Business process automation is gaining all the glamour in broadcast workflows at the moment. It cannot be denied that there are efficiencies to be gained by aligning technology with the commercial goals it seeks to support. It is important, though, that this does not obscure the need for developing automated media workflows. There are some processes which have to be handled in any organisation, which are purely technical operations, and which would benefit from automation. Telestream's **John Pallett** reports.

# Automating critical video processes

The processes outlined in my introduction may well be linked to infrastructures like asset management or business process management, and will certainly have commercial implications because they enable the broadcaster or content owner to do more and deliver to new platforms. However, such processes are often self-contained - frequently quite complex, and not falling into the category of asset management or business processes. They run every day, and in one way or another touch most of the world's video content.

At Telestream we have thousands of clients using FlipFactory to automate content-centric video workflows. Continuing this tradition, we have announced Vantage, which allows the user to build up workflows to meet their own unique needs, using a simple graphical user interface to create fully

**Run-time decision-making.**
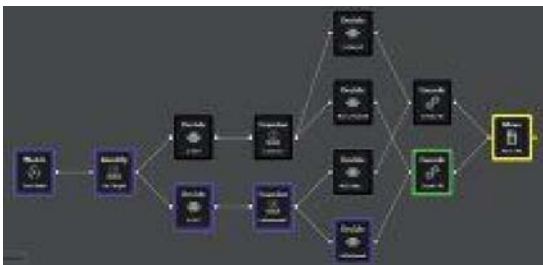


automated operations.

With Vantage, three innovations in particular are transforming the way that workflows can be constructed and managed.

## Runtime decisions

The first is the ability to model processes which are non-linear, and which make decisions at runtime. We are all familiar with flow charts containing decision boxes, and of course many of our workflows are organised like this. The decision-making, though, has tended to be the manual part of the system, which is where the operational inefficiencies lie. With runtime decision making, routine encoding and quality control processes, for example, can now be fully automated.

Let me offer a simple example. Previously, if you had a file-based quality control system, it might fail a piece of content and generate a report. In a linear workflow, the next step would be for an operator to check the content, identify the potential error, evaluate it, then decide whether to make an exception and accept it or set about correcting it.

That not only requires experienced staff, it requires them to be on shift at

the time the possible error is detected. If the error report is generated at night it may need to wait until the morning for the right person to read the log and start the investigation. What if that process is urgent? What if the piece of content was needed for transmission at 7.00am and the engineer did not come on shift until 8.00am? What if it meant that an iTunes release date was missed? The commercial consequences could be significant.

With runtime decision-making the workflow automation system can dig much deeper into the task. In the example case, the process would not just detect the error but interpret the reason for failure and try to correct it. We call this process self-healing.

For instance, if the encoded file is blocky, is the original blocky? If so, can we find a cleaner copy of the content from a different master source? Can we email the originator and get a better copy delivered?

If the master is good, what parameters can we tweak to get a better encode or transcode? Is there an alternative algorithm that might achieve a better result? Do we have anything spare in the bit budget to help us with this sequence? If we increase the file size what are the other implications?

As another example, what if an incoming spot has audio only on one channel? What if the same spot is not 30 seconds long? What if an output file is too large for the distribution channel? These are all errors that can have automated recovery steps.

With a few drag and drops an engineer can create a sophisticated, self-healing detect and correct workflow - modeling and automating the correction steps that they would normally perform by hand.  Of course any process which needs to go around a loop more than once will take more time than a straightforward pass - but almost certainly less time than alerting an operator, waiting for a decision and reloading the job into the queue.

## Asset tracking

The second innovation is asset tracking, an increasingly important requirement as each piece of media now needs to be repurposed for multiple purposes. Given the need to support different delivery platforms and languages, the number of assets involved in a workflow is increasing.

A particular job, for instance, may be triggered not by the arrival of media but by a subtitle file. When it arrives can we find the associated video? Does the subtitle timing match the video file? What if we need a new language track for one of our output files but not others? What about custom branding elements for broadcast, mobile, online and more?

With Vantage we can model the requirements visually, and use the intelligence within the system to coordinate the availability of assets. Conventional workflows only execute when 'everything is available' or when 'someone tells it to'. With Vantage, workflows can be modelled which respond to changing circumstances. It

> **With a few drag and drops an engineer can create a highly sophisticated, self-healing detect and correct workflow - modeling and automating the correction steps that they would normally perform by hand.**

may execute one task list based on asset availability, with other task lists synchronising with the outcome but waiting for their own triggers.

This is an important step in balancing loads on the system. Tasks can be processed as the elements come together, prioritised against a final deadline. Non-urgent tasks can wait until there is capacity in the system. That is a better use of system resources than planning for everything to be run at the last minute, which will inevitably require a larger server farm to provide just-in-case capacity.

## Metadata

The third, and in many ways the most powerful, of my three innovations is the ability to separate the metadata from the essence while it is within the video process automation system. Metadata abstraction is a powerful tool for developing complex workflows, and for ensuring that the final outputs are well presented.

When developing file-based workflows, perhaps the most common question is 'which file format should I use?'. What that means in practice is nothing to do with the quality of the content but the metadata file structure. I suggest that choosing a format just because the metadata structure works best for your particular architecture is looking at the problem through the wrong end of a telescope.

Vantage offers metadata modelling that can extract or insert metadata into a wide variety of video file formats. That means we can provide accurate transcoding of formats end to end with all the data in the right place at the right time.

But even more important, it means that the video process engine can use its own metadata structures, completely independent of the

content itself. That means that external data sources, such as XML and web services, can be incorporated with the results of in-workflow tasks such as quality control and file analysis.

This internal metadata is used to drive the process, it is modified as required, and the relevant components are written into the output files. Combined with our other two innovations - runtime decision making and asset tracking - metadata can be passed between files, or the properties of one file can be used to make decisions about a separate file.

At the end of the process, it is worth repeating, the internal metadata is checked to ensure that perfectly correct and compliant metadata is inserted into the output file, whatever the requirement. As is frequently the case, if there are multiple deliverables created by a workflow, each will have the right metadata.

## Conclusion

Few workflow automation projects truly do something new, rather they take what is being done manually, and then make it cheaper and faster. This makes innovation in workflow automation an opportunity to save money, and offer competitive advantage through higher service levels.

In Vantage, the three innovations above are allied with a simple graphical user interface to allow users to build the workflows they need, and combine with core services such as transcoding, analysis/QC, and capture. By simply dragging and dropping elements a customised process can be developed, tested and put into service. Under the hood, the software works to balance the processing load across the server network, making it fault tolerant and scalable.