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An experienced Senior Systems Architect with strong Product Management skills, particularly for the consumer electronics market. More than 28 years experience providing the technical leadership, architecture, design and implementation of successful consumer products across several markets. Consistent track record of innovation.

Innovator, Generalist, Self-starter, Experienced, Versatile, Flexible, Pragmatic. Good 'instincts' and judgment.

Technical Leadership	Company-wide/strategy, multiple teams, single team, mentoring. Excellent writing and interpersonal communication skills.
Cross-disciplinary	Product-wide experience. Deepest background in Software. Synergistic interaction with specialists in product marketing, UI, hardware, mechanical/industrial, etc. Comfortable with schematics, datasheets, mechanical drawings, et al.
Vendor Management	Make vs. buy, evaluation, due-diligence, SOW, point-of-contact, future requirements & roadmap feedback.
Customer-facing	External developer/SDK support, beta testing, customer issue escalation, online community presence.
Cross-platform:	Multiple hardware architectures, OS, toolchains. Design for portability, reuse and establishing/evolving platforms. Embedded, Desktop and Service.
Skills	Product/feature definition & refinement; extensive knowledge of consumer electronics market System and component-level architecture and design Hardware & software co-design/partitioning Software Implementation (from bootloaders to GUI) Prototype hardware bring-up
Product Experience	Embedded devices (e.g. cellphones, remote control/IR, server appliance, network card, etc.) Multimedia (PVR, media streaming, home theater products) Digital imaging (digital cameras, cellphone imaging) Connected products incorporating a service (e.g. PVR, mobile devices) Distributed systems (peer-to-peer networking, loosely-coupled systems) Local & wide-area networking (including peer-to-peer protocols & new protocol design) 'Virtual Machine' emulation (e.g. IBM PC emulation, AppleShare file server) Web services and site development
Platform Experience	Linux (embedded, desktop, server), (classic) MacOS, RTOS and 'bare metal'. C, Assembler (from 8 bit microcontrollers to 32 bit processors/SOC). HTTP/HTML/JavaScript, some C++, Java and PHP.

Lab126, Inc.
Sr. MTS

March 2009 – Present

Please note: abridged - some projects are still confidential

Responsible for all audio subsystems in userspace (Audible book playback, text-to-speech, music playback, audio capture). Overhauled audio subsystems to remedy significant design and implementation quality issues.

Point-of-contact with vendors for audio-related software deliverables (codecs, text-to-speech engine, audio post-processing).

Work closely with legal team to identify and address issues arising from mixing open source with proprietary licensed software.

Chosen by the Director of Software to get a floundering key internal project back on track (graphics related).

Palm, Inc.
Lead Architect

May 2006 – Feb 2009

Please note: abridged - some projects are still confidential

Senior member of the engineering team behind the Palm Prē smartphone and WebOS.

One of two lead architects in a new three-person architecture group at Palm. Provided system-wide technical leadership and cross-team co-ordination for the first phase of Palm's next generation operating system platform (Linux-based). Produced master architecture document for it. Conducted cross-team architecture reviews.

Contributed to new architecture/design process and internal documentation standards.

Worked with Palm IP attorneys, assessing blend of open source software with proprietary software (both Palm & vendor-supplied). Wrote Palm's first internal open source policy.

Assessed value of several patents from acquired portfolio. Suggested how they could be strengthened and extended.

Actively involved in the evaluation and selection of major silicon components. Part of a tiger team that evaluated and recommended a switch between silicon vendors mid-project, to address vendor's repeated schedule slips and escalating risks.

Active participation in new technology/vendor evaluations. Frequent interaction with multiple silicon vendors, both current suppliers and potential future partners. Provided feedback and suggestions to silicon vendor's roadmaps.

Participated in strategic contract negotiations with Palmsource (now ACCESS Systems Americas).

Key contributor to technology evaluation and vendor selection for the camera imaging subsystem on the Palm Palm Prē smartphone.

Developed a new architecture for media services. Prototyped a new asynchronous front-end for the media engine, along with a web browser plugin that provided a rich Javascript interface over IPC.

Filed three patents (US Patents #[691484](#), [726709](#), [726712](#)).

Palm, Inc.

Aug 2005 – May 2006

Sr. Architect, Media

Provided technical leadership for new team implementing media support for Palm products.

Evaluated media architecture offered by Palmsource's Cobalt operating system. Produced presentation for executive staff outlining deficiencies. Evaluated available open-source alternatives and selected GStreamer (before it was well-known).

Drove multimedia requirements to vendors. Created current and future codec requirement documents for external distribution.

Worked with vendors to explain requirements and find practical compromises. Worked with Intel Cellular & Handhelds Group (now part of Marvell) to have color-key support added to display controller of Monahans-LV.

Actively participated in new technology/vendor evaluations.

System administrator for internal server and external dedicated server (wiki, streaming server, etc.)

One patent filed (US Patent #[447464](#)), two further disclosures not pursued.

THX, Ltd.

June 2004 – June 2005

Chief Architect, A/V Systems

Principally involved in the creation and deployment of technologies and intellectual property related to THX's five areas of business.

Provided technical direction and assistance to product development teams. Provided technical guidance to product management and business development activities.

My primary project leveraged THX's excellent relationships with both the major Hollywood studios, and major consumer electronics manufacturers. It involved creating a technology standard for the content creation and consumer electronics industries, built upon the DVD and HDMI standards. Unfortunately the details remain confidential.

I also worked on a reference implementation of the technology based on a Sigma Designs DVD Player Reference Design.

Helped define the feature set, wrote microcontroller firmware and co-designed hardware for the 'Visual EQ' technology, announced by THX at the 2005 Consumer Electronics Show (see <http://www.thx.com/news/20050104A.html>).

Independent Consultant

Dec 2003 - June 2004

Consulted with two companies on consumer electronics product designs:

- [Sonos Inc.](#) on product definition and technical specifications for their [Digital Music System](#) product range.
- A second company, on product definition and UI of a high-end remote control.

Immersive Inc.
VP, R&D

May 2003 - Dec 2003

Immersive was a small startup creating products for the home theater and HTPC markets.

Small company meant broad responsibilities; from evaluating technology partners, through hands-on product development, answering dealer questions and interacting with customers (including online forums).

Product development was based on embedded Linux (kernel 2.4) running on a Toshiba MIPS-based platform. Media processing was handled by a combination of specialized video processing chips and FPGA/CPLDs.

Developed a number of software components, including an on-screen GUI application, through middleware, to kernel drivers for the hardware.

Philips
Sr. Systems Architect

April 2001 – May 2003

Lead Architect for the group. This group offers engineering services to other groups within Philips, and offered all disciplines necessary to take a project from concept to transfer to volume manufacturing.

Provided technical leadership for the development team. Offered technical & architectural support to customers, during product & roadmap definition in particular. Guided all disciplines involved in a new product's introduction.

Active participant in strategy planning, interaction with other parts of Philips, and business acquisition for the group.

Involved in the majority of projects, to some degree. The majority of my time was focused on these projects:

- Portable 10.4" LCD tablet designed to navigate and play A/V streams over 802.11a. Also supported web browsing. Based on a Geode (x86) processor running Windows CE and a media processor for decoding. Designed a consumer-oriented user interface which merged metadata from network sources into a single unified view.
- Internet-accessible service which indexed metadata from multiple content partners to provide a single aggregated view of media that could be streamed directly to the device.
- PC-based LAN-accessible jukebox server
- Wi-Fi MPEG-2 A/V stream transmitter. This set-top box encoded an analog A/V signal or TV tuner channel into an MPEG-2 transport stream and sent it over 802.11a. An internal web server provided a means to control the internal TV tuner, or an external device (by transmitting IR remote commands).

These projects integrated tightly together. They presented many challenges; technical, vendor management, content and software licensing amongst others.

Filed US patent #[10/034664](#).

TiVo Inc.

June 2000 – April 2001

Member of Technical Staff

Technical Lead for the UK version of the company's DVR product, launched by Sky Digital (major satellite TV provider in Europe) & Thomson Consumer Electronics (RCA & Proscan brands in the US).

Extensive work on infrared control of external devices, including complete rewrite of microcontroller code, adding decoding of several new IR protocols and providing a huge improvement in blasting accuracy. This greatly reduced the number of related support calls (ranked #2 previously).

Designed hardware/software solution for IR reception & transmission for 'Series 2' TiVos, which eliminated a microcontroller. Worked closely with hardware engineer to incorporate the hardware portion in the TiVo ASIC. Wrote supporting Linux device driver.

Key contributor to the second generation of the famous 'peanut' remote control which ships with all TiVo products.

Flashpoint Technology Inc.

Mar 1999 – June 2000

Chief Architect

Provided technical leadership and architectural direction for an embedded operating system for digital imaging appliances – Digita, Flashpoint's primary product. This OS shipped on several popular digital cameras from Kodak and Minolta, and color inkjet printers from Epson (only available in the Pacific Rim). Strategic relationships with Hewlett-Packard and Pentax were announced at PMA 2000.

Custodian of the public API, managed introductions of new APIs, deprecating old ones.

Introduced new system architecture for a discovery service, message-passing system and reference-counted memory management suited to an embedded environment.

Optimized the boot time down from 12 seconds to under 2 seconds.

Advisor to V.P. of Engineering and C.T.O. Active participant in roadmap planning and scheduling. Evaluated technology presented by potential development partners. Frequently asked to contribute material for presentations to OEMs and strategic partners. Two patents granted (US Patent #[6914625](#), [7107516](#)), one more filed ([11/156044](#)).

Philips Multimedia Center

Dec 1995 – Mar 1999

Sr. Systems Architect

'Father' of the [Philips Pronto](#), a remote control featuring a touchscreen bitmapped LCD. Wrote & pitched the product proposal, and worked closely with the development team to refine the feature set, user interface, and Windows-based setup/editor application.

It launched to rave reviews; demand outstripped supply for months. The original product has evolved into a profitable product range, and was OEM'd to a number of major CE manufacturers (Marantz, Yamaha, Onkyo, CAL, etc). It defined a new market segment for remote controls, and is still considered a benchmark.

Software Architect & team lead for the DVX-8000, a first-of-a-kind convergence product for the home theater market. It integrated a PC, Surround-sound preamp, DVD player, TV tuner and line-doubling technology into a single unit with the appearance and user experience of a consumer electronics product. The closest equivalent today would be to combine a Windows Media Center PC with a 'home theater in a box' product.

A 'technology statement' product for Philips, it received considerable positive coverage in the specialty home theater press, including covers of several magazines. Development schedules were extremely compressed, going from concept to retail availability in nine months.

Oversaw software architecture and development, provided extensive input to hardware architecture & design. Designed APIs and inter-processor communications protocols. Implemented DLL and driver APIs (plug & play static VxD, with sysperf support) to communicate with embedded controller. Some work on embedded controller firmware. Reworked video port manager (VPM) layer. Reverse-engineered remote control's IR 'clone' protocol to allow creation of PC-based setup/editor app. Wrote sections of the user manual. Designed several video test patterns for the setup application. Wrote Photoshop plugin for manipulating areas of the color key value (used by graphic artists creating user interface). Helped create graphic artwork for user interface.

Lead Architect on a joint project between Philips and Microsoft to define a new consumer electronics platform. This appears to have resurfaced later as Microsoft's 'Media Center' platform. Oversaw every aspect of the design of a complex PC-class development platform, including mechanical and industrial design, user interaction, hardware and software architecture, chip architecture selection and hardware design. Sadly Philips eventually determined it was not in their long-term strategic interest and withdrew.

Co-architect for SmartTalk, an architecture, platform and protocol for interoperability and integration of intelligent consumer electronics devices. Sony was approached with the result, and later other major consumer electronics manufacturers also joined the effort. This became the basis of the HAVi and HomeAPI standards promoted across the CE industry, and appears to have heavily influenced the design of UPnP and JINI.

Helped identify opportunities for cost-reducing the [WebTV](#) reference design.

Assisted in a large number of due-diligence, feasibility and proof-of-concept efforts, both internal and external.

Eight patents filed, seven granted (US patents [#5819294](#), [5959536](#), [6067478](#), [6212238](#), [6437828](#), [6480473](#), [6580461](#)).

Highlights of Older Work Experience

Apple Computer, Inc.
Software Architect

Feb 1992 – Dec 1995

- Key engineer on an electronic publishing system for eWorld (Apple's online service), based on a distributed object store. Patent granted (US Patent [#5625818](#))
- Extended eWorld's client software with an easy-to-use Interactive Calendar and Event Navigation tool. It was time zone-aware, supported international date formats and rich

- Developed a new processor emulation (of Intel iAPX 286) from scratch, with a much-reduced memory footprint and host processor requirements. This led to successful products for the Macintosh Portable and other popular low-end Macintoshes. This emulator was also used as the foundation for the NeXT port and later Macintosh versions of SoftPC.
- Designed and implemented a graphics driver for Microsoft Windows, which emulated a high-end intelligent accelerated graphics card. Passing higher-level graphics primitives to the host graphics system yielded substantial performance increases. This prototype eventually resulted in 'SoftWindows', which Apple chose to bundle with several Power Macintosh models at launch.

Digital Microsystems Ltd.
Software Engineer

April 1986 – May 1987

- Developed firmware for intelligent LAN cards (media access control and name service) and communications servers (LAN to X.25/X.3 and SNA)
- Developed various layers of protocol stacks (for two proprietary LANs)
- Wrote a debugger/monitor that proved popular with co-workers (embedded and TSR versions)

Comart Computers Ltd.
Software Engineer

Jan 1984 – April 1986

- Developed firmware for a desktop machine (not IBM PC compatible), including a re-entrant I/O system based on interrupt and DMA services
- Developed firmware to emulate IBM PC hardware by interpreting captured bus cycles
- Implemented ROM BIOS firmware
- Ported operating systems, wrote graphics and networking drivers

Almarc Data Systems Ltd.
Software Engineer

June 1981 – Jan 1984

- Developed firmware for Z-80 and 8086 S-100 systems
- Ported operating systems, wrote graphics and networking drivers
- Co-designed S-100 hi-res graphics card
- Supported developers at VARs and major accounts
- Wrote developer and end-user documentation
- Provided telephone support for end users

Personal Interests

- Home Theater, HTPCs. A/V and Consumer Electronics in general (perhaps more of a consuming passion than an interest...)

- Software development, some open source contributions. Occasional small hardware projects.
- Telephony & VoIP (run an [asterisk PBX](#) at home).
- Woodworking (or is it collecting power tools? :-).
- Photography.
- Remote controls (of all things... :-) and Home Automation.
- Various sysadmin/network stuff, and creating tools for same (My web sites, home & colo servers, firewalls/IDS, networking, Linux development, etc.).