



Automated Production of Movies on a Cluster of Computers

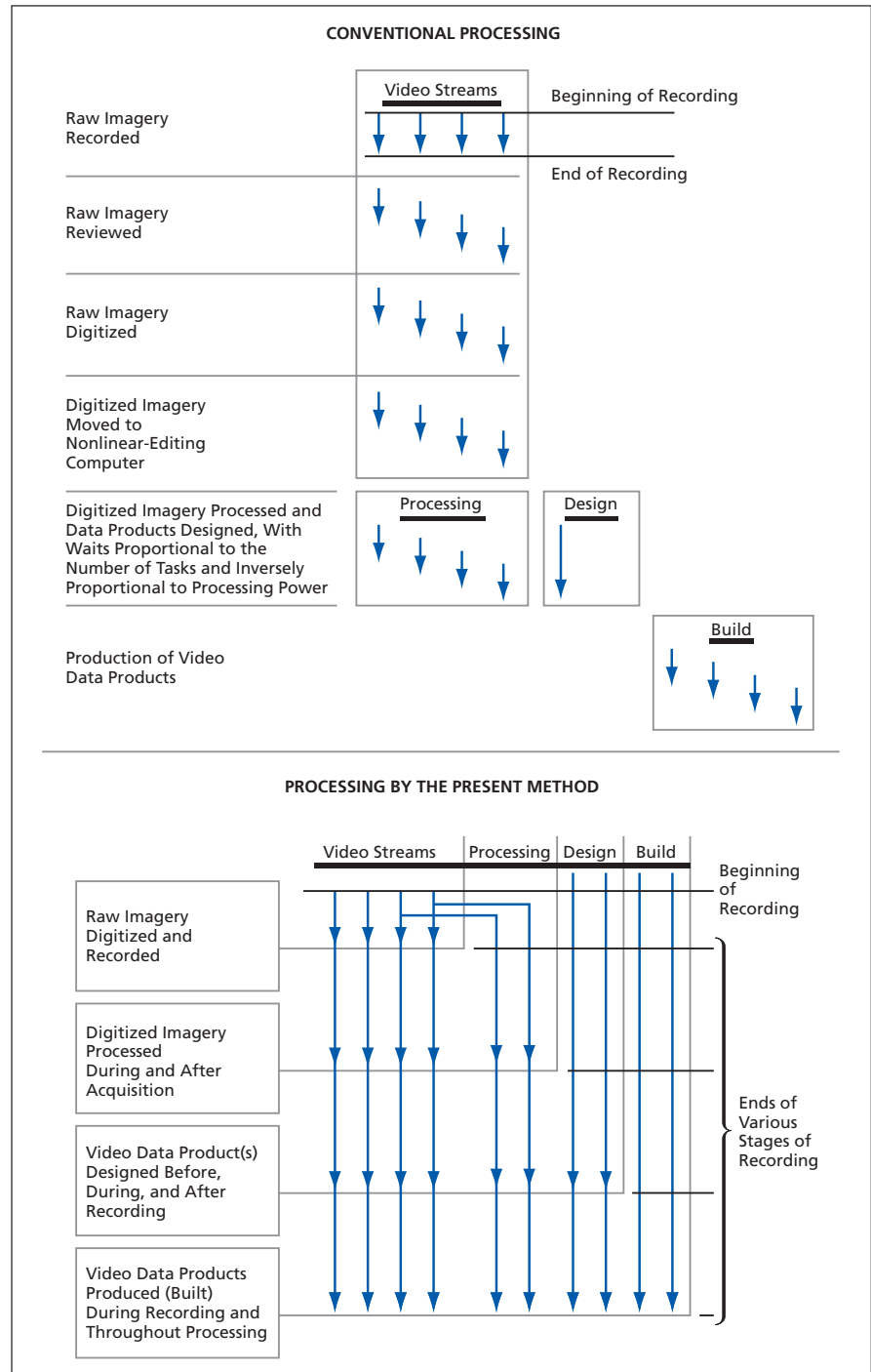
Processing is faster, easier, more flexible, and more collaborative than before.

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A method of accelerating and facilitating production of video and film motion-picture products, and software and generic designs of computer hardware to implement the method, are undergoing development. The method provides for automation of most of the tedious and repetitive tasks involved in editing and otherwise processing raw digitized imagery into final motion-picture products. The method was conceived to satisfy requirements, in industrial and scientific testing, for rapid processing of multiple streams of simultaneously captured raw video imagery into documentation in the form of edited video imagery and video derived data products for technical review and analysis. In the production of such video technical documentation, unlike in production of motion-picture products for entertainment, (1) it is often necessary to produce multiple video derived data products, (2) there are usually no second chances to repeat acquisition of raw imagery, (3) it is often desired to produce final products within minutes rather than hours, days, or months, and (4) consistency and quality, rather than aesthetics, are the primary criteria for judging the products.

In the conventional method of processing video imagery, the workflow is mostly serial in the sense that for the most part, each stage of processing must be completed before beginning the next stage, and the final product is a single video stream. In the present method, the workflow has both serial and parallel aspects: processing can begin before all the raw imagery has been acquired, each video stream can be subjected to different stages of processing simultaneously on different computers that may be grouped into one or more cluster(s), and the final product may consist of multiple video streams (see figure). Results of processing on different computers are shared, so that workers can collaborate effectively.

The software provides a platform-independent design format, enabling pro-



Workflow in Processing of Video Imagery is substantially serial in the conventional method but has both parallel and serial character in the present method.

duction on a cluster of diverse shared and/or dedicated processors. The software generates a graphical user interface (GUI) for designing automatic production of dynamic video and film products. The GUI includes a visual programming language that uses interactive computer-graphical versions of constructs (e.g., story boards) familiar to professionals in the motion-picture industry. The software provides for the use of programming techniques that do not rely on the availability of raw video imagery or of certain dependent and inde-

pendent variables at the time of design. These programming techniques apply to editing, compositing, and rendering processes. The software enables production of a variety of products from a single design, partly through reuse of design elements and programmable features. The software enables automatic alterations of the product(s) during production to meet certain design goals. These automatic production changes can be based on the characteristics of the raw video imagery and of other variables as they become available.

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