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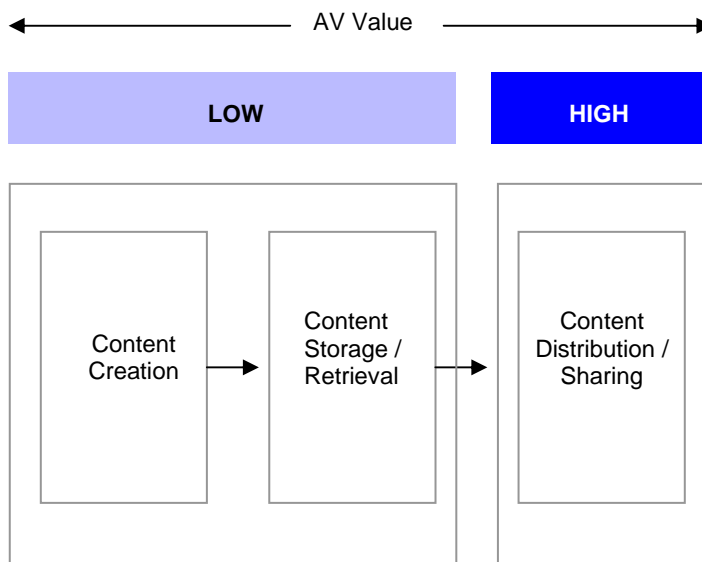
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## Content Management: A Critical Mission

In the collaborative environment that defines today's enterprise, managing knowledge and information has become mission critical. Organizations are implementing systems and platforms that simplify information management. The objective is to increase productivity through the creation and distribution of content with systems that help employees create, manage, use, and share information in the organization's business processes.

In addition, content management is an integral part of many AV applications including digital signage, videoconferencing, web casting, video-on-demand (VOD), rich media, and online learning. As a result, content management has become significant to the enterprise.

One of the biggest challenges of content management is user retention. Content managers must be sensitive to information overload, which creates a higher "decay rate" of knowledge through a lower retention rate. The rich media landscape has evolved from just one year ago, for example, over 500,000 videos are now uploaded to the Internet every day (Source: Streaming Media). People are inundated with information; therefore, it is critical that content stand out to be noticed and retained. In order to achieve this objective, content managers should aim to create the desired end user experience.



*There is an opportunity for AV service providers to add significant value in the content management value chain.*

### An opportunity for AV in the content value chain

The main steps involved in the content value chain include content creation, storage/retrieval, and sharing/distribution. Content creation is the responsibility of content originators, which may be internal or external to the enterprise. The AV service providers typically involved with this step of the process are Presentation Professionals and Digital Signage Specialists.

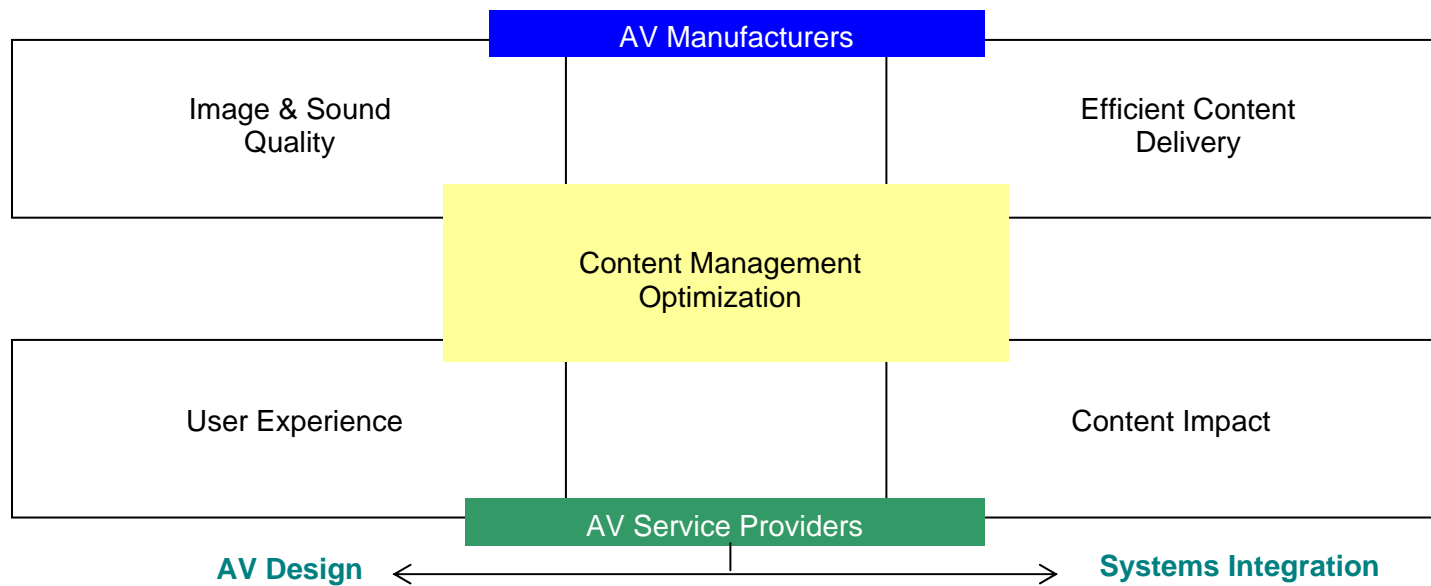
The second step in the process, content storage/retrieval, is typically the responsibility of the IT department. Storage and retrieval are process-driven, relying almost entirely on the infrastructure.

The final step is the distribution and sharing of content in which AV service providers can add significant value.

## Technologies



*AV manufacturers and service providers can play a significant role in the management and optimization of the content delivery process.*



### Content-based AV requirements are driven by technology innovation

Content is typically defined as digital audio, digital video, or the display material of a computer application. The increasingly digital and portable nature of content is creating a new set of requirements for AV system design and installation. Users increasingly desire access to information from multiple locations, and there is also a need for users to more quickly absorb information. This has generated a requirement for content delivery to be simplified and more efficient.

At the same time, technologies continue to evolve. For instance, high definition (HD) is now commonplace for both image and sound quality, which has become expected by the end user. Therefore, AV designers and systems integrators need to keep up with technology innovations in order to understand the spectrum of AV solutions available.

### How AV service providers are affected

In order to capture the opportunities created by the content management process, AV service providers need to fully engage end users, manufacturers, and each other. Success will be a function of a customer-centric collaborative effort, and AV service providers will have to bring their customers into the process in order to optimize content management.

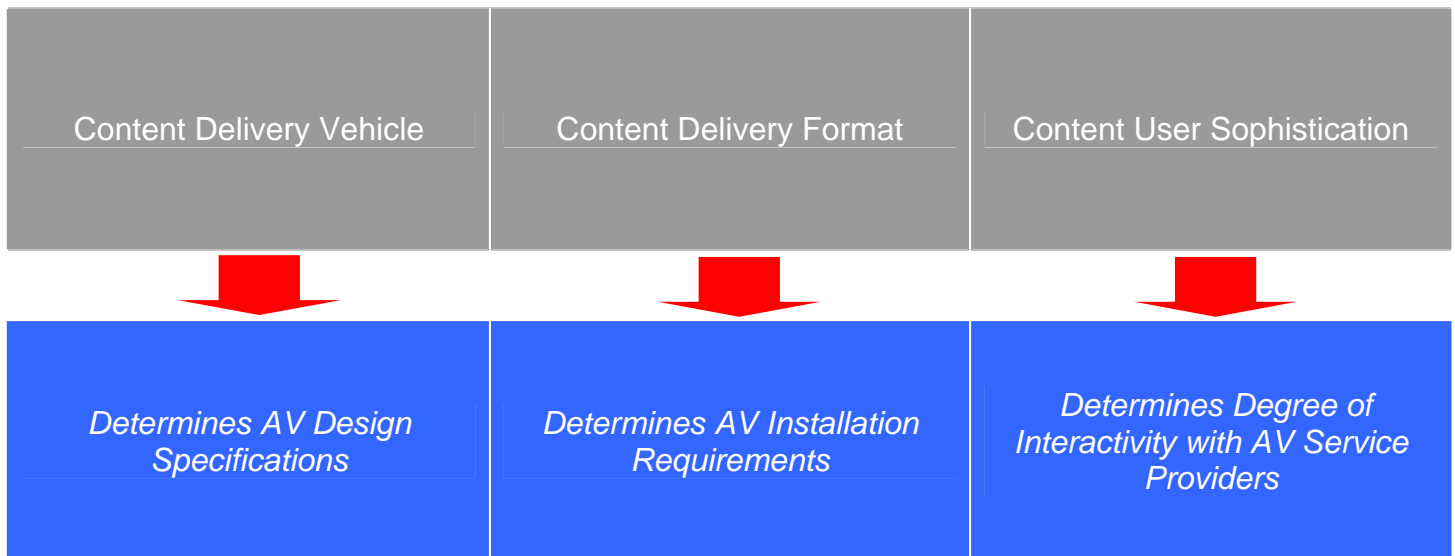
Since AV systems are expected to be experiential, customers will need to be involved in the process and provide feedback on the design and installation to ensure that the content is dynamic.

The following diagrams provide useful tools to share with customers who are reluctant to open up about their business because they are not accustomed to working collaboratively with vendors. Once AV professionals explain the benefits of a collaborative relationship, customers will be more cooperative.

**Industries**



*Content delivery vehicle, format, and the sophistication of the end user constitute the basis for content-related specifications in the design and installation of AV solutions.*



**The content delivery vehicle impacts the AV system design**

Content usage and the delivery vehicle are two important considerations in the design of content-driven AV solutions. Typically, content delivery vehicles align with both traditional and non-traditional AV applications such as digital signage or videoconferencing.

The content delivery vehicle is especially important in the AV system design process because it provides parameters for creating the user AV experience. The first question that AV system designers should ask is, “Who is the target audience?” More flexibility is required when there is a diverse range of content users.

**The time and the place of content consumption impact system installation**

Content delivery format issues (the time as well as the place where the content will be consumed) are important factors that affect installation. For instance, if the content to be delivered requires a significant amount of bandwidth and is delivered in real time using videoconferencing in a corporate boardroom, there is a different set of criteria for selecting AV components to be installed in the system than if the content is to be delivered in a classroom environment.

### **A unique opportunity for AV service providers**

Content Management is often the responsibility of IT managers, since it leverages the broader IT infrastructure of the organization. IT managers, while very well-versed in matters relating to infrastructure, often lack the skills or predisposition to manage content that optimizes the user experience.

Where IT is typically able to provide the mechanics of delivering content, the delivery mechanism and support platform are taken for granted and not considered value-add elements. The value resides in the experience of the end user who receives the information, which is a result of content creation. Simply put, content creation is more an art than a science, and it comes much more naturally to AV than IT.

Typically, when sharing or distributing content, customers are worried less about the delivery process than the impact that content will have on the recipient. The ultimate objective of content creation is maximizing the information retention rate of the target audience by keeping their level of awareness and alertness high as long as possible.

In other words, the desired end result relates more to the experience that the recipient of the content will have and the retention rate of the information being distributed.

### **AV service providers are in the best position to capitalize on the content delivery challenge**

Content delivery is intrinsically an AV function that requires IT skills and tools. AV service providers are presented with a unique opportunity to accomplish the reverse of what IT entrants have done in the AV industry.



Where IT vendors have leveraged their knowledge of networks to penetrate emerging AV applications like videoconferencing or digital signage, AV vendors can leverage their core competence to optimize the user experience and penetrate the intrinsically IT-centric application of content management. The AV elements of design and integration that harmonize time, place, and end-user experience of the content application are the most critical success factors for maximizing the information retention rate of the target audience.

### **Engineering the user experience**

How can the sensory experience of the consumer be optimized such that the content being delivered has a maximum impact and is fully absorbed? The answer will vary depending on the application. With applications such as training, retention rate is critical, but for collaborative applications attention span is more important.

### **A strategic and tactical assessment of end-user needs is critical**

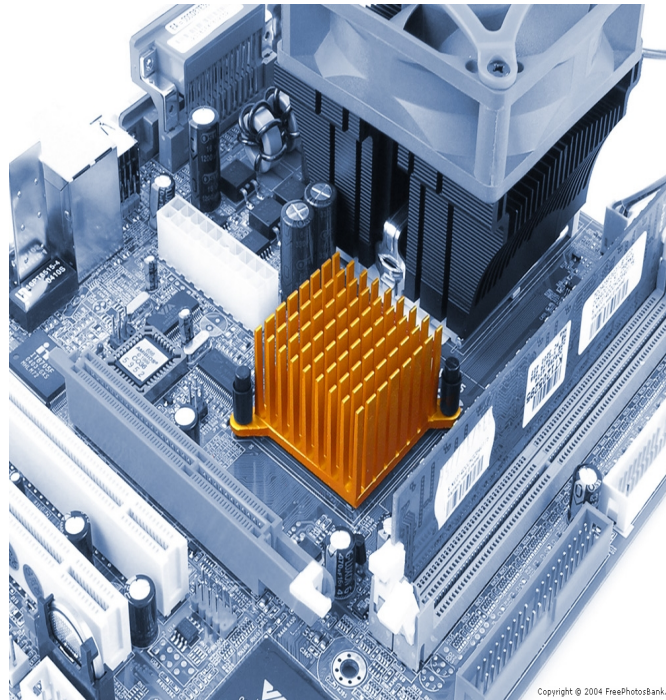
The AV design process should include a psychographic profiling of the end user and other stakeholders. There are typically three aspects to this process: profiling the users, establishing the content usage patterns, and identifying the key value linkages in the knowledge transfer or creation process. All three aspects must be addressed simultaneously as part of the AV solution design and deployment.

AV systems designed for the sole purpose of accommodating the room architecture are no longer enough. The sensory experience and conscious or unconscious expectations of the end user must be considered. The design needs to be both functional and experiential.

When selecting products to install, it is more important than ever for systems integrators to focus on product design, aesthetics, and how the product impacts the end-user experience.

### **With a few enhancements, AV professionals will deliver superior value than their IT equivalents**

Many IT entrants to “AV territory” have done so by capitalizing on their knowledge of networks and video, while downplaying the importance of quality audio. For the most part, IT professionals lack knowledge of audio systems and many have no interest in learning about them.



It is up to AV professionals to educate their customers about the benefits of quality audio. Training customers to think of audio as part of a complete solution is important, but before this becomes a reality, AV professionals must develop their own IT skills.

AV design consultants and AV systems integrators are uniquely positioned to become architects of the user experience. They have a significant role to play in adding value as packagers of complete solutions. One IT manager said, “IT is the electricity and power generator, but AV is the switch that turns the light on.” In other words, the services provided by AV are what ultimately get the end user excited. AV has become essential for engineering the optimal user experience regardless of the application.

## Organizations

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### **AV service providers must broaden the definition of their roles**

AV service providers must expand their definition of audiovisual and quickly find ways to embrace other types of applications including content management. AV service providers can no longer see themselves as providers of a linear audiovisual experience. They must realize that in today's rich media environment, where AV is bound to evolve, there is much more to audiovisual content than traditional video and audio.

Documents such as desktop publishing files and Microsoft Office ® applications are also part of the audiovisual experience. Podcasts, VOD, web-casting, and online learning are being embraced by organizations. These organizations will select service providers that have the capability to guide them through the adoption phase of these applications.

### **AV service providers must develop an IT toolbox that will help them enhance their core competence**

Mastering the tools of the IT trade is essential. Being network savvy is the price of entry for many emerging applications, which automatically excludes many AV professionals from participating in these fast growing market segments. Other important IT tools include programming, web design, system maintenance, and implementation strategies.



Digital media content has unique attributes, such as file size and layered complexity, which require specialized functions. Most content management systems are unable to address these demands. This represents a significant opportunity for both IT and AV professionals, since no one owns that segment of the market yet. However, AV professionals who develop their IT toolbox and leverage their AV core competence will lead the competition.

## Applications

### **AV's impact on content delivery varies with the AV application**

The impact of AV design and integration on the content experience often depends on the AV application. Some systems are deployed in order to consume third party content, but this requires accessibility.

In the process of designing and integrating AV solutions built for external content, AV service providers will need to identify and engage third party content originators. These service providers will need to work together to satisfy the requirements and expectations of their customers.

However, most content is originated and distributed internally. With such systems, AV service providers can deliver solutions that not only embrace the diversity of end-user needs and requirements but also comply with internal stakeholders' specifications including the IT department and the specific functional department(s) the systems are designed to address.



### **As systems become increasingly complex, a key consideration is user friendliness.**

AV manufacturers can play a role in streamlining content management by providing products and solutions better suited for data, video, and voice originating from a variety of content sources. However, the ultimate value that enhances the AV experience is in the design of the AV solution itself.

The more visually registering and processing the information is, the higher the retention rate of the recipient. With respect to ease of use, the network plays an important role in AV-related content deployment. Interoperability between various content sources defines how well the application supports content in any given situation, which is where AV service providers should focus their efforts.

## Spotlight Interview: Cisco



### ***Interview with Thomas Wyatt, Cisco Director and General Manager, Digital Media Management***

*This Spotlight Interview is part of our continuing series bringing you the opinions of market leaders shaping the future of the AV industry. We learn how Cisco sees AV professionals fitting in a fully converged industry, and we see the roadmap Cisco is following toward complete AV and IT convergence.*

*The interview will be of particular interest to systems integrators pursuing network-centric AV applications such as content management. Cisco sees the company operating collaboratively with AV and not in competition, which is contrary to the opinion of many AV professionals.*

**Acclaro:** When we take a look at convergence in terms of technology, how have you as an IT vendor experienced the convergence between AV and IT?

**Cisco:** It all begins with a natural change that is happening with the behaviors of many people that consume content. Cisco has historically been an IT vendor, but technology is evolving so rapidly that video is becoming a much more ubiquitous form of communication. Traditionally, video might have been independent of the IT network, but now with the emergence of the Internet and the need for organizations to communicate globally and quickly, video has emerged as a higher impact and richer way to communicate than traditional e-mail or voice-mail. Video is driving a lot of the convergence that we are seeing.

Any time that Cisco moves into a market, it is because our customers are asking us to help them figure it out. They want us to help them define this space and use the network as a platform for communicating.

At Cisco, we have been doing video broadcasting internally for 10 years now. Our CEO John Chambers does all his quarterly updates and information to a global workforce of 50,000 through video. On average, we do 700 video on-demands a month and about 100 live events. As a company, it is part of our DNA. We are becoming more sophisticated in how we manage the process of using the Internet to distribute content, and being able to manage these deployments is absolutely critical.

**Acclaro:** Have you met any resistance as you are expanding into the broader AV market, either from potential competitors or other members of the industry?

**Cisco:** Any time Cisco moves into a market there is some interest around it already. For the most part, people are usually enthusiastic and accepting of Cisco moving into the AV market. We are able to bring a higher level of scale and network know-how to an industry that was previously independent of IT.

I think we will follow the same course that we did with voice convergence. Initially, voice was a completely different technology than data networking but as convergence happened you can see that voice and data run over the same network. There is no reason that other things like video should not be on the same network.

In many cases we are partnering with AV companies which we would not have done 10 years ago, because AV was a completely different industry. Most of our partners are very enthusiastic that we are entering the AV market, which we are doing in a variety of ways. I am focused on the area of digital media, but we also offer telepresence and video surveillance. We think that video is a very strategic opportunity for us.

## Spotlight Interview: Cisco



*Continued...*

**Acclaro:** You mentioned that you collaborate directly with AV partners. Would you please elaborate on the type of partners and in what circumstances?

**Cisco:** One of the key application areas for us is digital signage. There are a variety of components that are important to digital signage, and some of those areas Cisco is not able to provide customers what they need. In those areas we are working with partners to help fulfill all parts of the value chain. For example, we are focused on the technology side of digital signage including the management, delivery, and access to digital media content across the network.

However, there are other components that are equally important, like how you create content that is going to be played back on these digital signs. This requires our customers to work with third parties whether it is AV companies, media agencies, or a variety of other partners to create that rich compelling content that you cannot get from a print poster that is sitting on the wall.

What we are trying to do now is evaluate a selection of AV and media partners who are helping us as we go out and talk to customers in a variety of vertical markets. They are helping us define the right content strategy for the company, how we go about creating the content, and provide value added services to our customers as an additional benefit for them.

**Acclaro:** Many systems integrators have faced a great deal of heartburn during the convergence of AV and IT. It started off with AV denying the convergence, so now they are playing catch up. Some would contend that the smaller player will disappear. What do you think of this?

**Cisco:** I think that there will be a natural convergence occurring the same way we saw with voice and data. Eventually most applications that can ride over an IP network will. This is because of the manageability of it, and it makes a lot of sense to do it from an infrastructure perspective.

At Cisco we are looking at digital media in two different areas, the digital signage market and what we call the desktop video or live Web broadcasting market. In each of those cases, Cisco is partnering with AV companies, specifically those that will provide services around AV. This means setting up a web cast, or coding and content, or it could be providing additional hardware and software that complement our technology. Historically, we might have not spent much time working with AV companies but now we are. If anything, I think that the convergence helps the collaboration with new partners that we otherwise might not have been working with.

**Acclaro:** One of the major ramifications of convergence for AV systems integrators is the customer decision-making process being uprooted. Where you used to have an AV decision maker, now you have an IT decision maker who would prefer to buy from IT integrators rather than AV integrators. IT decision makers don't typically understand AV and they prefer to deal with integrators who speak IT. When Cisco goes to the AV market, do you go through the AV channel or the IT channel?

## Spotlight Interview: Cisco



*Continued...*

**Cisco:** We go directly to the executives for the various lines of business at each customer. For example, if you take a financial services company that is interested in digital signage, we are going to position our products to the VP of Marketing rather than the IT Manager. The IT guys are very knowledgeable and make full decisions about network equipment like routers, but when we talk about applications that impact the business we sell to executives. Whether it is executive web casting in which we will sell to a CEO, or digital signage in which we will sell to the VP of Marketing, the difference is that we have to insert at the business level. Because it is Cisco, we have a natural ability to get the business people and IT people within the customer's organization to be able to communicate and partner together. A lot of times the business line will fund it, but the IT team is there to support it and make sure that it rolls out successfully. They already know Cisco well, so we are able to facilitate the collaborative approach that is required. The same is true if you look at AV. Typically, when we are pursuing an opportunity there are a lot of different players that need to play a role. We will go to the business folks to make sure that IT is involved, and if AV support is needed, then AV and IT will need to be brought in together. It really does depend on the application.

**Acclaro:** So, you would say that the first part of the process is Cisco going directly to the customer?

**Cisco:** For the markets that we are penetrating, which are Fortune 1000 type of customers, we already have very good relationships into those customer accounts.

**Acclaro:** Is Cisco involved in the deployment of the solution itself, or do you bring in partners during that phase?

**Cisco:** Most of the cases we will bring in partners that will help us with the deployment and facilitation of ordering the equipment and setting up the equipment. These markets we are entering are characteristically new. Typically the first 18 to 24 months will be Cisco-led until partners understand how to deploy it, how to sell it and have a lot of reference accounts to be able to feel comfortable. Once you get to that point, I think that the partners really scale the business for you.

**Acclaro:** These partners, are they AV/IT systems integrators?

**Cisco:** These partners will be AV systems integrators, IT systems integrators, content providers, hang and bang installers.

## Spotlight Interview: Cisco

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*Continued...*

**Acclaro:** The convergence of AV/IT and the different opportunities that it created is viewed by Cisco as a strategic thrust going forward. You acquired a digital signage company, and now you have the telepresence segment. Are there any other things that the industry should expect?

**Cisco:** If you look at our broader enterprise video strategy in the last 18 months, we have entered four new markets specifically in the area of video. The first one was video surveillance; we went out and acquired a company, and now we have an IP-based video surveillance product portfolio. Then last October we launched our digital media system for desktop video, web casting, and video-on-demand. A lot of times the digital media system is used in the enterprises for corporate communication. Now we have telepresence and digital signage, and I will tell you that we are not going to stop there.

There are a lot of opportunities for cross integration of many of these technologies that will provide value to our customers. We will continue to add to our video portfolio over time. As you know, Cisco spent \$7 billion to really get into the video side of the market. Over time you will see us make the enterprise video side just as important to the company as the traditional side.

**Acclaro:** Do you see any threat from other IT companies? There are companies like Microsoft that have come up with uniform communication.

**Cisco:** Yes, the digital signage and desktop video markets I focus on are very fragmented. The markets are very regional, most of them are not global and they don't scale really well. They are point product competitors for us.

But any time there is a new market in transition, and digital signage is definitely in transition, we expect that there will be consolidation over time. Maybe some bigger players will enter the market. Right now it is a very attractive space to be in and there will be growth in the digital signage market. We are very excited to be there.

**Acclaro:** Currently, you are focused on the Fortune 1000 companies. Are there plans to go beyond the Fortune 1000?

**Cisco:** Absolutely, as far as desktop video and digital signage go we are already selling to customers that are not Fortune 1000. That being said, in terms of what we will focus a majority of our energy will be the Cisco classified enterprise customers.

There is definitely opportunity with middle market customer whether it is telepresence, desktop video, or digital signage. There will also be opportunity with small to medium customers over time, assuming that they develop the network capability to be able to run these applications.

One of our early customers in digital signage is a small, canned coffee house in San Jose, CA. They have five locations but they are running digital signage, and for them it is a great opportunity. They are able to promote new products, new drinks on these displays, and they are seeing a tremendous amount of up-selling of drinks from the signage. There are opportunities for smaller companies, but at Cisco we have an advantage in the larger enterprise market.

## Opportunities and Threats



### Opportunities

### Threats

- Customers are increasingly seeking solutions that require a different mindset on the part of AV service providers. Many customers now require that their video conferences and conference calls be recorded, and they would like to be able to archive, search, and retrieve recordings from the system.
- AV integrators have been reluctant to embrace opportunities associated with the infrastructure side of AV solutions deployment. In the implementation phase, AV service providers develop capabilities beyond the norm to offer services related to the whole system.
- Content management creates an opportunity for AV systems integrators in several areas including remote management, application upgrades, and analytics. These can be sources of recurring revenue for systems integrators.
- Customers, especially in the digital signage area, are increasingly interested in services such as extended warranties and on-site repair.
- IT network companies and network consultants are developing AV capabilities in-house. Instead of using contractors, they are hiring people away from the traditional AV integrator.
- The digital signage marketplace has expanded the AV value chain beyond its traditional bounds. AV systems integrators that do not recalibrate their offerings to engage a new type of strategic partner will lag behind the digital signage opportunity curve.
- Rich media and digital content drive the need for content management. Increasingly, digital content is produced by and received from portable devices such as iPods and camcorders that have not been traditionally part of the AV systems integration process.
- Content management is attracting new market entrants from the IT value chain and blurring the lines that define the roles and responsibilities of AV systems integrators and independent design consultants.

## Demand Drivers & Market Trends



### Demand Drivers

- Customer demand has pushed the envelope with respect to quality. Initially, HD was being pushed only by manufacturers; however, today customers demand products with HD quality.
- End-customers increasingly expect to provide their input to manufacturers and service providers during the development of AV solutions supporting content driven applications.
- Digital signage is continuing to penetrate dozens of customer verticals for both broad and narrow-casting applications. As more evidence of ROI for digital signage solutions emerges, innovation is accelerating and adoption rates are increasing.

### Market Trends

- Markets, such as simulation and geology, will require more 3D technology. The proliferation of content that is becoming available on handheld devices is going to continue.
- There is no emerging single source to filter all the various content forms and consolidate them into a single platform for enterprise customers. Some firms, such as Cisco, are trying to get video device manufacturers to use one standard system.
- With the proliferation of content formats, it is not practical for all video devices to use one platform. Therefore, multiple content formats will continue to exist for the foreseeable future. However, standardization remains a key need for end-customers.



## Value Chain Strategic Recommendations



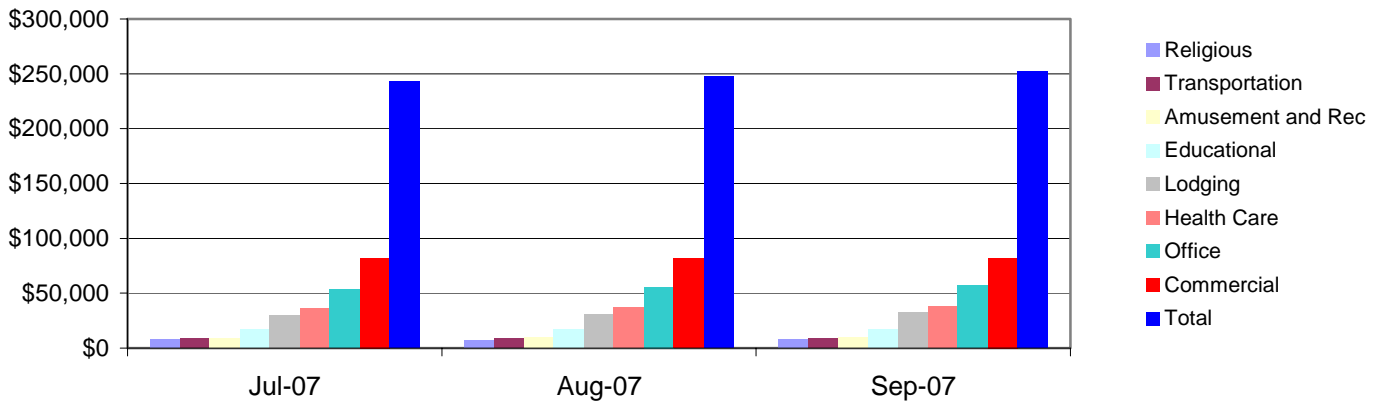
	Manufacturers	Service Providers
Revenue Growth (Market)	Incremental revenue opportunities exist for AV manufacturers that bundle their offering with software that supports content or provides innovative technologies to enhance image and sound quality.	There are revenue opportunities in integrating different technologies that will provide value to the end-customers including video, webcasting, digital signage, online learning, VOD, and others.
Product Planning (Product/Service)	In order to fully leverage content management opportunities, manufacturers should consider offering turnkey solutions designed to enhance content management.	AV service providers should consider working with third parties, such as media agencies, which are using AV companies or a variety of other partners to create rich, compelling content. AV service providers stand to benefit by extending their brick and mortar skills into the virtual world.
Strategic Partnerships (Value Added)	Cisco is partnering with AV companies, specifically those that will provide services around audiovisual. This may include setting up a web cast, or coding and content, or providing additional hardware and software that complements their technology.	AV design consultants and systems integrators should consider partnering with third-party content originators, IT vendors, and other software companies involved in developing solutions for content management.
Execution (Sales & Promotion)	Marketing activities should be targeted at business units (typically marketing departments) that are funding digital signage installations. The IT department is available to support installations and make sure that they roll out successfully.	To augment their AV core competence, service providers should consider developing content delivery expertise in-house. It has become a reality that in order to thrive in the rapidly evolving world of AV, service providers must become IT savvy.

**Pro AV Economics**

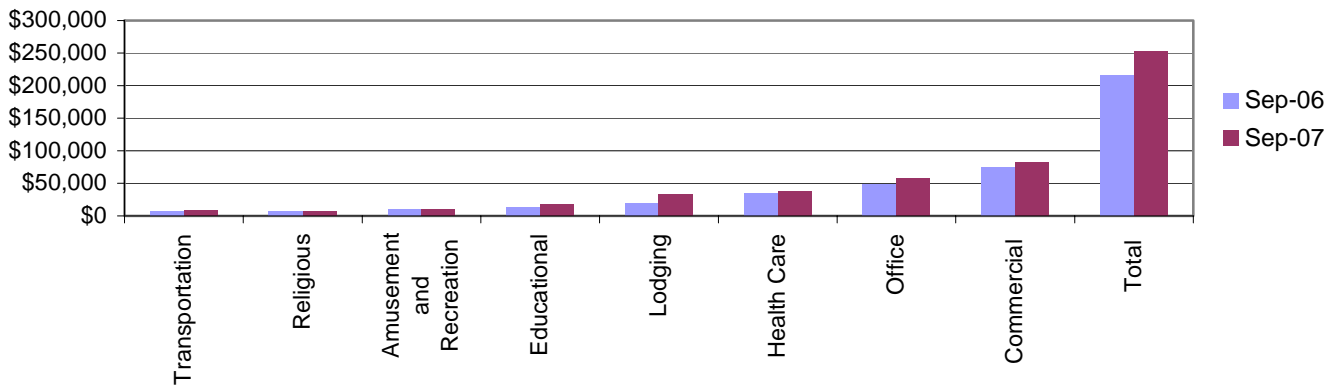


The construction trends in key AV verticals were selected in order to track the health of the AV Industry. New construction accounts for over 75% of the total AV market opportunity. (Source: US Census Bureau)

Average Job Size Construction Trends From July 2007 to September 2007



Average Job Size Construction Trends Comparing September 2006 to September 2007



Despite the credit crunch that affected the U.S. housing market, commercial construction appears to be healthy. During the most recently reported three months (July 2007 to September 2007) there has been some growth in most AV verticals.

Year-to-year comparison of construction growth (September 2006 and September 2007) shows a net growth for total construction as well as within each major vertical with the exception of Religious and Amusement Parks

**Overall sales for AV products and services are continuing to grow, driven by increased adoption of IT-based AV applications such as digital signage and videoconferencing.**

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