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Design Outcomes of ARM Developers

Comparing ARM Developments to those of
Freescale, AMD, Intel, Microchip and TI

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ABSTRACT:

In this report, EMF documents its findings of developer usage of embedded processors enabling developers using ARM architectures to understand what similar developers are experiencing and to be able to compare ARM-based design outcomes with other processor families.

It is estimated that there are over 70,000 embedded developers designing with ARM architecture. The purpose of this report is twofold: To present the design experiences of ARM developers and to present comprehensive comparative data from which the readers can easily examine how ARM developments compare with developers using Freescale, Intel, AMD, Microchip and TI.

In the first section of this report, for the five most used ARM architectures we present design outcome measures including number of developers per project; time from design start to product shipment, percent of designs cancelled, percent of designs completed ahead of or behind schedule, the percent of final designs that are within 20% of pre-design expectation (for Performance, Systems Functionality, Features & Schedule), and the issues developers report as being of most concern in their embedded developments.

In the 2nd section of the report (Appendix), EMF presents the entire 2009 EMF Embedded Developer Survey results (101 Tables) cross tabbed by architecture (8-bit, 16-bit, 32-bit, 64-bit, 128-bit, DSP, FPGA, Dual Core, Multicore, Multithread) and processor family (ARM Freescale, Intel, AMD, Microchip and TI).

The five most used ARM architectures are: ARM7TDMI, ARM920T, ARM922T, ARM926EJ-S, and ARM11MPCore.

COMPARATIVE DATA PRESENTED FOR THESE FIVE ARCHITECTURES AND INDUSTRY AVERAGES:

- Most significant issues impacting users embedded software development
- Number of software developers per project
- Number of new and modified source lines of code
- Total number of source lines of code
- Types of sensors and devices used by prime contractors
- Months from design start to product shipment
- Percent of designs cancelled – and number of months run before cancellation
- Percent of designs completed ahead of schedule
- Percent of designs completed behind schedule – and number of months behind
- Percent of designs outsourced
- Comparing final design results to pre-design expectations
- Percent of final designs that are within 30% of pre-design expectations for Performance, Systems Functionality, and Features & Schedule
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Table 1

Embedded Market Forecasters 2009 Trends in Tools, Projects and Technology in the Digital Processing World

A1. Are you primarily a hardware, software, firmware, systems engineer, or an engineering manager?

	CHIP ARCHITECTURE CURRENTLY USED										VENDORS CURRENTLY USED						
	TOTAL	8-BIT	16-BIT	32-BIT	64-BIT	128BIT	DSP	FPGA	D-CORE	M-CORE	M-THRD	FScale	Intel	AMD	M'chip	ARM	TI
Base: All respondents	471	178	176	334	152	29	169	187	59	41	51	127	174	77	74	85	121
No Answer	17	3	2	5	4	1	2	1	-	2	-	1	3	1	-	2	1
Base: Total answering	454	175	174	329	148	28	167	186	59	39	51	126	171	76	74	83	120
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hardware developer/engineer	42	21	18	30	11	3	18	27	6	6	8	12	12	7	8	11	15
	9.3	12.0	10.3	9.1	7.4	10.7	10.8	14.5	10.2	15.4	15.7	9.5	7.0	9.2	10.8	13.3	12.5
Software developer/engineer	184	48	50	132	57	10	49	57	23	12	23	39	72	28	21	27	36
	40.5	27.4	28.7	40.1	38.5	35.7	29.3	30.6	39.0	30.8	45.1	31.0	42.1	36.8	28.4	32.5	30.0
Systems developer/engineer	71	34	35	48	25	7	35	31	12	5	5	21	30	15	12	10	25
	15.6	19.4	20.1	14.6	16.9	25.0	21.0	16.7	20.3	12.8	9.8	16.7	17.5	19.7	16.2	12.0	20.8
Systems Architect	37	20	18	33	18	3	12	18	7	10	8	14	21	11	7	9	6
	8.1	11.4	10.3	10.0	12.2	10.7	7.2	9.7	11.9	25.6	15.7	11.1	12.3	14.5	9.5	10.8	5.0
Firmware developer/engineer	27	13	21	25	7	2	17	19	2	2	2	13	7	4	9	8	10
	5.9	7.4	12.1	7.6	4.7	7.1	10.2	10.2	3.4	5.1	3.9	10.3	4.1	5.3	12.2	9.6	8.3
Any managers (Net)	92	39	32	61	30	3	36	34	9	4	5	27	29	11	17	18	28
	20.3	22.3	18.4	18.5	20.3	10.7	21.6	18.3	15.3	10.3	9.8	21.4	17.0	14.5	23.0	21.7	23.3
Software engineering manager	18	8	6	11	7	-	10	5	1	-	1	7	5	4	3	3	6
	4.0	4.6	3.4	3.3	4.7		6.0	2.7	1.7		2.0	5.6	2.9	5.3	4.1	3.6	5.0
Software development manager	41	10	9	21	10	2	7	7	5	1	2	5	13	3	4	5	3
	9.0	5.7	5.2	6.4	6.8	7.1	4.2	3.8	8.5	2.6	3.9	4.0	7.6	3.9	5.4	6.0	2.5
Hardware development/ engineering manager	33	21	17	29	13	1	19	22	3	3	2	15	11	4	10	10	19
	7.3	12.0	9.8	8.8	8.8	3.6	11.4	11.8	5.1	7.7	3.9	11.9	6.4	5.3	13.5	12.0	15.8
Other (specify)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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EMF is the premier market intelligence and advisory firm in the embedded technology industry. Embedded technology refers to the ubiquitous class of products which use some type of processor as a controller. These products include guided missiles, radars, and avionics as well as robots, automobiles, telecom gear, and medical electronics.

Embedded Market Forecasters (EMF) is the market research division of American Technology International, Inc. EMF clients range from startups to Global 100 companies worldwide. Founded by Dr. Jerry Krasner, a recognized authority on electronics markets, product development and channel distribution, EMF is headquartered in Framingham, Mass.

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