

Implementation of cross-media production processes based on specialised open systems

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To continuously improve production efficiency, and to enhance the support of the various distribution formats in terms of high quality up-to-date content, are just two of the major objectives which leverage the increasing use of cross-media technologies in broadcast production environments. Regional sites are a good example where such a cross-media approach can be introduced very beneficially.

Clearly, the goals of the different stakeholders in the production process, and thus the design of media-independent workflows, are of superior interest. In this sense, technology clearly is just one important means to adequately serve these user requirements.

As soon as it comes to the real technical implementation, the integrated workflows require intelligent integration which seamlessly crosses boundaries between the different subsystems. Open and well established standards like MOS, MXF or AAF combined with state-of-the art middleware for enterprise integration are just few topics which demand attention.

The paper addresses these different aspects of cross-media solutions and also provides practical examples.

Why to implement cross-media production processes?

The intention to implement media-independent or cross-media production strategies has turned to be one of the important changes within the broadcast industry during the past few years. While the early approaches to cross-media originate from the era of the “convergence hype” during the late nineties, cross-media today more and more reveals its pragmatic potentials.

However, since cross-media production environments are far from being well-established; they are more at the beginning of an evolutionary process. For this reason, some attempt to define the term “cross-media production process” is required at least for the purpose of this paper:

A cross-media production process aims at sharing resources in the process of programme production for the different media outlets, as are television, radio, the world wide web, and other mainly IP based distribution platforms like DVB-H or DMB. Resources are meant in the sense of human resources, programme material, and the technical production environment. The production process itself is understood in a broader way, i.e. as the integrated process which starts at the initial planning and covers the entire production chain from ingest over the editing down to playout and reporting.

Although – according to the above definition – the technical production environment is one essential part of cross-media production processes and also is the central aspect of this paper, first the strategic motivation needs being carefully addressed in order to better understand the requirements which drive the technical objectives. This means nothing more than first asking “Why?”, while answers to how this can be achieved are the logical second step.

- Efficiency is the predominant argument. Broadcasters are forced to support an increasing number of services and products at high quality and speed, at a minimum of extra cost. Clearly this applies to today’s practise and to future challenges all the same.
- Secondly, the consumers’ value of a regional or even sub-regional programme focus becomes more and more obvious, while at the same time new distribution platforms like DVB or DMB more and more support such a focussed distribution.
- In consequence, the production process requires an increasing amount of complexity, while the amount of human resources (journalists, producers, technicians, etc.) is very limited. On the other hand, programme quality remains an outstandingly important issue in order to maintaining the broadcasters’ competitive position, and must be consequently maintained.

Taking the above top level objectives, the next question is on how these can be achieved within the production process itself. For this purpose, a simple process model shall be presented in order to decompose the entire cross-media production process (figure 1).

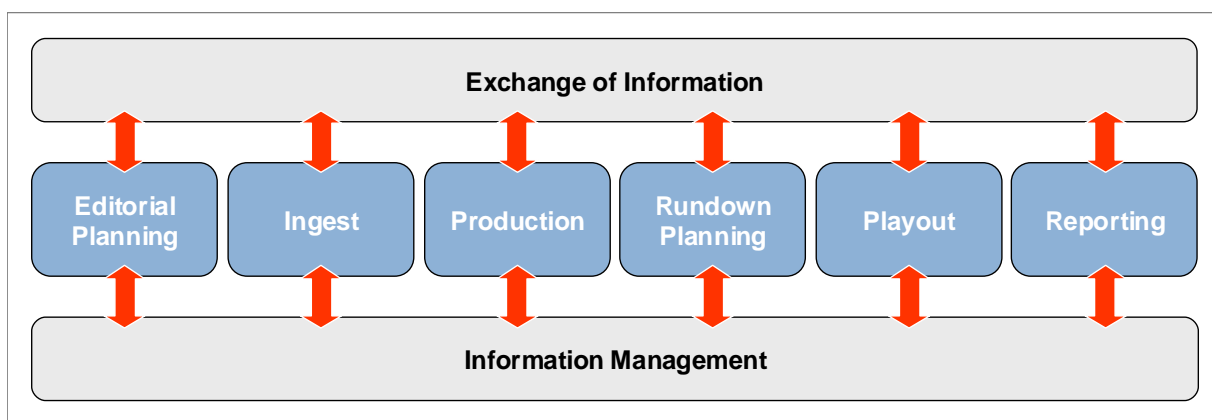


Figure 1: simplified model of the cross-media production process

From the background of this model, the top level motivation can be transformed as follows:

- For the purpose of the *editorial planning* step, this type of planning shall be more media-independent than it is today.
- For the purpose of *production* and *information management*, there is the requirement to increasingly share programme material among different material sources, i.e. between radio and television, in order to re-use it for different programme outlets.

- From the background of the increasing importance and complexity of IPR management, the *reporting* functions are also a target where a cross-media approach can be beneficial.
- All the above can be achieved only if the entire process becomes more integrated than it is today, in order to generate the intended increase of efficiency. This in consequence requires a tighter *integration of the related technical systems*, both new and existing ones.
- Last but not least any such process implementation needs being *flexibly scalable and future-proof*.

The specific views of the different stakeholders which contribute to the entire cross-media production process, adds another dimension to the question, how such a strategy can be successfully implemented.

The view of *journalists and editors* primarily aims at reducing those barriers between planning and search & retrieval functions which today exist e.g. for the different outlets radio, television and the world wide web, which are mostly organised in different departments.

The view of *producers and presenters* focuses on the integration of edit & production tools as well as on integrated concepts for multiple playout (e.g. simulcast with value added programme associated data on DBM or DVB) in order to leverage production efficiency by cutting today's frequently "artificial" boundaries between the different media domains.

From the standpoint of *operators*, the related technical infrastructure requires better integration and manageability in order to cover up with the increasing complexity which can be seen especially for software based systems.

Clearly, this long list of different goals is unlikely to become solved within one single step. For this reason, each broadcaster will apply its specific priorities, and in return, the implementation strategy must be sufficiently flexible and scalable in order to support each broadcaster's individual approach.

Characteristics of cross-media production processes

It must be pointed out that the production process has evolved differently for the different media domains in question, in particular for radio and television. While some of these specific characteristics are well due to the inherent difference in any of these media domains, others are less logical. In this sense, a cross-media production process should not be misunderstood as a comprehensively unified and harmonised process which becomes completely media-independent. However, a number of sub-processes are promising candidates for such a process harmonisation and integration (figure 2).

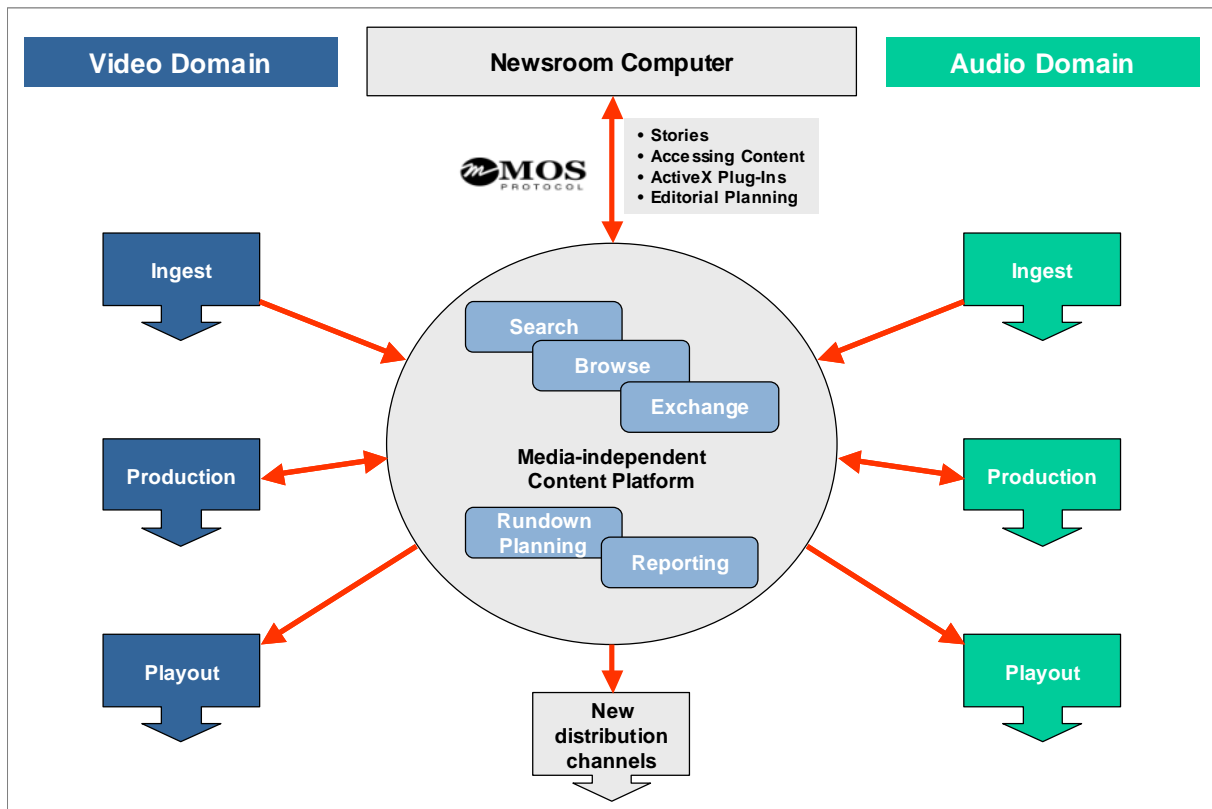


Figure 2: Process integration between different media domains

While ingest, production & editing and playout are likely to stay media-specific, a number of essential functions – related to the simplified process model of figure 1 – can be concentrated in the middle cross-media part:

- Especially for the editorial departments, the newsroom computer may provide access to both (or all) media domains in terms of writing stories and scripts, accessing media content, and of providing certain editorial planning functions.
- For the process steps of ingest, production and playout – which may remain media-specific –, a shared media-independent content platform would be of benefit. Such platform should support functions to search, browse and exchange media content of any type, and also the possibility to plan rundowns and to report on the respective playout in the form of detailed “as run” reports.
- As a third cross media element, mixed media services on new distribution channels may be generated from the cross-media platform, hopefully supporting a high level of automation in order to save resources.

For the different process steps, different goals can be identified which should be reflected by the technical implementation later on:

For the *Ingest* function, it is most important that material from the different media sources shall be available for every type of programme as quickly as possible, in order to being as up-to-date as

possible. This requires a strictly file-based contribution to the cross-media database as well as the possibility to access this new material from remote sites via WAN connections.

The *Production & Edit* function aims at sharing content with out the boundary of different media types: radio shall be able to use audio from video clips, whereas television might be able to re-use audio footage in combination with still images for certain stories, e.g. where video material is not yet available. Also, the material access (search, browse and transfer / exchange) should be harmonised in order to increase usability.

For *playout and reporting*, a unified environment for rundown planning and approval of stories and material is desirable, and similar presentation forms – e.g. self-operated playout also for smaller television operations – are another relevant aspect. Furthermore, the ability to generate new programme streams in example for simulcast should be (semi-) automatically generated. Finally, it is important that the reporting functionalities are consolidated in order to support a unified reporting which is especially helpful whenever same footage is multiply re-used for different programme outlets.

An implementation approach to a cross-media production environment

VCS promotes a cross-media production environment which combines different systems from a number of other system manufacturers, and which adheres to the fundamental requirements which has been described before:

- Provide a high degree of integration between system functions in order meet the objective of increased efficiency.
- Support a highly standardised and open integration architecture for the the media-specific subsystems and the cross-media environment, for both existing and new technology.
- Allow a highly scalable implementation approach in order to comply with the broadcaster's individual implementation approach, and to guarantee a sufficiently future-proof overall system concept.

The following diagram shows how the different functions and process steps are populated with the software components from different manufacturers, and combined to a highly integrated yet pragmatic cross-media environment which adds the advantages of proven media-specific subsystems and a cross-media integration layer (figure 3).

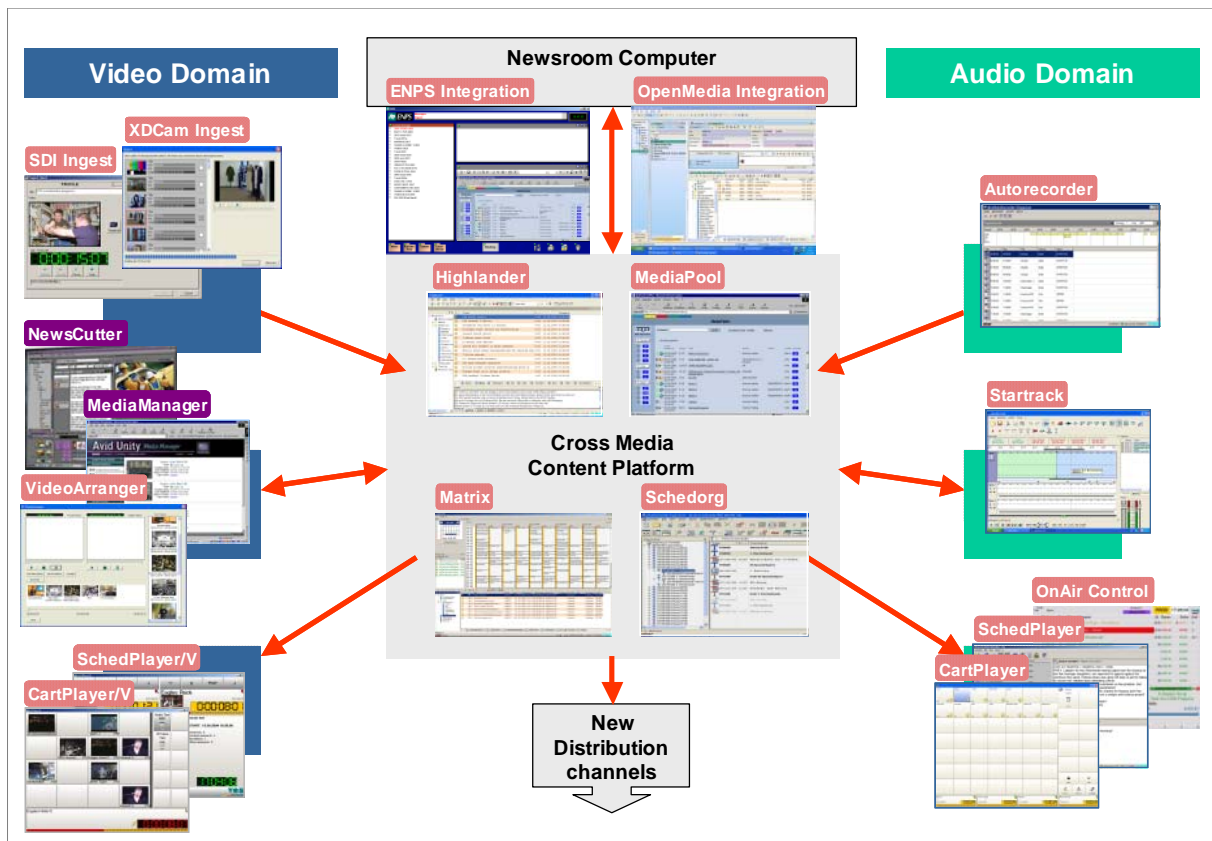


Figure 3: A practical example of the cross-media process integration

The diagram shows a combination of dira! tools both in the audio and the video domain as well as for the cross-media layer in the middle, as well as specialised video production tools and existing newsroom computer systems.

As stated before, well-established technical standards are highly important for an open and therefore future-proof overall system architecture.

- The *MOS* standard is used to integrate the variety of market-leading newsroom computer systems like AP/enps, DALET a.n.n. / open Media and Avid iNews.
- *MXF* has become the probably most important file format for file based, networked video production, and therefore is consequently supported as a standardised transport format in the LAN and WAN environment.
- *AAF* is very beneficial wherever more complex structures than supported by *MXF* are required. Although not used as frequently as *MXF*, it may easily become more and more important, e.g. as *EDL* format within Avid systems.
- *BWF* still may be used as a “material plus metadata” container format to exchange audio material, wherever *MXF* is not adequate.

- One very important issue of integrated workflows between different subsystems is about metadata. *BMF* is a good example of how metadata can be harmonised at the level of material exchange between integrated subsystems.

At this stage, it is worth being mentioned that some of the above standards require in-depth assessment because they support a high degree of specific implementation – like MXF and AAF.

Conclusion

VCS uses different facets of this approach in a number of projects. The major objectives for these projects shall be summarised, based on earlier statements of this paper:

1. In order to achieve the increase of efficiency which is expected from cross-media production processes and the related technical implementation, the specific user requirements must be seriously addresses and implemented. A “one-dimensional” attempt which does not take into account these specialities is considered much less successful.
2. Adequate technical cross-media platforms can be achieved only by integrating different specialised subsystems in combination with a “translating” cross-media layer for content access and content management.
3. Cross-media production processes and the related technical infrastructure still is a “new” field. Therefore, the implementation approach must be stepwise in order not to overload users and operational staff.
4. Last not least the high level of integration required together with usual increase and variation of requirements can be adequately addressed only by a high degree of scalability. Using well-established standards is a must to comply with this objective.

All in all, it can be concluded that cross-media production processes are now ready for the broadcast market, and will be one of the key technologies for the coming years.