

1. Public Executive Summary

The present document as well as the related software prototype addresses and maps the requirements collected, analysed and prioritised within a reference model as developed earlier to accommodate the variety of possible approaches to the media production flow particularly for 3D media production. The resulting Semantically Enabled WorkFlow Support System (2020SEWF) architecture was designed and implemented based on the user suggestions to keep the flow as flexible and modular as possible; taking into account also the expected application scenarios within the experimental approach as pursued in the project.

The design of the 2020SEWF has taken into account the needs, constraints and barriers related to integrating a new tool into a well-established industry characterised by a number of products most of which have an embedded workflow management and run on a variety of operating system platforms. Accordingly to be able to offer the users a workflow support facility that could open up new and useful degrees of freedom for workflow management with adaptation to specific contexts of use, a layered approach was adopted where semantically relevant information would be managed in terms of actions, actors, objects and their relations.

In the 2020SEWF Prototype that has been developed as described in this document, a semantic layer drives all the process-related definitions at the level where process logic could be outlined. This includes the ability to collapse (reduce), and/or expand the process definition granularity based on the reference model as already established. This semantic layer then sets up the processes to be executed in the operational layer where a finite state machine engine would monitor the pre-requisites and outcomes of tasks and the process verification in execution; including monitoring documents and metadata via checklist that are automatically generated by the top layer (the semantic layer) on the basis of the process semantics defined and modelled in the supportive ontology.

Supported meta-data and documents have been defined so as to accommodate the most flexible implementation of the entire process, possibly in all environments addressed by the project (i.e. 3D, 2D+Depth and Immersive). This was so as to ensure the widest possible adoption of achieved results.

This objective was also reflected in the choice of supportive technologies and tool used within the 2020SEWF system e.g. TopicMaps is an international standard; JBoss and FSMC are open-source products. The 2020SEWF architecture and its technical Implementation have been based on user-centric design and open source implementation and deployment. Usability was taken into account from the outset through extensive user involvement to establish users' most deeply-valued needs in this domain. This informed the design phase and the iterative cycles of refinements that have been informed by feedback from industry experts and practitioners as our end-users.

The evolutionary development cycles involved in creating this first 2020SEWF Prototype has involved a number of internal prototypes (mock-ups) which were used in cooperation with end-users to verify if the proposed design was fit to deliver the user-specified functionalities. The present version of the prototype is the first fully functional version that will be subjected to a set of planned Heuristic Evaluations as a preliminary step before being evaluated through a set of experiments and project test-bed as a supportive tool for production monitoring and management. This specific usage will complete the prototype evaluation and its responsive re-design, refinement and re-engineering as required.

Deliverable D3.4 is expected to include both the 2020SEWF Prototype, and, this document which describes the Prototype as derived from requirements elicited, analysed and documented in the earlier deliverable, D3.3. Therefore the present document sets out the system specification and description as well as provides all the information to support the users; including a step-by-step user guide and examples. Additionally the present document provides extensive documentation on the embedded supportive technologies, based on the studies and

analysis performed within the project as well as corroboration from documented information published by external sources.

Description of the system prototype

20203DMedia Semantically Enabled Workflow (2020SEWF) system aims to resolve the workflow related issues in the 3D media production domain, whereby it is crucial to provide the system flexibility demanded by the highly creative and dynamic nature of the domain. Accordingly the 2020SEWF system, in contrast with the traditional workflow management systems, has been developed to maximise the flexibility through semantically-enabled tracking of the metadata and process data and thereby semantically empowered decision support rather than focussing on process automation which would be inadequate if not underpinned by a semantic model and thus a usage-context-aware decision support capability as provided by SEWF. This provides the user with valuable information for either facilitating the task management or to determine where improvements can be made to increase efficiency and to improve the quality of the product or service.

To minimise integration efforts, the system exploits agile mechanism, i.e. the status of the task related documents are tracked, while the logs and other metadata sources are accessed, parsed and analysed. The structure and semantics of the defined reference model are exploited to generate checklists which are then used by the workflow management system and the finite state machine to inform the actor of the present state of each process via a unified colour-coding scheme for highlighting the related actions on the graphical user interface.

The 20203DMedia semantically enabled workflow (2020SEWF) system provides the twin functionalities of process deployment and management, which enables the user to manage predefined or self-defined XML-based workflow process definitions which model the workflow of the targeted media production domain. Additionally, the workflow definitions can be defined in a nested manner, so that the flexibility of the system is extended, which would allow the activities such as sub-contract and modular cooperative work to be better modelled.

The 2020SEWF system also provides strong functionality for process flow monitoring which enables the user to constantly monitor the progress and status of the workflow instances at runtime through a graphical user interface, where different colour coded blocks are used to highlight the status of the actions defined in the up running workflow process which facilitates the user to make various managerial decisions. Another feature of the 2020SEWF system is the development and exploitation of the semantic-based ontological knowledge model of workflow related metadata, which is implemented using Topic Map™ technology, i.e. one of the state-of-the-art XML-based ontology representation standards.

With such a scalable and extensible domain knowledge model, the 2020SEWF empowers the workflow management system with much more flexibility and scalability by decoupling the model of the workflow process from the domain or task specific metadata. This is in contrast to the traditional workflow systems where such metadata must be hard coded within the process definitions and cannot be altered at runtime. Therefore, one of the advantages of our system is that the behaviour of workflow can be easily modified by only updating the semantic model of the metadata without changing anything of the workflow itself. A typical usage of such semantic capability is reflected in the task management sub-module of the 2020SEWF system, where a state machine is developed in order to retrieve the relevant task-related information or meta-data which are defined in the Topic Maps on behalf on the user, such as the population of the check list which summarises the actions needed to be taken, the pre-conditions or required inputs for the completion of the given task, the constrains needed to be taken into consideration, other domain specific knowledge (e.g. differences between the 2D and 3D production approaches), etc.

Thus, with such semantically enabled workflow system, the user is provided with much more flexibility and extensibility in performing their 3D media production, whereby the enhanced decision support can be achieved by dynamically pushing to the user the semantic-based workflow related meta-data retrieved from the Topic Map empowered knowledge base.