devise strategies and systems to preserve digital information. The choice of the word “federations” is significant because it aptly describes what these institutions are doing. “Federation” can be defined as “people, societies, unions, states etc. joined together for a common purpose.” “...a federated body formed by a number of nations, states, societies, unions, etc., each retaining control of its own internal affairs.” (www.dictionary.com). According to these definitions, a federation is unique in that the individual institutions comprising it continue to “retain control of its own internal affairs,” while at the same time they are coming together to solve a common need. The phrase “distributed digital preservation federations” is being used increasingly to describe cooperatives of geographically-dispersed institutions who are banding together to form solutions to the digital preservation problem. Identifying and analyzing successful federation models as well as human practices that foster inter-institutional trust development are salient to the work of building distributed digital preservation federations.

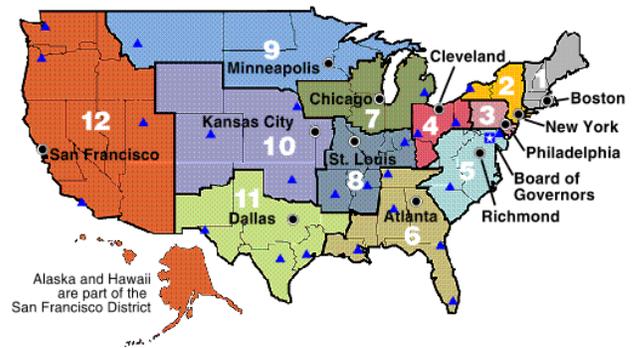
Existing demonstrations of cooperative trust as well as literature on trust relationships offer much to the international digital preservation community. One successful model – the U.S. Federal Reserve Bank (Fed) regional governance (trust federation) model – stands as an exemplar for centralized authority while providing for

distributed independent organizational governance; a key concept for any digital preservation federation. The Fed has many similarities to large-scale redundant internet networks and provides key elements for sustainability of a federated organization of independent agents. Inside a cooperative, inter-organizational model of trust, there are independent institutions and the people they employ that communicate, interact, and make decisions. The literature on organizational trust can illuminate the institutional qualities its people must foster to develop successful trust relationships. Therefore, we will explore the governance framework of the U.S. Federal Reserve Bank system as well as the trust models identified by Maister, Green, and Galford (2000), Holland and Lockett (1998), and Ring and Van de Ven (1994), and which apply to the dynamics of trust and trust-building between and among separate governing institutions, and adapt them to the distributed digital preservation federation context.

### Concepts, Models, and Frameworks for Trust

Within a trust model such as that of the U.S. Federal Reserve System (central banking) model posited in this paper, people, organizations, and the inter-institutional federations between them must have a formal mandate for “trust.” This type of formalized trust has been previously identified from both a contractual (Berman et. al.), evidence based methodology (Ross and McHugh), and organizational structure analysis (McDonald and Walters, 2007). In order for this trust model to succeed when applied to coordinated or federated digital preservation organizations, each autonomous entity must receive adequate preservation services while retaining appropriate autonomy for its primary institutional organization. The authors will delve further into examining what institutional and personal characteristics, principles, and building blocks must be present to foster and sustain trust in an inter-institutional model such as digital preservation federations. They will describe and discuss the dynamics of such a model and principles for building strong organizational relationships while describing the stages and key elements involved in establishing a long-term federated trust.

**U.S. Federal Reserve System.** The U.S Federal Reserve System is composed of twelve Federal Reserve Districts (see Figure 1), each of which has a Reserve Bank. The Federal Reserve Banks operate under the general supervision of the Federal Reserve Board of Governors which is located in the District of Columbia. While each district generates its own income from interest earned on both government securities and priced services for financial institutions, no district can operate for a profit. All profits are returned to the U.S. Treasury thus enabling a symbiotic relationship between the individual districts and its centralized governance body, the Board of Governors (Grey, 2002).



**Figure 1:** Map of the U.S. Federal Reserve Districts.

While this framework is somewhat artificial due to the restraints imposed upon it by the U.S. Legislative Branch, it does have one key feature that was embedded in its creation and that is the one of regional self-governance. After the failure of the 1<sup>st</sup> and 2<sup>nd</sup> Banks of the United States, the U.S. Legislative Branch wanted to build an entity that was not wholly controlled by the banking industry but that could affect central control over the economy in order to prevent disastrous short-term financial failures. The Federal Reserve Act of 1913 authored by Congressmen Glass and Owen did just that by creating a system that represented the interests, regionally of the banks that it regulates, of the United States by creating a large system of regional banks (eventually twelve-with several branches in some districts) which would have control over a central economy and yet have representation from every banking region of the United States (Cornell LII, 2008).

These districts each have their own governance based in a board of directors which is divided into three classes for representation including Class A, Class B, and Class C directors. Class A and Class B directors are elected by the regional banks of the individual Federal Reserve District while Class C directors are appointed by the System Board of Governor’s in DC. Thus a distributed system that meets the needs of local banks while implementing central stability from its System Board of Governors. When the system was created it was widely known that one of the main reasons for the failures of the 1<sup>st</sup> and 2<sup>nd</sup> Banks of the United States was that the banks were located in close proximity to the U.S. Congress and thus could easily be manipulated for political reasons. By creating a system that had both a central authority as well as regional autonomy the U.S. Congress enabled a sustainability model that is inherent in many areas of current society as derived from other large-scale autonomous systems such as that of the commercial Internet.

If we adapt this model to a distributed digital preservation bank or long-term data bank we see that for reasons of scale it will be necessary to have national and international partnerships; however, in order to retain digital works which have regional and local significance, a strong regional cooperative is needed. Both the MetaArchive Cooperative as well as other regional cooperatives such as the Alabama Digital Preservation Network (<http://www.adpn.org>) and the Committee on Institutional Cooperation's (CIC) HathiTrust (<http://uits.iu.edu/page/awac>) meet this criterion. While both the MetaArchive and the HathiTrust are actively building national and international alliances, it is the local and regional selection of content that will build strong preservation nodes over time. This in effect will give our long-term preservation partnerships regional self-governance while enabling trusted relationships for shared data curation for expertise and scale that will ensure long-term sustainability for our most precious record of knowledge.

**Holland and Lockett.** In the first model examined here for transactional based trust relationships we have identified one set forth by Holland and Lockett which looks at virtual organizational models. The prime motivator in this model is the idea of business and commerce being motivated by many complex partnerships in the supply chain in order to conduct business at a global scale. Much like the types of international trust relationships that digital preservation cooperatives seek, this virtual environment is built upon indicators of trust. In Figure 2 we see the trust antecedents for a collaborative federation with mapping to the organizational and individual behavioral elements and their outcomes. This mapping is typical of many non-profit virtual organizations but in this case uses communication feedback from the NARA/RLG Trusted Repository Audit Checklist and the DRAMBORA framework for trusted repositories for indicators of trust certitude.

Holland and Lockett devise five hypotheses which will be telling in the long-run as to how effective virtual organizations can be in managing national and international preservation efforts. These hypotheses are as follows (Holland and Lockett, 1998):

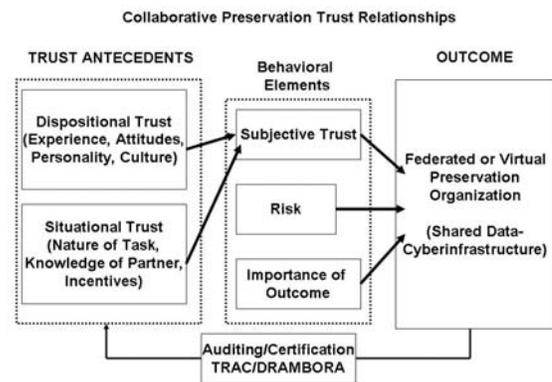
*Hypothesis 1: Virtual organizations will develop quicker and easier where the level of subjective trust between the different economic partners is high.*

*Hypothesis 2: The importance of subjective trust in determining the success of virtual organizations is contingent on the risk of failure and the importance of the outcome.*

*Hypothesis 3. Shared information systems amongst economic partners involved in some form of virtual organization will serve to speed up the trust/ distrust development process.*

*Hypothesis 4. International differences in dispositional trust will become less important than situational context in determining the level of subjective trust as shared information systems enable the free flow of performance information between separately owned economic partners.*

*Hypothesis 5: In business markets, virtual organizations will be characterized by long-term relationships and stability rather than transient relationships to support unique projects or electronic markets.*



**Figure 2:** Adapted from Holland and Lockett Model as diagrammed for digital preservation federations.

**Ring and Van de Ven.** This early (1994) model is designed to examine cooperative inter-organizational relationships (IORs) and the frameworks they utilize in formal, legal, and informal social-psychological processes when negotiating and executing their business activities. Ring and Van de Ven further focus upon and explore how and why cooperative IORs emerge, evolve, and dissolve. They assert that their findings enlighten our understanding of the transactional cost economics of business being conducted through cooperative IORs as well as other aspects of business relationship development. Their modeling can help in understanding the characteristics of digital preservation federations' lifecycle stages as these efforts are initiated, ascend, and mature.

Some of the key relational phenomena Ring and Van de Ven target for study involve the balance between certain relationship parameters. Among these are: positive versus negative framing of a situation between partners; personal versus business role relationships that drive the IOR; and psychological contracts (a compatible perspective that is shared between two parties, and therefore, a positive "connection" forms between them) versus formal, documented contractual agreements. They also note that the length of time an IOR continues versus the length of

time the original persons are involved dictates when informal processes become formalized. It is this balance between formal and informal, or the lack thereof, that are indicative of successful (balanced) or failing (imbalanced) cooperative inter-organizational relationships. Where the NARA/RLG Trusted Repository Audit Checklist assists with documenting and formalizing trust relationships (NARA-RLG, 2007), the work of Ring and Van de Ven supplements our understanding by illuminating the dialectical relationship they espouse between formal and informal trust markers.

Much as Holland and Lockett did later in 1998, Ring and Van de Ven developed a seven-proposition model that identifies the characteristics of IOR initiation, growth, and dissolution:

*Proposition 1: Congruent sense making among parties increases the likelihood of concluding formal negotiations to a cooperative IOR.*

*Proposition 2: Congruent psychological contracts among parties increases the likelihood of establishing formal commitments to a cooperative IOR.*

*Proposition 3: If the individuals assigned to a cooperative IOR do not change, personal relationships increasingly supplement role relationships as a cooperative IOR develops over time.*

*Proposition 4: Informal psychological contracts increasingly compensate or substitute for formal contractual safeguards as reliance on trust among parties increases over time.*

*Proposition 5: When the temporal duration of inter-organizational relationships is expected to exceed the tenure of agents, informal understandings and commitments will be formalized.*

*Proposition 6: As the temporal duration of a cooperative IOR increases, the likelihood decreases that parties will terminate the relationship when a breach of commitments occurs.*

*Proposition 7: When significant imbalances between formal and informal processes arise in repetitive sequences of negotiation, commitment, and execution stages over time, the likelihood of dissolving the cooperative IOR increases.*

## **Dynamics of Trust**

While international, national, and regional frameworks and models need to be pursued, institutions also need to grow their abilities in developing trust relationships between one another. In order to advance these relationships, we need to examine the qualities and characteristics of trust relationships within the context of organizational learning

and behavior. Authors Maister, Green, and Galford explore this in the book, *"The Trusted Advisor"* (2000), which can be adapted and applied to building successful models for trust relationships in distributed digital preservation federations. While the authors focus on professional services personnel acting in the role of advisors to companies – the advisor / client relationship – they articulate useful models of trust development, provide many insights based on their experiences as organizational consultants, and identify desirable organizational qualities for successful inter-institutional relationships, such as those we find in distributed digital preservation federations. Their work will be examined in the following sections and applied in a cursory way to the early experiences in federation-building for distributed digital preservation.

**Trust and the Individual.** Perhaps the most major insight offered by Maister, Green and Galford is that institutional trust isn't institutional at all. Trust is built between individuals (working for the institution); therefore people in institutions grow trust between them, and then bring their institutions into partnerships based on that trusted relationship. To go forward, there must be a satisfactory level of assurance that each institution will perform their roles and responsibilities for the other. Trust is built organically and based upon the experiences each institution has with the other. This is stated by our trust experts Maister, Green, and Galford as, "trust results from accumulated experiences, over time." (p.23). Thus these observations, known in aggregate as institutional trust, take on human qualities because it is established and maintained by people. It is both rational and emotional, as people are. The emotional side is something we must pay close attention to if trust relationships are to flourish. For instance, we value trusted colleagues when they comprehend, support, and demonstrate a dedication to achieving objectives that are complimentary to our own institution's objectives. Colleagues may not always agree and they may even challenge our viewpoints. However, they do so with care, and maintain a concerted sense of achieving the shared objectives. Therefore, we trust their motives and lines of questioning. In this scenario, our emotional self initiates and we ask ourselves questions like:

- Does this colleague understand me, or is she pushing her own agenda?
- Is she helping me think through a problem, or is she just trying to substitute my thinking for hers?
- Does she have my interests at heart, or her own? Is she on my side?
- Am I comfortable with her style, or is she overbearing and domineering?

- Is she giving me new perspectives to consider, and is she doing it in a way that I'm comfortable with?

These are examples of the internal questions we ask ourselves as we assess and evaluate whether or not a colleague – and by extension, her institution – can be trusted. If the answer to many of these questions are “no,” then we conclude that the colleague does not share our objectives and viewpoints. We immediately question her motives and ultimate goal. Asking ourselves, do we trust her? Can we trust her words and actions? The decisions we make about individuals with whom we enter into business relationships is extremely personal and this process applies to the world of building distributed digital preservation federations as well.

**Establishing Institutional Trust.** With trust being a human-based rational and emotional process, as well as a process of accumulation and growth, one can conclude that trust relationships are a “two-way street.” Trust is fundamentally about assessing and managing the risk perceived by each institution entering into a relationship. In other words, “trust entails risk” and is thus one of the components of any trusted federation (p.24). Any partner in a trust relationship can choose to either follow through on the agreed upon actions, or do something different. However, because of the trust relationship it is most likely the partners won't do something different. (p.24). This is due to the nature of trust relationships where the institutions involved both participate (i.e. “get”) as well as reciprocate (i.e. “give”) in the relationship. Neither wants to upset the balance, otherwise the equation falters and the collaboration is no longer of benefit.

Maister, Green and Galford, posit that there exists a “trust equation” expressed as:

$$\text{Credibility} + \text{Reliability} + \text{Intimacy} / \text{Self-Orientation} = \text{Trustworthiness}$$

These four primary components bear examination as we attempt to establish successful and long-lasting distributed digital preservation federations.

**Credibility.** Both credibility and reliability are the most tangible of the four components. Credibility comes from the mastery of our professional body of knowledge and how we communicate it. Therefore, credibility has both rational and emotional elements. Maister, Green, and Galford state that credibility is content expertise plus “presence,” referring to how we look, act, react, and talk about our content.” It depends not only on the substantive reality of the advisor's expertise, but also on the *experience* of the person doing the perceiving.” (p.71). This relationship illustrates the “two-way street” paradigm of

trust relationships. To build credibility, it is not only about expertise; it is about how that expertise is communicated and then perceived by the person receiving it. Credibility is about words and language, including non-verbal language.

**Reliability.** If credibility is about the use of language to communicate expertise, then reliability is about the actions taken to fulfill a promise or intention that was communicated. It is about “the repeated experience of links between promises and action” (p.74) or “of expectations fulfilled.” (p.75). Creating opportunities to demonstrate reliability to prospective partners is best done “by making promises, explicit or implicit, and then delivering on them” (p.75). Here too with reliability, there are rational and emotional aspects. The emotional aspects relate to doing things in ways that our partners are familiar with and prefer. Therefore, our own institution's culture needs to support learning about our partners with whom we conduct business, their preferred ways of “doing business,” and then deliver on our promised roles and responsibilities in ways they are accustomed. As new federations of digital preservation activity arise, we must recognize that reliable, dependable behavior by our institutions may not be perceived as such by our partners. We must understand this and learn how they perceive and measure reliability in a partner's actions, then set out to behave in recognizably dependable ways.

**Intimacy.** Intimacy and self-orientation are the more elusive of the four trust components. Intimacy refers to our emotional response to words and actions. It is about our intuitions in regards to who we are interacting with and whether or not we are comfortable in this interaction. Describing intimacy, Maister, Green, and Galford offer:

*“People trust those with whom they are willing to talk about difficult agendas (intimacy), and those who demonstrate that they care (low self-orientation).”*  
*“Intimacy is about ‘emotional closeness’ concerning the issues at hand... it is driven by emotional honesty, a willingness to expand the bounds of acceptable topics, while maintaining mutual respect and by respecting boundaries. Greater intimacy means that fewer subjects are barred from discussion.”* (p.77).

In digital preservation partnerships we need to achieve a state where collaborators from different institutions can challenge each other's thinking, take each other to task on comments made, be critical (constructively, of course), and be very honest about difficult matters as they occur. Strong emotions may arise and they need to be communicated, while the others receiving this emotional communication need to be comfortable enough to allow these expressive moments to continue and resolve themselves. In these cases, people only need to convey their thoughts and be validated that they have a certain point of view, as opposed

to changing everything because of that view. Once these experiences occur and everyone accepts what was said (not necessarily agreed to), intimacy develops and people feel that more topics can be discussed and resolved. There will be many lurking, hidden issues to resolve in delicately balanced, broadly-based preservation federations. Increasingly, these federations could be international in their composition. The more intimacy developed between partners means the more they will examine tough issues, discuss, and resolve them, all to the benefit of the federation's operations.

**Self-orientation.** Self-orientation is a critical concept that can make or break the success of any federation. It is about this sense of giving to others that permeates all collaborative work. If an institutional partner feels that another partner is being self-serving and not considering the needs of the other partners, and then their motives are questioned, they are not trusted, and eventually they are marginalized or perhaps even removed from the federation. Maister, Green, and Galford, on self-orientation, state that “there is no greater source of distrust than advisors (i.e. partners) who appear to be more interested in themselves than in trying to be of service to the client (i.e. the other partners)” (p.80). Further, “...any form of preoccupation with our own agenda is focusing on something other than the client (i.e. partners), and it will reduce trust directly” (p.81). Several steps can be taken to build core values into our organizational cultures that value understanding our partner institutions. Some of the inter-personal abilities to be cultivated in preparing a “partner-ready” organizational culture are (pp. 80-81):

- Recognizing that “defining the problem” is the most important activity, as opposed to being the institution that initiates the plan or technique to solve the problem.
- Listening actively to one another, summarize what is being heard from your partners.
- Discussing the motivators behind an issue, not just discussing the issue itself (this requires intimacy).
- Being willing to say “I don’t know” when we truly don’t know (shows authenticity, builds credibility).
- Acknowledging each other’s thoughts and feelings on a given topic.

Focusing on what others are expressing is critical to lowering self-orientation, which supports staying focused on partner needs and, in turn, builds trust in the relationship. If the institutions in your federation truly share the same problem space, and you’ve done the work of selecting partners correctly, then what is good for them will be good for your institution as well.

Maister, Green, and Galford assert that the “trust equation” is not “just so much softness” (p.83), but rather it has real consequences for the economic costs of business relationships. Costs go down if business can be generated with existing clients because trust relationships have been formed. The authors conclude “the cost of developing new-client business is 4 to 7 times higher than the cost of developing the same amount of business from an existing client” (p.84). Similarly, with digital preservation federations the costs of developing new trust relationships is high. Federations like the San Diego Supercomputer Center’s Chronopolis Project and the MetaArchive Cooperative’s MetaArchive of Southern Digital Culture both began by working with partners from previously existing multi-institutional projects, each which had an interest in digital preservation. The major motivations to federate were: 1) the desire to hold down costs (a shared value and scale); and 2) to find partners around which they could build a trust relationship to advance a new, complex preservation federation. This meant finding institutions with whom they had already *invested* in a trust relationship. This was one way of reducing costs, advancing the federation quickly, and with high-quality outcomes. Developing trust relationships costs time, effort, and resources. Models for building them such as the trust equation helps us identify proper modes of conducting our “preservation business” inter-personally and inter-institutionally.

### **Advancing Trust Relationships**

Balancing the components of the trust equation and the inter-personal abilities that have us focusing on our partners’ needs while meeting our own institution’s objectives, may seem counter-intuitive. It feels like an act of faith, trusting that our partners will put our own institution’s objectives in the forefront. To further illustrate how an ascending cycle of trust grows to enable the trust relationship phenomenon, Maister, Green and Galford, identify and describe five stages in the development of trust. They are: 1) Engage; 2) Listen; 3) Frame; 4) Envision; and 5) Commit. Their work focuses not on “solving the problem,” but rather on “building the relationships” that keeps institutions together who will eventually solve the problem.

A cursory understanding of these stages will help us to see their impact on building distributed digital preservation federations. The “Engage” stage establishes that partners have identified an issue worth discussing, and that they are worthy institutions to discuss the matter with, given their adequate desires or expertise regarding digital preservation. Second, is the “Listen” stage, where partners believe they understand one another’s perspectives, experiences, and approaches to digital preservation. This third stage known as “Frame” is when one or more partners

help “crystallize and clarify the many issues involved” (p.87) in the digital preservation problem for another partner. The receiving partner realizes that value is being added by the clarifying partner; hence a significant amount of trust can be developed in this stage. The fourth stage, “Envision,” we are not yet offering solutions to the problem of digital preservation. Instead, this stage is when partners join together and develop options for how the problem may be resolved. This is a visioning period where many approaches are imagined. Together the partners begin to better understand their goals and what is required to meet them. The fifth and last stage is “Commit.” This stage is where the partners understand “in all its rational, emotional, and political complexity, what it will take to achieve the vision, and to find the determination to do what is necessary.” (p.89). Commitment begets action, which is taken by the partners together as a federation to resolve digital preservation issues. Being aware of these trust development stages helps to nurture business relationships that can withstand misunderstandings and differences of opinion to band together resources, imagine new digital preservation approaches, and enact them.

### Conclusions

The successful preservation of valuable digital assets will require the expertise and collaboration of many individuals and institutions, both in the public-sector as well as in the commercial sector. In order for the library, archives, museum, and the broader cultural memory sector to accomplish their goals of long-term preservation for the world’s knowledge, records, and artifacts, it will be necessary to build collaborative partnerships both from the stand point of a regional perspective, as well as from a national, and international perspective.

This paper presents ideas for governance frameworks as well as solid business principles for developing trusted relationships both from the stand point of public and commercial entities. The scale and complexity of the issues that need to be addressed in the preservation community will require this type of self-interested governance and collaboration model in order to succeed. More work is needed to address the question of how we will build these new collaborative organizations. With successful data preservation and access as the ultimate objectives, the implementation of structural mechanisms such as formalized trust agreements as well as business modeling in relation to organizational trust development will provide the means by which we can achieve our long-term goals of preservation, access, and discovery.

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