



TriMedia Business Line
Philips Semiconductors

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Agenda

- Introduction
- Products using TriMedia processors
- Technology overview
- Future outlook

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TriMedia Introduction

- **Philips Semiconductors has employed breakthroughs in VLIW architecture and compiler technology to create award winning media processors**
 - Support concurrent real-time processing for multiple datastreams
 - Optimized for digital multimedia including video, audio, communications, and graphics processing
 - Program development and optimization entirely in high-level languages
- **TriMedia processors are leading the consumer electronics industry in the transition from fixed-function products to flexible multifunction, interactive digital appliances**

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Polycom ViewStation Video Conferencing

World's Leading
Videoconferencing
System Vendor



1997: ViewStation
1999: ViewStation SP

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Philips Videoconferencing Systems



**Matchview Tiger
Videoconferencing
System**

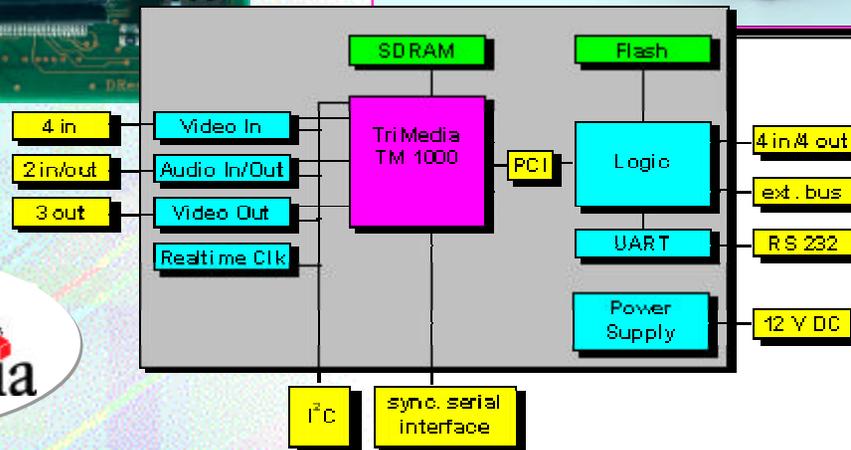
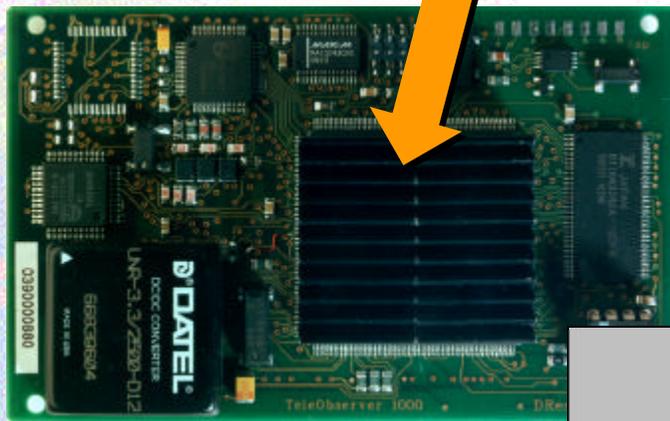


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Dresearch TeleObserver Security

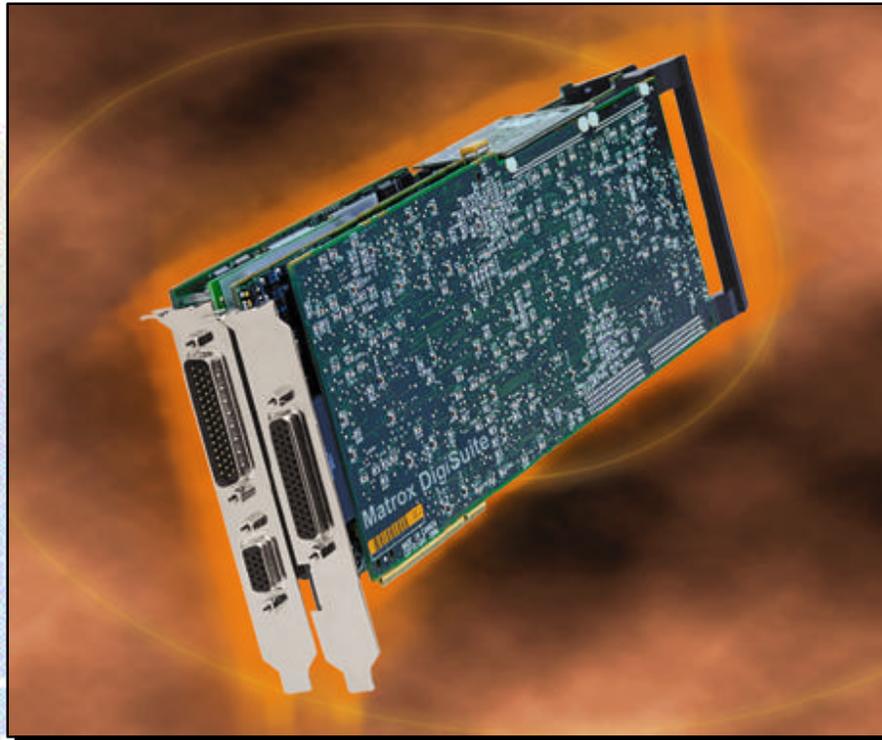


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Matrox DigiSuite™ Video Editing



- 1998: DigiSuite
- 1998: DigiSuite LE
- 1999: DigiSuite HDTV



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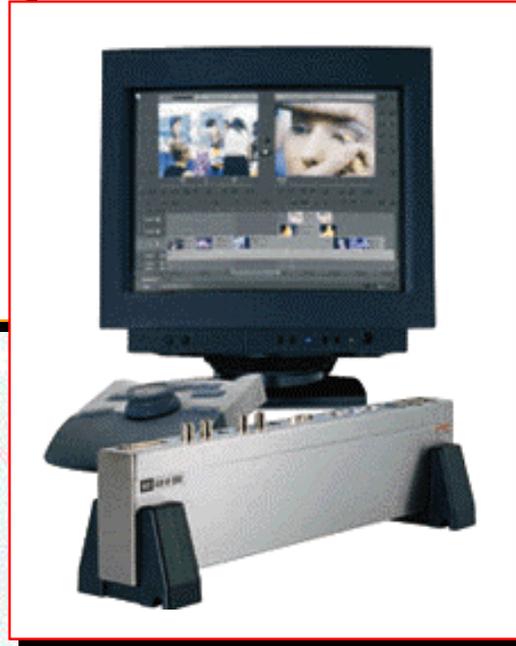


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Fast Multimedia Video Editing



1997: Blue Editing System



1999: 601 Editing System



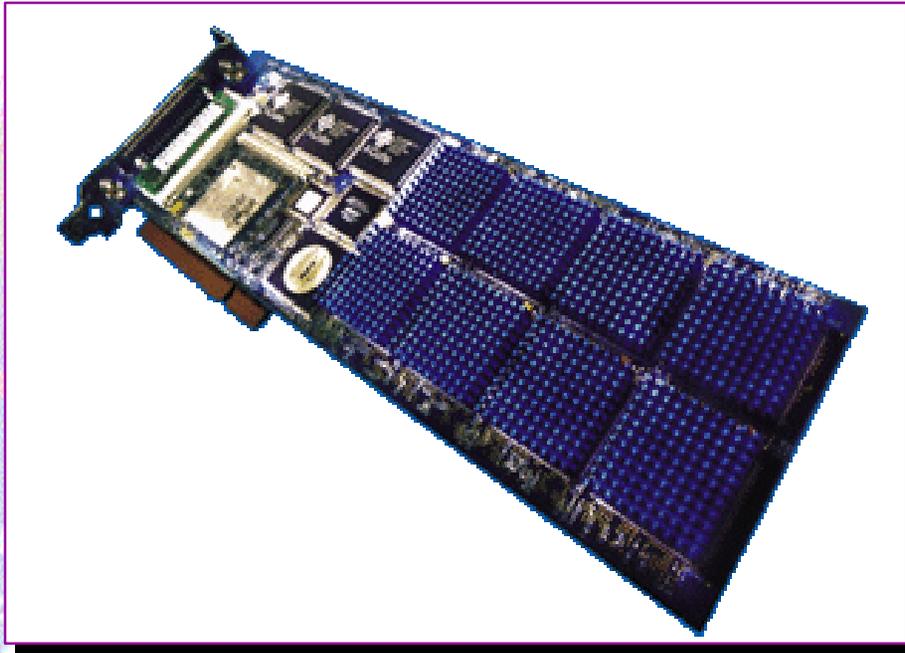
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Integrated Computing Engines

BlueICE™ Video Effects and Finishing



1997: BlueICE (TM-1000)

1999/Q3: BlueICE (TM-1300)



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Telestream ClipMail Video Mail System



**Broadcast-quality
video e-mail**

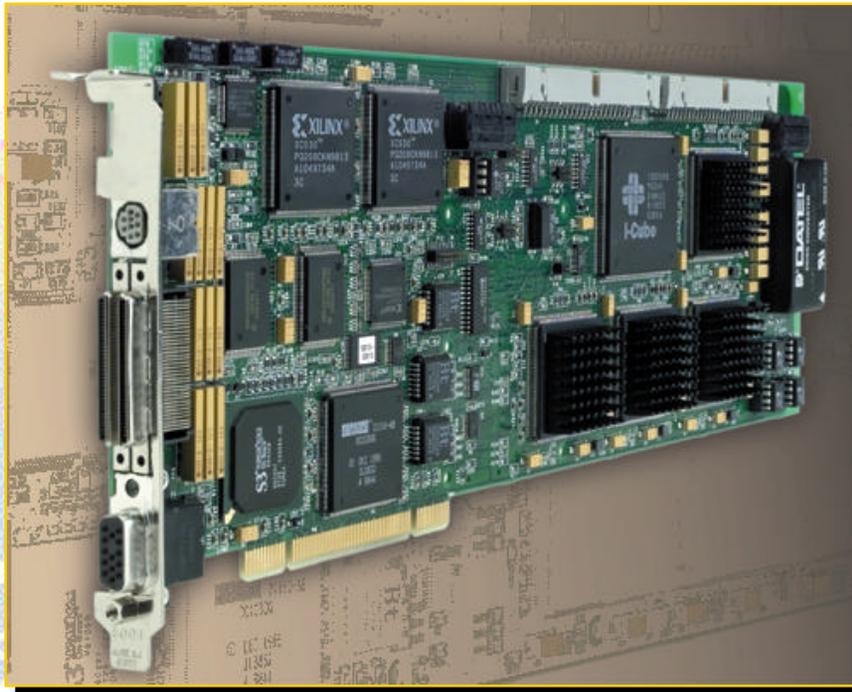


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Alacron FastSeries™ Machine Vision



**Video Processing and
Pattern Recognition for
Manufacturing Automation
and Robotics**



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Philips 64" Rear Projection HDTV

**1999 Consumer
Electronics
Manufacturers
Association (CEMA)
Innovation Award
Winner**



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SAMSUNG ATSC TV Receiver



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Philips DVS Advanced Set-top Box

NEWS RELEASE

PHILIPS UNIT WINS ORDER FROM UPC TO SUPPLY DIGITAL CABLE SET-TOP BOXES

(English, AFX News, April 16, 2001)
Philips Digital Video System (DVS) has won a major order from United Pan-European Communications (UPC) to supply digital cable set-top boxes, head-end and conditional access equipment for the European market. This order marks the start of a new generation of digital set-top boxes.



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TriMedia Processor-based Products

- **Announced and Shipping:**

- Videoconferencing
- Video editing
- Video mail
- Security/Surveillance
- Digital TV
- Digital set-top box

- **In Design:**

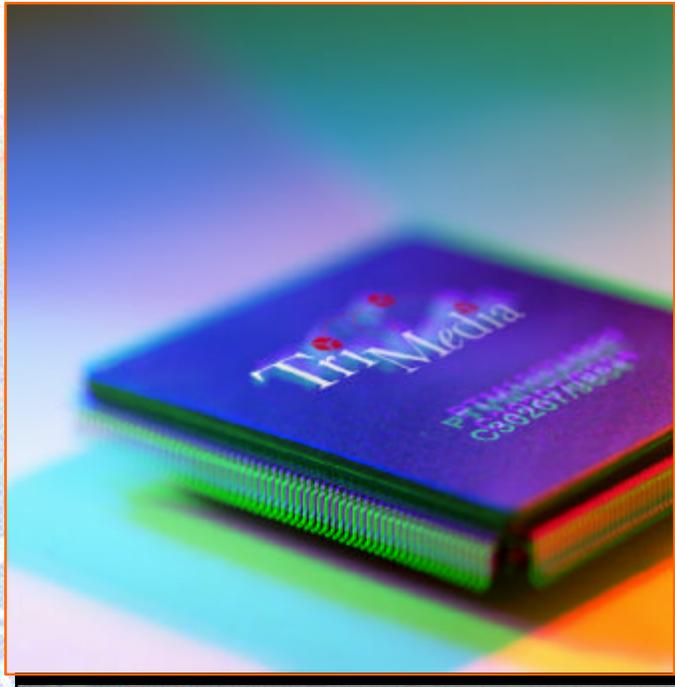
- Analog TV (high-end)
- Digital video recorder
- Advanced video phone
- Navigation and car infotainment systems
- Consumer security systems

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TriMedia Technology Overview



- A **media processor**
- VLIW architecture
- C/C++ programmable
- >7 billion ops/sec
- Software development environment and application libraries

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TriMedia Processor

A programmable processor designed for the concurrent control and processing of multiple media streams.

User Benefits:

- **Fast time-to-market**
 - Easy to change software, easy to develop follow-up products
- **Investment protection**
 - Changes in standards and product upgrades can easily be implemented in software without hardware redesign
- **Lower unit cost**
 - Multiple functions can be supported with a single chip by loading different application software

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TriMedia Products

Processors

- **TM-1000** 4 bops - 1996
- **TM-1100** 5 bops, DVD decryption - 1998
- **TM-1300** 7.2 bops, DVD decryption - 1999
- **TM-2700** for high-definition DTV - 1999

Software

- **TriMedia Software Development Environment 2.0**
- **Metrowerks CodeWarrior™ for TriMedia**
- **TriMedia Application Libraries**

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TriMedia Highlights

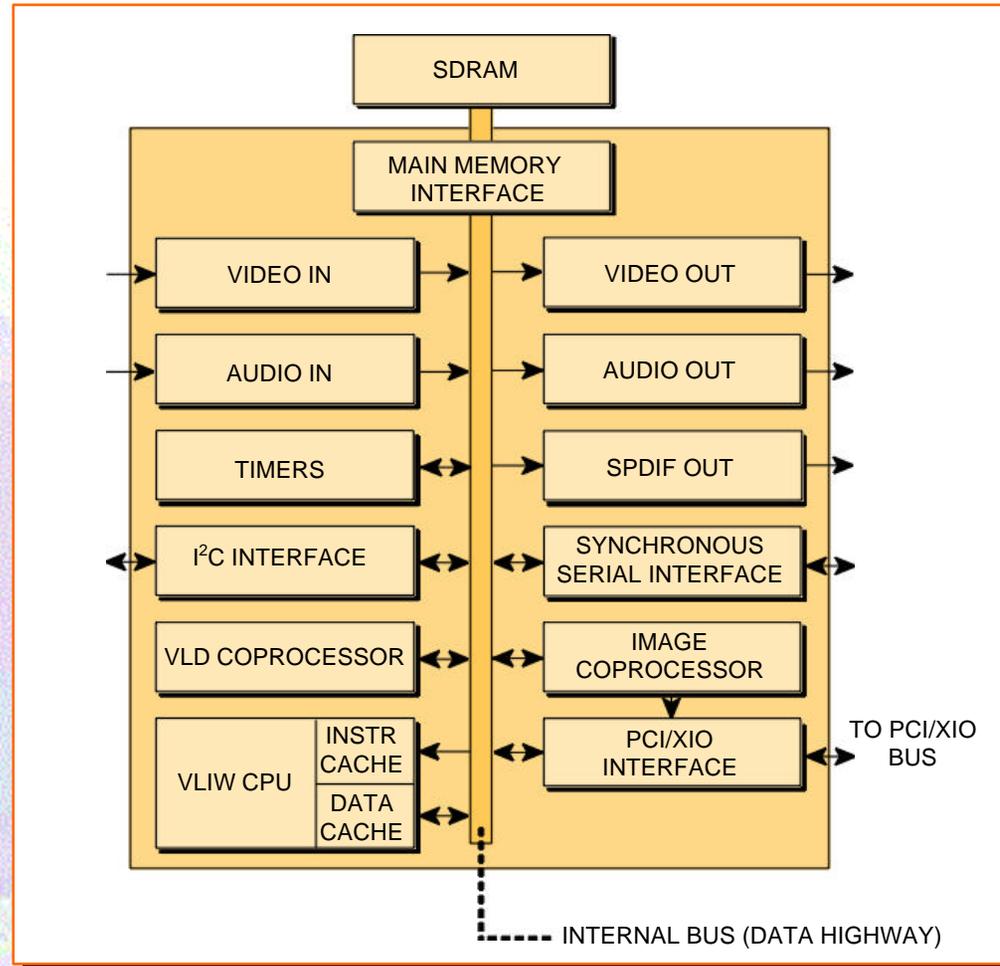
- **VLIW processor**
 - 5 issue slots
 - 27 functional units
 - Up to 38 atomic operations per clock cycle
- **Scheduling compiler**
 - Application development and optimization entirely in C/C++
 - VLIW scheduling by the compiler
- **System-on-a-chip**
 - Video and audio coprocessors, PCI/XIO interface, communications interface, DVD decryption
- **Real-time operating system (pSOS+™)**
- **High-performance Java™ support**

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TriMedia TM-1300 Architecture

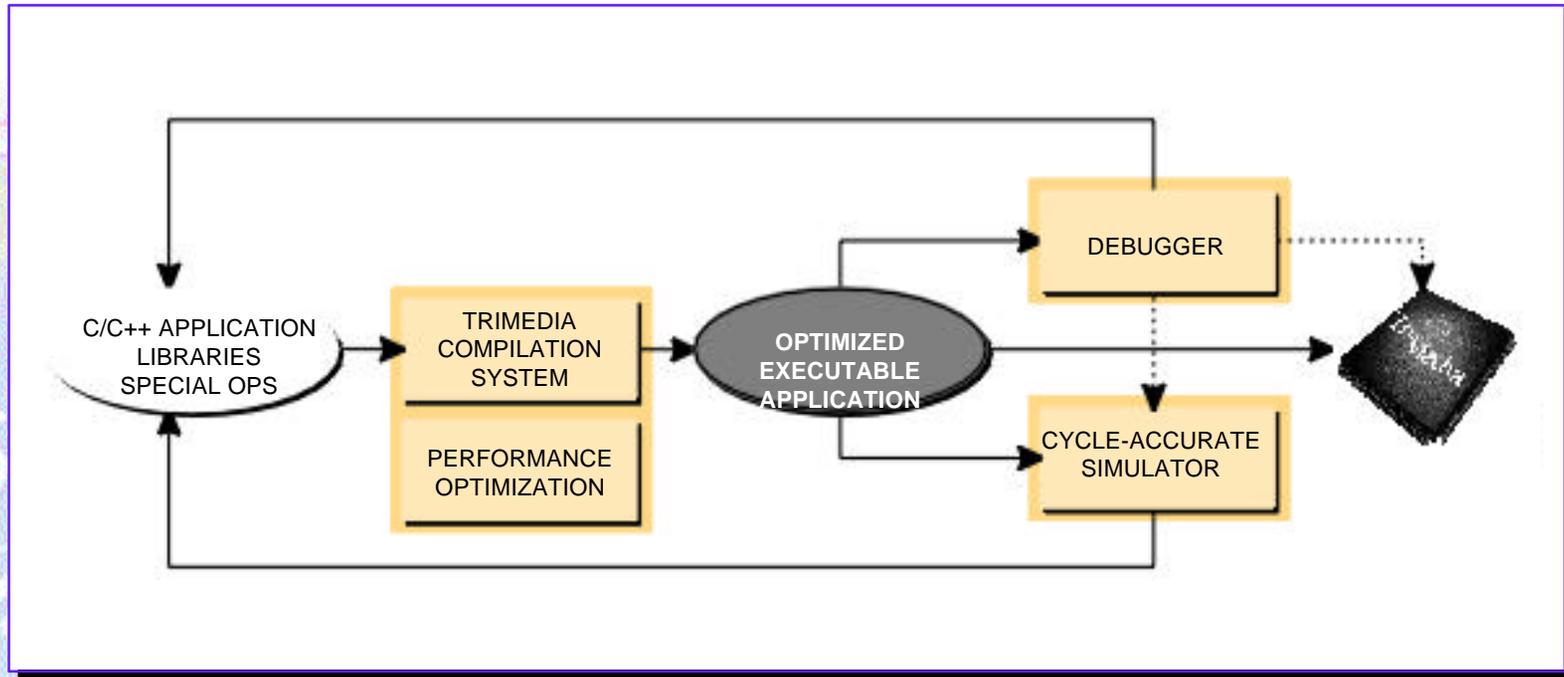


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TriMedia Software Development Environment



CODE DEVELOPMENT ↔ OPTIMIZATION ↔ SIMULATION/EXECUTION

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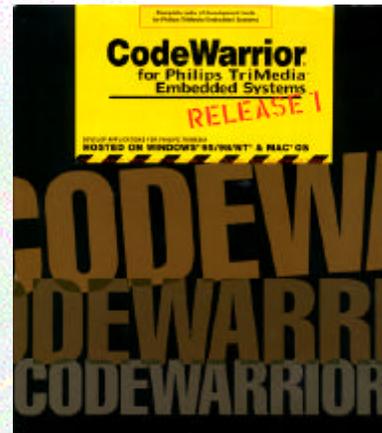


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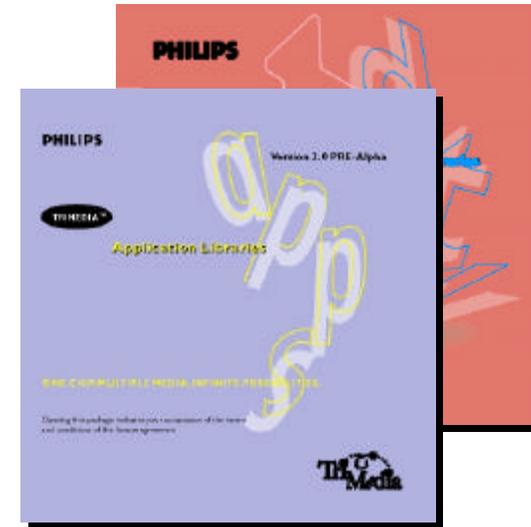
Software tools



TriMedia SDE 2.0
TriMedia SDE 2.0
For TM-2000 Series Processors



Metrowerks CodeWarrior
for Philips TriMedia
Embedded Processors



TriMedia Application Libraries
TriMedia DTV Application Libraries

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TriMedia Applications

- **MPEG encoding/decoding**
 - MPEG-1, -2, -4
- **Dolby AC-3, Dolby Pro Logic™**
- **Videoconferencing**
 - Complete H.324 reference design
- **DTV**
 - Complete ATSC reference design
- **Games**
- **Communications**
 - v.34, v.90, xDSL
- **Java Virtual Machine**



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TriMedia Developers Kits



**General Purpose
TriMedia Developers Kit**



**Video Telephony
Developers Kit**



DTV Developers Kit

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TriMedia Development Partners

Include . . .

- 4i2i Communications Ltd.
- ACE Technosoft
- Analysis and Technology, Inc.
- Beski Communication Systems, Inc.
- Bitstream, Inc.
- CresSoft, Inc.
- Metrowerks, Inc.
- Momentum Data Systems, Inc.
- NSI Com
- Origin NV
- Silicon and Software Systems
- Silicon Automation Systems, Ltd.
- Specs
- Spyglass, Inc.
- Timbre Engineering, Inc.
- Videon Central, Inc.

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Future Outlook

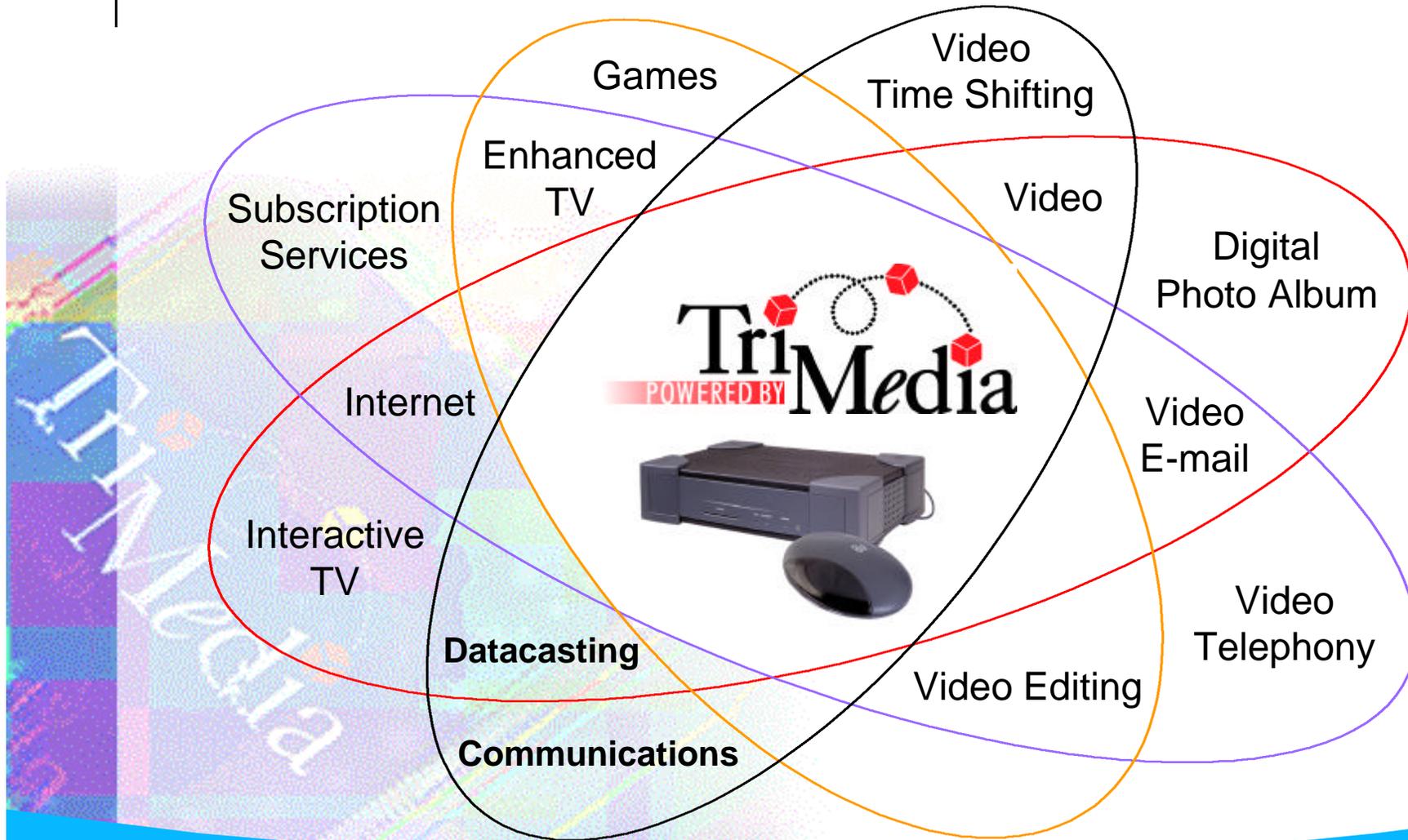
- **Higher performance, application-specific, 32-bit TriMedia processors**
- **New 64-bit TriMedia processor**
 - will boost video performance by more than a order of magnitude
- **Improved software development tools**
 - performance
 - automated code tuning
- **More software applications**

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One Chip. Multiple Media. Infinite Possibilities



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