

Context-Aware Multimedia Content Adaptation

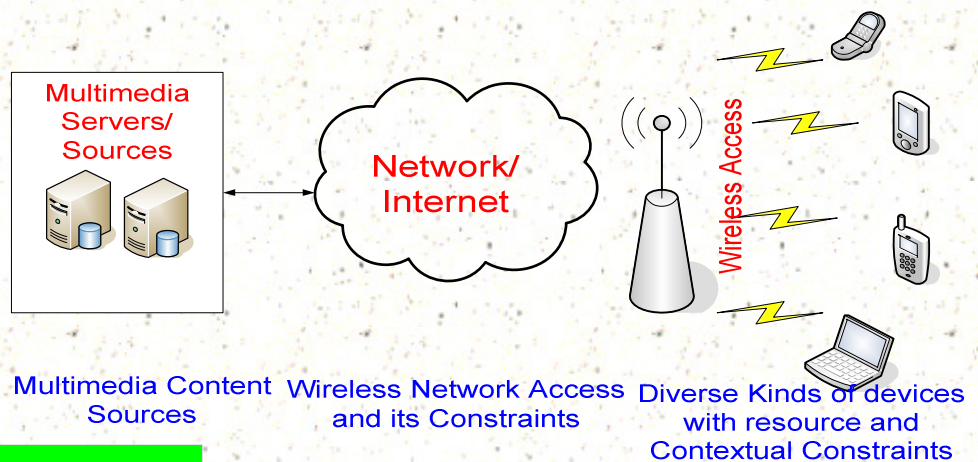
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Summary: Emergence of multimedia enabled devices and wireless technologies has driven the desire of consumers to access content, anytime and anywhere with the best possible quality. However, the high degree of heterogeneity and inherent constraints of devices and wireless networks are preventing this reality to happen. Current solutions try to adapt the contents according to these constraints, but are yet to fully address all problems and situations. This work seeks innovative solutions for adapting multimedia contents to suit consumption conditions and context constraints.

The Problem:

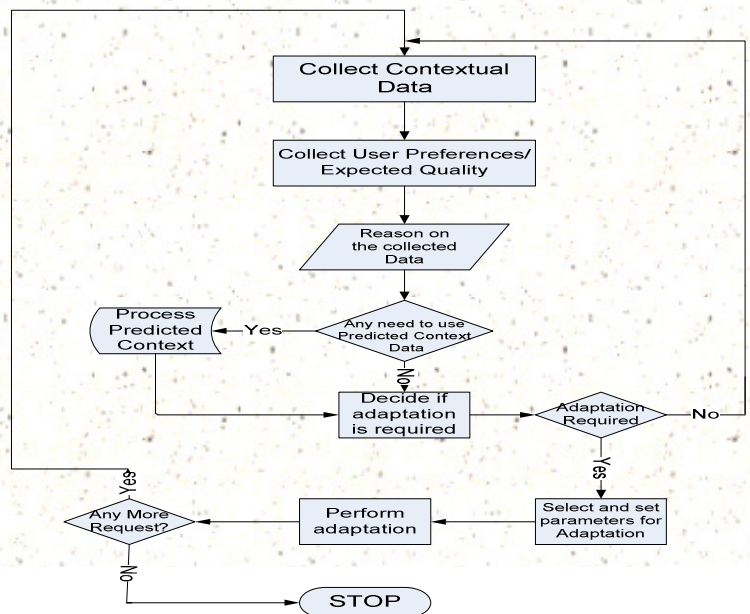
- ◆ Wireless Network Conditions still very unpredictable.
- ◆ Devices come in diverse capabilities
- ◆ Contents come in different formats
- ◆ Users Quality expectation affected by User Preferences, Environmental, Device and Network conditions.
- ◆ We seek a solution that can predict contextual information in a way that user quality expectation can be guaranteed from both user/application and network levels contexts in a bidirectional manner using machine learning.

How can we predict contextual information which can be used to fire appropriate adaptation mechanisms that minimize quality degradation ?

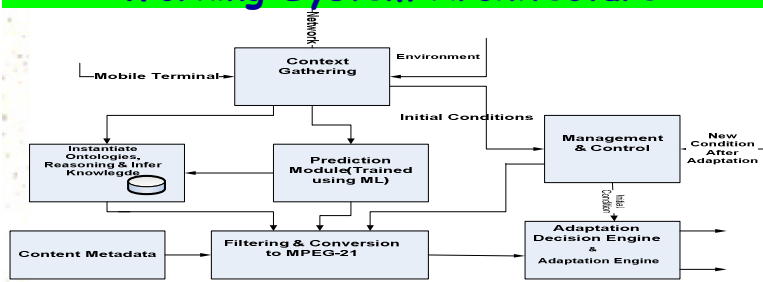


Proposed Solution

- ◆ Using Standard MPEG-21 UED to represent Contextual Information.
- ◆ Using Machine learning to predict associated contextual information to reduce overall Adaptation time.
- ◆ Designing appropriate Adaptation Operations/Operators as well as Adaptation Decision taking Engine (ADTE) based on bi-directional decision algorithms.
- ◆ Design and implementation of the proposed system.
- ◆ Using established scenario to prove the proposed solution based on Scalable Video considering new and emerging requirements.



Working System Architecture



So far...

- ◆ Two Application Scenarios have been established
- ◆ Contextual Information Requirements were derived from these Scenarios.
- ◆ Representation of these Contexts using MPEG-21 UED currently ongoing.
- ◆ Next we experiment with machine learning algorithms and select appropriate one for context prediction.
- ◆ Design of the proposed predictive algorithm.
- ◆ Design and Implementation of the system
- ◆ Experimentation and evaluation follow.

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