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CTO & INFORMATION ARCHITECT

My greatest contributions are in the area of creative problem solving and technology team management. I have demonstrated the ability to structure and implement large-scale creative and technical solutions involving cross-disciplinary approaches.

For the past twenty-eight years, I have been actively involved in the creation, design, implementation and operation of multimedia environments for digital media production and dissemination. My expertise is in the area of creative idea development and information architecture for a multiplicity of media. This includes Direct Broadcast Satellite [DBS], Broadband Cable (DVB, VOIP, and DOCSIS), Feature Film Visual Effects, Digital Studios, Internet Content and Information Technology Infrastructure, Creative Title Development, Hardware, Software and Computer Human Interfaces.

I have made significant advances in the area of Digital Broadcast, Intelligent Studios for Digital Media [ISDM] Creation, Dynamic Data Driven WEB Sites, Photonic Storage Area Networks, Collaborative Creation & Computing, Linear / Non-linear (interactive) video programming and digital media distribution systems.

Media Productions have ranged from MTV music videos, documentaries to an arcade based flight simulator, live performances and feature film visual effects.

I have assumed an integral role in the application of resolution independent digital imaging, film, video, and audio techniques to solve problems ranging from corporate communications and intelligent digital media studio architectures to the next generation of 3D stereo digital cinema. I have a clear view of the opportunities and challenges presented by the media convergence.

Responsibilities including content creation, information architecture, people and project management, system design and operation have provided a firm foundation for me in structuring solutions to today's information opportunities. It is my intention to continue to apply my creative and management skills with my technological expertise to penetrate the ever-expanding information market. My most recent efforts have been in the design and architecture of information super highways.

My diverse background and passion for excellence provides a unique opportunity for companies wishing to define the media information marketplace. I welcome the opportunity to discuss how a synergistic relationship may augment your endeavors.

Recent projects include Secure Personal Preference Information, Coral Reef Monitoring Program. Megayacht information architecture and systems integration. Piloting Yachts and Aircraft.



AquaPass 2004 –

Chief Technology Officer / Inventor / Co-Founder

AquaPass is defining the next generation of customer relationship management by empowering individuals with secure portable personal preference information. AquaPass provides VIP style services to all of its members securely communicating personal preference information in context with each transaction. AquaPass exchanges your criteria for success to merchants, others and service providers from all industry sectors. AquaPass incorporates biometric scanning technology to assure that you are in control of each transaction. Coming soon: <http://www.aquapass.com>

Monitor A Reef [MAR] 2003 –

Chief Technology Officer / Inventor / Co-Founder

Monitor-A-Reef [MAR] is a coral reef preservation program designed to deliver coral reef experiences to students of all ages on a global basis. MAR provides the ability to monitor coral reef status by transmitting live audio, video and telemetry information to classrooms and learning institutions over the WWW! This innovative program has the ability to create a generation that appreciate and respect the aquatic life forms enough to insure their survival.. Please visit: http://www.sail-cats.com/html/saving_the_reefs.html



Yachting Exchange

**Chief Technology Officer [CTO]
Information Architect**

Created an innovative business model to empower the exchange of information between yacht owners and service providers on a global basis. This model empowers the local economies of remote islands and yachting destinations to exchange local information, services and goods for local currency and or exchange credits.

Prominence Real Estate Advisors 2003 -

Chief Technology Officer / Information Architect



Authored business plan for the restructuring of the Lady Luck Resort Hotel in Las Vegas Nevada. This business plan converted hotel rooms into vacation timeshare intervals. Designed two new architectural elements to address some opportunities in the high rise condo market. The virtual window is a panel trimmed out to look like a real window, however the window uses tunable spectrum lighting to emulate natural light for areas that a natural window is not available. The virtual view window provides active digital cinema quality displays to provide views and media rich information and entertainment. PREA is in Scottsdale Arizona and is developing a multiuse high-rise in Denver's LoDo.



Shirley MacLaine CineMedia Center 2002 –

Chief Technology Officer / Information Architect

Designed an innovative digital content creation facility in collaboration with the Academy of Arts University San Francisco for Shirley MacLaine and the State of New Mexico. This project is a consortium of film makers, Stars, private enterprise, educators and government to create new business and educational opportunities.



Hangar 22 Alameda Point Naval Air Station 1999 –2003

Chief Executive Officer / Co-Founder

Hangar 22 was focused on the development of interactive media for commercial and educational applications. **Hangar 22** provided MacKay the opportunity to develop 4Ci an interactive advertising application leveraging broadcast cable and satellite distribution systems with two way communications to the viewer. Interactive advertisements replaced the traditional interstitials allowing the user to acknowledge interest and retrieve additional information.

EyeSpring: Contracted with **Wright Technologies** now **EyeSpring** on the business / software development and deployment of their next generation visual collaboration system. This product provides remote viewing and annotation of large images over the networks including the Internet.



Hangar 22 volunteered the complete resources of the company to the CIA following the September 11 attacks on the USA. Concurrent with this activity we began exploring ways in which we could safeguard America. **Jeffrey Diamond** identified **PROMIA** as potential client with their US Navy [USN] contract for computer network **Intrusion Detection System [IDS]**. **Hangar22** and **Jeffrey Diamond** successfully delivered the **GUI for Cyber warfare Visualization** to **PROMIA** that will be used in the **USN IDS**.



MacKay worked with **UPC/e-City Amsterdam** to develop the next generation \$1.1B interactive television [iTV] capability. These efforts included walled garden development, system engineering, program development and project management.



Renaissance Center 1992 -1999

President / Chief Technical Officer / Founder



Founded a unique consulting firm operating as a virtual corporation by incorporating a network of teams' structure. This organization has contributed significantly to the development of high-end media projects. These projects range in scale and complexity, which further demonstrates the opportunity for this type of operation.

GM Hughes Electronics. Working for **Hughes Satellite Communications**, I performed an analysis under contract to evaluate the \$1.3B **DirecTV** Castle Rock Network Operations Center. Following this contract I was directed to lead the team to generate the test procedures for bringing the system on line. Upon completion of this task, I was incharge of automation acceptance and operation for the pilot project. The pilot project was a six-channel version of the **DirecTV** system where the integration work took place. I learned every system in the facility and operated the pilot for the **first DBS transmission to the Consumer Electronics Show**. These systems were then replicated in Castle Rock for the initial deployment of the **DirecTV** service.



SUNUP Digital Systems. Following the **DirecTV** experience I joined forces with the leadership of **SunUP** to design the next generation broadcast automation system for large multichannel installations. My responsibility was understanding the overall system requirements and generating the graphical user interface [GUI]. This effort resulted in the TCS system that was used in the **ASTRO MEASAT** project and **DirecTV Japan and Latin America**.



DiviCom. Worked with the **DiviCom** team to address large system projects including **EchoStar the Dish Network** and **Time Warner's** Warner Bros. Network. This responsibility including comparative product analysis, market research, needs assessment, technical documentation and general support. This work comprised the compression systems for the Dish Network Cheyenne Broadcast Center.



MEASAT Malaysian DBS. Won a contract to design and generate the Request For Proposal [RFP] documents for the \$1.2B Malaysian DTH system **ASTRO MEASAT**. Responsibilities including presentations to top management and government officials including the Prime Minister. Site surveys for facility location and coordination with building architects was provided. RFP response analysis and bid selection was also performed.



Pacific Telesis Video Services. The Communications Group [TCG] was contracted to evaluate the content creation needs and generate the architecture and detailed design for the **Interactive Development Center [IDC]**. This effort combined networked computing, with audio video, geography information systems and the telecommunications infrastructure. Generated a design document that defined a \$10M facility for interactive service content creation.



Pacific Telesis Media Park. Was contracted to evaluate the content creation needs and generate the architecture and detailed design for the Media Park M.A.D.E. collaborative media creation environment. This effort leveraged the telecommunications infrastructure to deliver content and services to content creators and service bureaus. Generated a design document that defined a web centric approach before **MOSAIC** was a household item.



Synapse Technology. Reported to **Robert Abel** for a variety of projects. These included **Harvard DeBois Institute, Quincy Jones, TCI Telecommunications Inc., Celebrity Cruise Lines,** and others that I am not permitted to disclose.

Ameritech. Worked with **Robert Abel's Synapse Technology** to address a range of creative and technical issues related to design and deployment of a full service network. Responsibilities included network architecture, end user experience, customer premises equipment. Generated Strategic documentation set for content creation, channel creation, and related technical requirements.



Charles Schwab. Worked with **TCG and Synapse** to identify an Internet approach to informed interactive securities trading. Lead a team to create the overall creative and technical requirement to deliver a web based experience. Developed a working prototype that was presented to top management. Portions of this work evolved into the current web based trading system used today.



Wells Fargo Bank. Worked with **TCG and Synapse** to identify an Internet approach to informed interactive banking. Lead a team to create the overall creative and technical requirement to deliver an interactive CDROM and web based experience. Developed a working prototype that was presented to top management. Portions of this work evolved into the current web based trading system used today.



Media Fusion. Consulted on a variety of content related projects including feature films. These projects included consulting on visual effects creation and management for **MASS.ILLUSIONS, Access Media Luxembourg, Kawai Institute, Maui Super Computing Center, Gram Nash Life Sighs, & Star Gate.**



High Tech Center Babelsberg. Won a contract to define the overall information architecture and author the RFP for a 100M DM digital film studio in **Babelsberg** Germany. Facility included live action stage, motion control stage, virtual set stage and related infrastructure to generate world class audio and visual effects. This included acquisition, editing, creation, CGI, compositing, recording, format conversion, authoring and collaboration. This facility defined the next generation in Intelligent Studios for Digital Media creation.



LDT Laser Display Technologie Gera Germany. Performed a technical evaluation of the LDT laser video projection system for the investors. Project involved evaluating a three color laser projector using a proprietary modulator to project high definition video.



Silicon Graphics Computer Systems. Worked under contract as a Solutions Architect for the Professional Services Group. Developed and documented complex information architectures for **Dubai 2000** Satellite Television and Web facility United Arab Emirates, **LUME** Digital Media Facility University of Art and Design Helsinki Finland, **TV Azteca** digital conversion project Mexico City,



PricewaterhouseCoopers. Consulted on a variety of media content management projects. These projects include **NBC News** Media Asset Management based **SEGUE** RFP proposal, and other that I am not permitted to disclose.

Village Labs Super Computing Center Designed the information architecture for a computer graphics rendering service in Tempe Arizona. This included **Cambridge Gamma Series** computers with Hippi connections rendering series of film and video resolution images.



Art and Culture.com. CTO for **Planet Live, Inc.** creators of **Art and Culture.com** an Internet startup focused as a curated web portal and hub for the arts. Defined the information architecture to create a database driven hypermedia experience customized for each user. Built the technical team and provide guidance for technical and business issues.



MoreCars.NET. CTO for MoreCars, Inc. an Internet startup focused as a web portal and hub for the automotive enthusiast. Defined the information architecture to create a database driven hypermedia experience customized for each user. Built the technical team and provide guidance for technical and business issues.



Computer Graphic Service Corporation CGSC Co-founder and CTO of an Internet startup to develop and deploy an Application Service Provider [ASP] service for the media professional. Designed IT infrastructure and consult on the business logic. CGSC was contracted by **SNI Storage Networks Incorporated** to create an extensive market study on the feasibility of outsourcing storage .needs for the entertainment industry.



Celebrity Cruise Lines Provided information architecture and business planning to **Robert Abel** for the design of the next generation cruise ships. These ships were built by **Sony** System Integration group and are currently in use.



Oriental Financial Group OFG Developed **e-Hispanic bank** to conduct internet banking transactions. Evaluated realtime banking platforms. Designed information architecture for Java Database Connectivity to core banking system that delivered a web centric GUI. This n-tier architecture included load balancing and audit trail capabilities.

Random Order Generated system architecture for next generation interactive content creation. Worked with **Robert Abel** to create several interactive commercials and the interactive Eric Clapton concert. Designed and developed the iTV Lab in Los Angeles. Served as CTO for strategic alliances.



Sullivan-Knobeloch Residence Designed the information architecture for a private residence in Topanga, California. This included all communications and entertainment systems. Designed the home theater and critical listening room for an esoteric HiFi.

INTELLEC PRODUCTIONS Somerville Massachusetts: Co-Founder with **Yanni & Demetri Samellas** and **Chris Mohen** for one of the first computerized music video production companies on the East Coast. **Intellec** Won the first MTV basement tape awards for **Digney Fignus** "The Girl With the Curious Hand". Worked with **Todd Rundgren's** Utopia video studio paint system. Produced films and videos for: **The Cars, Eben Ozen, and Jon Butcher Axis.**



SONY Sony Advanced Video Technology Center [AVTS] 1989 -1992

Director of Graphic Products / Director of New Products and Technology

Played an integral role in the development of **BVE** professional broadcast editors, **DME** digital video effects processors and **DVS** digital video switchers. This included computer human interface, software and hardware systems. Working as part of an international team from Atsugi Japan and Europe, I conducted field research for functional requirements generation. Together we identified technical solutions that could be produced cost-effectively.

Working with an international team of top management and engineering, I proposed a distributed collaborative workgroup approach to digital media production. The **EIGER** project incorporated an innovative 3D GUI, object oriented software developments: OODBMS, C++, Widget Wrappers, and CASE tools.



Designed an all-digital approach for **DirectTV** baseband system. Presented this work to top management at **GM Hughes**. Generated sections of the Sony response to the Hughes RFP for DirecTV. This effort resulted in the award of a \$50M contract to Sony for work on DirecTV and a US patent.

Sony Japan provided me the opportunity to build a technical team and working prototype of this digital production and postproduction environment. This advanced environment was successfully demonstrated to management and industry experts [**Francis Ford Coppola; Zoetrope, Michael Cunningham; Western Images, and Phil Squyres; Columbia Tri Star**]. At this time, Sony is currently developing a line of products to bring this work to the commercial market.



General Electronics Systems/DiaQuest 1985 -1989

Director Interactive Video / Computer Graphics

Joined **GESI DiaQuest** to expand system level engineering efforts. Contributed technical expertise in the areas of system design and product development. Designed multimedia videographic systems including turnkey video installations for **Lockheed, Pacific Bell, PG&E, Lawrence Livermore, Sandia, Chevron**

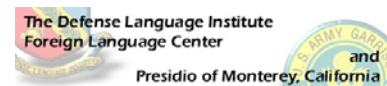


and **Hewlett Packard**. Performed project/technical management and client service functions for all aspects of projects.

Defined and aided in the design, manufacturing and marketing of single frame animation controllers for 2D and 3D computer graphics output to video. This effort resulted in the full development of two products. 1) The **Series II** animation controller and 2) the **Image node** video server marketed by **DiaQuest**. Engineered and manufactured the Paint and Animation System that was an OEM product for **WAVEFRONT Technologies**.



Designed and installed large interactive video development and delivery systems for **The Defense Language Institute** and **Pacific Telesis**. Made significant contributions in the areas of virtual control systems for multi-media environments. Advanced the concept and utilization of Hypermedia tools and techniques.



Directed research efforts in the area of **Intelligent Studio for Digital Media [ISDM]**. Research centered on a Sony NEWS UNIX based workstation coordinating a SMPTE based AB roll video edit suite and MIDI based music system through a virtual front end. The main objective is to produce a high-end multi-format environment with a producer level front end.



Massachusetts Institute of Technology 1985 - 1985

Director of Engineering

Massachusetts Institute of Technology MIT Center for Advanced Visual Studies **Rus Gant** contracted me to aid in the production of the interactive videodisc “**The First Emperor of China** “. This disc is being utilized by the Peoples Republic of China and **Simmons College** Graduate School of Library and Information Science for multiple applications. Responsibilities included field photography, videography, field audio recording, postproduction supervision and audio mastering. This work is presently being used in interactive instructional programs by **Harvard, MIT, and Simmons College** and distributed by **The Voyager Company**



VARITEL Video 1984 - 1985

Chief Engineer Postproduction

Negotiated an agreement with **Varitel Video** to take possession of the **Atari Edit Lab** at which time I became a partner and employee of Varitel. Responsibilities at Varitel included technical team management and system engineering, integrating the **Atari** Post production system with the existing Varitel multi-format suites in Los Angeles. I also worked as an on-line multi-format videotape editor and audio engineer. Served as the design engineer for the multi-format edit suite for the San Francisco office. Designed the system and turned engineering drawings over to the implementation team for the build-out. Varitel Video is now **EDS Digital**.



ATARI Coin Operated Games 1983 - 1984

Technical / Creative Director

Joined the **Coin-op division of Atari** to produce interactive videodisc based arcade games. Successfully completed **Fire Fox, RoadRunner** and **Battle Star Galactica** game titles. To accomplish this we combined my previous efforts at Atari Corporate Research in intelligent studio development to design and build an automated video production/post-production facility. The focus was creating interactive videodisc titles that used pre-rendered computer generated imagery.

Designed built and operated the EDIT LAB, Atari's in-house production and postproduction facility. This facility features Shooting stage, online and offline video editing, CGI, Audio sweetening suite, computer lab and hardware software lab. Our in house production and postproduction requirements allowed me the opportunity to apply and expand my skills as an audio engineer, video editor, videographer, computer generated imagery designer, system engineer, and software engineer. Designed an Interactive Broadband Communications Network Universe [IBCNU]



ATARI RESEARCH 1982 - 1983

Senior Technical Supervisor

Senior Technical Supervisor for a group of 14 engineers, technicians, programmers and designers. Coordinated advanced development efforts. Automated the office with a **VAX 11/750** running custom software in addition to CAD and graphics applications. Provided technology transfer function between Corporate Research and Design Research.

Authored and presented proposal for the “**Cinemia Center for Interactive Disc Development**” for **Alan Kay** and **Tedd Hoff**. Proposal detailed an AI based system that provided a basic research environment for videodisc emulation production and pre mastering. Techniques were developed to provide automated design and tracking of interactive video segment, this was accomplished using **VAX 11/ 750** and **Datatron Vanguard editor**. Techniques developed here were used in the full-scale system used to produce interactive videodisc based games for **Atari Coin-OP Research**.

Was the technical lead for the development of “**ERIC**” the company’s first interactive videodisc project. “ERIC” was a point of purchase sales tool, which I personally demonstrated to **Sears & Roebuck and JC Penny**. The project was well received by both parties and was transferred to manufacturing where 1000 kiosks were produced and distributed. I assumed project management responsibility in addition to hardware and software. I also was involved in the video programming production and postproduction.



Contributed hardware and software expertise on the “**PLAYLAND**” projects the company's first videodisc based arcade game. Stop frame motion control was used; working the **Richard Taylor Magi-Synthevision**, we created one of the largest motion control sets ever assembled. Programmed camera moves to match frame edit into a movie map of the model amusement park. The project used videodisc segues into computer graphic arcade games.

Produced a multi-media project “**STORY LINE**” a multi-monitor videodisc based presentation on exhibit at **Great America Park**. Tasks included high registration accuracy film transfers, videotape editing, hardware interfacing and system software.



DIGITAL EQUIPMENT CORP. 1978 – 1982

Electrical Engineering Technician

While directly reporting to System Interconnect Signal Integrity Engineering, I also worked for other groups including Corporate Research, Corporate Library Media Services, Field Service, CAD Services and others.

Project engineer for the development of the **DR11-W** general-purpose D.M.A. interface to the **Unibus**. I took over an incomplete design, finished the design and all issues required to bring the module all the way through manufacturing. I also supported the product after its release and consulted with users, aiding and implementing applications. Users consisted of **NASA Johnson Space Center, Lockheed, Aydin Controls** and **Bell Labs**.

Prototyped and aided in the design of a high-resolution graphics workstation to be utilized in a **Xerox Smalltalk** environment. System consisted of 1024 x 768 pixel bit map providing a multi-window display. This effort was the original prototype for the VAX station.

Worked with Field Service Engineering developing an interactive training system that utilized a videodisc player and a **VK-100 gigi** terminal. This system was developed to evaluate the potential of interactive video for field service educational purposes. This system was the original development that evolved into the **IVIS** system.

Specified and assembled a **VAX 11/750** system for the signal integrity engineering group (Supervisor **Don Vonada**). The VAX 11/750 systems were not available at the time and this system was assembled from component parts to provide a VMS environment for the execution of such programs as **SINE, SLICK, SAGE, FIELDS, PAULI, TDR** and other.

The Audio Clinic 1975 - 1978

Founder - Chief Engineer



Started an audio system engineering and service company in Columbus Ohio. Provided technical service for **TECH hi-fi, Campus Music Emporium**, and the **Agora**. Tasks included business management, audio system engineering, electronic design and repair.

Performed FOH and stage monitoring sound reinforcement design, installation, and operation for touring bands. Designed audio systems and repaired equipment including electronic musical instruments.

Invented a single stage FET amplifier that was placed inside a electric guitar for overdrive distortion effects.



Contributed to the experimental **Warner AMEX QUBE** interactive cable TV trials in Columbus Ohio. Worked with **Dr. Curri** and **Dr. Wells** at **Ohio State University [OSU]** to produce computer generated interactive video games for deployment over the CATV network. Consulted on production and technical issues for interactive programming while attending Ohio Institute of Technology [OIT].



Patents Applied For [PAF] and Issued

• High Definition Multiple Image Display	PAF
• Variable Scale Input Device	5,191,320
• Multi-Dimensional User Interface	5,148,154
• Variable Scale Rotary Switch	5,187,630
• Improved Variable Scale Rotary Switch	5,351,161
• Methods and Apparatus for Selecting Functions	PAF
• Control Center Consoles	341,833
• Control Center Consoles	341,834
• Electronic Image Stabilization System	5,253,071
• Integrated Multi-Media Production and Authoring System	5,307,456
• Improved Lens Filter Assembly	5,208,624
• Flat Panel CRT	PAF
• Multi-Head Magnetic Disk Drive	PAF
• Video Storage, Processing, and Distribution System	5,305,438
• Workgroup Dataflow Storage Area Network	PAF
• End to End Asset Management for Interactive Distribution	PAF
• Secure Portable Personal Preference Information Device	PAF
• Secure Portable Personal Preference Information Service	PAF

References

VideoTapes, VideoDiscs, Compact Discs, and DVDs are viewable upon request.

Internet URL's available upon request

Personal references are available upon request