

Digital Storytelling

By Ben Davis



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Issues of Preservation and Media Production: New Paradigms for the Digital Age

May 12, 2000, 2:00 p.m. to 5:00 p.m. The West Coast Room, Covel Commons, Sunset Canyons, UCLA.

The goal of the symposium was to foster information exchange and initiate potential collaboration among cultural, educational and business communities on the issues of preservation of media production in the digital age.

Sponsored by Razorfish, Inc. in collaboration with Warner Brothers and the UCLA Department of Theater, Film, and Television

In the spirit of free exchange, the names of those working in the corporate context have been left off the transcripts that follow. Those in academia have been retained.

List of the participants:

1. Robert Rosen, Dean, UCLA School of Theater, Film and Television
2. Elizabeth Stanley, Assistant Executive Director, Director's Guild of America
3. Richard May, Vice President, Technical Operations Warner Brothers
4. Rob Hummel, Executive Vice President, Technicolor, Inc.
5. Ted Gagliano, 20th Century Fox
6. Jan-Christopher Horak, Universal Studios
7. Darrell Hope, Managing Editor, Directors Guild of America Magazine
8. Adina Lerner, Assistant Archivist, The Walt Disney Company
9. Edolfo Leones, Digital Asset Manager, The Walt Disney Company
10. Linda Tadic, Digital Projects Coordinator, Getty Research Institute
11. Steven Swimmer, Manager Web Services, Getty Information Technology Services
12. Sonja Brugger, Mediatrade
13. Paolo Penza, Mediatrade
14. Dawn Cicero, Venice Interactive
15. Kyu Kahn, Manager, Paramount Pictures
16. Grover Crisp, Vice President, Asset Management and Film Restoration, Sony Pictures
17. Garrett Smith, Vice President, Digital Mastering Operations, Paramount Pictures
18. Michael Friend, Director, Academy of Motion Picture Arts and Sciences Film Archive, AMPAS
19. Leon Silverman, Laser Pacific Media Corporation
20. Adrin Nazarian, Special Assistant, California Trade and Commerce Agency
21. Dave Schunelle, THX Division, LucasFilm Ltd.
22. Phil Feiner, Pacific Title
23. Rick Dean, THX Division, LucasFilm Ltd.
24. Anthony Jackson, Digital Asset Manager, Dreamworks
25. Benjamin H. Davis, Senior Scientist, Razorfish, Inc.
26. Charles "Tad" Marburg, Vice President Technical Operations, Warner Brothers,
27. Clarissa Weirick, Vice President, Legal and Business Affairs, New Media, Warner Brothers.
28. Tim Kittleson, Director, UCLA Film and Television Archive
29. Michele V. Cloonan, Chair, UCLA Department of Information Studies
30. Howard Besser, Professor, UCLA Department of Information Studies
31. Richard Muntz, Chair, UCLA Department of Computer Science
32. Robert Winter, Director, UCLA Center for Digital Arts
33. Vwani Roychowdhury, UCLA Department of Electrical Engineering
34. Edward Richmond, UCLA Film and Television Archive
36. Jim Pendleson, UCLA Film and Television Archive
37. Brent Kaviar, Vice President, Post Production Services, New-line Cinema
38. Jody Feiner, New-line Cinema
39. Gregory Lukow, UCLA Film and Television Archive
40. W. Edward Johansen, Southern California Council on Arts and Entertainment

Transcript:

BEN DAVIS: Thank you all for coming. Like a good thriller, you are probably all wondering why we brought you here. I want to let you know something about my new role with Razorfish, Inc.

Razorfish provides strategic and creative technology solutions for businesses and organizations moving with the digital change. We partner with clients to plan, design, and build products and services that shape the way the world perceives and interacts with them. The Science Department at Razorfish is a high level internal group that is concerned with knowledge management and creative expertise building within the company - both for internal management and for the evolving needs of asset management as a digital business practice. We are broadly interested in the practice of imagination, reason, and memory.

My role as Senior Scientist is to integrate projects in internal communications and creative development with external programs in sponsored research, education, and advanced technology. For me this is a kind of knowledge cartography - mapping ideas and skills to good practice.

Today's meeting is an example of the kind of external event that the Science Department is interested in sponsoring -- to bring together a diverse group of thinkers in order to better understand a problem space - in this case the issues around digital asset management and leveraging assets in the film industry - and most importantly what that means to preserving film as a long term integrated business form as well as the premier art form for storytelling. Film is the medium of cultural memory for our time.

This event came out of another project I did with Margaret MacLean, formerly with the Getty Conservation Institute and Stewart Brand of the LongNow Foundation called "Time and Bits: Managing Digital Continuity". That meeting brought together a group that included musician and artist Brian Eno, Wired Magazine editor Kevin Kelly, Internet Archivist Brewster Kaele, inventor Danny Hillis and others to discuss the fragility of digital media and the potential consequences of committing cultural knowledge to that form.

I want to thank those of you attending. You were invited because of the quality of your thinking - your "mindfulness" in understanding film, technology, and time as well as the value of storytelling. If wilderness is the preservation of the world then your "mindfulness" about film might just be the preservation of storytelling.

Thanks also to Warner Brothers, the UCLA Department of Film and TV, and Ed Johansen of the Southern California Council on Art and Technology. I will now turn this over to Robert Rosen, Dean of the School of Theater, Film, and Television at UCLA for his opening remarks.

ROBERT ROSEN: One of the reasons that we thought it was useful to get together, at least in my experience in twenty-five years of working in preservation, was that I have learned more from colleagues than I did any other way. There was a sense of camaraderie and collegiality that crossed institutional boundaries and corporate boundaries. Entities that were competitive in every other way shared a common conviction and commitment around issues of preservation. The notion of getting together periodically, if only to reaffirm a notion that there is a community of interest, is important. It opens up very good and positive ways to work together in the future. This meeting is organized around a notion of sharing - being honest and forthright - and coming out with opinions and views on a number of issues. I would like to frame a possible focus for today.

There's an often-used quote- --that if you don't learn lessons from the mistakes of the past you are condemned to repeat them again in the future. Preserving the first 100 years of film was to a large extent dealing with mistakes that were made in the past 25,50,75--100 years. Often in good faith, often with the best knowledge there was around at the time. But we're picking up the pieces. And if we started and went around the room and made lists of our favorite mistakes, the ones that irk us the most, the ones we feel we can learn lessons from, it would be a very long list. For me, there were four mistakes that loomed very large that might be very relevant today.

The first is the notion of the technological quick fix. I think it's a lesson we learned from the past. And it's hard to believe now, but people here have the memory, that it wasn't very many years ago that people were saying the answer to preserving motion pictures is video! Transferring the two-inch or one-inch video was a good, economical, reliable, compact, easily retrievable way to deal with motion pictures. It's hard to believe that now, but it was this notion of a technological quick fix.

A second lesson had to do with the notion of trade-off on quality. Skimping on quality. We all know that in a number of both public and private archives, there was a belief that once you copied the nitrate stock onto film, you could destroy the nitrate. Sometimes this was done without having made a test print only to discover later on that the preservation wasn't really very good. The techniques later on would get a whole bunch better. That is the trade-off in the area of quality. And we all regret it.

There's a third big mistake that I think we've spent a lot of time rectifying. That was the notion of looking at preservation as a singular act of copying rather than a process of caring for the works. And in some instances, the good work might have been done on the preservation



and then got put in the vaults. And then, because there's no holistic plan for dealing with it, how it got used, pulled out of the vault and used to make these prints or what have you, and destroying the original wasn't taken into account. Or, looking only at the film material itself and saying all of the film related material -- costumes and posters and paper material -- would somehow take care of itself. That is not planning in a holistic way, but rather seeing preservation as limited to putting a film onto the best possible material and putting it into storage.

A fourth big mistake from the past that I think we've all learned lessons from were the notion that the media product has only one life to live. Once the silent era was finished, for instance, those silent movies were dead storage and were no longer relevant. And of course, we learn later on that all of these materials would be re-purposed, recycled, re-found, re-released, have new commercial life, new creative life later on. But at the time, it's finished.

Now, the question, I think, is this. In 2100, people will be looking back at us. We've looked back at the first 100 years; we tried to deal with all of the problems that are out there. But a 100 years from now, they're going to be looking back at us and they're going to say, "Did they do the right thing?" Or will they have a similar litany of mistakes and problems and issues, maybe somewhat similar in terms of technological quick fixes and in terms of a lack of holistic planning and preservation.

The specific problem, the thing that's different now, so we can't totally rely on precedents in the past, has to do with the digital revolution. Now there've been a lot of meetings that have talked about the use of digital technologies for preservation and restoration. Not that there aren't clear answers in all of that, but they've been explored a lot.

But there is something else that's radically different. Now there are all digital technologies in the film production process itself. What implication does that have for what we do as preservationists for the strategizing of restoration and preservation? Everything from digital image capture to editing to special effects and how they're produced and how the materials are saved to the eventuality of digital distribution and projection. All of those have potential implications to coming up with a preservation strategy.

So it seemed to me one of the things that I haven't heard any collective discussions on by this community was how do we come up with preservation strategies for current production, looking forward now and into the future, that take into account the radically different circumstances that result from the use of digital technologies and every aspect of the production process.

I don't think in the course of a couple of hours of frank interchange we're going to come up with definitive answers, but hopefully, out of the exchange comes an agenda of questions that then can be pursued more persistently over time.

What are the implications for preservation of digital image capture? For, on the one hand, looking at 24 frame image capture for major motion pictures -- and there seems to be a definite move in that direction, big announcements in the trades, you know -- that major motion pictures will be made in that way. What are the implications? What do we mean now by the preservation master? What are the other questions about quality? What are the questions about keeping?

The second kind of question in image capture, one that certainly is one we think a lot about in the film school, has to do with all of that digitally based independent production. It may be magical and wonderful to be empowered to use digital cameras and desktop editing to produce low budget independent features, some of which are going to be of enduring cultural significance. But what do we tell filmmakers right now about preservation? What should they be doing? What are the guidelines for all of this production about the holding of these materials and the passing of these materials on to the future? And what responsibilities do public institutions, the public archives, and others have?

Special effects are not now just the margins of storytelling, very often, they're at the heart and soul of storytelling. When I look at the credits as they roll by at the end, I see all of these companies that are involved in them. Who has these materials? What are the original materials that you're going to want to hang onto? That you're going to be able to use and maybe realize in the future? Where do they reside? What form are they? Is that an issue?

In an age of digital post-production, what are the materials that reside other than what makes its way up to the screen? What form? Based on what kind of selection criteria?

Digital production and distribution: One of the things--terrible experiences we've had over time -- was the realization that often the only thing that's survived of a lot of these films happen to be really spectacular prints. And I know we had a lot of experience at the archive in doing restoration and preservation of quality prints because they were the only things that survived. In a world of digital distribution and possibly digital projection are there implications that these will be harder in the future to find? That plurality of prints out there will enable you to make those decisions. And if it is the digital distribution, what's the form? A different set of issues.

The issues of administration and organization: If one has a holistic approach to a preservation strategy that involves all aspects of how the materials are handled and all of the materials--the film and the film related materials--who does this? Is decentralization a fragmentation? Or



is decentralization in some way coordinated as part of an overall plan? How is the information gathered for this kind of decision making? What are the selection criteria?

Issues of principles and goals: What are the criteria for the establishment of preservation strategies that are out there now that have been changed in some way because of the implications of digital production?

Issue of budget and finance: How do you make the case that preservation pays? Are there models out there that talk about both the costs and ultimately the advantages that come from preservation strategies? There are models, what are they? Do we share them in some way?

What is prospective preservation strategy for non-film or film-related materials, artifacts, costumes, promotional materials? Who, what, how?

Another issue is the challenge of obsolescence. When you're in the digital world, 50 years from now, are you going to have the hardware to actually access a lot of this data? Thirty-five millimeter film is a pretty unusual worldwide global cultural event to have that kind of standardization. Will we have the technologies out there that enable us to have access? With all of the layers of encoding that have gone into them, will we have any way to get at that information? The algorithms that were used for compression technology, will we be able to get at it 50 or 100 years?

What are the digital issues of artists' rights? Probably the one artist's right that's self-evident is the right to have your film survive. And in a digital age, what does that mean? What kind of contractual obligations might there be in order to ensure that?

There's also the question of surviving in what form? Given the possibility in the digital world with the total mutability of any image into any image. What kind of protections will artists be looking for in terms of survival, not just of the physical material, but also of the integrity of their performance and even their look.

And finally how do we educate the next generation of film watchers and filmmakers. In the radically different environment of digital technology how does that take place? What kind of programs needs to be developed?

This diverse array of issues all pivot around the issue of the digital, the implications of digital production on various aspects of restoration and preservation strategy. Hopefully this resets the agenda. Perhaps we can enter into some of these issues in a somewhat systematic way.

STUDIO EXECUTIVE: My big concern is that as we start this process of making digital images that we are in fact putting on the shelf something that may be significantly less quality. At the same time there's a lot of promising technology-- Lockheed Martin just announced a 12 million-pixel camera. Optical tape that has longer-term life than magnetic tape. As an industry I think we just need to begin to understand what is happening with our eyes open. If you're a media archeologist you dig this very rich media layer that started 100 years ago, film goes halfway up, then you're starting to see this layer of tools for videotape in 1954 and that lasted all the way to probably 1978. And from 1978 all the way to 1996 we started to see this D2 layer. From 1986 to 1992, we saw a Beta cam. And from 1992--yesterday afternoon, we started to see this new technology like the HD cam. We're going to see shorter and shorter technological development of videotape formats. I guess we have to make sure you capture each of these things. You've got to have something left in the warehouse that allows us to play this stuff back. And I think you really have to--seriously as an industry -- talk with each other not just in the armchair circles, but also in production circles.

STUDIO EXECUTIVE: I remain unconvinced that anything beats polyester separation masters. If we've been doing this for a 100 years and somebody said, "we've got this stuff that you can wind on these reels and can hold it up to a light and you can actually see the image there" we would think this was a brilliant solution. I think that people get caught up with techno-lust and the incredible excitement thinking that cheaper is somehow better and will result in a better solution.

I was up at LucasFilm a couple of weeks ago talking to them and it seemed like I was suddenly shining the light on something they didn't even consider with this next episode (of Star Wars). I said, "you are of course, when you're all done, you're going to lay it down on black and white separation masters, right?" "Well no, it's digital because we can just clone it and go with the new technology, we'll just clone it." I said, "No, no, no, that's foolish because you don't understand, DVDs are not archival. The Technicolor can tell you all the top secret results of the making of CDs and DVDs -- the polycarbonates on the molecular level want to realign themselves. And after a while those bits will start to disappear.

STUDIO EXECUTIVE: People think that just because you can clone digital information without a generational loss that digital information lasts for generations. But it doesn't. I looked at Disney's restoration of THE LITTLE MERMAID. I was heavily involved with LITTLE MERMAID's first release, where we came out with an excellent release print for the director. It was the first and last Disney animated film done on color negative. We made separation masters at falsely high gamma levels to give them greater saturated colors. The release print suddenly



was the way they wanted it because the color negative was never contrast saturated. So we made them on polyester masters. And every printing inter-negative on LITTLE MERMAID's first release was made from these separation masters. When Disney wanted to restore LITTLE MERMAID, they did through a Domino system, 8-bit color. When I took my daughter to go see the re-release of THE LITTLE MERMAID I about died. I couldn't believe how flat and dull it looked. It turns out that the directors all had the same reaction.

So what did they do? Guess, what? They went into the vaults and they still have the separation masters. They were in fine shape. So they made the international release a year or two ago of THE LITTLE MERMAID from these separation masters. In archival restoration, there have been mistakes made. But I believe in properly processed polyester separation masters -- there's nothing better than that. There's this elegant thing -- there's this worldwide standard of 35 millimeter. And you know what, if you do produce films all digitally, -- and there's no film in the origination process -- I hope we're not stupid enough to lose the fact that if you really want to archive and keep it for a long period of time, lay it back out to a good robust film.

STUDIO EXECUTIVE: I don't think that that is necessarily a major problem you have to face. There are a couple things that are happening in the ensuing years. You take a look at these rich films with content, the digital effects, and most people don't realize that they're actually below HD resolution. When you scan, when you go at "2K" the actual pixel count is 1,828 lines across the horizontal. We've talked about HD; you're talking about 1,920 samples. Now, there's another color issue because the sub-sampling of color in the HD cameras has got to be overcome in the ensuing years.

But you have to step back and take a look at the business side. I think you can all agree that in 50 years, film's dead. We're just going to argue about when that migration happens.

Now, what's going to happen 2, 3, 4, 5 years? When film (stock) sales are declining, continue to decline? Kodak is discontinuing certain film stocks. And now I've got to go and argue with them. They're discontinuing certain film stocks like 5231. Well gee; Steven Spielberg shot SCHINDLER'S LIST on that stock. But this is a harbinger of the cutbacks that are coming. The amount of film stocks that have been taken out of the catalog because they're not big runs is getting bigger. Even though they're necessary for all the rest of the work to be done -- they have been -- very slowly over the past ten years -- coming out of their (Kodak) catalog.

How do you get more people than just the one's in this room to understand this?

HOWARD BESSER: There are examples that make it very easy for people to get it quickly. The one that I use all the time is asking people - the average person knows about word processing files - So I say, "OK, ten years ago, what was the best selling word processor?" WordStar. How many millions of copies of WordStar were there? How many hundreds of millions of files were there in WordStar? Can anyone now read a WordStar file?

STUDIO EXECUTIVE: That's a very quick and instantaneous way of getting through to most people what the issue is around digital. But I'd like to say that there's no, there's obviously no easy route or no easy answer or we wouldn't be here.

HOWARD BESSER: Yes, we know there are problems with digital. But there are also problems with analog. And if we think particularly of the direction that we're moving in terms of new product, those new products defy the ability to capture them on film in some of the ways that have been suggested. When we think of these new products that will be multi-faceted, have interactive pieces to them, and you think about transferring those to film, it doesn't work. You can transfer the pieces to film, but what you end up with is something that's far less than the original.

So one characteristic is the kind of interactivity and the pieces. The second characteristic that we're starting to see more and more is the re-purposing. The fact that you take certain segments of something and you reuse them in different products or even in the same product in totally different ways. And so the same segment of footage--visual footage, or the same segment of sound --might even be used within the same product, many different times and many different ways. And that creates a whole other set of issues. We're seeing more and more of these products and we can't just say we're going to transfer these to film. It's just not going to work.

This is not a storage problem; it's a file format problem. The storage problem is easy. It's the file format problem -- it's how the pieces are joined together. If you're all using some kind of standards like SMPTE or MP4 or MPEG4, or some kind of standards to put the pieces together and to store the individual pieces, we're all in that same boat and the ability to keep that in digital form over a greater time period is much easier. Do people remember a time period when there were all kinds of film formats and all kinds of speeds that ranged from 18 frames a second to over 24 frames per second. Until we standardized on a particular type there really was not much hope of continuity over a prolonged period of time. Once you have a standard type that's pretty widely accepted, then you have much better hope of keeping something over time.

What I've been working with is standards for moving image and multimedia type of material.

STUDIO EXECUTIVE: For the last couple of years I did my taxes on MacInTax, and I can't change it because even though the data is there,



it's supposed to convert it to the new version and I don't feel very comfortable trusting that. Each configuration is going to convert all my tax data. And that's just going from current programs that are created by the same company. And believe me my taxes are not that complicated, so I'm thinking if you kind of do that with film, it has much more complexity. If you want to have a standardized format, I just don't know that that's really going to be possible.

HOWARD BESSER: I come out of the library museum and archive world where we had a number of standards for library records, cataloging records, for about 30 years. There is a huge difference between standards that are proprietary or industry driven standards, and standards that are what we call "open standards", where different products will implement their versions of the open standards.

If you take Microsoft Word and convert it from one version of Word to the other, which you have to do because Word only works two versions back anyway. You end up losing things like bold face and headings, which is exactly the kind of thing you're saying. Yes, you have that and you always will have that because these standards are proprietary standards – they aren't open standards. They are totally the standards of one manufacturer. When we start having standards that are open standards, we have a much better chance of actually mapping between those. For example, in the library world, we've had the Mark standard for over 30 years. Any library can read any other library's catalog record and mount it --and they don't lose anything. Admittedly that's a simpler standard, there's maybe 300 fields to it, 300 different definitions. It's relatively simple. But again, it's an example of something that is an open standard. Other kinds of examples more recently that we haven't had enough experience with, but that are open standards, include various implementations within SGML. The text inputting initiative we've had for about ten years or so.

We've had the encoded archival description for about four years. We're having quite a bit of luck--a lot better luck with these things than with something like Microsoft Word, or that you're going to have with MacInTax. There is a huge difference between standards that were created solely for open interchange and standards that are really created for the convenience of a particular manufacturer.

STUDIO EXECUTIVE: I think they're both saying the same thing. My personal examples at work are working on transferring animated movies direct to high definition from digital files. And as we began the project, I was promised it would all be 16 bit TIFF files. Then as we went through it, it turned out there were five different kinds of files that we had to decode, and transfer to high definition. And the worry was would they really match in color? Sometimes they were in the same stock and had a good match. It's the weight of material out there that will keep something going. Thirty-five millimeter film will keep going because we have a lot of it. And somebody will keep making it. Kodak will probably keep going for a long time on that. But digital file formats are really problematic and I don't think--I think I agree that it's not necessarily the hardware, its can you read those damn files in about 30 years.

ROBERT ROSEN: Remember that for entire sectors of the moving image production industry, films are dead--have been for some time. The television news has been dead for almost 20 years. Television news produces much more in terms of moving images. Voluminous--exponentially more than all the major film studios put together. They have for years.

For television in general, much of film you see is dead. For the new Internet productions, for the new independent filmmakers, film is--it's not even an option. So I think we should keep that ideal out there, reality may be leading us to pose questions like once film continues to die off in certain moving image production sectors, what kind of infrastructure is possible for servicing the transfer of materials back onto film for those who are capable of doing that. But I think less and less people other than major theatrical film producing studios and some television producers will be doing that technology service. I don't think it is going to be viable in any other sector. So we're left with all those sectors, whether it's videotape and 50 formats or all the file formats we're talking about in addition to production. Film is simply dead. It has been dead, it will be dead. And I think while keeping the ideal, if we could recognize the reality of how to move forward in this post-film age in so many sectors, I think there should be a platform for discussion.

STUDIO EXECUTIVE: There's another big issue, which is the schism between the private sector and the public sector that this field allowed to dominate itself with for about 50 years. It wasn't until 1988 when Michael Friend and I organized the first--when we worked over at the preservation center at American Film Institute -- organized the first ever meeting of all the representatives of all the studios in their library preservation sections and all the major American film archives. 1988! It's astonishing that that was the first time that that ever took place. And there are commercial responsibilities to preservation; there are cultural responsibilities to preservation. And those two sectors have to be involved in ongoing, coordinated effort, cooperative effort -- joint projects, if these solutions will ever be envisioned.

I think the move towards digital challenges not just the preservation of the media itself, but also the context in which the media exists. We have these bizarre graphic files of still images, moving images, audio and video files, and the navigation, the interactivity itself, none of which has a common syntax or descriptive language or the equivalent of an Edit Decision List (EDL). There seems to be no overarching language that this stuff could be retrieved with. So I think that part of the issue is not only media, but to understand how to find ways to create descriptive languages like the EDL that we see in video. So that so much of these digital tools, which ironically work so easily, so much of it, is literally disintegrated. Because of file formats and other issues there are even a larger challenges.



STUDIO EXECUTIVE: There's one thing I want to address, MPEG's a bad word in the motion picture business.

STUDIO EXECUTIVE: I was talking about MPEG 4. It is not a compression scheme; it is essentially a set of directives about how the different pieces fit together over time. It's not a compression system.

STUDIO EXECUTIVE: My point, any form of compression, you know, is bad. The various formats -- what I will call the universal file format of the decade--because it will switch decade to decade--Kodak developed the VPX file, which they did a lot of research on and found out what can capture all of the information in a piece of camera negative -- where you take the negative out in sunlight and expose it and process it, it's as flat as it can be. And that definition is published, it's on record and the new scanners that are being developed are able to spit out these types of file formats. But the thing that comes out of that is, is that the major manufacturer that has developed it and promoted the software has discontinued the software and has gotten out of the hardware business. Which is Kodak.

STUDIO EXECUTIVE: To my knowledge they're going back in the business of selling scanners in conjunction with Phillips. What we're going to see in the next version coming down the line somewhere between 12 and 18 months, using the newest and latest versions of the Kodak chip, when scanning can become affordable as 4K, as close to real time as possible, that's going to change the paradigm for what we do because then all of a sudden, it's going to be done faster, and hopefully, cheaper. We have to keep in the mind that facilities will have to go out and buy these machines and pay the banks at the end of the month.

The technology that exists today that has migrated into the motion picture business is known as arrays. We've done an array of independent disks and they're getting cheaper and they're getting bigger. And with this whole basically broadband push companies are banking hundreds of billions of dollars on it. We will see within the next 2, 3, 5 years--if not sooner--as fiber gets laid across this country and in Europe, the bandwidth is going to be there, it's just going to get cheaper. The Seagate drives are increasing from factors of 36 gigs to 73 gigs. You can store, next month, full resolution 4K movies within 4 disk arrays with basically half the physical format of 35 mm separations. I'm not saying you should replace it, separations are the way to go, the form factor is shrinking dramatically and the cost of this stuff is absolutely plummeting.

Moore's Law, the CPU cycles were actually coming out faster than the memory and the storage. Now it's the exact opposite. The CPUs are coming about every 18 months according to Moore's Law. The storage is absolutely dropping like a rock. So my point is that within the financial and banking institutions, all the credit information--all the information resides on these types of disks with dual power supplies...

I predict within 5 years the infrastructure will be economically in place and that's probably being a little optimistic. It could happen sooner. In which case you could store entire uncompressed movies on these arrays very inexpensively. And you've got data that you upgrade--you just move the data into another box. You're not dealing with tape. You're not dealing with magnetic substance falling off the base. And I think that's where you have to sort of sit back and take a look at the 100's of millions dollars that's being pushed to the Internet that is accelerating this development.

STUDIO EXECUTIVE: Here's part of my concern. Let me see if I can say this articulately. Two months ago in VANITY FAIR magazine is an ad for Kodak, it showed a shoebox full of envelopes and negatives saying, you know, your family photos in the past. And it showed a new type of gold disk photo CD down below. These are your family photos in the future. Now we all know in this room that the shoebox of negatives will last longer than the photo CD.

Because when you say film is dead -- and probably it is likely to--consumers don't think about the fact. I mean, people shoot their VHS videotapes from 18, 15 years ago, none of them know that those tapes are going to fall apart sitting on the shelf. They don't know that. They think it's going to be like their 8 mm home movies, which are probably going to fade, but at least the image is still going to be there. It won't be economically viable for Kodak to maintain that massive machine that it takes to even just coat the separation masters. If it ends up in 20 years, all they're making is separation masters, they won't be making any more because there's no economy of volume to support that massive equipment.

And it seems to me that is the way it's heading. Kodak sends those mixed messages about it. You know what? What this group should be doing to be most effective, rather than wistful thinking that film is the best -- Let's acknowledge that film's going to be gone. Let's acknowledge-- the economics will drive it because the situation is not likely to be on the cover of TIME magazine or anything like that to educate people. I tried to talk to Kodak about that, they have the responsibility to communicate the importance of the long-term archival stability of film. I've got color negatives from the late 50's when I was around the Christmas tree and I just was amazed at reprint quality. You know what? They look spectacular. My family took good care of them. But if they were shot on a Casio 640 by 480 digital camera 40 years ago, what is the likelihood that whatever media it was stored on will still be around? It'll be like WordStar. But I think maybe for you guys to be most effective -- let's acknowledge that film's going to be gone.

STUDIO EXECUTIVE: The experience of the commitment to film, the feeling about film as a preservation medium, film as a carrier for the



message, for the aesthetics of it -- it's not just nostalgia, it's based on good solid fact. It is evident that film will be dead, for real. There's a crisis of memory at that level, or popular culture, but also for the art form of the industry we're involved in. Then, it would seem to me self-evident you've got to have a strategy. You've got to have a strategy. And otherwise, we're going to fumble around in the same way that people in the first 100 years fumbled around on what to do with nitrate. And I don't see any that are out there. A strategy. Standards are one thing, but the history of doing standards is not reassuring. Think about NTSC. They end up developing a standard--it doesn't mean a good standard. It means a convenient standard. An economically convenient standard. A lowest common denominator. So that by itself is no cause for optimism if quality is one of your concerns. And the question of who is going to be developing that strategy - it sort of developed defacto based on the, what, logic of the marketplace? And that does not--that is not cause for great optimism. So where do we go?

STUDIO EXECUTIVE: ... Bob Rosen's 100 years from now - They will have their work cut out for them trying to fix all those digital files and wishing they had film to use!

STUDIO EXECUTIVE: A further thought on that, we were talking about the strategy and the limitations. And some people, I'm not saying in this room, but if you hear people saying just transfer it to the newest thing, transfer it from today's to tomorrow's, and when we think back today and how many hundreds of thousands of reels of film that we have that just depends on who had possession and who owned those reels of film. Did they transfer them? At least with film you have the advantage of keeping it until later on, You see a picture on it and whether it's 35 mm or 16, or 70 or whatever speed it goes, it's still a transparent medium with a picture on it. We're getting into all this electronic stuff and we go back 20 years, we didn't have any of it. We didn't even think about it. Heaven forbid somebody's sitting there with his or her laptop computers keeping up with what we're talking about. They were writing in shorthand, steno pad, which had been put in the file cabinets instead of a disk. How do we maintain that in some manner that can be reproducible in the unforeseen future?

STUDIO EXECUTIVE: I have three projects that I'm doing right now that are all digitally based. And I'm trying to determine what I should ensure that we get. If one film is shot on a Sony consumer camera, another project that we also used a digital camera, a third project where they shot 35 mm and went into a high def mode for their postproduction.

STUDIO EXECUTIVE: ... less controlling because the elements are even harder to keep track of when you're talking about files and formats in computers that change so rapidly. Even if they were preserved for me, what can I do with it in 20 years, or 50 years?

STUDIO EXECUTIVE: That's not necessarily true. I delivered to Warner Brothers "On Any Given Sunday" - when they requested all of our files and provided them with a whole list of what they are. The unfortunate thing is we gave them on the current Sony VPS tape that Sony's just announced the new version of the tape deck coming out in six months. So, can they play that out? All you can do as a vendor is give them the information but it's really a systems problem for a studio to take a look at. And the database you're putting this stuff in - that goes under an IS group within the studio. And there are some studios that are looking into setting up these groups so that they can actually reuse and re-purpose stuff when they get it. Everybody works in non-compliant software packages. They won't give you the algorithms that build this stuff; they'll give you the final placement of background, the studio paid for it.

VWANI ROYCHOWDHURY: Currently the resolution might be poor, but that can be fixed. Second, digital's main advantage is that once you do error correction often enough, you have perfect copies. So the questions that are being raised are here we don't have the tools for yet. Like I make a digital production, I don't know what format is current and that's very real. And I don't think there is an easy solution to that. I understand the organizational problems behind that process are very troublesome. Now, on that I have different ideas. But I wanted to stop right now just so that I am in the same ballpark as you guys are. If you offer technological solutions to preservation of the documents that you are making right now, you can come up with ten different solutions. Whether someone is going to adopt it, whether you're going to make it palatable, whether you're going to come with an industry around preservation, you know, that's a different issue and very pressing issue.

STUDIO EXECUTIVE: The issue is that there is no perception of the problem by management - certainly in terms of the studio environment -- and the fact that to date there's not been a crisis of a magnitude, which has really forced management to rethink their policy.

ROBERT ROSEN: I think both of those comments have opened and actually made a logically segue to a different area. The first was the purely technological. That is a direction where there's no certitude that there is any clear-cut reason for optimism about the long-term keeping. Although, in theory those questions could be resolved. But we don't see those resolutions out there in any concrete way. That is a reason for great concern. So if it's not going to be the technology alone, and it never is, that would solve it -- it is the organizational form, the activity, the processes, and the guidelines that are on the table. Maybe we might want to talk a little bit about how it is on the table out there?

STUDIO EXECUTIVE: Most of our television product is on film. That's where the major amount of money comes from -- the television part. So continually we're up against the commercial plan, which originates from production. And as someone said, I think that from the outset, there is a push to eliminate as much of the cost as can be eliminated. And that there isn't a perception of a need to plan into the process how you're going to preserve it.



STUDIO EXECUTIVE: I'm not one of those people that say digital is bad. In fact, I live in a digital world and I don't think it's bad. But I think it's difficult to be in this digital world. Its because it shows you this promise of what can be done if you have a billion dollars. But the reality of it is if you count all of the films that we've made this century, what do we get? 25 years? Maybe? Or go in the dark. It's just that, it's really almost like window dressing at a political level. And to give an example of why, yet another example of why I think it's extremely difficult and going no where fast, and by the way, I may--this is maybe paranoid now because I've been thinking in the back of my head off and on for about a year or two--to go back, I think I made ASCII files from my leading edge 8088 computer... I loaned to somebody that--do they still make those floppies? But, they got killed in the earthquake and I'm afraid that those files, I've got to go back and try to get re-upped to paper. And put into a file cabinet. Because someday I may want to read out of, you know, the 80 pages that I must have written, there might be three words that are important to me later, but then I have to go back and try and do that this weekend, which should take about most of it. I may be calling you on this week to find resources to discover all that.

But, Michael had asked me about possibly recreating a presentation that I did about the brave new digital world a few years--I'm not even sure it was even two years -- ago. And also in the process of trying to hook up a projector, we're working on a digital prototype that's very similar to what is in cinemas right now, showing this experiment, this science project that shows movies without celluloid. And we ran into a number of things that--there was just a feeding frenzy on devices. But what happened is that we're going to have to settle for the fact that if I was able to do it, I would have to at least for the digital side, I'd have to stand up and make it about how it doesn't work exactly how it should because the math doesn't exist anymore. We know, OK, the engine to run that math, OK, they are, I'm trying to learn these things like gamma curves and all that other stuff and they type in all these little things. And laptops hooked up to boxes to change the picture. The picture's kind of red, so they go, ahhh... then it's not red. But somehow <LAUGHTER> you know, I mean that makes me think, well, OK, give me a laptop--they added laptops to space shuttles to keep them going. Right? I mean, I believe that this laptop contains more computing power than the first space shuttle, at least that's what the guy at NASA told me a couple of weeks ago. You know, 20 something years ago, I was thinking should I go to LA or should I stick it out in Eugene, Oregon and shoot 16mm films for the CBS affiliate? So now I'm ending up back at CBS for my second run on it. But no one's using film. So, there are all of these things <LAUGHTER> slower than the output of the information in this age. The point is that every indication that I have is that we have a plethora of data that is coming out and it's not a fixed target, it's a moving target and it's like one of those virus things that can come out of the Philippines and then, you know, within 12 hours, I've got somebody e-mailing me from college saying watch out for this e-mail, we're having trouble at home with this ILOVEYOU thing. I mean that's the world that we're in. How do you keep up with that? You can't send the FBI after every little thing.

ROBERT WINTER: I got to run in just a second, so if I can make a real quickie--I teach 18 to 25 year olds mostly. I'm a music person and I must tell you that these kids don't have a clue that there's a preservation problem. They think they've got the newest, hottest hard drive and so their Zips crash every so often, they'll go buy another cartridge and so forth. It's just a philosophical issue, even when I try to explain, most of them don't even know that Bob Rosen's incredible film archive is about 100 feet away from my center for digital arts, they don't even know what's there for the most part.

But the notion that nitrate film stock and so forth was a problem in that--I mean, they haven't just got a clue about any of this. And I think one of the things that's clear to me, is we need all of this horsepower, intellectual firepower here to train our kids and I think that we don't have the people who can really train them. We can obviously get you folks to come over a 100 feet, but we really, I just--you know, just listening to this I'm really aware of how much more we need to have your insights. I think it's going to be a really interesting issue, not just for those of you in the know, for who it's obviously complex enough. But for the kids who it hasn't even dawned on yet that there is a problem.

STUDIO EXECUTIVE: We need these things like Edit Decision Lists (EDL) for digital. We need translators in the era of digital files. We need format conversion systems that can transcode a new version and we need a way to understand what that means. And those are hard things to do. So, I think we need to start--these notions of EDL and ways to put into context with what we are doing, that a lot of what we're doing. With a film you don't have the EDL of how you got there.

STUDIO EXECUTIVE: I think we have help in that direction. Look at the navigation of the Internet. I can correspond, I can exchange multi-media data with someone traveling in India and Africa on top of the Himalayas, God knows where, correct? And that's also creating other problems. Which is how do we deal with all the information, what do we do with this information? So the preservation issue is going to become a mass consumer driven issue. Manufacturers are going to come up with that as a business model. They will be saying you can buy my product; you can preserve it for prosperity. Because we doubt that soon, like these kids who are 25, when they become 30 they'll say, gee, you know, I'm already getting old... but I'm losing my information from 5 years ago. OK. So this Internet border, which is a complicated situation, is going to have its own pressures on preservation. I think you will have considerable broad based consumer level support for it.

STUDIO EXECUTIVE: The industry is not supporting issues in preservation, they discount that. And they're ignoring it because all the while they're pushing through that small bandwidth pipe faster, there's nothing there to make them look at preservation.

ROBERT ROSEN: Well let me ask you this. A number of years back, one of the things that Martin Scorsese and those directors did is they



blew a whistle on the issue of color fading. And there was this great "ah ha, really?" and then it precipitated a lot of debate, discussion, and definitely low fade film stocks and more money that went into better storage facilities all over the place. Listening to some of the discussion here, I can't help but believe that somebody blowing a whistle about all those digital images that are being shot which will disappear. And that some of the issues of preservation have only for reasons of family history and what have you, very much are out there and I think preservation is a sort of major, a major issue of social debate and is lying in wait. And that at some point it will move out from this sort of back alley of culture to sort of a mainstream issue.

STUDIO EXECUTIVE: You're seeing a development of a middle-ware, which is basically a translator and work program. I think that if preservation needs that much attention from a PC company or animation studio then it'll be hard to develop. I think that if there is enough of a demand, of people saying, "you know what - I can't do this" or "someone sent me this image but I can't open it" or you know, "I want to look at my baby pictures and I can't". Until someone asks, nobody's going to solve it. I think too that there's also a lot of education that we need to do among the artists who are making films so that they're aware that there's an issue.

STUDIO EXECUTIVE: Are all of you were not aware of the Association of Moving Image Archivists (AMIA) and their lists? I recommend that you get on it because it's a good place to keep up with--the only place to keep up with this kind of stuff globally. So the strategies are out there. Right now, the only strategies available are a multiple migration strategies along a range of formats over time. There are efforts to try to change that.

STUDIO EXECUTIVE: And let's just quell the notion that coding is transparent. It is not. There are experiments that have been undertaken in which various digital formats have been transferred across formats and the results are worse than making analog-to-analog copies.

STUDIO EXECUTIVE: To get back to the issues of getting the word out to the artists, the people who create this work we're all talking about preserving. I agree with you and you that it's very important that that word get out I went to a symposium last weekend and listened to a cinematographer speak about a film he had done. Afterwards I went up to him and I asked him about the film. The film had been created in a certain way to get a certain look. I wanted to ask him exactly what work he had done in treating it by fading a number of inter-negatives. And he said, "well actually we treated the original." and then he followed it up by saying "we virtually destroyed the original to get what we want." And I said to him, OK, so did you document all those chemical processes that you did to the stock? Are you going to be able to do reproduce it? I think that getting the word out there to the artists is very important.

You thought this issue was going to be films shot two different ways and you wondered what to save, unfortunately I think you have to save both.

STUDIO EXECUTIVE: You also have to save all the Files, every step--Otherwise you won't know how to put it all back together.

STUDIO EXECUTIVE: Exactly.

STUDIO EXECUTIVE: All the studios are in danger of leaving their final audio masters on digital today. Everything is going towards the hard drive. And they're getting away from protecting it in final dub form and in protecting it on film. If you don't protect the audio you have an incomplete film. I have proposed that the studios immediately considered a digital archival medium for audio. That we save everything on 35mm and polyester-carbonate. And it's the most stable and reliable medium I'm aware of for archiving audio. Somebody's trying to sell me on the fact that the digital format was archival. . Again, it's really interesting to talk about archives and things, we're talking about digital processing -- every single time digital comes up, the word "archive" comes up.

STUDIO EXECUTIVE: And if I could just amplify that -- I'm not really afraid of digital. I do realize it's that great train coming at us. You probably the best storage right now with digital by storing it on black and white negative film. A kind of negative that would stay stable when put into vaults. And is there going to be enough economic incentive for Kodak or Fuji to actually come up with and make preservation stocks, if that was the way to go. I know there are films that were definitely done in my lifetime that we tried to locate negatives, -- maybe part of them were damaged, maybe part of it is the way films get orphaned and passed around -- most everyone here knows more details about that than I know. But there's all these things that come back to the fact that I don't think it's thinking retro thinking right now to use film to preserve digital. I'd rather lose a tiny bit of fidelity or a tiny bit of generational loss to know that I have most of it. Whereas plugging it into the digital machine and sometimes not getting anything. If you cannot play it back on something that's current in a few months, what's going to happen in a few years? Let alone 200 years. So I don't know any other way.

STUDIO EXECUTIVE: Digital is that unreliable. And by the way, I love digital things. I love digital and I hate digital. I love it because it allows me to do certain things I can't do in any way. It's taking out scratches in film--but it's also unreliable because although we were able to fix that, it's not clean. It's not the same as the original. And part of the solution to that is, of course, we have to make sure we keep the original. Keep the uncorrected original. Because five years later, you can do even better and you want to go back to that rather than that interim system.



STUDIO EXECUTIVE: The thing is that the digital technology, the digital information age is nowhere near the maturity that you have in the film industry.

STUDIO EXECUTIVE: That's perfectly true. And the fact that digital is enticing is evident because we are having this meeting, correct? At the bits and bytes level, digital is really reliable. There is no substitute. The CD audio disk for instance - you use it and no problem. This is because there is constant error-correction. Even if you drop many bits as long as you don't drop drastically many bits, you can exactly recover the original information.

STUDIO EXECUTIVE: How long do we have to wait until this until this issue of digital stability is resolved?

ROBERT ROSEN: That's up to us. If you raise the preservation issue and make it a bigger thing. You will get huge amount of support from the consumer at large. One of my hopes is that we don't leave here today without some notion about an agenda for the future. If in fact, one of the issues--one of the goals would be if the archive people who knew the problem were able to articulate and list the problems, say what the needs are and engage in dialog with the manufacturers and with the people doing research including people in electrical engineering. Have an agenda of things we'd like to see with as much specificity as possible. The people in this room oversee assets that are in the billions of dollars, let alone cultural worth. The people in this room are the ones who want to say these are things we need. These are things we really need. These are the areas that need to be researched, these are the goals we need, and these are the problems that are out there. And then to get them out there. How that happens, maybe we can talk about a little bit later.

MICHAEL FRIEND: I think that the issue I want to speak to is not something that has been spoken of in this room thus far and because it hasn't been spoken, a lot of statements have slid by without being challenged. A lot of statements, which are, in terms of their real world content rather ridiculous because they aren't in the real world. When we deal with film preservation, our job is to capture all the data in its original and render that in a subsequent version on film. That's what our goal is. You can achieve that goal--but one thing for certain about what we do is we deliver it back to film because film is the medium we are preserving.

Our first responsibility -- at least in my archives and in the archives that I know -- is to try to preserve film. And there are aspects of film in terms of its quality, in terms of its physical characteristics that are nowhere captured in digital and which you cannot see in digital projection. Digital changes what a film is, no matter how good you are with digital, no matter how great a Telecine you have, no matter what the display medium, it's a different medium. It makes an effect on your eyeballs in different way.

My argument here, my issue here is the fact that we're not dealing yet in our discussion with the specificity of film or the specificity of television or the specificity of digital. I worry, for example, about how do we preserve 525 line interlaced analog television when all of the equipment, all of the data stores, all of the playback is progressive scan, not interlaced, it is not 525 lines, it is any kind of line you can get on your screen. Its lines double automatically in some cases. So I want to bring the discussion back, for a second, to the issue of media specificity of film, of videotape, of digital origination if that's what the medium is. And its original display. It's true that most modern media is becoming more and more an object of migration. It is meant to exist on several different kinds of screens. Film is a little bit different, it was originally--film really has one place to exist, which is on a big screen. And no place else.

But, we have to take some interest in the quality of the work we are doing. The ability of our schools to embody and carry forth the real data content of the original media. Including the specificity of that media. And we haven't started to talk about that yet, because nobody yet knows how to really do that. We can make pretty good television out of any kind of film that's decently shot. And even if it's not decently shot, we can fix this video. We're always doing that. But, to preserve a film, as opposed to growing a dinosaur or blow up a star, to preserve a film is very, very difficult to do in digital. As far as I know, it's never really been done at the same resolution level of the original.

So, we talk as if the problems are in digital duplication or in understanding format obsolesce, the problems go all the way back. We talk about format obsolescence; it starts with the issue of specificity of the medium. And we have to figure out both standards technically and also historical and ethical standards for the transfer of things from one medium to another and for getting that back to the original medium.

ROBERT ROSEN: But you say you were going to get onto things that are originated in digital...

MICHAEL FRIEND: Things that originated in digital have that, the same problems only faster, obviously. What everyone has alluded to in terms of format obsolesce is a point of fact, the fact that the medium no longer exists. There is a new medium which emulates most of the characteristics and which is popular out there and cheap enough to get into. Let's transfer it from this old medium, called Beta FP into this new medium called Beta F, or whatever we're going to call it, you know, or digi-beta. It is the same thing; you're throwing away over half of the information in your Beta FP every time you transfer it to digi-beta. Now you're going to get it back--you're going to get it back in some form, when you compress your Beta FP and your digi-beta signal, but it ain't the same thing. And also once you put it into that format, there are consequences because you are then a proprietary compression format and there's no transparency between that format and say any



other 10 or 15 other proprietary formats. And to me, if it originated on digi-beta, you ought to be able to reproduce that exactly the way it was originated. We'd want to discuss that film or that video in its historical context.

I think the idea of trying to store on the perfect medium that the program was originated in is just simply a non-starter. It'll never happen. I worked for a company at one point that specialized in recovering old video material. It wasn't that many years ago. Certainly not 12 years ago. All--almost all of the machines that I used at that time simply don't exist anymore. They're gone. And mostly all those people who have the IBC one-inch tapes and VIHA have in color tapes; hopefully all that stuff will get transferred because you're not going to find those? Anymore. But ah, there's no economic imperative to escalate these old formats. There's simply--I'm not, I'm not arguing for perpetuating physical format. I'm for perpetuating the data.

STUDIO EXECUTIVE: Well that's what I think is interesting about this archiver, an archive machine as it were. If you could come up with some kind of international standard that would encourage someone to actually build a machine that they might build for 50 years, you should be able to start saving that which is necessary to save. It's the idea of trying to save everything you do, then that's a curve that goes like this... is, that's not going to happen either.

STUDIO EXECUTIVE: I think Michael has a really good point, but I'm not sure that the issue there is an issue of storage. There are a number of ways we can look at that. The issues--we don't have the tools today, but perhaps at one point in time we will have the tools that will allow us to replicate a particular type of environment, a particular type of roll onto a screen, a particularly luminescence things like that that we will be able to either replicate that scientifically or technologically or--and we will be able to avoid in transferring from one file format or physical storage medium to another, we'll be able to avoid the kind of flapping of the image that happens when you move to video, things like that. I think in trying to discuss this, it's more important to focus in on what it is we're trying to do and how we might do it, than what are the tools are today. Because it's clearly, as you pointed out, that those won't work but there may be other ways to do it and, you know, I think that people like computer scientists they find that a very interesting kind of challenge to try to work on.

STUDIO EXECUTIVE: Well, what I was going to say is that in fact if you look historically, with the great influx of money for preservation in the last 20, 30 years have been when we recognized that it was a, that digital assets be managed for video. Right? So the first wave was with video, then with like HBO, it's aftermarket. And today, it's the Internet. It's the idea of re-purposing that kind of comes of post-modernism, but in fact it's what the Web is about. And if you frame this as managing digital assets, you know, that rather than as preservation, at least in our world, we can make the appeal. Preservation is good or intellectuals we believe in--but for the business practice, it's always digital asset management. And it sounds good because there's a market.

STUDIO EXECUTIVE: The other thing that wasn't really brought up was what constitutes a significant artifact. When you're making films digital and with data special effects, they're in a wire frames, texture maps, and all of the stuff that goes into this film. And I think most people would say the significant artifact is the film frames or the IP or whatever--

And also let's say at some point down the line we decide that the story of TWISTER or the acting or whatever it was that's significant, but this effect of this car spinning around was somehow significant. Maybe we don't know 100 years from now they'll say this was very significant. Will we have a way of preserving it?

BEN DAVIS: I think that I'll say Harry Potter style we didn't have any hinkey-pinks in this group. Hinkey-pinks, if you read the Harry Potter books, are people that tell you the wrong way to go. I think everybody in here has some very interesting ways to go. I think a lot of this comes down to the notion of asset management. For preservationists and for the business model, there's a common ground there. There could be a common language for preserving and creating good practice for managing assets. And I think that's an interesting thing I heard coming out of this from the archivist's point of view, from the standard's point of view, from the business strategy point of view. I think that good practice in asset management might be a key discussion for a next meeting.

The other thing that I realize in this meeting is that the film business, the making of film, is perpetual. There's no end to it. There's no going out of business. There's no going out of the story-telling business. It's something that we do. And I think that quote I started with about the wilderness being a preservation of the world, I think this sort of mindfulness or looking at storytelling in film with our eyes open is the preservation of storytelling. I think that is at the root of emotionally why we want to have this dialogue. And I hope that's where we can go with this discussion after we've exhausted whether analog lasts longer than the digital, or digital has all these problems, but that digital can be fixed because it's a fixable--I think, at another level, conceptually, why do we do this? I think it is that emotional need to preserve storytelling.

TAD MARBURG: I just want to say thank you to everybody who came. And to the people who stayed on. When Bob and Ben and I and Ed started talking about this, we'd discussed which questions - should we do this, should we do that - and we finally came upon the idea we really shouldn't limit the discussion because the subject is so large we would be restricting ourselves. I realize by leaving it alone as we



did, we may have tended to repeat ourselves, but I think we have opened a dialog and I think Michael's point about the standards is critical. The longer I'm in the business, the less I know about what's going on in this business. And certainly in my recent business with Kodak, I was absolutely sure that we really don't know what's going on. And bless their hearts, they don't either. It is certainly very important to meet professionally. What I have a passion about is the issue of motion pictures and entertainment in general. I hope that this begins our dialog and that we can find other opportunities to get together -- maybe not as large a group, but at least Ed and I and Ben will put together the e-mail list from this group so you'll be able to see who was here and you can start a dialog separately and go on from there.

ROBERT ROSEN: Being further away from the archives and all of the activities that you're involved in and from the industry as well - one of the things that seems apparent to me coming out of this meeting and you may have been attending a lot more of them, is that there really is -- and I hate to use terms like that -- a kind of a crisis. It's a cultural crisis in part, a crisis of cultural memory in a broad sense. I think a point was made about the Internet at the conference (Time and Bits) at the Getty - the Internet is the first worldwide global cultural event that had no historical memory. That is a pretty key moment in history, the denial of history right now. And listening to the discussion here, I come away with a real mess. We've got fabulous technologies that can do extraordinary things in a production context, that can do extraordinary things in terms of manipulating images but that in terms of any kind of consensus about where we're going to be a few years down the road and how we're going to preserve that work that is starting to come out and will be coming out doesn't exist. We've got a lot of practices, some of them are probably, undoubtedly better practices than others, which one is in fact the best practice isn't clear at all. I come away with a sense that there's a hell of a lot to be done and if what needs to be done can come from anywhere, it ought to come from the people in the trenches. The people who actually do this work and know all of these problems and can articulate the needs. How to do that, given that we don't constitute any kind of efficient organization, or group or a body what have you, isn't terribly clear to me, but the need is clear.

STUDIO EXECUTIVE: I just wanted to suggest that one of the great things here today was meeting other people whom I've never met before, but a lot of us are old faces here and a number of us have known each other for a number of years, primarily in the context of the organization that I mentioned several times to you, the Association of Motion Image Archivists. And I think we have an opportunity to carry forth the dialog here today. This year, AMIA is meeting in Los Angeles, the week of November 13th; it'll be headquartered in the Sheraton Universal Hotel. And AMIA talks about these issues year in and year out over a five-day conference week. And in particular, there are two groups that the preservation community of AMIA, which is a formally constituted committee of AMA membership, they are the ones who were involved in this... this initiative that I mentioned earlier. Representative in this group, in union group that is trying to work with manufacturers and broadcasters and archivists. The standards that embody--the preservation committee and AMIA has set up a digital policy sub-committee that's tracking and involving itself in these very issues. So I would really recommend participating in the AMIA preservation venues. They're open, they're very informal, and it's not a structured, heavily structured meeting at all.

AMIA also has a digital archive interest group; it's a little more informal organization. But it's done some really interesting things in the area of digital asset management. For instance, last year they conducted a survey of a dozen different, of the leading digital asset management software providers, of a dozen questions and the response is--the publishing--regarding the functionality of all of these different softwares is on AMIA's Website. So that dialog is going forward with real investigation in terms of other kinds of products that are out there. So I would really encourage anybody to participate in this conference. AMIA is a very open group, it is the people in the trenches, it's not just the public sector, and it's the private sector, the studios, the networks, and manufacturers. Kodak is there every year. It's a great opportunity that we have this year here in Los Angeles to carry forth a dialog. So there will also be a follow-up of digital asset management. .

ROBERT ROSEN: Is a worthwhile get together and if there was a notion of getting together in the future, around what more specific and more focused way conceivable. Is this a useful, albeit informal, forum even beyond... because we're all in town here. The AIMA is, you know, has meetings here and then conferences all over the country. But it's an opportunity this year, but on an ongoing basis, is this something we want to do again?

STUDIO EXECUTIVE: One of the things that would be helpful to me and useful, I think, to a lot of people, is success and failures. To discuss specific projects, what went well and what problems did they have and how they deal with those problems.

STUDIO EXECUTIVE: We're just getting into the methodology too--I was really intrigued by your comments about supporting DVD as a strategy for financing preservation. I think you can have a session devoted to how do you get the word out internally within business plans.

But maybe from a philosophical point of view when they hear the digital word, they think that everything is blissful. And everything is better. If we were to somehow as a group, find the right person, spokesperson, spokespeople to actually just come out of the closet as it were and say, since digital won't work for film preservation, what are we going to do about it? Just make that the position. You know, come out and say, it doesn't work yet. We anticipate that sometime in the next 100 years it could work, or make it 25 years, whatever, we need to talk to more optimists over here and get kind of a handle on when that integration of it is.

Because we're at the dawn of the of the digital age and there's no hiding from it. It will either consume us and leave us in the dust or we will integrate it into our corporate and cultural heritage. And I believe if we take the stance - -not beat around the bush, let's come right out and



say, this is it, how are we going to knock it off? How do we come up with the creative financing to, to do what we know we have to do now and how do we get the attention of the people that have not always shown the most foresight. I think we all know all the stories about how negatives got thrown away of famous movies or sound, all the 50's stereo soundtracks that weren't available because TV was mono. And there was no cable or yada, yada, yada. So we need to get the attention and the pocketbook and the cultural aspects and the corporate livelihood of it. Something like that.

STUDIO EXECUTIVE: I've got a slightly different kind of yield of what we've said here, and what we've kind of come to consensus about. I think--I agree with you, but only to a certain extent. So let me try to summarize and say where I think we should go. I think we have close to a consensus that in fact digital preservation is not here. And that we need more resources towards more conventional forms of preservation. I also think we have a consensus that digital preservation will be necessary sometime in the future and I think that the consensus is far less than 100 years. I think it's much closer in terms of the future. So what I would propose is in terms of mixed depths. I don't think that if we meet again or if we do anything again we don't have to go, run over all that ground again. It seems to me we can start focusing our attention on certain things.

One type of thing is exactly what you said, is how do we make a case for and get the resources for continued, more conventional forms of preservation on film? That's one path. And I think it's an important path to follow.

A second path to follow is, given that we're going to need digital preservation and that we're going to need it--I think sooner rather than later--for a variety of reasons ranging from Michael's statement about whatever type of medium that it's in, that's the one that you want to put it out in. Or getting stuff that is in digital form. To some of the things that I was saying about increasing use of resources that are not just digital, but defy even being on film.

So, given that we have to do that, what are the next steps that we should be taking in terms of addressing that issue? And maybe we can kind of decompose that and start looking in a more focused way at "A," similar to what you were saying for analog, digital--how do we get resources to put towards this? How do we get say a business model focused on this? How are we going to convince people that that's important? That's one path.

Another path is what are the hot buttons of the issues and trying to push them? How do we harness, for instance the computer science community to try to address some of these issues that we know are hot button issues. That we know are not working now and that won't... things like, you know, in my opinion, the biggest issue is file format issues. And the file format issue cascades into all the issues of how do all the pieces fit together. And I made a strong statement about standards for that. I, you know, I didn't make that like that is the answer, but I made that as that is our best hope. Maybe we can, you know, kind of follow up on that in terms of trying to see what, what, is it even realistic? Is it not? What would we need to be harnessed in order to do that if not, what direction do we go?

And then there's probably several other kinds of things along the lines--there are other things that have been mentioned in terms of getting by in from the creator of the image and getting more attention from the creator community. We can probably identify about 6 strands that have come out of this discussion. And try to have focus--either focus attention on that from the group as a whole, or sub-groups of people working on trying to at least draft something that identifies what the problem is and then maybe circulate that and come together to talk about what the solutions might be. Things like that.

STUDIO EXECUTIVE: I think it really gets down to the point that... we could go on the rest of the evening. I think we need to set up in the near future another session and continue along the lines of restoration.

STUDIO EXECUTIVE: Basic principles that, you know, per the interim that we need to adhere to is continue film preservation. Do it on polyester base. You know--low temperature. Low humidity. Until all these details can be worked out on the back end. And most importantly, and I want to stress there's a lot of different facilities and systems that are out there. And the most important thing that you need to look at as an archivist is get the opportunity to look at, print all the originals--run it through the system and project it side by side and then switch the projectors. And then choose the proper way to preserve the integrity of the image. Because what you want to do is not try to necessarily match the dupe. You want to try to match the original as best as possible. And if you adhere to those quality standards, everybody will be pretty good shape for the interim.

STUDIO EXECUTIVE: We keep talking about this idea of a digital film preservation format. I don't have a clue as to what that is. And, you know, years ago someone said to me, well, you know we can transfer your film to high definition and not only will it look half as great in video format but you'll still have the digitized, we will have it in our library of digitized films. And they were archived in this format. And I, my answer to that was, no, I think what you're going to have is a lot of high definition junk.

STUDIO EXECUTIVE: I want leave you with one thought. I got contacted two weeks ago by Pixar. And Don Lasiter made his career--really



started at animating those little Luxo lamps. And I got a call from them saying, "you've got to help us out, here's all the film elements." And I said, "film elements? Where are the high tech computer tapes?" Uh, well, they no longer exist. And all they have is an 8-year-old film recorded dupe negative. Actually the original's gone, they've got a dupe on it.

ROBERT ROSEN: One of the issues that we keep trying--any archivist is always going, "where are the originals?" And the answer is there's not necessarily one original, there may be a number of originals that are your masters. And the notion that, and I'll draw the parallel with the nitrate. The notion that you had the digital material, you transferred it and used it in film. Now you can dump the digital material is parallel to the notion of "I transferred the nitrate out of the safety, now I can dump the nitrate." It's still the best material and so the question of how to hold that, you know, and what do you hold that's still out there?

I don't disagree with the--we need to know how to talk with the business side, but if we're going to come up with a format to do that, but not taking it back to film for some reason 50 years from now - there's no way to really do that. It's not film preservation but something else -- the representation is falling down.

STUDIO EXECUTIVE: I think there's still this issue of purely digital artifacts like the wire-frames that are used to animate things and texture maps and all of those things. They may not seem significant at the time, but you know, 50 or 100 years now from now, they may seem very significant and will we have those items or will we have this black hole in history we're going to maybe think the greatest art of some films is that aspect of it. And it may not exist.

MICHAEL FRIEND: Well, I think first of all, we have to separate out the three very different tasks that sort of lie behind what you're talking about. First of all, it's film preservation. We don't have a solution in film preservation. There really and truly, is such a thing as film preservation. We keep duplicating film, we go to safety film, we go to polyester film, and we'll go to some other film maybe. Every time we do that, we lose a certain amount of data in the original. So that's not really preservation. That's a holding pattern and that's all we can do. It's the best thing we can do. What we need to do is develop a system whereby we can scan all of the data out of that original into a computer, make whatever corrections we feel are justified and render that back to film with no loss of data and entirely, transparently, and in a context with respect to the original, historical look. That's the problem with film preservation today and for the rest of time because film is increasingly going to be an antiquarian exercise.

Now the fact that billions of dollars of resources are captured on film makes it a much more entrenched issue. And frankly, fortunately, we have a lot of money behind our motives here. But the film preservation issue, apart from continuing and improving our traditional scans, our traditional work, and the standards that we use, comes down to finding that solution. How do we get from film into digital and back into film transparently? And that means that is going to involve a lot of investigation into the aesthetics of these physical materials and how we capture those and how we build an on-going context for how something originally looks. There's some things we should be doing today for that too, but we won't get into that now. But that's problem one is the middle level problem.

A larger problem, a higher-level problem, which concerns not just us in our limited industries, but it, concerns the whole world. How do you permanently store digital data? Whether it's image data, text data or whatever else. Somebody is going to come out of the woodwork with bubble or photographic memory or ion etched ports and say here it is, it packs 7 quadrillion bits into one nanometer of space here. And it lasts forever unless you drop an H-bomb on it in which some of the information may not be recoverable. So you know, somebody up there is going to solve the digital storage problem for us and we will take advantage of it as soon as it drops down to a level where it's price effective.

But that doesn't solve the shorter term, but extremely important historical and aesthetic problem of capturing the films that we have today. When you see a silent film today, you're seeing nothing compared to what the original looked like because we've lost so much value from that tradition. Are we going to say the same things about the films we're making today? And if that's the case, these are not dependable objects on which to base aesthetic inquiries because they're highly misleading. So we've got to figure out, for our generation and for the rest of time, how we isolate and continue those aesthetics in the media of the future. How do we build this trans-universal translator, this mediation machine that gets us through the digital domain and back to film again with transparency.

OK, that is the major problem for the film tradition. It doesn't solve the problem for the people out there of the television tradition or the other digital media traditions. And if we can solve the film problem, we're going to have a lot of tools, a lot of knowledge, and a lot of experience on how to solve the video problem and the subsequent digital media problem.

But the biggest, most intractable and absolutely most urgent problem to solve is the film problem, because film is what's going away. And if we, it seems to be relatively inevitable that Kodak will continue to produce fewer film stocks. We'll have a harder time keeping film as a medium, you know, and I always want film as a medium. I always want to be able to put up a 35mm print for an audience in a room with 600 people. That's my antiquarian past as a film archivist. And I want that print to look the same as it looked in January 1941 when it first hit the screens if I can do that. OK? So we've got within the archive community a problem and a project we need to do of how to create



that transparent art.

You have it also in the film industry and I'll tell you why though, because you can translate all of this stuff to digital right now, or you can dupe it down, continue to keep to duping. And if you lose that, you lose the film, you say, "OK, we still got the video, we can still syndicate it" but in the future, what's going to be valuable about those films are those images that are on digital video. Is there originality, there authenticity? If anybody can make a film, look the way films look today, but they're not making any more Michael Creighton films. So increasingly, the resource, which is not just a sort of general programming unit for all of the studios, is going to reduce itself in size and viability. DUFFY'S TAVERN, MR. LIMPIT, some of these films are going to drop out of the tradition because they are not going to be re-sellable in the future, but CASABLANCA will be. But SCHINDLER'S LIST will be. So there's going to be a core of historical material.

And as the focus on the libraries goes from general programming to historical value, the acuity and the quality of the preservation and the originality of those images is what's going to give them their value. If you can only reproduce CASABLANCA as a sort of flattened out video version of what was in film in the future, you will not be able to syndicate your product as effectively and your library won't be worth much. So there's a reason for the studios to get behind a true film preservation initiative. And to understand how, those film resources, with all their super sampling characteristics, with all their qualities, which is far greater than any digital system we have today, 4K notwithstanding, you know. We already have a system which is better and blows away all of these marvelous things we're talking about. We just can't keep it around long enough to prove that to the future.

So this first task, the film-digital film task is at the heart of what we do. If we fail at this, it's not likely that subsequent aesthetic attempts will ever being able to solve these problems of either video or other digital media. People are going to lose grasp of what the actual media is. I believe that we have to have a sort of media specificity solution from all of our media. We can't lose any of those aspects because, you know, I just saw Woody Allen the other day so I'm on this wavelength. But, as Woody Allen said in ANNIE HALL, you know, and drags in Marshall McLuhan, "The medium is the message." and the specificity of film is as much a part of the message as Ingrid Bergman and Humphrey Bogart. We don't really know that yet because we still live in the film world and we haven't distanced ourselves enough to understand how important that specificity is. But, our problem in the archives and I believe in the studios for the near-term, say the next 25 years, is going to be to solve the film preservation problem in the terms that I just started outlining. So we don't want to separate that antiquarian project? Off from digital asset management, I think, which is also a very, very big, very, very brave and growing problem. And we should try to do that.

ROBERT ROSEN: The fact that we've got a lot more to say suggests -- and I hear the tone -- that this was not wasted time. That the idea of getting together, arriving at some consensus about an agenda, a more focused agenda would be a good thing to do.

TAD MARBURG: I just want to throw in one thing. I want to start with where we were leaving off.

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