



Embedded Computer Board and Module Market ARM Adoption - Overview, Trends and Challenges

July 2012

Speaker: Mark Watson
Report Author: Toby Colquhoun

Agenda

- An introduction to IMS Research
- Report scope and research method
- Introduction to key report findings
- Why is ARM's share of the embedded market forecast to increase?
- Projections for the future/open questions
- Questions

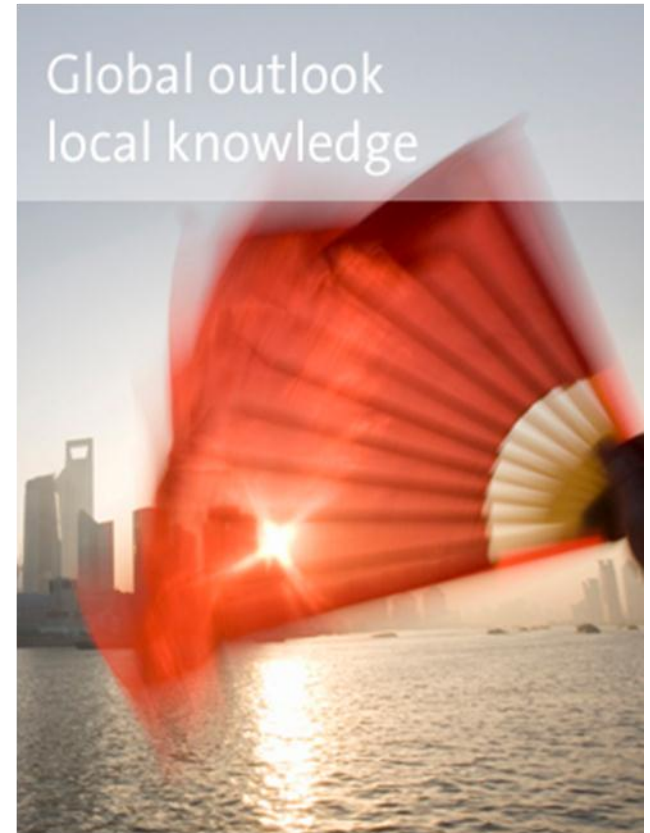
IMS Research Company Introduction

Who are IMS Research?

An established and global company

- Selling reports across 50 countries and to over 2500 clients
- Released over 250 syndicated reports in 2010
- Continued and substantial growth - 42% growth in FY11
- Founded in 1989
- Recently acquired by IHS Inc. (NYSE:IHS)

Global outlook
local knowledge



The World Market for Embedded Computer Boards and Modules – 2012 Edition

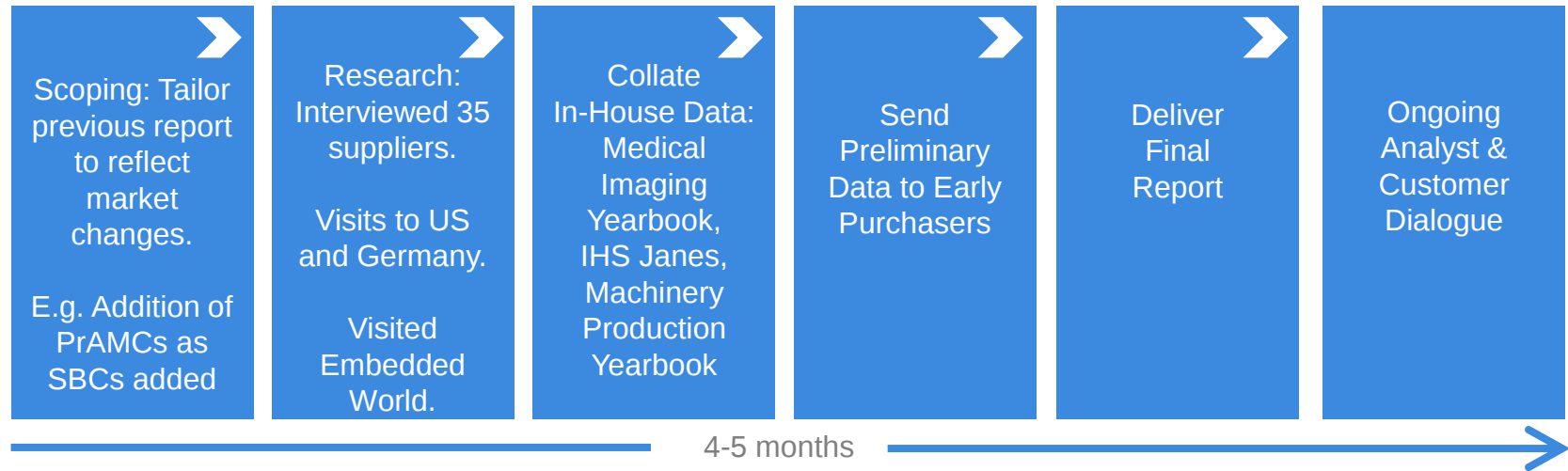
Report Scope and Research Method

Presentation source: "The World Market for Embedded Computer Boards and Modules – 2012 Edition"

- World report with 3 regional volumes
- 8 major technologies considered: Standalone Boards, ATCA, cPCI, VME, VPX, Mezzanine, COMs & PC/104
- Each technology further segmented by processor architecture, country/region and industry sector
- Market share statistics for the leading players in each region
- Point of market measurement: board-level component study
- Full report has approximately 150 tables, each with multiple data points, and provides discussion of key findings

Research Method

IMS Research work flow



- 35 Interviews conducted with key board vendors, silicon suppliers, connector manufacturers and distributors
- High level of reported data
- Statistics based on aggregated supplier questionnaire data and supplier discussions
- Extensive library of secondary research
- Report will publish July 2012

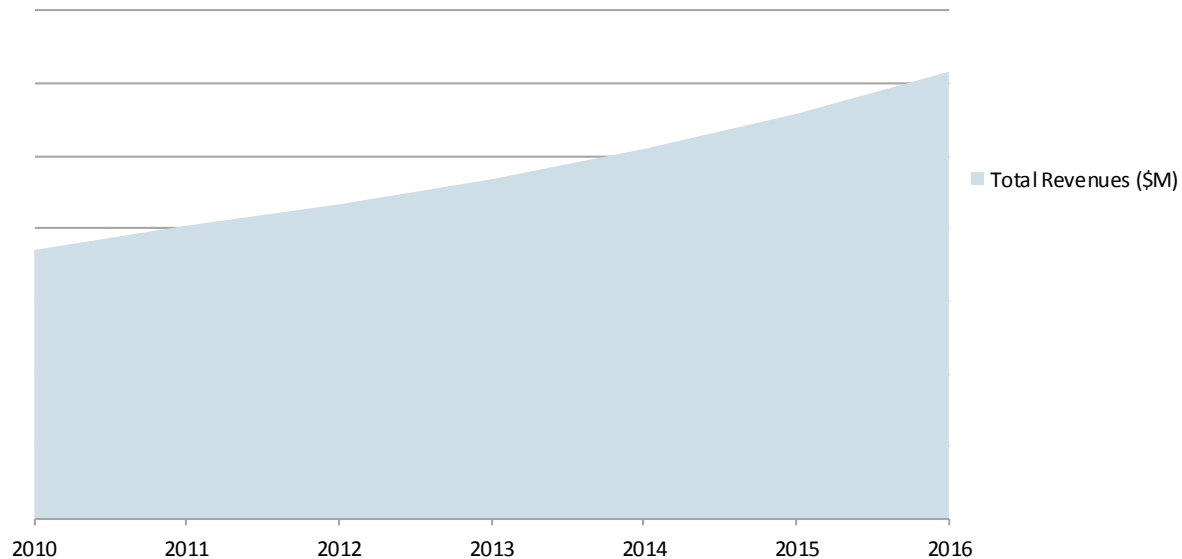
Key Report Findings

Merchant Board Market Growth

Figure 1

The World Market for Embedded Computer Boards and Modules

Revenues (\$M) 2010 - 2016



Source: IMS Research

Jul-12

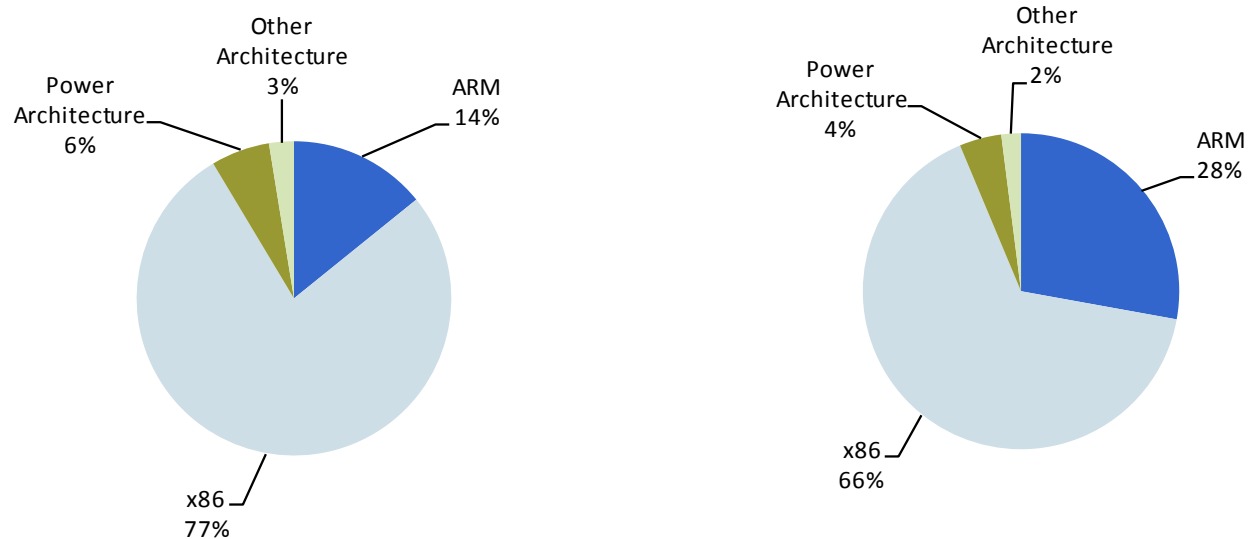
- Make vs. Buy: Three main trends leading to cost analysis favouring “buy”
 - Declining OEM Resource
 - Increasing Silicon Complexity
 - Reduce development time
- Captive market exceeds merchant market size; good growth potential

ARM Penetration Forecast to Increase to 2016

Figure 2

The World Market for Embedded Computer Boards and Modules by CPU Architecture

Unit Shipments % Share in 2011 and 2016



Source: IMS Research

Jul-12

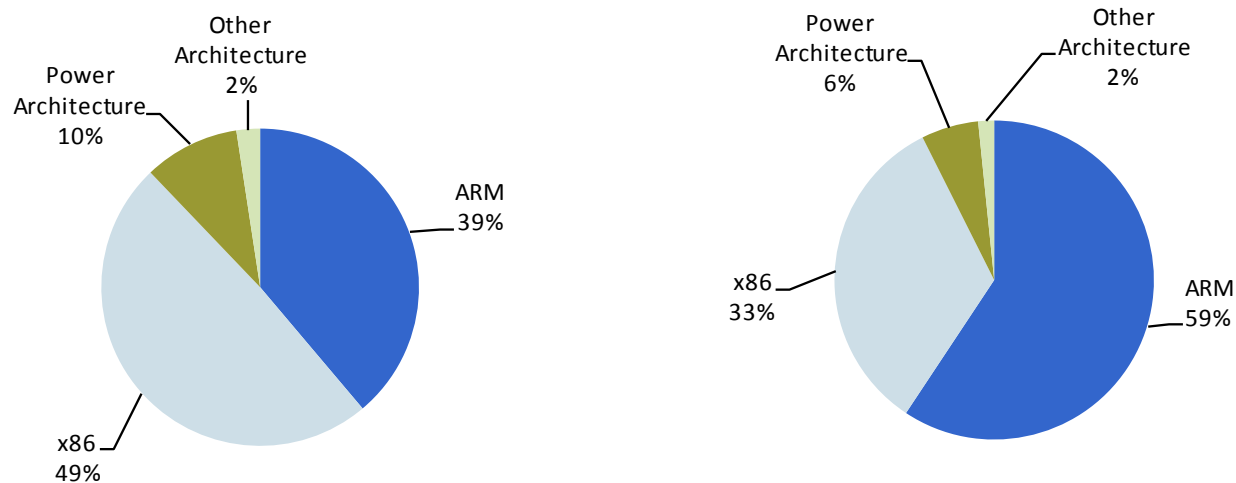
- ARM shipment market share is forecast to double to 2016; result skewed by influence of SBCs and Mezzanines
- What does this analysis look like, just for COMs?

ARM Penetration for COMs Only

Figure 3

The World Market for Computer On Modules by CPU Architecture

Unit Shipments % Share 2011 and 2016



Source: IMS Research

Jul-12

- ARM-based COMs are projected to substantially increase unit shipment share between '12 and '16

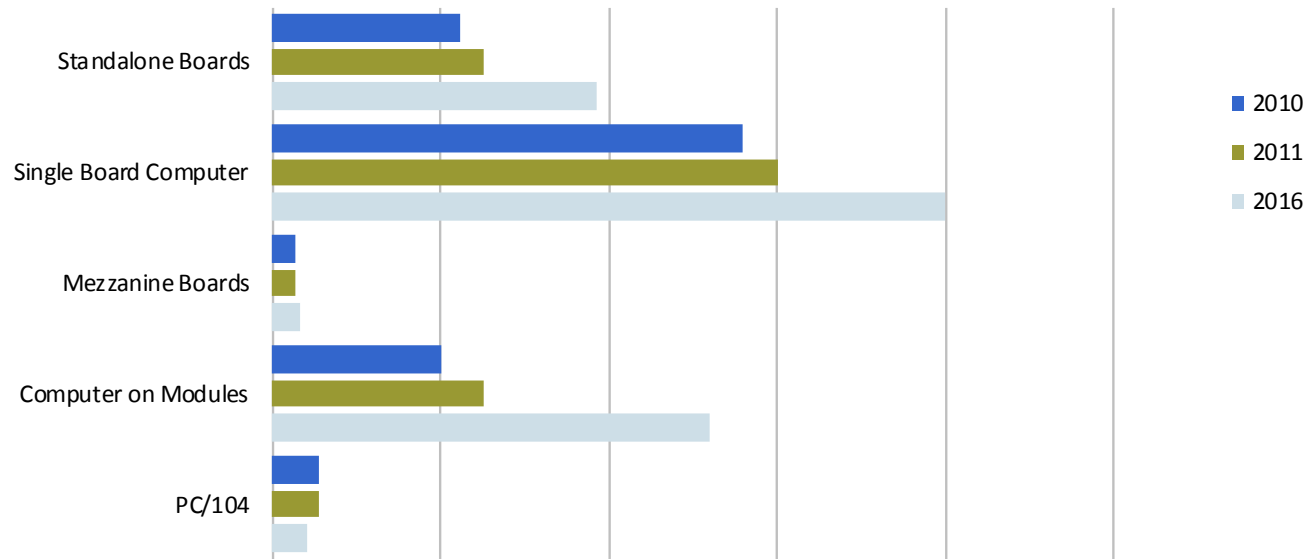
Why is ARM forecast to become a more important part of the merchant embedded computer board market?

Benefits of COM Concept on ARM Adoption

Figure 4

The World Market for Embedded Computer Boards and Modules by Product Type

Revenues (\$M) 2010 - 2016



Source: IMS Research

Jul-12

- Merchant market for embedded computer boards estimated at USD 2.6 billion in 2011; projected to reach USD 4.4 billion dollars in 2016 (CAGR of just under 9%)

Technical Trends have made ARM Viable

- Increasing feature/performance set of ARM processors, driven by consumer world:
 - PCIe
 - Multiple Cores
 - Gigabit Ethernet
- ARM is “suitably complex”
- ARM licensees have products suitable for tough applications
- Timing is at least as important as technical trends...

Has ARM's time come?

"An invasion of armies can be resisted, but not an idea whose time has come."

– Victor Hugo

- Average prices of x86 processors have increased year-on-year
- Several form factors are moving towards end of life
- Benefit of integration into standard form factors; small COMs (originally driven by Intel SOCs) are a very good platform for ARM technology
- Verticals that can benefit from the feature set of ARM are projected to grow well

New Vendors Entering ARM Space

Table 1

Market Share Estimates For Suppliers of Computer on Modules

Worldwide in 2010 and 2011 - \$ Revenues

Company Name	2010 Rank	2011 Rank
Kontron	1st	1st
Congatec	2nd	2nd
MSC	3rd	3rd

The market in 2010 was estimated to be worth \$500 million
The market in 2011 was estimated to be worth \$630 million

Source: IMS Research **Jul-12**

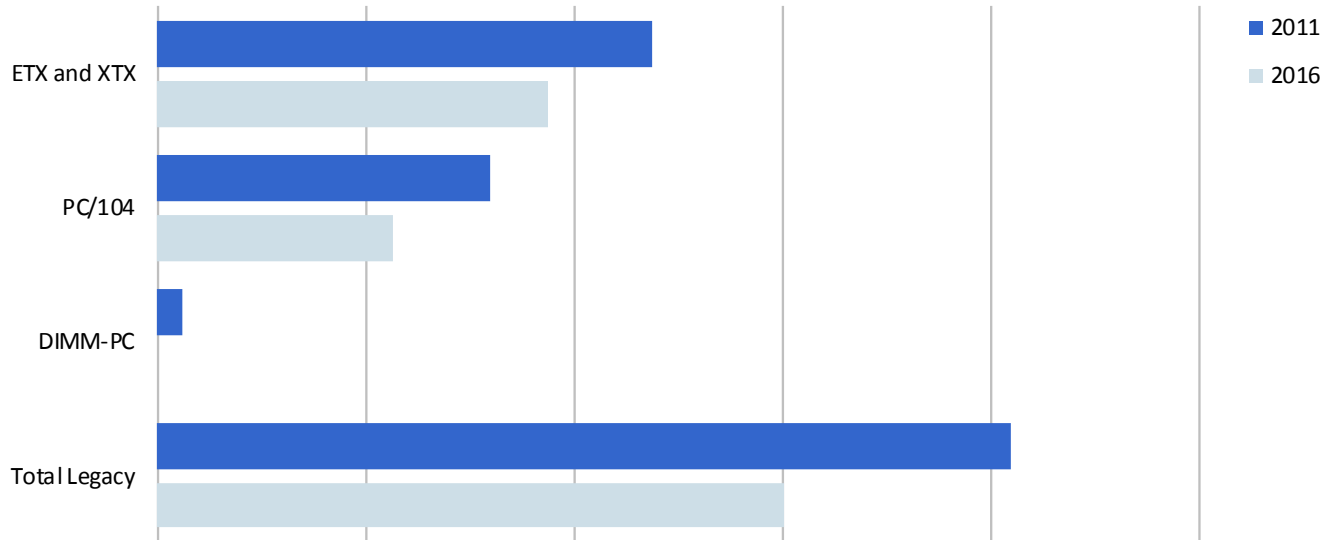
- COM supplier base is highly fragmented
- Competition for projects is intense
- Vendors accounting for about 50% share of the COM market have announced new ARM products

Decreasing Share for Several Form Factors

Figure 5

The World Market for Selected Form Factors

Revenues (\$M) - 2011 to 2016



Source: IMS Research

Jul-12

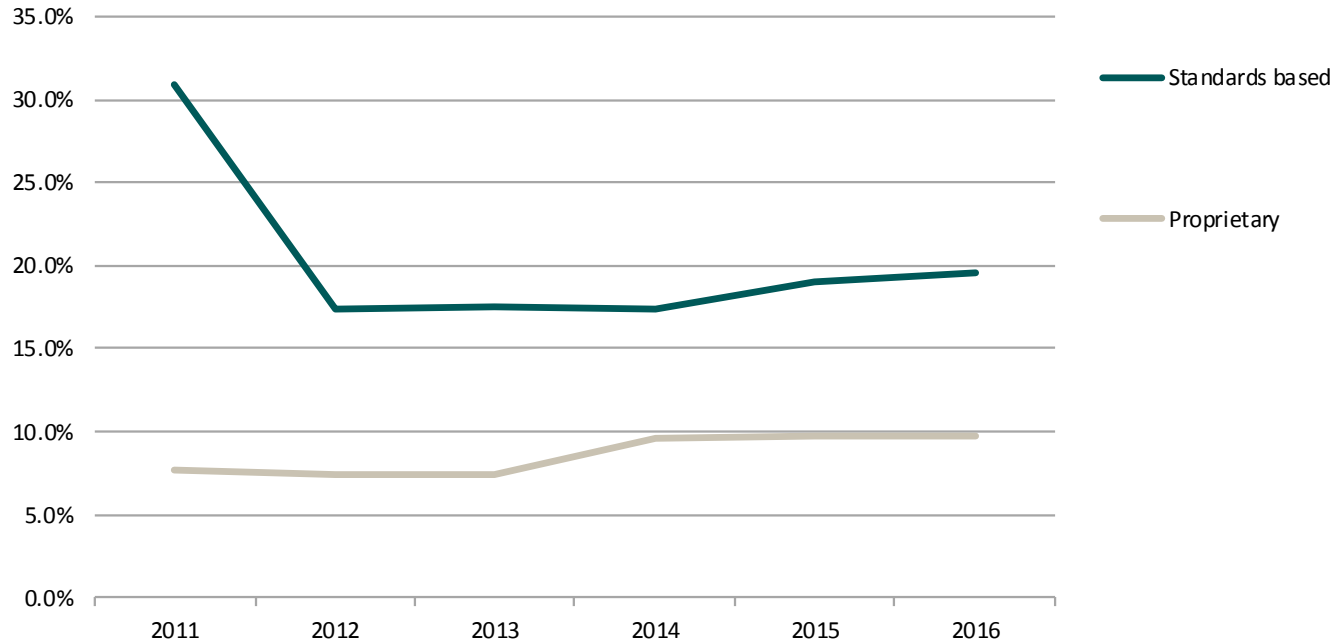
- On average, ARM-based modules less expensive than these form factors
- End users that want to maintain original application can use a carrier board with a COM as a migration path

ARM Benefitting from Standards Integration

Figure 5

The World Market for Computer on Modules by Form Factor

Revenues Growth Profile - 2011 to 2016



Source: IMS Research

Jun-12

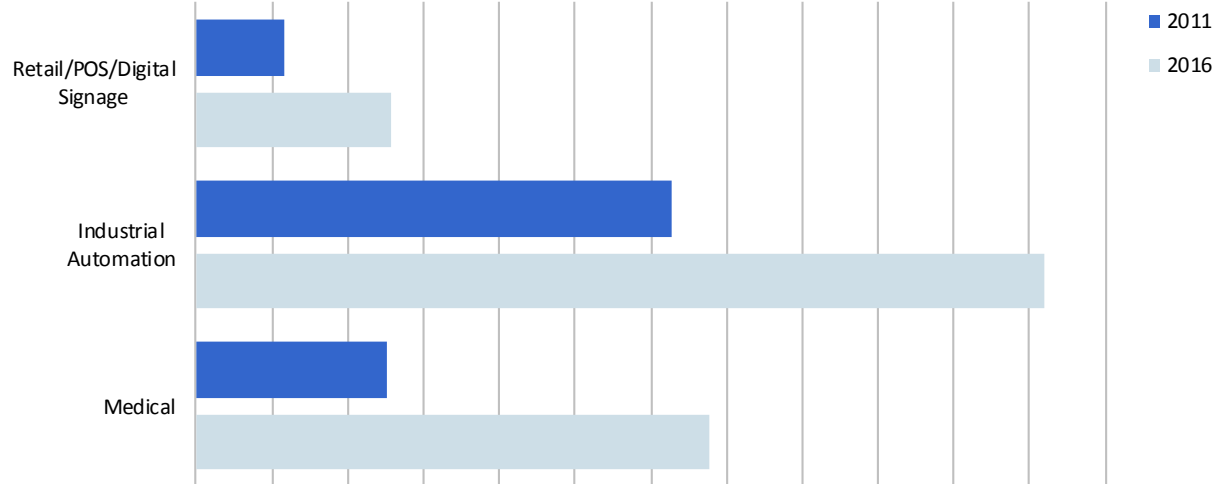
- Standards-based COMs include: COM Express variants, ETX/XTX, CORE Express, Qseven (small form factors driving adoption of ARM)
- Standards-based vs. Proprietary is a key buying decision for OEMs

Vertical Growth – Positive for COM and ARM

Figure 6

Computer On Modules Adoption in Selected Industry Sectors

Revenues (\$M) 2011 - 2016



Source: IMS Research

Jul-12

- Devices that require a battery, are power or space constrained can benefit from ARM.
- Medical - Home healthcare
- Industrial Automation (driven by India/China) - Space constrained applications: PLCs, HMI, M2M, Test and Measurement

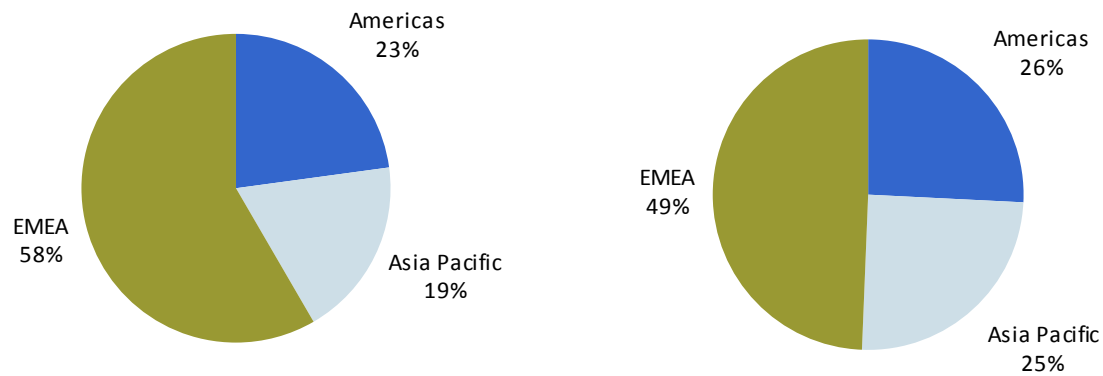
Overall, these trends mean that ARM-based COMs are set to grow well: what other trends are there?

Other Trends Influencing COM –based ARM Adoption

Figure 7

The World Market for Computer-on-Modules by Region

Revenues (\$M) 2011 - 2016



Source: IMS Research

Jul-12

- COMs market is forecast to become less European-centric
- Customisation becoming increasingly important for COM market
- Changing make vs. buy threshold (favouring “buy”)
- Possible penetration of ARM into communications

Remaining Challenges/Open Questions

- What will Intel's response be to encroachment by ARM technology?
- How successful will standardisation of ARM-modules be?
- On-going economic uncertainty
- New users of ARM will likely experience some "pain." How significant will this be?
- Will there be enough software engineering resource?
- Could there be a trend back to x86 (late '12 to early '13)?

Questions?

Speaker: Mark Watson
Report Author: Toby Colquhoun

T: + 44 (0) 1933 402255

www.imsresearch.com

www.ihs.com

E: Mark.Watson@ihs.com

E: Toby.Colquhoun@ihs.com