Synamedia

AI-Based Technologies in Video Coding and Streaming: Future Outlook

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Mile High Video, May 2023

AI is Everywhere in (Live) Video Coding & Distribution

Accurate quality metrics

Search space exploration
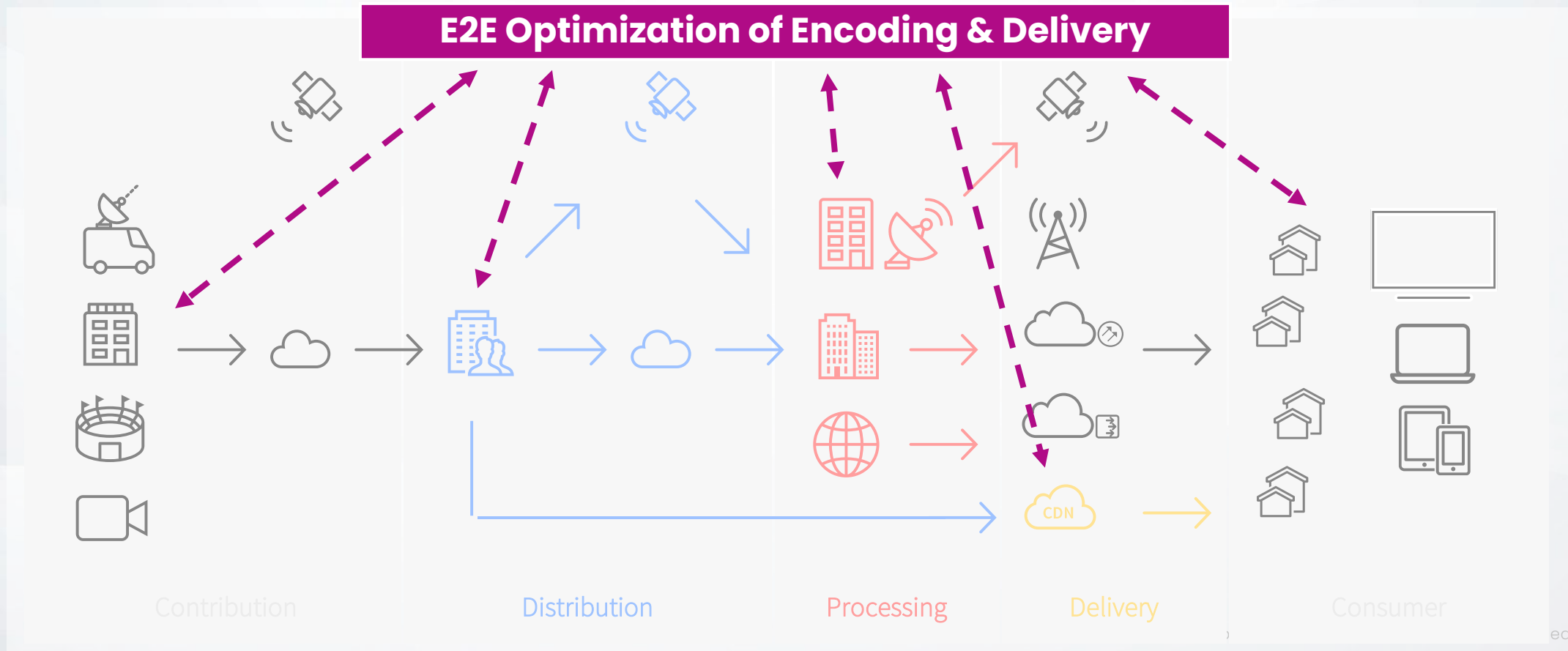
Dynamic ABR ladders

Pre-/post-processing

Content-adaptive encoding

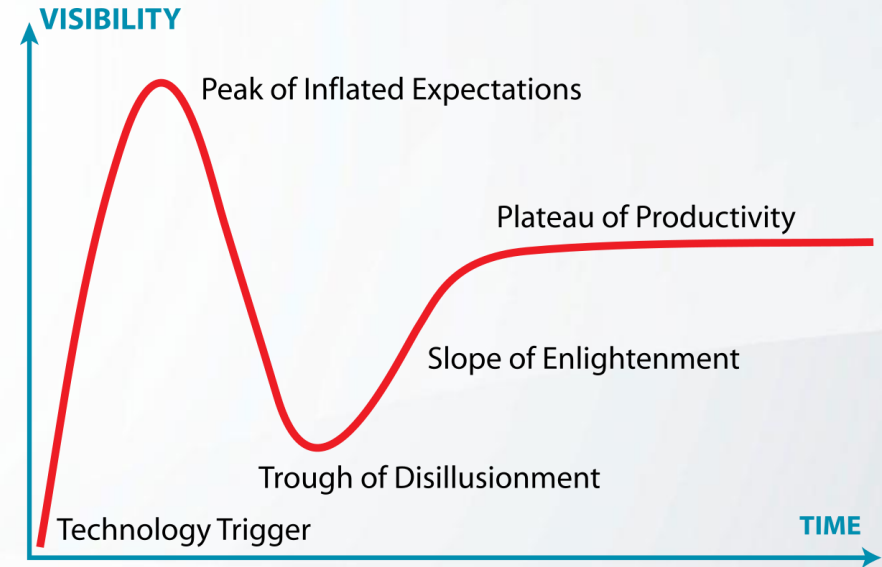**Insights & Analytics**

AI-based coding (tools)

Quality control

Automated Quality Monitoring

E2E Optimization of Encoding & Delivery

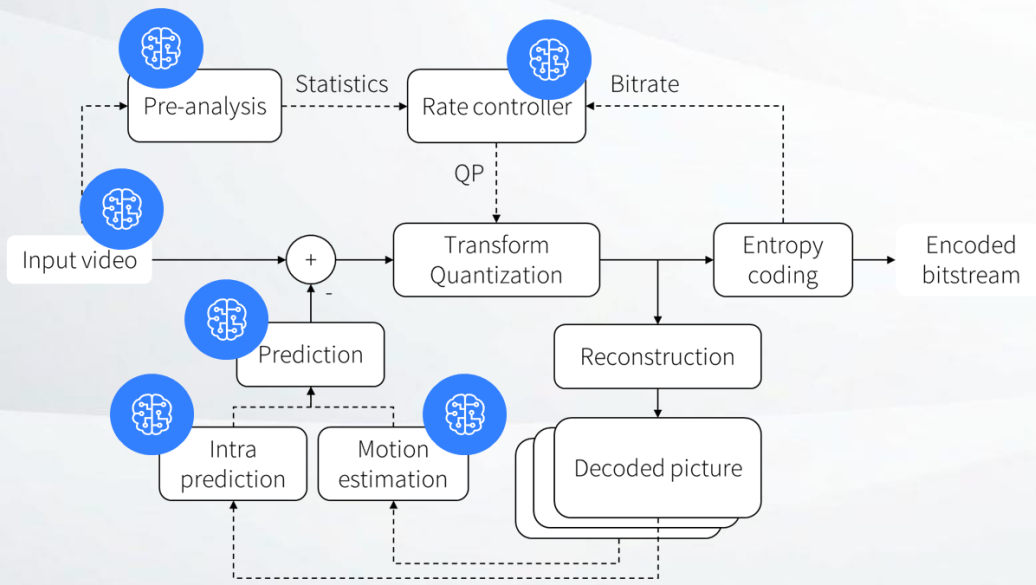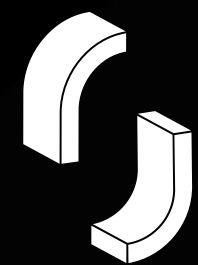Contribution | Distribution | Processing | Delivery | Consumer

Computational Efficiency is Key

- (Power) efficient usage of AI
- Focus on computational complexity reduction and network simplification
- Intelligent network / feature design, pruning, quantization, efficient implementation

VISIBILITY

Peak of Inflated Expectations

Plateau of Productivity

Slope of Enlightenment

Trough of Disillusionment

Technology Trigger

TIME

Statistics

Pre-analysis — Rate controller — Bitrate

QP

Input video — + — Transform Quantization — Entropy coding — Encoded bitstream

Prediction

Reconstruction

Intra prediction — Motion estimation

Decoded picture

TINY
ML

- **Analogy with "TinyML"**: running AI algorithms on low-power chipsets
- Instead of running a single algorithm at <1mW, run millions of AI decisions on a server with 100s of W

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