



White Paper

Hybrid QC: A More Complete Approach to Delivering High-Quality Video

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1. INTRODUCTION

Quality control (QC) operations are evolving. A decade ago, QC was strictly a manual-based process. In more recent years, broadcasters have relied on file-based, automated QC workflows to speed up operations and ensure the accuracy of video and audio content.

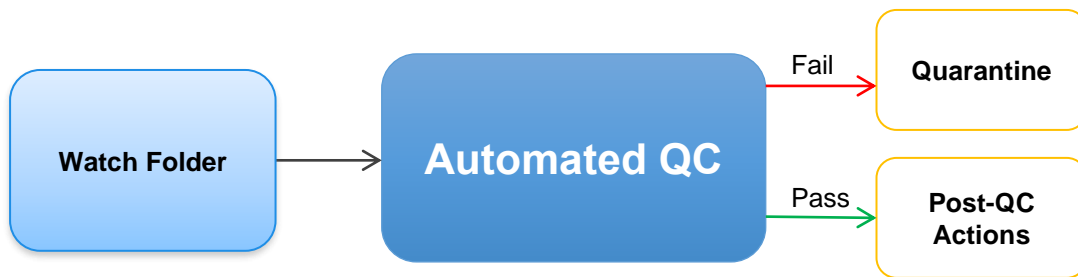
Automated QC solutions are an essential part of file-based workflows. They have the capability to check content for conformance, metadata, and different kinds of audio video quality issues. However, leading auto QC companies are beginning to realize that it's not a perfect or complete process. A few issues cannot be detected by automated QC solutions. Moreover, if detection is supported, it is not fully accurate.

This has led to a shift to hybrid QC platforms, which enable broadcast operators to perform auto and manual QC checks in parallel from a single platform. While the biggest advantage of this approach is accuracy, simplicity is also a factor, as a broadcast facility's entire QC policy can be implemented in a single solution. This paper will explain certain scenarios where using a hybrid QC solution is ideal, along with the key requirements that broadcasters should look for in a hybrid QC solution.

THE HYBRID QC WORKFLOW

A broadcaster typically performs the following checks before the content can be called "OK":

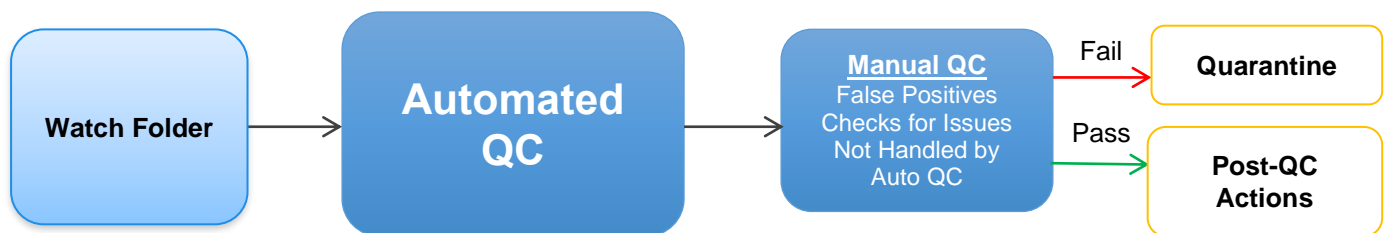
| Auto QC Checks | Manual (or Eyeball) QC Checks |
|----------------------------|---------------------------------------|
| Chroma Change | Lip Sync |
| Blockiness | Aliasing |
| Motion Jerk | Progressive Rollers |
| Video Dropout and so on... | Spelling and Punctuation and so on... |



A Typical Broadcast QC Workflow

Typically, after auto QC, the manual QC is performed outside the auto QC platform based on the organization's policies and then the files are either passed or failed. The passed files are then pushed for post QC actions.

With hybrid QC, auto QC is complemented by manual QC checks on the same platform before the files are passed as shown in the figure below. Hybrid QC ensures that the file needs to be reviewed for manual checks before it can be moved to Playout or Quarantine.



Hybrid QC Workflow

WHEN MANUAL CHECKS ARE NECESSARY

There are a few scenarios where broadcasters may prefer to perform manual QC as opposed to automation due to scarceness of time or because content is too critical.

One instance is when special effects are added to video. Special effects detected by an automated, file-based QC solution are often identified as artefacts in the video

frame, also known as false positives. Manual intervention is necessary to understand the anomalies and take appropriate corrective measures.

False negatives can be another challenge with an automated QC solution. In this instance, errors that need to be reported are ignored by auto QC systems. Without using manual intervention, broadcasters would be unable to address critical issues in the video or audio stream, such as lip sync, which automated QC solutions are incapable of identifying alone.

KEY CAPABILITIES TO LOOK FOR IN A HYBRID QC SOLUTION

Given the benefits that manual checks bring to the table, broadcasters will want to choose a file-based QC solution that includes manual and automated capabilities. The system should offer a comprehensive range of audio/video quality checks, as well as support for a wide range of media formats and codecs, including SD, HD, UHD, 4K, and mixed workflows. A powerful media player will ensure that the broadcast workflow is well-integrated and efficient. Manual intervention can be built into the test plan, allowing users to add necessary errors, as well as mark each manual task as reviewed.

Scalability is another important requirement in a hybrid QC solution. Choosing a software-based hybrid QC solution, broadcasters can expand the quality control workflow as their needs grow. Seamless integration with media servers, transcoders, MAM archiving, and workflow solutions is also essential, as it assures trouble-free installation and upgrades. Finally, broadcasters will want to select a hybrid QC solution that is built with high availability, continuing to operate even if one of the hardware components is down.

NEXT GENERATION HYBRID QC FOR FILE-BASED WORKFLOW

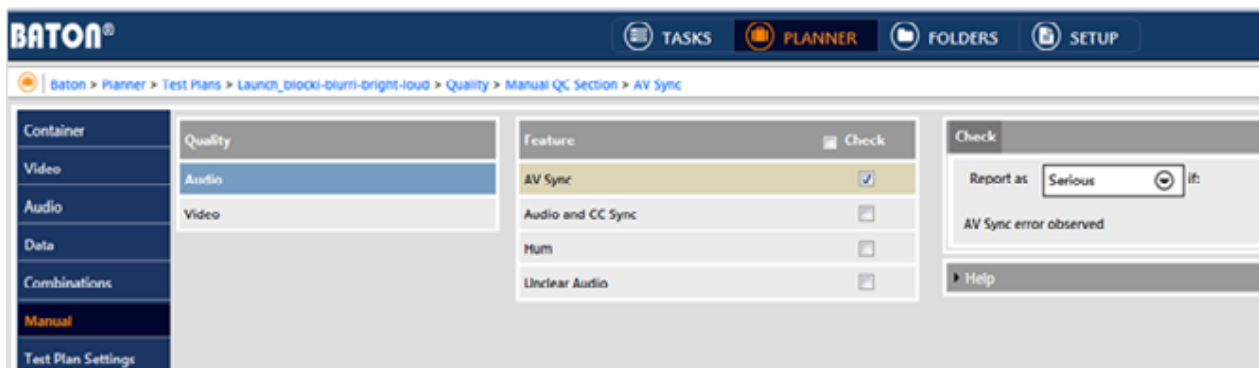
BATON®, the trusted auto QC tool, is the only tool available on the market that enhances the auto QC checks by allowing users to add manual (i.e., manual) checks, enabling operators to implement their QC policies more effectively. The platform includes an even more powerful BATON Media Player that shows a list of manual QC checks enabled in the test plan, allowing

users to add necessary errors, as well as review auto QC results. The result is a well-integrated and efficient broadcast workflow. In the following sections, we will how users can perform manual QC as well, using the BATON auto QC platform.

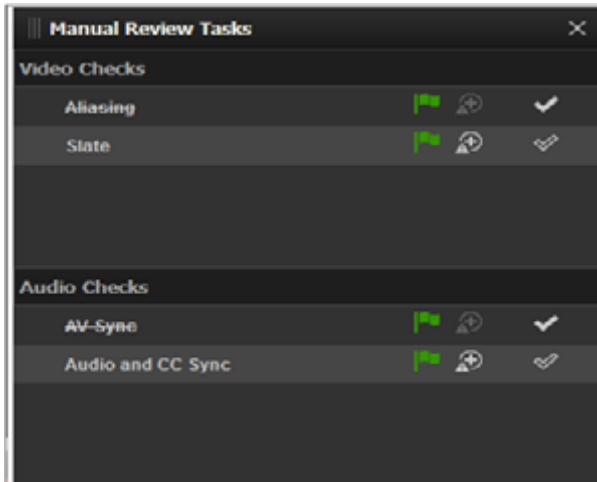
INTEGRATION OF MANUAL QC CHECKS ON AUTO QC PLATFORM

Just like auto QC, every facility also has a list of eye ball QC checks for which content may need to be reviewed before sending to the next stage. A test plan defines a list of checks for which media has to be verified. The test plan in the BATON system extend to include manual QC checks as well with an additional “Manual” section which refers to both audio and video manual QC checks. This section can be populated with a predefined manual QC list identified based on the customer feedback, as well as from forums like DPP, EBU-QC etc.

BATON provides a functionality to register new custom checks. This functionality is available to users with Admin or Test Plan Manager privileges and it is part of the test plan interface.



If the user has enabled any of the manual QC checks, then content QC will be considered complete only after the user has reviewed all the required manual QC checks.



MANUAL QC THROUGH BATON MEDIA PLAYER

Upon opening the verification report in BATON MEDIA PLAYER (BMP) for such tasks, BMP shows a list of manual QC checks that need to be reviewed. This list is generated based on manual QC checks enabled in the test plan. After reviewing the file using BMP, the user has an option to add necessary errors, if present, and then mark each manual task as reviewed. During the review of the verification report, if the user adds some error for a particular manual QC check then automatically status of that task will become "failed". Default severity of such an error will be according to the test plan configuration. For example, if the user has specified "AV Sync" error as serious in test plan and then during the review if the user adds AVsync errors, then the default severity of these errors would be "Serious". User has the flexibility to change the severity state to Warning etc.

Manually-reviewed errors and automatically-generated errors may be re-reviewed by a supervisor/ peer to check for any false positives or false negatives. The user has an additional option in BATON to specify that review needs to be done for manual QC errors without really specifying the exact checks. This setting is part of Global settings under the test plan which could be overridden at a test plan level also. Manual checks can be subsequently marked as "Reviewed" by clicking on the tick mark icon against each one of them. Once all manual QC tasks have been reviewed by the user, he will

then have the option of invoking post-QC actions. Depending on the new state (success or failure), tasks will move to playout / quarantine / correction operation as specified in post-QC action.

ONLY MANUAL QC

There could be few scenarios wherein customers may like to only perform manual QC because of paucity of time or criticality of content. In such a scenario, customers can still route their content through BATON for manual QC, even though it is an automated QC solution.

CONCLUSION

Relying on a combination of auto QC and manual intervention, broadcasters can fully comprehend why false negatives and positives occur, detect critical issues that aren't measurable by automation alone, and take appropriate corrective measures. Benefits include increased efficiency, cost savings, and content quality.



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