

Evans Data Corporation

Embedded Systems Developer Survey, Volume 1, 2002

Second edition of our new in-depth survey series that measures attitudes and intentions regarding technology amongst over 500 embedded systems developers. Conducted in January, this volume includes sections on hardware platforms and considerations, Linux and Open Source Software in the embedded world, Java in embedded devices, embedded databases, tools, tasks, languages, and issues with embedded systems development and more

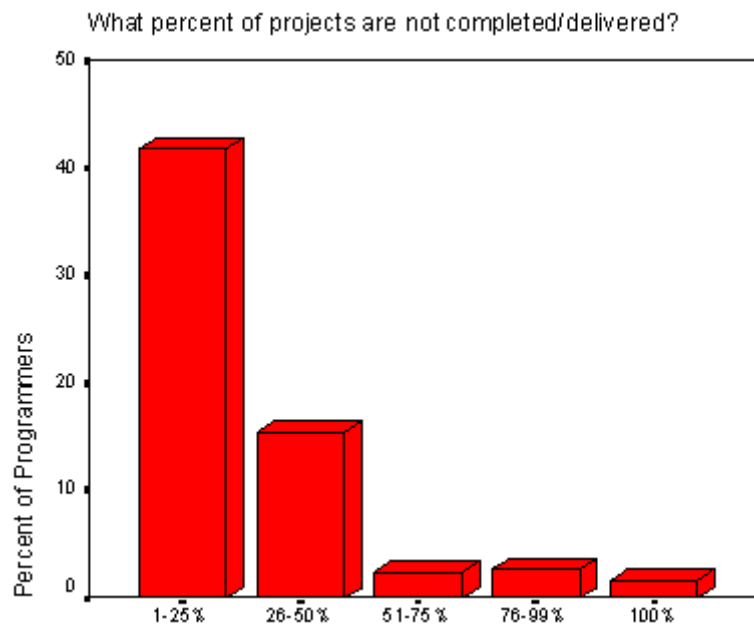
Perceived difficulties in migrating from an in-house OS to an off the shelf OS

Note that this question is aimed at those who already are using an in-house OS. Licensing costs, source code and inertia are the major inhibiting factors in switching to a commercial OS. The third reason, "no compelling reason to change," tracks with the issue of legacy code and systems. Engineers already comfortable with an in-house system know it works and know how to fix it if there are problems. The operating system is, after all, only the foundation of the functionality of an embedded system. Once that is in place, the job is to get busy differentiating and adding value.

If your organization is currently using an in-house proprietary embedded OS, which of the following issues make it difficult to switch to an off-the-shelf embedded OS?	Count	Percent of Responses	Percent of Cases
Licensing costs too expensive	151	13.8	57.4
No compelling reason to change	133	12.2	50.6
No access to source code	110	10.1	41.8
Development tools too expensive	107	9.8	40.7
High investment in legacy code	107	9.8	40.7
Insufficient control over OS internals	89	8.1	33.8
Insufficient visibility into OS internals	85	7.8	32.3
Lack of expertise	78	7.1	29.7
Lack of information about alternatives	61	5.6	23.2
Retraining costs too high	55	5	20.9
Lack of satisfactory development tools	50	4.6	19
No trust in newer solutions	41	3.7	15.6
Waiting to see others adopt first	27	2.5	10.3

There also appears to be the concern that if a change is made to a commercial RTOS, it will also necessitate the purchase of a new tool chain. For many, the cumulative costs of tools and licensing added to the "if it ain't broke, don't fix it" view of changing keep them with their familiar code. It is the new companies rather than established companies with new projects that are fueling the move away from the proprietary OS.

What percent of projects are not completed at all?



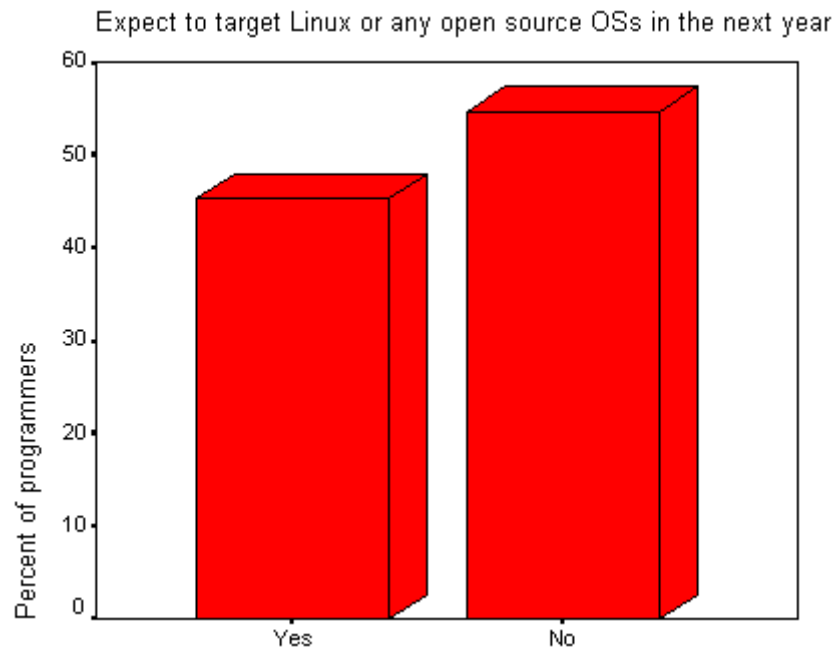
Some fifteen percent of developers report that between 26 and 50 percent of their projects are never finished. Forty-one percent report that up to 25 percent of their projects are abandoned. This represents a tremendous waste and has been the object of many a high-level study in attempts to improve the development process and to develop better tools and methods to help developers.

What percent of projects are not completed/delivered?

	Frequency	Percent	Valid Percent	Cumulative Percent
0%	175	33.3	36.0	36.0
1-25%	203	38.7	41.8	77.8
26-50%	75	14.3	15.4	93.2
51-75%	12	2.3	2.5	95.7
76-99%	13	2.5	2.7	98.4
100%	8	1.5	1.6	100.0
Total	486	92.6	100.0	
No Answer	39	7.4		
Total	525	100.0		

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What percent expect to target Linux in the coming year?



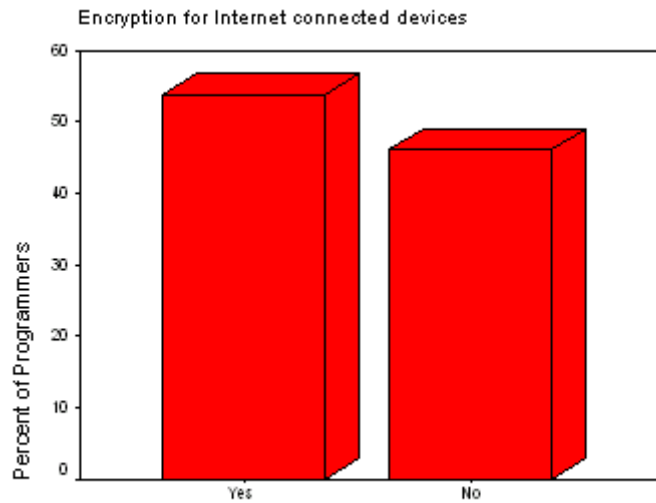
What is expected in the coming year shows a dramatic upswing in the interest in embedded Linux with almost half those asked saying they expect to target Linux or an open source OS. Since few other OSs, such as ATI Nucleus and, to a certain extent, QNX, supply source code and the others that do charge very high prices for it, the bulk of these responses indicates Linux. An increase from 14 to over 45 percent over the next year should herald a dramatic change in the software content of embedded devices.

Do you expect to target Linux or any open source operating systems in the next 12 months?

	Frequency	Percent	Cumulative Percent
Yes	238	45.3	45.3
No	287	54.7	100.0
Total	525	100.0	

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Encryption for Internet connected devices and the chips used



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If ever there was a doubt that security is vital for embedded systems, this result settles the question. Over 50 percent of Internet connected devices will incorporate some form of encryption. This is no longer even a political issue. It is simply required for commerce to take place and for remote equipment to be able to operate reliably.

Encryption for Internet connected devices

	Frequency	Percent	Valid Percent
Yes	105	20.8	53.8
No	90	17.8	46.2
Total	195	38.5	100.0
No answer	311	61.5	
Total	506	100.0	

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Motorola and Intel currently dominate the embedded encryption scene, with Broadcom and SafeNet holding respectable shares. Given the numbers in the previous questions, this market should hold opportunities for additional players.

	Count	Percent of Responses	Percent of Cases
Intel Fast Ethernet MAC	38	38.8	61.3
Motorola MPC180/MPC190	32	32.7	51.6
Broadcom BCM5840	12	12.2	19.4
Chrysalis Luna 520	3	3.1	4.8
Hifn 65xx/7xxx/8xxx	5	5.1	8.1
SafeNet SafeXcel 2141	8	8.2	12.9

Note: This multiple response question allowed the developers to select as many responses as they wished, and thus the total will not come to 100%. The response column shows the percent of total responses, while the case column shows the percent of actual developers (cases) who responded.