



SBS KOREA

A fully asset-management based digital news operation in action

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Since 2001, **Kane**, a market research company based in Paris has developed a series of detailed reports on **Server-based News** operations and **Media Asset Management** systems in the broadcast sector. These studies, updated twice yearly, are based on several hundred site visits and meetings with leading broadcasters and manufacturers. They analyze and track developments in functionality, best-practice and ROI, from both the broadcaster and the manufacturer viewpoint, and provide a strong basis for carrying out detailed evaluations of news and production solutions, especially those which bring together several components such as Media Asset Management, editing and storage, NRCS, automation, graphics, and networking.

The Kane studies and the body of data built up over the years by Kane are the starting point for this **Comparative Case Study** of the technology solutions in operation at **SBS**, one of the leading broadcasters in the Asia-Pacific region.

Kane was inspired to make a study of the SBS news project because anecdotal evidence suggested that very innovative operational procedures had been implemented, using a Media Asset Management-based infrastructure provided by a KONAN, a company until now little-known outside Korea.

The report shows that, according to the best practice criteria established by Kane, **SBS is at the very top of the global scale** and operating at a level of effectiveness which is higher than any other broadcaster studied by Kane.

Introduction

For some years, **Digital Asset Management** has been a hot topic for broadcasters. Almost all TV and Radio enterprises, wherever they are in the world, face the same twin imperatives: cut costs by improving efficiency, and generate new revenue by exploiting new content delivery opportunities such as Video on Demand, Internet streaming, and content-to-mobile. Many concede that the implementation of broadcast-specific asset management systems is a pre-requisite for meeting both requirements, but are still unsure of the right choice of system or implementation strategy. There have been a number of less-than successful trials, and few real successes.

This is why considerable attention is now being paid to the asset-management based news production system in operation at **SBS** in Korea. SBS is Korea's largest commercial broadcaster, delivering its programmes via Television (terrestrial, cable, and satellite, and including an HD service) and Radio. It is one of three premium channels in Korea, and employs over 1,500 staff.



New SBS headquarters

In December 2003 SBS moved into a new headquarters building, and decided that as part of the process its news operation should migrate to new technology base, one that would provide SBS with both operational efficiencies and a platform for introducing new services in the future. Central to this concept was a production infrastructure based on disk-based shared storage accessible to all, which would and allow easy access both to current production material and the archives, while at the same time putting the latest generation of creative tools in the hands of journalists and production staff.

A task force of 6 people began work in July 2002, and in March 2003 the choice was made to appoint IBM as integrator, and the Korean company KONAN, a Media Asset Management solution vendor, as the main software provider.

The first news show was broadcast with the system in February 2004 and all bulletins were on the air with the new system by June 2004. Therefore the total project duration was 2 years exactly.

The SBS News Operation

The SBS newsroom produces news for its terrestrial channel and its web service (SBS also produces 3 cable channels themed on golf, other sports and drama, with no newscasts).

The main 8 o'clock news lasts for 45 minutes and usually includes upwards of 32 stories, most of which contain a video element.

In addition to the main bulletins SBS generates another 7 daily bulletins, a total of over 4 hours of coverage.

The newsroom has almost 300 journalists, of whom 120 are reporters in the field, along with 46 cameramen and 48 craft editors as well as ingest, graphic and production staff.

These personnel are served by one of the world's largest digital production systems, which includes:

- 40 concurrent ingest channels (KONAN)
- MAM server (KONAN) storing and managing all media assets including workflow and media transfers.
- Central digital storage with IBM GPFS providing 300 hours online and 300 hours nearline (Total 28TB, mirroring system)
- 41 craft editing systems (GVG Vibrant) operating at MPEG2 (50 Mbps)
- A dual low-res environment in which the KONAN system digitizes all incoming material at MPEG1 (1.5 Mbps) and at 300Kbps using Windows Media9. MPEG1 provides 300 journalists editing at low-resolution while 1000 users can browse media with Windows Media 9.
- A Digital Archive of 25,000 hours (FrontPorch Digital DIVArchive and a StorageTek data library)
- NRCS provided by CIS, and automation software provided by D2Net, both Korean companies.

Underpinning all of this is a Media Asset Management system provided by KONAN which provides comprehensive cataloging, retrieval and workflow management capabilities. The KONAN environment is built of four main components, all of them developed by KONAN:



Figure 2: SBS news studio

- **Asset Manager.** This is the principal MAM server, which stores and manages all video content and associated metadata in the system and controls their relationships. It provides workflow management, management of user transactions, utilization and distribution of contents, and traffic control.
- **Search Engine.** This is a flagship product for KONAN that supports large-volume multi-media search and a large number of concurrent users in multiple languages. It has been the subject of many years of development. (KONAN search tools are licensed by many IT developers and ISP's in Asia)
- **Cataloger:** This is a tool for analyzing video clips and extracting key metadata such as keyframes, closed captioning and face characters. Keyframes are extracted based on automatic detection of scene changes and image indexing. The metadata are stored in the Asset Manager. The Konan Cataloger supports up to 8 times faster than real time playback for a digitized stream.
- **Client modules.** KONAN provides four different client modules:
 1. A browser for searching and viewing video with metadata, storyboard, extracted face images, and thumbnail images.
 2. A MetaEditor for viewing and editing metadata
 3. A ProxyEditor for rough cut editing, and
 4. An administrator module for the management of the entire MAM system and users.

The SBS Archive

Since its launch in 1991, SBS has generated over 70,000 hours of news archive material, which is stored on a total of almost 150,000 cassettes. As part of the run-up to the digital news project, archivists selected and ingested the most important and relevant 3000 hours of this deep-archive material, one of very few broadcasters in the world who have carried out such a systematic digitization of existing tape-based archive material.

15 months into the digital era, the Data Library now manages almost 9000 hours of news archive, corresponding to some 70,000 items. SBS has 3 archivists who catalog “on the fly” at the ingest desk, and 5 others who select from source materials and rushes video to be saved in the Data Library or on line. SBS saves an average of 12.5 hours of material per day, including each newscast as a single item, and up to 8.5 hours of source material. SBS no longer keeps any new material on tape other than as data.

KONAN DigitalArc for SBS NDS

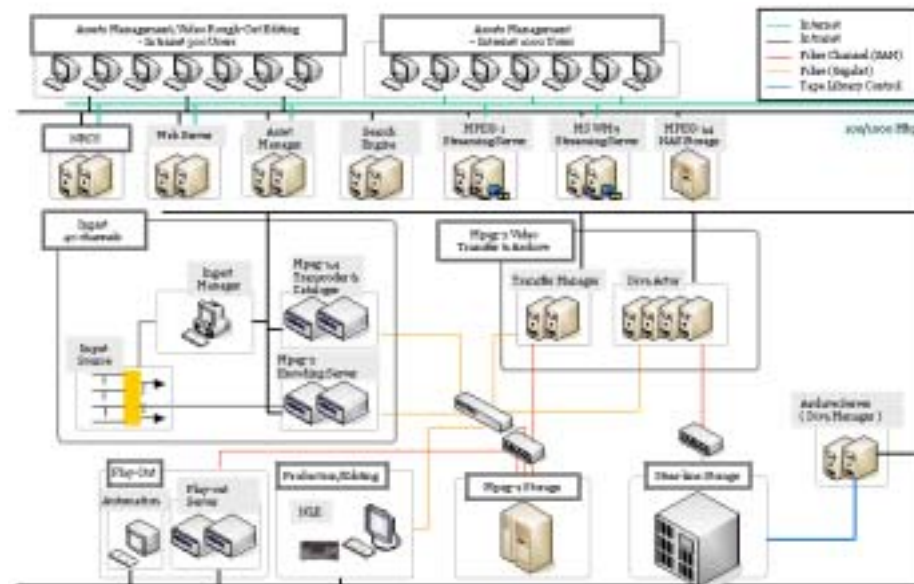


Figure 3: SBS System Diagram

Best Practice Analysis

Kane has carried out extensive research among broadcasters and manufacturers worldwide and has compiled a digest of Best Practices for digital news production.

These fall into five categories:

- Ingest and cataloging
- Production
- Archiving
- Playout and distribution
- Integration and security

Our analysis for SBS shows, in each category, a number of issues; their impact; and how they are addressed in the SBS digital system.

Ingest and Cataloging

Best-practice ingest requires a number of features in order to capture live feeds from a variety of agencies with as high degree of automation as possible. These include scheduled as well as “crash” records, segmentation of agency feeds into individual stories. The ability to use LAN and WAN technologies are all notable features. There are considerable potential savings to be realized by replacing a legacy video distribution system with an IP-Based WAN.

Streaming or chunking increases the speed of processing by allowing breaking news to begin to be edited even before transmission of rushes is over.

Automatic indexing addresses the high cost of human cataloging and allows a more efficient archiving process, although a degree of manual indexing is unavoidable. A thesaurus can take time for an archivist to build, maintain and use, and many broadcasters do without one; but a “keep it simple” thesaurus is extremely effective in certain cases to enhance search efficiency and speed. Another feature is still barely present among broadcasters although journalists have long asked for it: to index a video with the text of the voice over.

In terms of indexing and cataloging, the SBS case is a notable one because volumes are huge in terms of incoming feeds, and because of the use of a high resolution of 50 Mbps. Face detection is a feature unique to KONAN, and helps archivists to systematically index by a person’s name and face.

Table 1: Ingest and Cataloging

Category	Best Practice	Detail	Impact	SBS practices
Ingest	Scheduling of live feeds	The ability to schedule in advance and automate the ingest of live feeds at known times	Productivity (reduces the cost of 24x7 ingest)	KONAN Ingest Manager improves automated scheduled ingest for up to 40 concurrent feeds and VCRs.
Ingest	Live ingest segmentation	The ability to segment incoming feeds automatically (can depend on agency formats)	Productivity (aids navigation, reduces processing time)	Scheduled development for Konan Ingest Manager.
Ingest	Reception of incoming video feeds via IP	Ingest via data feed rather than as video. Can depend on the server's input protocols and formats.	Enhanced news coverage, flexibility of feeding, and speed of processing	Ingest Manager accept files via ftp. Transcoder module allows conversion. SBS has 6 ingest points in Seoul and video transfer is done over IP.
Ingest	Ingest of multiple feeds directly to online storage	Depends on server capacity and ingest feature	Productivity, speed of processing, multiple concurrent access	Up to 40 concurrent hi-res encoding files are stored directly on servers with 2x300 hours of storage available on line.
Ingest	Faster than real time ingest	Ability to ingest video and record it onto disk at faster than real time. Can depend on network bandwidth and server processing	Speed of processing	In case of file ingestion, KONAN Transcoder transcode hi-res MPEG2 50Mbps to low-res MPEG1 1.5Mbps and WM9 300Kbps at simultaneously during the hi-res encoding process at faster than real-time speed.
Ingest	Streaming or chunking	Ability to start editing video before ingest is finished	Speed and productivity	Konan Streaming Manager allows this kind of transfer.
Cataloging	Manually prepared but assisted by indexing tools	Closed Captioning, OCR, scene change detection, speech-to-text, face detection	Speed and productivity	SBS uses Konan Cataloger for scene change detection, face detection, and closed captioning functionalities. SBS does not use a speech-to-text function since there are not yet any sufficiently reliable and satisfactory Korean language solutions on the market.
Cataloging	Thesaurus/controlled vocabulary	Allows a consistent approach to taxonomy, naming and metadata capture by defining word choices and definitions		SBS does not use or feel the need for a thesaurus, although KONAN has a thesaurus module.
Cataloging	Script/voice over as metadata for video	Allows the inclusion of intro and voiceover scripts as metadata, and thus their use as indexing and navigation aids. Requires workflow and and scriptot interface between NRCS and DAM software.		SBS does not require this indexing method, as archivists are cataloging and selecting archive material separately from final story. If necessary, the open architecture and API could provide such an interface.

Production

New technical architectures based on networked storage bring to all journalists (at last!) the ability to share all media. An appropriate low-resolution capability makes this perfectly possible from the field or from remote locations, and in addition allows other departments to browse media from a standard workstation. Bandwidth is an issue for large enterprises, and cost for small ones. Dual or triple media databases (i.e. high resolution, low resolution 1 for editing, low resolution 2 for browsing) add complexity, and can be hard to keep synchronized especially for late-breaking material.

Special effects are generally simple in news, but some are necessary for legal reasons, such as mosaics for concealing identities. Multi-skilling (especially journalist editing) may be considered as "best practice," as it provides additional coverage capabilities, and an increase in production capability in the case of breaking news. 60% of newsrooms according to our report are practicing journalist editing. A smaller proportion (20%) create and record voice-overs as part of browse-resolution editing.

Graphics are crucial to make news understandable. Creating a graphic is largely an editorial process rather than a production one, which is why template-based graphics (where journalist can choose a graphic style from a catalog) and simulation tools are so important.

SBS is notable because of the use of WindowsMedia9 as second browse resolution for visualisation, and because of a high level, for a premium channel, of multi-skilling among journalists. This is still more common for small channels or continuous news channels. At SBS all news items for the main 8 PM bulletin are rough cut by journalists, to be reviewed and finished by craft editors.

According to a satisfaction survey commissioned by SBS, Mr. Lee, VP and Project Manager, found that 20% of journalists got used to editing after 1 month, and 41 % after 2 to 3 months. It took 1 year for 6%.

9% do not feel the need for re-training, 46% would like refresher courses 2 or 3 times a year, and 32 % once a year.

Table 2: Production

Category	Best practices	Detail	Impact	SBS practices
Storage	Shared media, central repository	"Ingest once, use many times." All users have access to a central store. Depends on an appropriate network/disk array and adequate server capacity to handle multiple concurrent video data flows	Parallel workflow: speed and productivity	IBM GPFS provides SBS with a shared media environment including 41 high-resolution NLE workstations. For the low-res clips SBS uses NAS storage (5 TB) for 1,000 browsing users and 300 rough-cut editors.
Storage	Remote access	Allows access to media from outside via IT methods	News coverage and speed	SBS, following their policy, only local access is permitted for the moment, even though the infrastructure is ready to allow media access via web browser.
Storage	Synchronisation between low and high resolution through clip generation	Problems occurs when rushes/sources video are cut directly on edit workstation because of urgency, bypassing central ingest. A clip generation process must create low res for visualisation	Efficiency in the validation process	With Konan Transcoder, synchronisation between hi-res and low-res clips are 100% guaranteed.
Editing	Advanced editing for news	Transitions, effects and other "craft" edit capabilities on a networked NLE	Enhanced creative freedom, house style, rapid processing of shared material	SBS deploys 41 Thomson Grass Valley NLEs
Browse	Low-res browsing	Automatic browse version encoding/transcoding to provide low res media access across the	Workflow efficiency inside and outside the news department	SBS uses Konan's "Transcoder" to generate 2 low-res versions, one for editing in MPEG1 (1.5 Mbps), the other for browse visualisation in WM9 (300 Kbps). 300 SBS users currently edit with the "Proxy Editor" and 1000 users visualise with "Browser". Proxy Editor has multiple number of audio tracks and is capable of sound trimming.
Browse	Browse editing on the journalist's desktop	Shotlisting and simple editing at low resolution	Enhanced newsroom productivity and coverage	
Browse	Voice-over creation and recording at browse resolution	Ability for browse editor to manage multiple audio tracks, audio effects such as cross-fades, and ingest/conforming of voice-over commentary		
Graphics	Templated Graphics	Journalists can create graphics in house style using a system of templated graphics into which specific data is filled	Speed, productivity, improvement in news presentation and comprehensibility	D2Net has developed template-based graphics system with SBS graphic users. With this system, users can edit subtitles, browse and search the graphic data in NRCS and Browser.
Graphics	Automated captions and subtitles with preview	Text drawn from NRCS is formatted as on-screen graphics using templates; is previewable at the workstation; and played out by the automation system		

Archive

The advent of mass storage on data libraries or on disk arrays accentuates the need for a highly efficient search engine capable of dealing with hundreds of thousand of items with a high level of performance. Many of the best engines were developed for Internet Search Portals, and mark a true convergence between the Internet and Broadcasting. It is no coincidence that KONAN's search engine, which powers the SBS digital news system, is licensed by many Asian Internet portals.

Best-practice content management in broadcast requires the concept of a "container" which allows broadcasters to group assets in many formats within the same "folder;" not just video and audio tracks, but attached scripts and wires, and other related audio, graphics, animation, and photos.

The rapid emergence of HDTV around the world (in which Korea is a leader) creates a new challenge for preservation at a higher resolution than the 25 Mbps normally considered as sufficient for news. Very few use 50 Mbps as well as IMX, but solutions are now under development by all manufacturers and it is just a question of time.

Very few newsrooms are managing metadata relative to rights clearance as well as inheritance rules when using several sources to edit a final story. However this is increasingly important.

Most broadcasters maintain a deep archive on shelves, even if they have online storage for current and future material. Once they launch IT-based production systems, they start keeping all or some of edited packages and in certain cases rushes.

The SBS archive is notable because while it is one around 50 newsrooms with an IT-based mass-storage archive in the world, it is one of only a handful to have systematically digitized past news content. Many broadcasters do little with their historical archives because they do not know the content sufficiently to make a relevant choice. At SBS, the quality of the previous "text" archive database was good enough, and SBS is helped by its relatively short history. SBS is also unusual in that it saves source material selections rather than final stories. Final stories are saved inside bulletins preserved as a whole, rather than individually.

The SBS Archive solution has a big online capacity of 600 hours, and relies technically on GPFS IBM file system which looks robust enough after fine tuning for 50 Mbps, and on KONAN's celebrated famous search engine, which is a standard in the Unicode world.

Table 3: Archive

Category	Best practices	Detail	Impact	SBS practices
Archive	Search Engine	Powerful intuitive searching integrated with other workflow elements	Speed, productivity, news accuracy	The Konan system uses an own-developed search engine widely used as a 3rd party component by Asian ISPs.
Archive	Container to manage multiple audio tracks	Ability to handle multiple languages	Efficiency of language and localization processes	SBS only manages assets in 2 languages (English and Korean), but Konan metadata structure can deal with more.
Archive	Fast searching response time	Ability to manage a large number of items and numerous concurrent searches	Speed, productivity, news accuracy	Under 1 second according to KONAN Search Engine in all cases.
Archive	Audio, stills and graphics in addition to video	Ability to handle and browse graphics-only and audio-only assets in addition to video assets	Efficiency of repurposing. Ability to streamline pre-broadcast workflows	SBS currently manages a central repository with video, audio assets, graphic materials and tape information.
Archive	Video partial retrieve	HSM software and archive hardware allow partial retrieval of clips based on timecodes	Speed and selectivity of processing	SBS uses Konan search, IBM file system, and Front Porch Digital DIVArchive + StorageTek data library all of which work with "partial retrieve" feature.
Archive	HD-ready preservation format ie. IMX/50 Mbit/s	Use of a sufficiently high resolution for storage in order to be used in HD news in the future (> 50 Mbit/s).	Preservation	SBS works with high quality video at MPEG2 50 Mbps I-Frame-Only format.
Archive	IT standard format	Use of a storage format capable of future conversion (i.e. IMX) for future-proofing and portability	Preservation and cost of archive ownership	SBS stores media in the Grass Valley GXF format
Archive	Rights information as metadata	Ability to manage rights status as metadata, with an inheritance mechanism in the case of mixed sources	Speed and legal costs	SBS does not require this category of information for the moment, but Konan can handle this concept as well as inheritance rules through EDL evolution.
Archive	Digitization of legacy archives	An organisational as well as technical issue: whether or not to ingest existing archive material	Preservation, speed, accuracy of news	SBS completed this task before launching its server-based newsroom in February 2004.

Playout & Distribution

Getting breaking news to air as soon as it arrives is a crucial element of best practice.

It is key for productivity and reduction of staff in the news gallery to easily group together (and produce as one element rather than many) video, audio, stills, CGI, graphics and animation, and html.

It is highly desirable for certain news formats to be able to create a “news wheel” (i.e. an automated news bulletin without presenters), particularly for 24 hour news channel, but also where premium channels are proliferating the number of bulletins without additional staff.

NRCS (Newsroom Computer Systems) must control automation, either internally or by interfacing seamlessly with third party automation systems. This allows changes at the last moment (to drop or to replace a story) to be decided from a journalist perspective. The agility of the rundown is increasingly important as bulletins are more and more subject to last minute changes. Therefore the user-friendliness of the status display inside the rundown is essential.

It is becoming compulsory to have publishing tools (and technology) to repurpose scripts and videos for mobile phones and Internet portals.

At SBS, the level of integration of all systems components (KONAN browse, ingest, media management and transfer, CIS NRCS, D2Net automation and graphics interface) are very much “state of the art” in terms of smart interfaces. This allows changes to be made at the last moment, and very low staffing levels in the news control room gallery for both short and long newscasts. SBS’s use of open standards and XML architecture will allow repurposing of content for other media or other channels when needed in the future.

Table 4: Playout and Distribution

Category	Best practices	Detail	Impact	SBS practices
Playout	On-air shunt	The ability to route a feed directly on air, bypassing the news production system	Speed to air of breaking news	SBS uses its general router to re-direct video feeds to on-air transmission in the case of breaking news.
Playout	CGI and graphics attached to video	Auto-follow: the ability to synchronize and play out together server-based video and graphics	Productivity of news gallery	SBS uses the CIS NRCS to attach graphics to video in the rundown; the Konan Proxy Editor can select and attach graphics to stories through one of its video tracks.
Playout	Newswheels (preparation/automatic mode)	Ability to prepare and produce quickly night automatic newswheel through NRCS or automation specific features	Productivity	SBS does not require this feature since it does not broadcast automated newscasts without a presenter.
Playout	NRCS controls automation	Integration between NRCS and automation (or internal NRCS automation capability) to allow NRCS to control all on-air devices from a central rundown	Control of agenda by journalists. Speed	The CIS NRCS rundown controls the D2Net Automation rundown.
Playout	Ability to drop, replace or change the order of a story quickly in a rundown	Fast and accurate automation between NRCS and automation, either by internal NRCS automation capability or by integration (i.e. with MOS)		CIS NRCS rundown is able to change any item until the last moment. SBS news are very reactive, and changes occur all the way through the newscasts.
Playout	Story status display	Instant status updates, usually colour-coded, to show status of individual elements. Depends on the integration between NRCS and automation as well as a workflow feature (validation/readiness of stories) associated with colour on the rundown		CIS NRCS manages news workflow with configurable colours in the rundown (i.e. green=video ready, red=video not ready, orange=on-air).
Distribution	Publish to WAP for video	Dependent on technology and services architecture inside software	Productivity, new revenues	SBS has no current requirement but can use Konan XML extract.
Distribution	Publish to the web for video			

Integration & Security

As IT-based systems become more and more the norm in broadcasting, integration and security are an increasingly pressing issue.

Newsrooms need to assemble many proprietary pieces of hardware and software quickly and efficiently into real-time systems without the need to access or change source code. OSS, XML, truly supported APIs, a consistent services infrastructure and a component-based architecture are important best-practices steps towards speed of implementation and future-proofing.

Scalability is also important and is closely linked to an open architecture.

Redundancy is rare in the network area, but progress is being made towards secure solutions, with back-up and disaster recovery sites becoming more common. There is in many places a new vision regarding maintenance where IT, broadcast and networking know-how must all be shared by each maintenance staff member.

The SBS implementation is particularly interesting due to the simultaneous launch of new editorial, production and archive solutions after a project gestation of only two years. Most other broadcasters adopt a stage approach which takes much longer. SBS's speed of implementation is also remarkable because a new building and complete technical installation was also created at the same time. The SBS project was the result of a very experienced 6-person team many of whom had backgrounds of 15 years or more in broadcast, IT or journalism. Another crucial factor was that KONAN, responsible for much of the software involved, had previously developed SBS's radio archive solution, and KONAN itself had a long history of major projects.

Table 5: Integration and Security

Category	Best practices	Detail	Impact	SBS practices
Workflow	Workflow tool	A workflow tool is used to design and change business processes involving media inside the newsroom: validation of a story by the editor in chief, media transfer for on-air operations, archive decision.	Ability to improve continuously organization efficiency	SBS uses Konan's workflow engine to design production and broadcast operations.
Media Identification	Naming synchronization	Integration between the NRCS, media ingest, and the media asset management system offers a simple way to give media a smart ID and to link the rundown to media IDs	Data integrity and ability for the journalist to retrieve media quickly	Media ID is given automatically when saving an edited piece and this ID is linked to NRCS and automation by MOS interface and drag & drop.
Integration	Ability to integrate components from different vendors simply and easily	Depends on API support and use of standard protocols such as XML	Speed and cost of implementation	SBS used an open-architecture approach to reduce system implementation time to 20 months, with 8 different vendors involved. New news production and news archive systems were launched at the same time.
Maintenance	Scalability	The ability to increase the dimension of the system (users, disk capacity, supported peripherals such as edit suites) without replacing or stopping systems	Cost of ownership, system lifecycle duration, flexibility, ability to meet future business requirements	IBM GPFS configuration tools help SBS to increase disk capacity or NLE workstations numbers. Also, KONAN MAM softwares can handle rapid expansion of multimedia contents and number of concurrent users.
Maintenance	Development capability and roadmap	Use of new technologies such as MS Dot net (.net) or J2EE, and true component architecture design	Speed and cost of implementation, future-proofing	Konan already uses a standard and open APIs. Konan plans to develop a complete component architecture during 2006.
Security	Redundant architecture	Redundancy of all critical points: IT, NRCS servers, on-air servers, I/O server ports, network including switches, routers.	TV-operations continuity	SBS has invested in full redundancy of all components including switches, disk arrays/on line storage, MAM, search server and broadcast servers.
Security	Recovery mechanism, breakdown intervention process	Use of a minimal automatic recovery process, along with user training to handle technical problems by organisational means. All maintenance staff trained in IT, networking and video		SBS uses Konan MAM security features such as automatic recovery process, load balancing and error monitoring.
Security	Back-up site	Disaster recovery or back-up site/service		SBS has a remote back-up site located in Ilsan, which is a suburb of Seoul.

Best Practice Conclusions

There is no doubt that the evidence of Kane's Best Practice Analysis places SBS and its suppliers, especially KONAN, in a leading position among the world's broadcasters.

We have compared SBS with a number of leading broadcasters in Europe and North America, and while the average broadcaster in this category achieves a score of 59% against our list of best practice elements, **SBS achieves 77%**.

Many of the areas where SBS is not following our best practice guidelines are a matter of operational and managerial choice, and could be achieved if desired. In fact, SBS could already achieve 91%, and even 95% with the promised 2006 developments from Konan.

According to Kane's evaluation method, therefore, SBS's implementation is one of the best and most advanced in the world.

Return on Investment

ROI is a key element of every major broadcast project, and it is interesting to examine SBS's implementation in that light.

Like many other broadcasters, SBS has not reduced staff by implementing a server based newsroom. There have been several small adjustments, such as editors (minus 2) and archivists (plus 2). But as a total, staff numbers have remained constant.

On the other hand, SBS currently produces 8 newscasts a day as opposed to 7 previously. Actual news production has increased markedly, from 158 minutes per day prior to February 2004, up to 246 minutes by May 2005, an increase of 56%. This result has been obtained in spite of a reduction in the working week for each staff member from 6 days to 5, an additional productivity increase of 20%.

In total, therefore, with static staff numbers, **productivity has improved by 87%** (combining increases of 56% and 20%) since SBS was launched its new server-based and complete archive integrated system.

Without the server-based and desktop technology to edit, broadcast and repurpose news material, SBS would have had to recruit anything up to 179 additional personnel to achieve the same volume increase (+87%), against a start level of 206 staff. Even if we concede that SBS could have made some productivity gains with traditional tape based newsrooms, it is reasonable (but very conservative) to estimate that only 20% of 179 additional staff would have been necessary to recruit. Saving can be estimated to 20% x 179 x 130k\$ /year as average cost.

Another direct gain is realised by SBS avoiding external storage space for the archives. Before launching a digital mass storage system, SBS used to rent an additional 66 square metres of physical storage on shelves, at an accumulating yearly cost of \$40k per year.

Taking everything into consideration, it is estimated that the SBS's overall investment in the digital news and archive systems will be repaid in 3 years. With a less conservative hypothesis this could be reduced to little over a year.

This is impressive enough. But the true "jackpot" will come if and when SBS gets authorisation from the Korean Broadcast Regulation Authority to launch new channels requiring a news element.

If this can be carried out without having to hire significant additional staff, the incremental advertising revenue can be attributed as direct gains generated by SBS's digital production system.

Harder to assess and validate are the more "qualitative" aspects of the ROI equation at SBS. Examples of these qualitative gains might be streamlined workflow, work efficiencies gained, opportunity cost by not losing or misplacing contents, improved quality of media content thanks to the digitised process & contents management, better coordination among employees along the workflow, and so on.

Although these are hard to measure, the evidence given by SBS staff working on the new system would support a view that such gains are being achieved.

SBS's recommendations

Yongdae Jo, SBS Technical Project manager, Honggyu Han, SBS Head of Archives and Sun-Myung Lee, SBS VP and overall head of the project, offer a number of recommendations for other broadcasters contemplating an archive project.

Mr. Han says that training and communication are by far the most important success factors.

Mr Lee has compiled the following set of "rules" for a successful project:

- a. **Communication:** be sure to explain fully the aims of the project to users.
- b. **Partnership:** choose your integration company with care: they are your insurance policy.
- c. **Training:** people are the biggest barrier to technology implementation UNLESS they are educated sufficiently.
- d. **Management Commitment:** direct access to and support from the CEO is crucial. The management of fundamental change, especially when workflow is involved, means that there will inevitably be moments when CEO support must be used to reinforce the objectives
- e. **Patience:** enough time must be given to a project to succeed. Goals and timetables must be truly realistic and achievable and not cater to unrealistic expectations of users or management.
- f. **Stabilisation:** it must be recognized that in any software project, bugs are inevitable and not so much a threat to reliability but the means of achieving it as long as they are correctly resolved.
- g. **Passion:** the project team and its patrons must show total commitment to its success.

Kane's Overall Conclusions

There can be no doubting the success of the newsroom project at SBS.

Working in close partnership with its suppliers and notably with the Korean company Konan, SBS has succeeded in implementing highly progressive new operational processes and workflows with a minimum of disruption.

Konan's combination of an extensive existing product base and a willingness to enter wholeheartedly into a development program to meet SBS's needs is a crucial part of the project's impact, and the result is a system which goes further down the road of a fully asset-management based news production and delivery operation than any other broadcaster we have seen.

It is notable that in our formal best-practice analysis SBS and Konan score more highly than any other broadcaster we have studied.

Equally impressive is the way that SBS have managed the project, and especially the human elements which so often prove difficult. It is obvious that staff at SBS have been fully involved in the project, and well-trained on the new systems.

In both what they have achieved, and how they have achieved it, SBS and Konan deserve widespread recognition.