Lessons Learned in Massive Video Production (MVP) for University Alumni Outreach

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ABSTRACT
In this paper, we describe lessons learned in creating a Massive Video Production (MVP) mechanism and filmography environment for the University of California at Berkeley. The goal was to provide a university department mandated to expand alumni outreach with personalized university-branded alumni *VideoGreetings* using a convenient and dynamic alumni outreach tool with modern multimedia production standards coupled with commonplace digital camera raw clips with no intervention on the part of the alumni coordinator and department other than editorial approval of the finished production. The actual mechanism consists of a hosted production engine, filmography and search environment, review and editorial functions, and subscription and protection.

Keywords
Massive video production, automated filmography

INTRODUCTION
Massive Video Production (MVP) is a concept where we reverse the roles of studio and customer. Normally the studio produces for the customer hundreds of feature films for an audience of millions annually. In the case of MVP, however, it is the audience of communities of interest, each of which may encompass thousands of people in a community group, who "produce" one to ten short features per person for the studio to re-vend to the same audience.

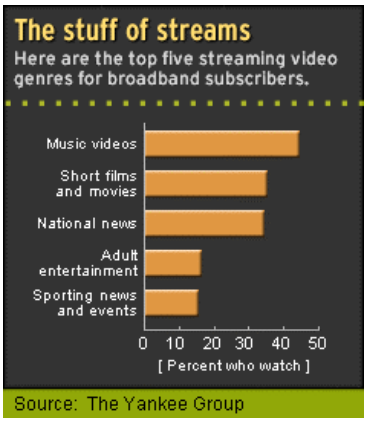


Figure 1: Internet video interest today.

Like massive multiplayer (MMP) gaming, the same customer involvement and stickiness issues apply, where the involvement and relevance to the customer's life dictates the interest and longevity (see Figure 1). The opportunity provided by MVP to the customer is that they can make it part of their life in a "studio" world where the sleekness of production creates a more vivid life than reality.

The opportunity provided by MVP to the studio, in turn, is akin to the "self-service" gas model – the customer drives the production directly, so the costs of acquiring the content is negative and the value of the eyeballs and the relationship is high. The ownership of the property through management of produced content now is possible with MVP. Real-time short material ideal for rapid consumption churns constantly and more effectively in an Internet environment.

Unlike MMP, there is no hard-core "gamer" audience for MVP – MVP has no small, informal but powerful constituency that must be wooed to garner favorable reviews through Internet chat and word-of-mouth prior to release of a game. Nor is there the not-so-delicate difficulty in broadening demographics to address market growth while retaining the hard-core audience who is put-off by anything that doesn't directly cater to them.

MVP Audience
MVP instead caters to the hard-core television audience who imagines that they could act out *Hamlet* or imitate Jim Carey in *Ace Ventura: Pet Detective* in short bursts with veracity and skill equal to that of professional productions. This audience is fragmented and individualistic, and absorbed with their personal concerns and views. They wish to use the power of studio production and processes to "act out" their desires. For them, "all the world's a stage". All they need is the studio to make it so.

The MVP audience is larger than the MMP audience and is the critical "missing component" for stable MMP deployment. Like a giant Prozac for the hard-core gamers, rich media involvement for the entertainment audience comes with the embedded customer understanding of breadth, as movies are rated for audiences broader than a guy with adrenaline and an attitude.

As the entertainment industry grapples with how to use the Internet, some parts become clearer while others remain unresolved. While a few years ago the "Internet as TV" metaphor was commonplace, recent challenges have made it clear that Internet video is not television but something entirely different. Another emerging issue is that of the stark demographic differences found in the use of the Internet.

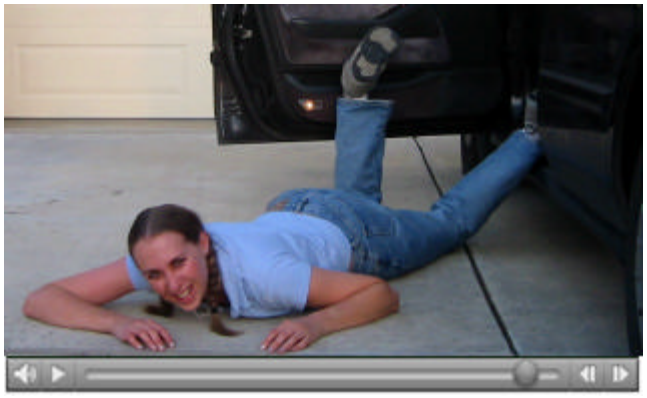


Figure 2: Gen-Y Movie Clip Antics.

Multiplayer games, instant messaging and Internet video usage is very different for "Gen-Y", "Gen-X" and Boomers, and the means to address these differing patterns of usage must be found. For example, while Boomers and Gen-X seem to prefer the DVD player long-play experience, Gen-Y's express more interest in nonlinear video viewing, where they might "hop" around or review a section over and over again, and find quick clips appealing (see Figure 2).

Like the transition from the big screen to the small screen, the transition to the smaller screen of Internet video is tending towards shorter, faster, and more volume than ever before. With the rise of broadband as the preferred vehicle for Video on Demand (VOD), an immense new pipe for distribution to customers will be filled with content – either with or without the assent of the content provider. Seamlessly joining this with web content, games and other applications into rich multi-tier environments is the media landscape of growth the next few years. Thus, the challenge of providing "media-less" media without resorting to mass piracy or the fragile Orwellian DRM schemes that frustrate the customer completes the picture for what the next decade should bring.

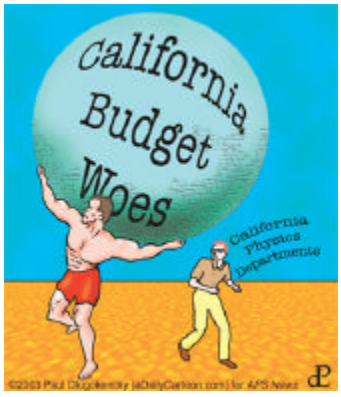


Figure 3: Physics Under Stress

Many prospective customers for MVP have already chosen very well developed paths towards the use of media – so much so that outdated notions warp anything new so as to reach the ends already chosen. Our interest in early trials of this exciting new concept was to work closely with an audience in severe need of help to repair their community relationships necessary for survival. In these dismal economic times one does not need to look far for customer (see Figure 3) who has an imperative to action, especially in academia.

BACKGROUND: IMPERATIVE TO ACTION

The Physics department of the University of California at Berkeley is considered one of the California educational system's greatest assets, sporting a rich productive history of Nobel-winning research and education.

However, according to the Report on the State of Physics conducted in 2003 by a blue-ribbon committee for the Office of the Chancellor, any asset, however revered, must be protected and renewed:

The Berkeley Physics Department, once among the most pre-eminent in the world, is in a state of genteel decline. After undergoing a demographic transition that decreased the distinction of its faculty, it has lost further ground from recent faculty losses and is housed in inadequate and aged buildings. Faculty morale is low, partly as a result of these circumstances and partly because of insufficient engagement of the campus Administration in its fate.

The Los Angeles Times, in an article entitled "Physics Program's Star Dims at Berkeley" (July 14, 2003), took this concern further:

A sustained decline in physics at UC Berkeley could have marked repercussions. It's not just that students might miss out on studying with luminaries or that they could opt to go elsewhere. In a broader sense, the university and state could feel the loss. Physics underlies most scientific inquiry and technological progress. It has applications in everything from electronics and biomedicine to national defense and space exploration.

Along with recommendations by the blue-ribbon committee to fund new facilities and enhance department-administration relations, the ability to recruit and retain the next set of rising stars in physics has become a burning issue. As the Los Angeles Times continues:

At Berkeley, considered one of the finest public universities in the nation, faculty long have attracted offers from Ivy League schools. But recent developments in the physics department dramatize the growing competitive pressures.

Many of the best and brightest in physics have received their degrees and training at Berkeley and have gone on to further work at Berkeley and other universities, entered into education and teaching, or moved into industry. Clearly, the Berkeley physics alumni group could be a powerful motivator for positive change in this time of crisis.

The question was "How can we reach out to this long-neglected alumni resource without significantly raising overhead for the department?"

Renewing the Alumni Outreach through MVP

"Fundraising for the Physics Department must become one of the University's top priorities." – UCB Physics Review.

The recommendations from the panel placing fundraising as a major priority for the department left unspoken the issue of from whom the funds were to be raised. Alumni outreach has been spotty at best over the years, and a website gift program has not attracted a great deal of broad interest. The Director of Development handling alumni relations for the department put out the call for assistance from alumni for a novel way to attract alumni to alumni dinners and events, and through these efforts reattach them back to the department.

Stanford University, in contrast, has an extensive centralized alumni outreach program. Events and newsletters are produced regularly for all departments. Colloquia and seminars are presented regularly to interested alumni of Stanford and other universities alongside regular students and faculty. Most importantly, industry relationships are carefully nurtured, with the intent that alumni of Stanford will "give back" to the university as they achieve success.

Unlike Stanford's private status which makes fundraising necessary for operation, UC Berkeley is a state operated and run university, and much of its funding is provided by the state. While Berkeley's experience in fundraising is much less than Stanford's, the number of successful and affluent alumni is much greater due to its greater class sizes. Certainly, taking some steps towards strengthening the alumni relationship would also raise alumni awareness of Berkeley's fiscal needs.

The Chief Technology Officer of ExecProducer, an alumna of the Berkeley physics department, received this call to action and responded with a suggestion – perhaps a MVP alumni experience website might reconnect disaffected alumni who have not heard from the department since graduation, and through this process, involve themselves in moving the department back to its eminent status?

CREATING THE ALUMNI VIDEOGREETING

Video editing and video production is becoming commonplace and inexpensive. Digital cameras and camcorders typically are sold with pre-packaged video editing software packages which can be converted to a variety of formats (avi, mov, …) for use in http downloads. However, many digital cameras now support directly mpeg movie clip creation, editing, and download to a PC.

Finally, streaming video production is becoming feasible for the student, through use of Internet services. This means that streaming produced movies can be quickly deployed, creating a dynamic environment for communications between students, parents, and the community.

The goal of the *Berkeley Physics Alumni VideoGreeting* was to use on-demand uniquely created streaming medias supplied by students, faculty, staff and alumni to encourage alumni communication and outreach. The hope was that greater visual participation and the dynamic creation of video supplied by alumni themselves would increase alumni awareness of departmental events, issues, and fundraising.

Issues in servicing a university customer included:

- Infrastructure requirements and IT issues.
- Budget and purchase abilities.
- Non-technical oversight and approval.

Figure 4: Alumni VideoGreeting Campaign

We found communicating as well as implementing the *Alumni VideoGreeting* experience (see Figure 4) had to be entirely a consumer-oriented one, with no additional expenditures in infrastructure or technical resources required by the department or alumni outside of commonplace computers, broadband connectivity, and digital cameras with clip capability.

IT and Computer Services in Universities

"Computer support within the Physics Department seems to be in an appalling state. Horror stories from graduate students, junior faculty, and staff about the state, the integration, and the maintenance of the existing plant abound. This state of affairs is highly discouraging, uneconomical, and damaging…" – UCB Review.

As illustrated in the Berkeley physics department report, there's a terrible situation that has developed with respect to computer technology. The department cannot unilaterally make decisions to improve or remove roadblocks to its use, because they immediately run into the IT and computer support service groups mandates and rules which do not anticipate such initiatives. Mediating decisions in this area is time-consuming and requires equal (or greater) "hands-on" technical expertise, which even a computer science department may not possess, and hence in a budget-starved situation is the last priority.

For example, at an institution with far better private fundraising like Stanford, one might think IT would get better resources and training – however, it is just as likely

that the secretary who books talks with industry is still working off an aging wheezing PC because "it still works". One cannot underestimate how foolishly frugal even the best colleges are, where they cleave to IT and computer decisions made upwards of 30 years ago and left unchanged because "it still works, doesn't it?"

So in taking sales to universities one inherits all of the legacies and must be realistic about how much of the IT infrastructure one must take on in order to achieve a task. The advantage for enduring this – if you can galvanize relationships given all of the obstacles present, smaller or better run community, educational, and special interest groups are a breeze in comparison.

Consumer Focus

In a review of equipment the department already possessed, it was observed that much of it was consumer-oriented and commodity-based Apple Macs and Windows PCs. Internet access for email and web was available, and white-listing of automated email newsgroups and lists was possible. In fact, from the staff's point-of-view, the equipment and access was very similar to that at home (although in many cases their equipment at home was more up-to-date).

In addition, while the addition of a computer or other IT equipment or major application required the interaction of computer services, purchase of consumer items such as digital cameras downloadable to Windows PCs / Macs was not regulated. Download of updates of software such as QuickTime 6 and other players also was not regulated. The reason is that these same items and environments are available to any consumer and widely used, and interdiction would be impractical.

Finally, widely available broadband means that any consumer can obtain quality Internet and email connectivity. Simple administration and automated update features from companies like Apple and Microsoft allow non-technical users of these systems the ability to upgrade or expand use without resorting to centralized tech support. In other words, the consumer experience gives a department the means to confront hostile and incompetent institutional staff blocking anything other than minimal usage.

Turnkey Services for MVP

Thus, motivation for the complete turnkey approach to media required for MVP is to avoid the formidable barriers presented by such institutional IT support. These requirements are as follows:

- The department can purchase consumer equipment like digital cameras as part of their standard budget process.
- The department may contract out for services such as alumni website management and MVP services with no centralized service overhead.
- The department personnel can administrate the contract on the services with no unusual technical support demands.

If these barriers to the purchase of MVP services can be overcome, the MVP alumni outreach process could commence.

In May of 2003, an agreement was reached with the department and ExecProducer to create 2,500 alumni MVP "greetings", website, filmography and search mechanism, and subscription mechanism. The website included department-supplied digital photos for a "photo gallery", artwork for department-branded productions, and department supplied clips.

Figure 5: Berkeley Physics Alumni Video Website

MVP ALUMNI VIDEOGREETING IN ACTION

An automated production mechanism and email interface to convert any digital camera clips to mp4 streaming video was used to allow alumni to create a "video memory book" of alumni experiences at the university (Figure 5). The website automatically updated and displayed new videos as they were received and approved by the departmental alumni director.

The alumni video web site includes written materials as well, including news, information on events and fundraising goals, and updates. Materials are easily added in with a simple update interface. However, the primary mode for communication is not written profiles or materials, but video clips supplied by the alumni. Alumni can search for other friends, professors, and students, and can reestablish contact with colleagues. An employment and resume exchange with alumni and current students is planned, along with several video projects illustrating favorite classes to be shot by graduate students.

The video web site was placed into test fall of 2003, with initial videos of department events and personnel shot by graduate students, staff, and alumni (see Figure 6). Formal launch of the alumni site is scheduled for June 2004.

The MVP Alumni Process

How simple did we make the process? At its simplest, in just five easy steps – take, send, get, view, and experience – and all done in five minutes.

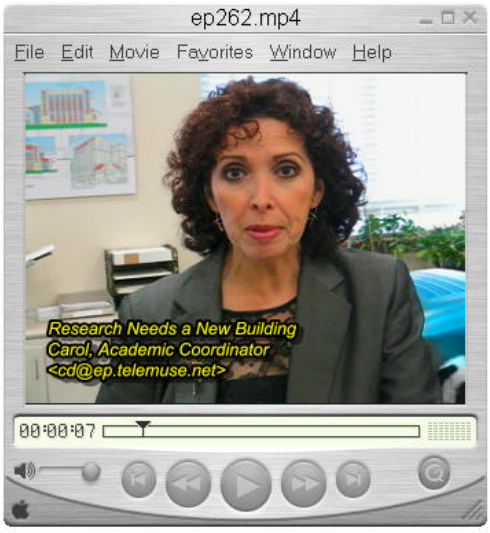


Figure 6: Carol Dudley speaks on department needs.

With a web page channeling them through this process, the alumnus or alumna can use an ordinary digital camera to capture the memory under script control. For those requiring it, a web page "teleprompter" is available which coaxes them through clips that they can review, re-shoot and edit with the camera (some digital cameras even have editing functions built-in). Having acquired the "take", they use an ordinary personal computer and email to communicate this to the production website at an automated email address, accomplishing the "send" step.

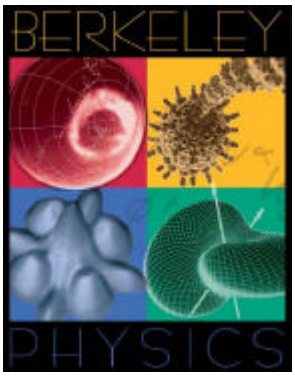
A fully automated server array at the receiving site receives the request and performs billions to trillions of operations on the incoming request (see the discussion on architecture). In the end, it completes a production, the combined product of the incoming material, professionally edited flexible templates, library footage / imagery, and individual creative insights / directives. Instead of controlling the process at the camera, actors, director, effects, post, and print stages, the individual is guided through the process with most of it already done – requiring only the executive "oversight" decisions on which ways to vary the flow.

A great deal of clarity is brought to the process by this high degree of automation, as it focuses the attention of the department and alumni on getting a good work product first, with creative alternatives second. Most people are overwhelmed by the myriad details and choices demanded to create a quality video production, and never experience success before frustration forces them away from the process. As Eric Berg of PriceWaterhouseCoopers stated at a media function last summer to the author, personal video production software is so complicated that it "stays on the shelf" never to be used.

By getting the alumni to success quickly while still keeping them engaged, they are no longer stopped by minor details but instead retain the perspective of refining the work product already created to the degree that time, skills, and the leadership of the project (in this case the alumni director or coordinator) finds suitable.

The results of the production run, completed on average in about five minutes, is shipped back as a viewer embedded in ordinary email that only the alumnus or alumna (and in turn the alumni director) can see – the "get" step.

Both "view" the result, gauging it carefully, but with different aims. The alumnus is focused entirely on his appearance in "his video movie", while the alumni director is concerned with "keeping on message". If something different is desired, subsequent production runs with changes can be easily accomplish by repeating the prior steps. When the production is signaled as final, the *Alumni VideoGreeting* is placed in the media library and scheduled for viewing under the direction of the alumni director. The community may now "experience" the result, as well as viewing all the other productions of the individual and groups.



Each video memory, whether of a professor, class, or project, appears as a completed movie, with titling, music, and imagery pre-selected by the department (see Figure 7). Hence, all videos had a consistent and professional appearance, consistent with the image of the department.

Figure 7: Video Cover Art

Customer Recommitment to Excellence

"While it is true we have work to do, we don't see physics at Berkeley in decline. We see our physics department poised for great revitalization." - UC Chancellor Robert Berdahl and Dean of the Physical Sciences Mark Richards in a letter to the UC community.

In meeting all of the turnkey services issues for the department, we found a renewed sense of enthusiasm from the staff, which was required as a new host of issues unique to the university IT process appeared. Among the items we experienced and resolved to complete this goal:

- Peer-to-peer filters and limits on file sizes. Universities are increasingly concerned with unauthorized file exchanges of music or other copyright material. However, large dataset exchanges are commonplace, and processes exist for increasing file sizes and obviating limits, requiring only an email explanation.
- Non-standard email and browsers. Many universities do not use the vendor-supplied email and browser packages on PCs and Macs, preferring their own home-grown derivatives such as Eudora (for email) or Opera (instead of IE on Windows, for example). Support for

these less-common email and browsers was done as part of the MVP service.

- Spam filtering of email. Many universities employ their own spam filtering, which removes HTML formatting and often marks as suspect mail listing and automated responses such as those used by the MVP service. Email lists may be "white-listed", avoiding the spam filtering and HTML deletion.
- Player support. While many players exist, we found the most common player in use was QuickTime, with support for the latest versions simply a download from Apple away. We mandated QT 6.0 or better for use with the site. Other player support in any format is possible with the MVP mechanism, but in tests the customer found a "Chinese menu" choice of players too confusing. Ironically, supporting only the latest version of QuickTime alleviated the customer's stress.

MVP ARCHITECTURE

In summary, the architecture of the MVP service mechanism is in essence an object-oriented software re-implementation of a studio and broadcast environment. Like managing multiple concurrent real estate projects, resources and space are allocated virtually to an authorized production for the duration of its run and then returned for use in another production. Production is automated and of high quality. Access is through the most commonplace Internet interaction – email. Schedules, searches, and ratings / reports are built-in as part of the customer experience. The architecture is a hosted software enterprise three-tiered application in a datacenter.

Almost all of the software is in Python scripts, with key bottleneck portions that are memory / CPU intensive like codecs implemented in C/C++ native compiled code. An object database and a SQL database retain the software objects, schema of external data relationships, and a mass filer holds the video library content files. A security mechanism is used to decouple each tier such that all tiers must be successively compromised in order to penetrate file contents. It is also possible to independently manage operations for each of the tiers, potentially with different business partnerships.

Entry to MVP is through a massive web/email front end that optimizes mass input of volumes of potentially huge (e.g. 100 to 500 MBytes) emails. Spam, authorization challenges, email flooding and other potential attacks are handled by the front end. Format and standards issues are addressed by a proactive support environment that redirects to existing customer support services already present elsewhere on the web.

The application tier is a scaleable software cluster that handles coarse grain parallelism of separate video tasks scaled by a joint resource scheduler. All elements are identical and separately replaceable, and can be added / dropped in operation. If too few are available to meet demand, the application array processing rate falls gracefully. Processing elements can be run independently to test new versions of the application, and to experiment with integration of new video processing technologies and techniques.

Each processor element possesses tools for video manipulation under scripted control through external XML description. Supporting software systems are used to translate from existing production systems into the XML description held in the database. Specialized use of low-latency communications technologies allow for high efficiency remote procedure calls to coordinate processor elements, achieving extremely high server resource utilization

Back-end systems supporting databases and filers can be run in fault tolerant duplex mode with a variety of different technology bases, and potentially in different geographic locations.

A significant consideration is the network architecture of the datacenter, specifically the entry / exit structure to the head end and its peerage on the network. To handle the resulting potential load of millions of high bandwidth media streams, a distributed video architecture that moves more of the content closer to the edge is a desirable refinement anticipated for ultimate deployment.

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