

Automated decision-making

Workflows can be designed to adapt to incoming media automatically.

BY JOHN PALLETT

Across the industry, the power of file-based workflow automation is rapidly expanding to meet today's increasingly high-volume operations. What started as simple data interchange and content repurposing for the Web has developed into powerful video production processes, involving file-based workflow automation systems and sophisticated process design tools. These systems and tools allow many new capabilities, including the ability to add automated decision-making as part of a workflow without requiring custom engineering or human interaction.



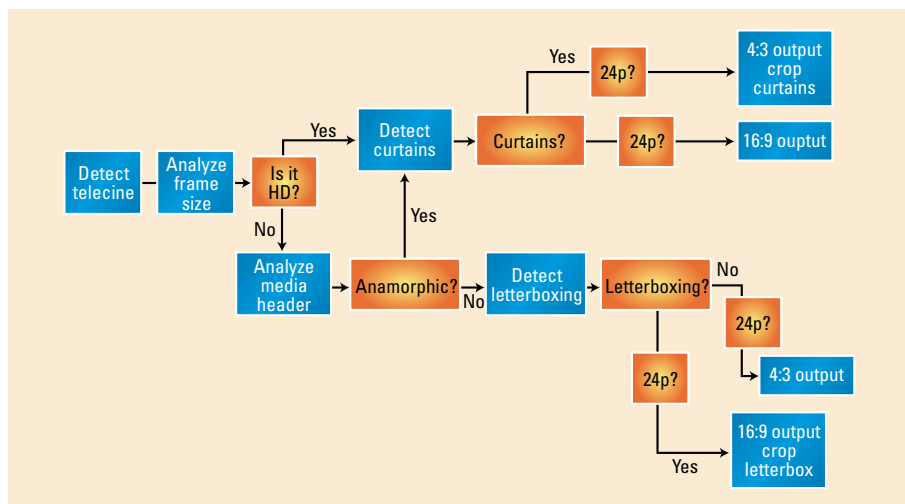


Figure 1. A sample workflow for transcoding

What is automated decision-making?

Automated decision-making is when a video workflow automation system determines which branches of a process to run, based upon data within the workflow, while the workflow is running. The newest generation of tools for video workflow design and automation allow the ability to model and automate this type of decision-making.

Decisions typically can be made upon a wide variety of data present in a workflow. For example, decisions may be made using the results of media analysis — the examination of file headers to determine media properties, extraction of media metadata, video or audio analysis, quality measurements or reference checks. Decisions might also be made based upon external system data such as distribution rules, air dates or packaging metadata. Further, decisions might involve process control data such as system load, job history or recent failure rates. Finally, automated decisions may simply respond to operator input, providing back-end fulfillment of review-and-approval workflows, packaging from data entry or routing of media based upon operator choices.

Automated decision-making has a broad range of applications, but three common uses are to make the

workflow more intelligently by adapting to incoming media dynamically, to make the workflow capable of responding to errors, and to make the workflow enforce regulatory or contractual requirements.

Smarter workflows

Workflows that adapt to incoming media — such as smart transcoding workflows — generally will combine some form of analysis to determine what work needs to be done based upon media file properties. (See Figure 1.) For example, a transcoding workflow might pick either a 16:9 or a 4:3 output transcoding profile based upon whether the input media file is SD or HD, whether it is anamorphic, and whether letterboxing or curtains are present in the video signal.

Similarly, a workflow might automatically generate transcoding profiles based upon media properties, such as calculating the correct bit rate

to meet a file size constraint, and deciding whether the output meets that constraint. Alternatively, a dynamic profile might be generated to crop off detected black edges in the media, or to perform inverse telecine to create a 24p output if previous analysis determined that the content was telecined.

Automatic error prevention and recovery

Workflows that are aware of potential errors offer the benefit of being able to prevent or respond to problems early in the process, without requiring operator input. Such automation can significantly speed up the detection of — and response to — errors in the workflow. (See Figure 2.)

For example, a workflow can confirm that an incoming file can be read, that it is in the right format and can validate that there were no transfer errors by checking hash values before and after the transfer. In the case where invalid media is supplied, a workflow might email the provider automatically to inform them of the error, rather than waiting for an operator to do so. This automated response can cut hours, and even days, off the recovery from media errors in a workflow.

A workflow can also do diagnostic work to determine the source of an error. For example, if a transcoded version of a video file is of poor quality, a workflow might automatically analyze the input file. If the input file is also of poor quality, the workflow might email the provider. Otherwise, it might try alternate encoding profiles or video filtering to attempt to correct the issue.

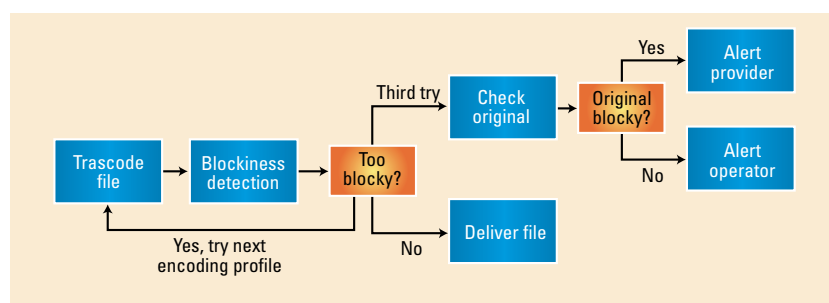


Figure 2. A sample workflow for dealing with blockiness

This type of automated correction is not limited to transcoding quality issues. For example, gamut or level errors can be detected and a workflow can automatically decide whether to correct errors based upon those results. As another example, commercial timelines can be normalized to ensure consistent use of bars, slate and consistent duration. A workflow can decide whether to add or remove material from the timeline automatically, even generating slates if necessary when they are missing.

Regulatory and contractual compliance

Workflow automation can also help with regulatory compliance. For example, a workflow can analyze audio levels and then decide whether to trigger steps to correct those levels. Similarly, a workflow might detect V-Chip ratings and take steps to ensure that adult content does not get sent to family distribution channels.

As a more complex example, a workflow may determine that a media file does not meet caption compliance requirements. In response, it might attempt to insert captions from an associated caption file or flag a clip for review by an operator if a caption file is not available.

Similarly, workflows can automatically assist with contractual compliance. For example, a workflow that is aware of an embargo date might delay the delivery or processing of a file until the embargo date has passed. Similarly, a workflow that is aware of the current system load, and which is also aware of the air dates for material, can make decisions about which material to process first, ensuring that last-minute deliveries are processed in a timely fashion.

It is a fact that a computer is better at some forms of decision-making than a human. If compliance checking is left entirely to people, they may misread an embargo date or hit the wrong button. While computers cannot yet completely automate compliance checks, they can reduce the

number of errors and help avoid penalties and fees.

Business impacts

Automated decision-making offers a wide range of business advantages.

First and most apparent, in today's workflows where decisions, error detection and correction are

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done using manual labor, offloading these decisions to a machine can significantly reduce costs or free up personnel to perform more productive tasks. Further, automated workflows run 24/7 allowing them to respond

to media in the middle of the night, regardless of what labor is available at any given time.

By removing the need for labor, automated decision-making also allows companies to pursue revenue opportunities that were otherwise too operationally costly to justify. For example, automated content ingest can help ensure that the correct service level agreements (SLAs) are in place.

Decreasing the number of regulatory or contractual compliance mistakes can help a company avoid fines or penalties. While not all mistakes can be prevented, automated decision-making can streamline the process of identifying and addressing issues, allowing early detection, automated correction attempts and more time for operator recovery when it is absolutely necessary.

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John Pallett is director of product marketing at Telestream.

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