6. The cost of inaction

Making the case for digitization at Anon University

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Anon University is a hypothetical university representing a conglomeration of organizations with holdings of legacy physical audiovisual media. It exemplifies a universal conundrum that poses a serious threat to the future value derived from content stored on physical audiovisual legacy media. This paper proposes a new model and application for quantifying the financial and intellectual implications of decisions regarding digitization of physical audiovisual media holdings. Cost of inaction (COI) calculates the return on savings of previous investment in collections while recognizing that the window of possible return is limited because audiovisual media degrade or become obsolete. While the subject of this example is a university, the issue is not specific to academic institutions. It manifests in organizations of all types and sizes, including government institutions, corporations, non-profits, museums, media companies and more. Some of the arguments and positioning may differ based on organization size and type, but the core concepts and calculations are the same.

Setting the stage

Staff at the Archives and Special Collections within Anon University (ASCAU) estimate that they hold about 100 000 rare or unique audio and video items which would be deemed preservation-worthy but that have not yet been digitized. Their video holdings consist of media such as VHS, U-matic, one-inch open reel, Mini DV, Betacam SP and Digital Betacam, among other formats. Their audio holdings include instantaneous disc, quarter-inch open reel, audiocassette, DAT and more. Less than 3 percent of their total audiovisual (AV) holdings have been digitized to date. ASCAU's non-digitized holdings are effectively inaccessible in any meaningful way because they are largely undescribed and unplayable in their current state. The backlog of unprocessed materials represents approximately 50 percent of the total holdings. For these materials there is minimal collection-level description, and most do not contain inventories. For the 50 percent of processed AV collections there is no item-level description. Adding to the backlog, acquisitions far outpace the rate of preservation, and the budget for acquisitions is larger than the budget for preservation.

As this type of scenario commonly plays out, there are few requests for access to materials because there is little information published about audiovisual content in the holdings. When requests do come in, each one becomes an immediate preservation project that jumps the prioritization queue, because in almost every case ASCAU is unable to fulfil a request without digitizing materials. There is no ability to play back most of the materials, and it is against policy to play back original recordings for access even in cases where the equipment and expertise available.

The backlogs and limited description leave the employees of ASCAU to depend on varying levels of descriptive annotations (with varying levels of dependability) scribbled on boxes and labels to discern whether or not a particular item is likely to be the subject of the patron's request to deem it worthy of using a portion of the small on-demand digitization budget reserved for such purposes. Once this decision is made it could take weeks to receive the access copy. It is not until this point, when the content is actually accessible, that the

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patron is able to establish whether or not it is indeed related to what she or he was searching for.

While it is easy to bemoan the expectations of a culture that demands instant access and expects everything to be online, it is also the case that the scenario described here would not be deemed as effective or meaningful access by most people. Additionally, access requests are the number-one driver of digitization, but the lack of discoverability in the collections means there are far fewer requests for access to materials than expected.

When such requests for access are received, the materials generally must be outsourced to a digitization vendor unless the formats meet the capabilities of the library's services. In house, there is a small digitization facility for audiocassettes and VHS tapes within the library's preservation department, but there is no permanent staff for digitization, and finding the expertise and funding to do training with graduate students on a regular basis is challenging as well as being a high cost due to inefficiency from frequent turnover and retraining.

There is no programmatic ongoing digitization effort. Most digitization has been funded through grants, although these tend to focus on access-centred projects such as online exhibitions where only a small portion of the budgets goes to digitization.

A shift

In 2013, worries about media longevity appearing in listserv messages, blog posts and conference presentations began to catch the eye of stakeholders in ASCAU's Archives and Preservation Departments. The post that first drew attention was from Richard Wright on the Association of Moving Image Archivists (AMIA) listserv, where he stated: "For video the problem is even sharper: complete disappearance of an (affordable) ability to transfer" (Wright 2013c).

The thought of this possibility caused great alarm, and they searched for additional information to support his claim. On the PrestoCentre website, they found additional statements from Wright on the topic: "75% of the analogue video held in Europe in 2006 will be lost by 2023 when video digitisation will simply have 'ceased to be' " (Wright 2013a). "So that's it: going, going, gone for analogue by 2023" (Wright, 2013b). This spurred further research whereby they discovered the following:

- The International Association of Sound and Audiovisual Archives (IASA) Task Force to Establish Selection Criteria from 2003 reported, "in the mid- to long-term there is a major risk that carrier degradation combined with playback obsolescence will defeat the efforts of archivists" (IASA 2003). A decade had already passed. Where were they on the timeline now?
- The US National Recording Preservation Board 2006 report "Capturing Analog Sound for Digital Preservation" stated, "it is alarming to realize that nearly all recorded sound is in peril of disappearing or becoming inaccessible within a few generations" (NRPB, 2006, p. v).
- A study from the same organization, published in late 2012, reported that:

  > many analog audio recordings must be digitized within the next 15 to 20 years—before sound carrier degradation and the challenges of acquiring and maintaining playback equipment make the success of these efforts too expensive or unattainable.

  They also noted that while this was published in late 2012, it was years in the making, going back to 2009, leaving them wondering whether 15–20 years was more like 10–15 years now (NRPB, 2012, p. 7).

Prompted by their growing concern they looked to organizations such as IASA, the Association for Recorded Sound Collections (ARSC), and AMIA to confer with colleagues. Among experts they found consensus around the prediction that between the present and some time between 2023 and 2028 analogue materials would become inaccessible.

With their newfound knowledge they formed a working group within the university, pulling together stakeholders including archivists, preservation experts, researchers, faculty and information technology staff to focus on the issues surrounding preservation of and access to the AV holdings.

Invigorated, they prepared a bold statement for the upper administration laying out the information about the estimated size of their holdings and the timeline in which they had to act. They also took the opportunity to express the troubled state of access to their AV holdings, proposing it as a warning of what could become permanent if action was not taken. Their main points emphasized:

- the great cultural significance of the collections, highlighting particularly valuable content and examples of how it has been used in important work;
- the valuable public relations and reputation building stemming from acquisitions and holdings;
- the potential damage to ASCAU's good reputation by falling short on its obligation to preserve and make accessible its recordings;

- the potential damage suffered to the staff's good reputation if the significant highlighted materials were permanently lost while in their care;
- the potential perception of irresponsibility implied in acquisitions that outpace and demand greater budgets than preservation and access;
- the potential failure to fulfil ASCAU's mission to provide access for faculty, students, researchers and the public; and
- a call to action to identify, prioritize and digitize priority materials before 2028.

The upper administration took the statement to heart and charged the working group with quantifying the problem. The administration provided the group with a modest budget to conduct a survey of holdings and to report on the findings, along with an estimated budget and timeline for getting this work done.

Feeling the wind at their back, the working group members got to work, and over the course of the next several months conducted a survey of holdings which they used to generate a plan for digitization. Based on their findings they estimated that approximately 65 percent of the undigitized holdings would ultimately be deemed worthy of digitization and preservation, totalling approximately 63 050 items, 60 percent audio and 40 percent video.

Exploring the economics of digitization they discovered that the cost of outsourcing preservation reformatting had decreased approximately 70 percent on average in the past five years. In other words, what would have cost USD 150 in 2009 cost USD 45 in 2013. This provided an impetus to outsource a majority of the work, although they also identified certain materials that they would want to digitize in house. Concerned about keeping the budget as low as possible in order to increase the likelihood of funding, they decided to focus on doing the minimum necessary to ensure the materials were not lost. Items could be catalogued and made accessible in all kinds of ways after 2028, but only if they were digitized prior to that. In order to maintain the option to do anything with the content after 2028 they needed to digitize it. After 2028 there was no option available – the content would be permanently lost. With this in mind they decided to capture a minimal amount of metadata, focusing on information that they would not be able to capture later, as well as any metadata required to be able to responsibly manage the collection of files generated through digitization. They also recognized that they needed to have a reasonably robust centralized digital storage environment. The risk of storing all of the digitized files on unreliable and/or non-centralized storage would be too great.

After a great deal of analysis and planning, their total budget estimate to digitize and store everything by 2028 was USD 9 305 311. This sizable number worried the working group, but they found confidence in their strong arguments, solid planning and well-reasoned budgeting. It was also not an unprecedented number for other types of projects considered a university-wide priority, particularly given that the budget was allocated over 15 years. They would also argue that the university's continued acquisition of materials over the coming years would be well served by this same infrastructure.

In addition to delivering the report, the working group gave a presentation on its proposed plan to upper administration. Despite what were eye-popping numbers at first glance, the group's members entered the meeting with a good deal of hope based on their previous success in garnering support and great enthusiasm about the importance of the project.

During the presentation the upper administration was outwardly stunned by the dollar amount. Questions were asked about whether or not all of the 'priority' materials were truly preservation-worthy, and whether the working group could get the digitization done more cheaply with student labour. The conversation turned to thoughts of monetization and revenue streams, as administrators wondered aloud about everything from licensing content as a way to generate revenue to having vendors digitize the content for free in exchange for offering the vendor exclusive licensing.

Diplomatically, working group members reminded the administration of the complex issues of rights and donor agreements and the challenges that these presented in regard to licensing content. They also raised concerns in a nuanced way about the innate contrast between their mission of providing access and placing the keys to the content solely in the hands of a commercial interest. The administration then turned to thoughts of Anon University being a service provider to other institutions as a way to generate revenue, asking the working group about the feasibility of this. Working group members replied that it was a possibility but that it would take more staff and an increase in annual capacity in order to get their own work done in addition to doing work for others. The budget would have to go up significantly to accommodate these increases, and they admitted that they felt unsure about it as a strategy for recouping any costs beyond those of acting as a service provider.

Frustrated at the seeming lack of good options, the administration brought the meeting to a close, conveying that the bottom line was that it would be irresponsible of

them to expend those funds without a plan for return on investment (ROI). It was a non-starter without identifying ROI. They asked the working group to come up with thoughts on ways to generate revenue and at minimum recoup their investment in the digitization project.

An impasse

The impasse represented in this scenario is one that has presented itself for decades. Archivists and caretakers of collections have been frustrated by what is perceived as short-sighted thinking, and executives and administrators have been frustrated by a perceived inability to face the economic realities. This disconnect has persisted over time with each 'side' digging its heels in further.

As a community, archivists and caretakers have fallen back on arguments centred on potential loss of knowledge and culture, as well as damage to reputation and failure to fulfil institutional missions. While executives and administrators care a great deal about these arguments, at the end of the day they are staring at a budget for which they are responsible, a budget that does not care for non-quantifiable arguments. In rare cases when compelling arguments based on reputation, mission and the currency of knowledge and culture have fallen on the right ears at the right time, they have translated into currency that will fund initiatives. In most cases these arguments alone are not effective in capturing the understanding and wallets of funders.

There is a critical component that is often overlooked in these exchanges and the thinking that surrounds them. This is the *cost of inaction*, or COI. Let us examine what this looks like in the case of Anon University.

A new perspective

At the next working group meeting a realization materialized. The Archives and Special Collections at Anon University were established in 1963, 50 years prior to 2013. The discussions with the administration had treated this effort as if the investments in their holdings would begin with digitization. They had failed to recognize the investment made in these collections going back to 1963.

The Archives and Special Collections were founded with the deposit and acquisition of a large collection, containing approximately 20 000 audiovisual items. Between 1963 and 2013, ASCAU had acquired 80 000 additional audiovisual items. Since 1963 the university had invested in staff, real estate, construction, utilities, specialized temperature and humidity controls, management, administration, moves, rehousing, equipment, supplies, consulting, acquisitions and more to support these collections.

The working group decided to estimate the past investment that the university had placed in its physical audiovisual materials. They explored various methods of deriving this number. One method involved allocating a percentage of the operational and capital budgets between 1963 and 2013 to the audiovisual holdings. Another would estimate an average cost per item per year for each year since ASCAU was established. A final option would estimate audiovisual-specific expenses, such as specific staff or projects. The first method proved to be the most reasonable and they arrived at a number of approximately USD 11 million that Anon University had expended on the AV holdings to date since 1963. In addition to the current holdings, the university was acquiring an average of 1 600 items per year. At this rate of growth, if the university paid an average of USD 2 per item per year (factoring in staffing, facilities, collection management, etc. over that time) the total investment on legacy physical audiovisual items between 1963 and 2028 would be approximately USD 14.5 million.

Based on the consensus that reformatting will be largely impractical or impossible after 15 years, if the university took no action to digitize and provide a basic digital preservation storage environment for these items they would effectively throw that 65-year investment of USD 14.5 million out the window, having received little to no benefit given that the holdings were largely inaccessible during that time. The cost of inaction in this case would result in the loss of 124 000 items in their care *in addition to* USD 14.5 million. This significant portion of the funding expended in the Archives and Special Collections would be deemed fruitless, a wasted cost.

The working group's prior calculations on project cost came to approximately USD 148 per selected item to digitize and provide a basic digital preservation environment through 2028. Expending these funds would effectively result in the saving of this past investment, yielding a return. The USD 14.5 million invested between 1963 and 2028 in the physical audiovisual holdings is allocated over 78 650 items (65 percent of the 124 000 items in holdings by 2028, minus the 3 000 items digitized as of 2013). This mean that the average investment would be approximately USD 184 per item. For each item they spent USD 148 on to digitize and store over the next 15 years, they would recoup USD 184 of past investment, yielding a return of approximately 24 percent through 2028 – a difference of 124 percent compared with losing the USD 184 invested in that item.

Armed with this information members of the working group created detailed financial models based on this concept and took them to the administration. They also reiterated the

concerns around reputation and mission. While the budgets of the administration had not changed and they wanted to dive into details of the financial analysis, they ultimately agreed in concept that the fiscally responsible thing to do was to avoid throwing decades of investment out the window. However the administration wanted options and asked the working group to come up with three scenarios representing digitization of 100 percent, 50 percent and 25 percent of the current estimated 63 050 items, starting in 2015, and to report on the implications of each. The administration asked the group not to consider the growth of the archive and to assume investment would be limited to 63 050 items through 2028.

The working group performed the requested analysis, providing scenarios for digitizing the current preservation-worthy items, and offered the following summary:

	100% Digitized	50% Digitized	25% Digitized
Budget	$10,244,585	$5,427,536	$2,713,990
Content Lost	0	31,525	47,286
Investment Lost	$0	$6,319,610	$9,479,196
Investment Saved	$12,639,300	$6,319,690	$3,160,104

The information was provided to the administration along with supporting arguments regarding the intellectual and reputation implications of each scenario.

Armed with a more robust argument, the administration was inspired to reach out to the president and the board to seek funding for an initiative to digitize their priority holdings.

Although the goal for funding was the original USD 9 305 311, the funding commitment they received was for USD 650 000 per year for five years starting in 2015, with consideration for a funding commitment past the initial five years in 2018.

The cost of inaction calculator

Although this is a hypothetical story, it is clear that incorporating the COI model and analyses into the decision-making process around digitization of legacy physical audiovisual media helps organizations understand the implications and make well-informed choices. Providing objective financial metrics and quantifying the loss of media and content can make the case for taking more immediate action while also helping to avoid a paralysing all-or-nothing mindset by enabling insights into the choices available.

To date there has been no way for organizations to quantify the financial and intellectual cost of inaction in order to supplement traditional arguments and bridge the gaps between caretakers or archivists and executives or administrators.

AVPreserve has recently released the Cost of Inaction Calculator, a free and open web application that enables organizations to analyse and report on the implications of various scenarios representing different levels of action.[1]

The calculator prompts users to enter the following parameters (Fig. 1):

- last year of magnetic media,
- number of objects in collection,
- collection's audio/video percentage,
- investment to date for media,
- annual cost per media item moving forward,
- digitization cost per item,
- year you will start digitizing items,
- annual digitization budget,
- storage service (dictates annual storage cost)
- annual decrease in cost of storage and
- annual increase in cost of digitization.

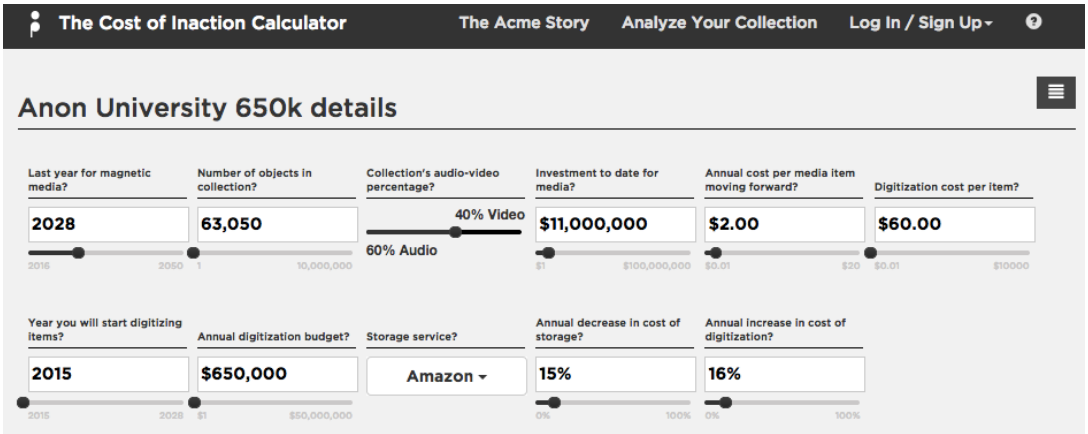


FIGURE 1. Collection parameters for entry.

1 See https://coi.avpreserve.com.

The help menu offers information on how to interpret and adjust these parameters, as well as on the assumptions behind them.

There are two sections where reporting is provided, both in charts as well as tabular data. The first is called the *collection analysis report* and provides results based on the collection details entered by the user as follows:

- year,
- media,
- content saved,
- excess items digitized,
- investment made,
- content lost,
- investment lost,
- investment saved,
- digitization expense,
- storage expense,
- digitization + storage expense,
- investment saved per USD 1 of expense and
- quality of selection.

The data reported show the cumulative progression of implications over time (Fig. 2–3).

The second section is called the *start implications report* (Fig. 4–5) and it answers four primary questions:

1. If I start digitizing in year *x*, how much will I need to spend per year to digitize all items that have not been permanently lost already?

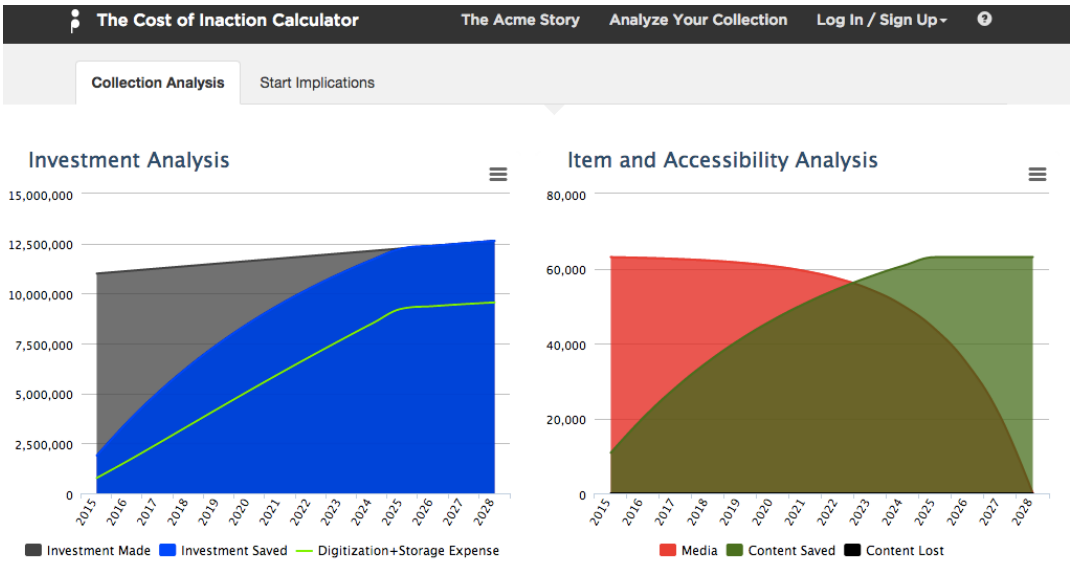
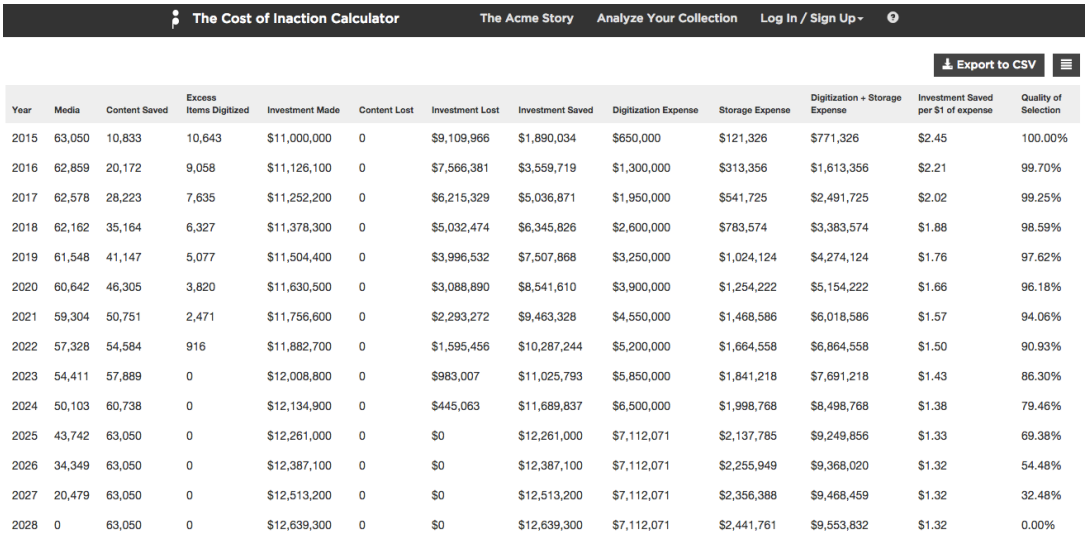


FIGURE 2. Collection analysis charts.



Year	Media	Content Saved	Excess Items Digitized	Investment Made	Content Lost	Investment Lost	Investment Saved	Digitization Expense	Storage Expense	Digitization + Storage Expense	Investment Saved per $1 of expense	Quality of Selection
2015	63,050	10,833	10,643	$11,000,000	0	$9,109,966	$1,890,034	$650,000	$121,326	$771,326	$2.45	100.00%
2016	62,859	20,172	9,058	$11,126,100	0	$7,566,381	$3,559,719	$1,300,000	$313,356	$1,613,356	$2.21	99.70%
2017	62,578	28,223	7,635	$11,252,200	0	$6,215,329	$5,036,871	$1,950,000	$541,725	$2,491,725	$2.02	99.25%
2018	62,162	35,164	6,327	$11,378,300	0	$5,032,474	$6,345,826	$2,600,000	$783,574	$3,383,574	$1.88	98.59%
2019	61,548	41,147	5,077	$11,504,400	0	$3,996,532	$7,507,868	$3,250,000	$1,024,124	$4,274,124	$1.76	97.62%
2020	60,642	46,305	3,820	$11,630,500	0	$3,088,890	$8,541,610	$3,900,000	$1,254,222	$5,154,222	$1.66	96.18%
2021	59,304	50,751	2,471	$11,756,600	0	$2,293,272	$9,463,328	$4,550,000	$1,468,586	$6,018,586	$1.57	94.06%
2022	57,328	54,584	916	$11,882,700	0	$1,595,456	$10,287,244	$5,200,000	$1,664,558	$6,864,558	$1.50	90.93%
2023	54,411	57,889	0	$12,008,800	0	$983,007	$11,025,793	$5,850,000	$1,841,218	$7,691,218	$1.43	86.30%
2024	50,103	60,738	0	$12,134,900	0	$445,063	$11,689,837	$6,500,000	$1,998,768	$8,498,768	$1.38	79.46%
2025	43,742	63,050	0	$12,261,000	0	$0	$12,261,000	$7,112,071	$2,137,785	$9,249,856	$1.33	69.38%
2026	34,349	63,050	0	$12,387,100	0	$0	$12,387,100	$7,112,071	$2,255,949	$9,368,020	$1.32	54.48%
2027	20,479	63,050	0	$12,513,200	0	$0	$12,513,200	$7,112,071	$2,356,388	$9,468,459	$1.32	32.48%
2028	0	63,050	0	$12,639,300	0	$0	$12,639,300	$7,112,071	$2,441,761	$9,553,832	$1.32	0.00%

FIGURE 3. Collection analysis tabular data.

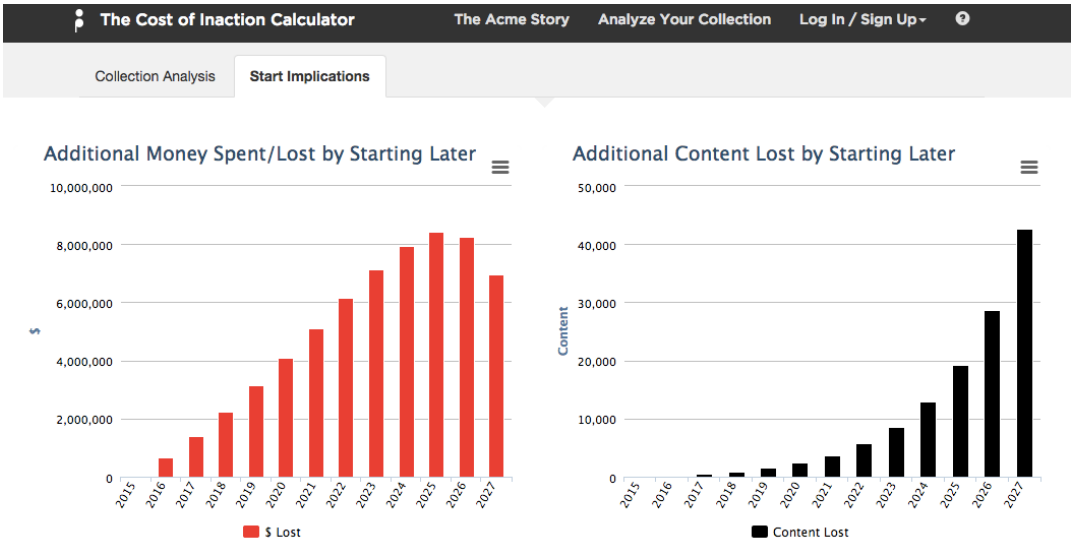
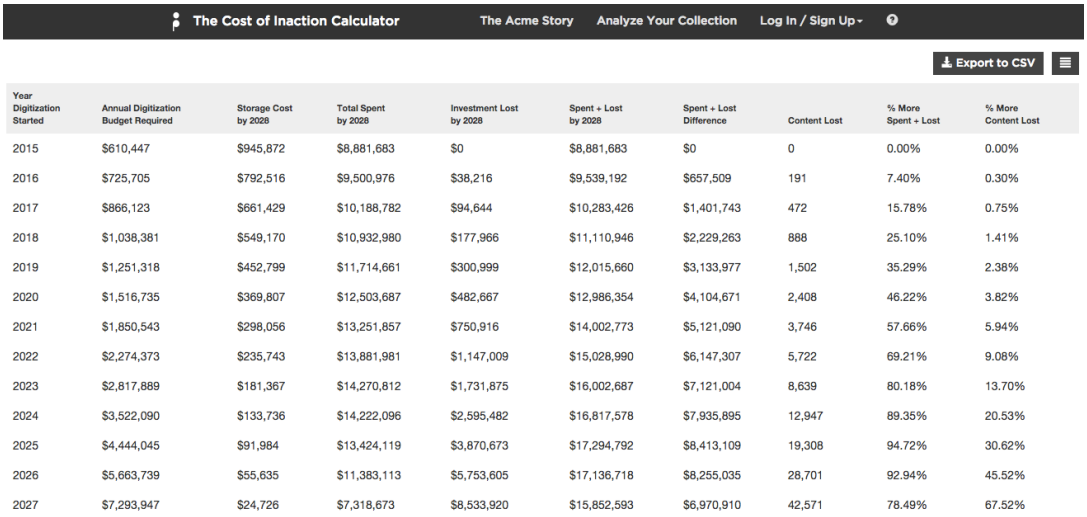


FIGURE 4. Start implications charts.



Year Digitization Started	Annual Digitization Budget Required	Storage Cost by 2028	Total Spent by 2028	Investment Lost by 2028	Spent + Lost by 2028	Spent + Lost Difference	Content Lost	% More Spent + Lost	% More Content Lost
2015	$610,447	$945,872	$8,881,683	$0	$8,881,683	$0	0	0.00%	0.00%
2016	$725,705	$792,516	$9,500,976	$38,216	$9,539,192	$657,509	191	7.40%	0.30%
2017	$866,123	$661,429	$10,188,782	$94,644	$10,283,426	$1,401,743	472	15.78%	0.75%
2018	$1,038,381	$549,170	$10,932,980	$177,966	$11,110,946	$2,229,263	888	25.10%	1.41%
2019	$1,251,318	$452,799	$11,714,661	$300,999	$12,015,660	$3,133,977	1,502	35.29%	2.38%
2020	$1,516,735	$369,807	$12,503,687	$482,667	$12,986,354	$4,104,671	2,408	46.22%	3.82%
2021	$1,850,543	$298,056	$13,251,857	$750,916	$14,002,773	$5,121,090	3,746	57.66%	5.94%
2022	$2,274,373	$235,743	$13,881,981	$1,147,009	$15,028,990	$6,147,307	5,722	69.21%	9.08%
2023	$2,817,889	$181,367	$14,270,812	$1,731,875	$16,002,687	$7,121,004	8,639	80.18%	13.70%
2024	$3,522,090	$133,736	$14,222,096	$2,595,482	$16,817,578	$7,935,895	12,947	89.35%	20.53%
2025	$4,444,045	$91,984	$13,424,119	$3,870,673	$17,294,792	$8,413,109	19,308	94.72%	30.62%
2026	$5,663,739	$55,635	$11,383,113	$5,753,605	$17,136,718	$8,255,035	28,701	92.94%	45.52%
2027	$7,293,947	$24,726	$7,318,673	$8,533,920	$15,852,593	$6,970,910	42,571	78.49%	67.52%

FIGURE 5. Start implications tabular data.

2. If I start digitizing in year *x*, how much more money will I spend than if I start digitizing in year *y*?
3. If I start digitizing in year *x*, how much more investment will I lose than if I start digitizing in year *y*?
4. If I start digitizing in year *x*, how many more items will I lose than if I start digitizing in year *y*?

This report provides results based on a subset of the pertinent collection details provided by the user as follows:

- year digitization started,
- annual digitization budget required,
- total spent by 2028,
- investment lost,
- spent + lost by 2028,
- spent + lost difference,
- content lost,
- percent more spent + lost and
- percent more content lost.

The COI Calculator allows saving of multiple scenarios in order to perform comparative analysis and to come to a better understanding of the implications of different decisions. It also allows exporting of the charts and tabular data as well as sharing links to scenarios.[2]

2 For an Anon University scenario, see https://coi.avpreserve.com/viewcollection/MTMzM0Y1MzQwMzk0 (100% scenario); https://coi.avpreserve.com/viewcollection/MTMxM0Y1MzQwMzk0 (50% scenario); https://coi.avpreserve.com/viewcollection/MTMyM0Y1MzQwMzk0 (25% scenario); https://coi.avpreserve.com/viewcollection/MTMwM0Y1MzQwMzk0 (USD 650 000 scenario).

Bridging the gap

The cost of inaction has been a missing link in the discussion and analysis surrounding the funding of audiovisual digitization and preservation efforts. Recognizing and being able to articulate this concept helps bridge a gap between caretakers and administrators and offers an effective financial metric that is a meaningful addition to traditional arguments based on cultural and intellectual significance. Adding COI to ROI provides a 360-degree perspective, looking both at past investment and the return on savings of that investment with future expense, while recognizing that the window of possible return is limited based on the obsolescence and degradation of audiovisual media. There is a cost of inaction, and every organization should come to an understanding of that cost in the formation of a digitization and preservation strategy in order to help make well-informed decisions. While the scenario painted in this article focuses on a university, this rationale is just as true for all organizations holding collections of physical legacy audiovisual media.

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