2013 EMBEDDED MARKET STUDY
UBM Tech Electronics’ Brands
Unparalleled Reach & Experience

UBM Tech Electronics is the media and marketing services solution for the design engineering and electronics industry.

Our audience of over 2,358,928 (as of March 5, 2013) are the executives and engineers worldwide who design, develop, and commercialize technology. We provide them with the essentials they need to succeed: news and analysis, design and technology, product data, education, and fun.
Purpose and Methodology

• **Purpose:** To profile the findings of the 2013 results of EE Times Group annual comprehensive survey of the embedded systems markets worldwide. Findings include types of technology used, all aspects of the embedded development process, tools used, work environment, applications, methods and processes, operating systems used, reasons for using and not using chips and technology, and brands and chips currently used by or being considered by embedded developers. Many questions in this survey have been trended over two to five years.

• **Methodology:** A web-based online survey instrument based on the previous year’s survey was developed and implemented by independent research company Wilson Research Group from January 18, 2013 to February 13, 2013 by email invitation.

• **Sample:** E-mail invitations were sent to subscribers to UBM/EE Times Group Embedded Brands with one reminder invitation. Each invitation included a link to the survey.

• **Returns:** 2,098 valid respondents for an overall confidence of 95% +/- 2.13%.
Disclaimer

The following information is the property of UBM Tech, a division of United Business Media, LLC. UBM retains ownership of all rights, including intellectual property rights, in and to the Database, the Survey questionnaires and the Survey results.

No claims are allowed without the expressed written permission of either Alex Wolfe (alex.wolfe@ubm.com) or David Blaza (david.blaza@ubm.com) at UBM, LLC.
In which region of the world do you reside?

- US & Canada: 61.1%
- Europe: 20.0%
- Asia: 12.7%
- Middle/South America: 3.0%
- Australia: 1.8%
- Africa and Near East: 1.3%

2013 (N = 1,914)
How many employees does your company have at all locations?

- **Under 100**: 43.7% (2013), 42.4% (2012)
- **100-499**: 16.0% (2013), 15.6% (2012)
- **500-999**: 6.1% (2013), 6.3% (2012)
- **1,000-4,999**: 5.4% (2013), 6.9% (2012)
- **5,000-9,999**: 4.3% (2013), 3.5% (2012)
- **10,000-19,999**: 12.1% (2013), 13.3% (2012)
- **20,000 or more**: 2.1% (2013), 2.0% (2012)
- **Don't know**: 10.0% (2013), 10.0% (2012)

Average Number of Employees:
- **2013**: 3,965
- **2012**: 4,856

**2013 N=2025**
**2012 N=1547**
My job function includes:

- Writing firmware/sftwr for embedded systems: 56.9%
- Hardware/software integration: 56.6%
- Debugging firmware/software: 55.3%
- Architecture selection/specification: 50.8%
- Firmware/software design or analysis: 45.4%
- Project management: 45.0%
- Debugging hardware: 43.2%
- Prototype testing: 39.9%
- Firmware/software testing: 39.7%
- Device programming: 39.1%
- Designing hardware for embedded systems: 36.9%
- System design: 33.7%
- Hardware/software co-design: 26.7%
- Board layout/design: 24.9%
- Hardware/software co-verification: 19.0%
- Connected device design: 8.9%
- SoC (system-on-chip) design: 6.8%
- Other: 3.4%

2013: Average number of years out of school = 19.7 years

2013 (N = 2,020)
For what types of applications are your embedded projects developed?

- **Industrial controls & automation**: 33% (2013), 31% (2012), 33% (2011)
- **Consumer electronics**: 23% (2013), 23% (2012), 24% (2011)
- **Communications/networking**: 23% (2013), 25% (2012), 26% (2011)
- **Medical**: 17% (2013), 16% (2012), 17% (2011)
- **Automotive**: 17% (2013), 15% (2012), 18% (2011)
- **Electronic instruments**: 17% (2013), 15% (2012), 17% (2011)
- **Aero/Military (Net)**: 17% (2013), 16% (2012), 17% (2011)
- **Computers and peripherals**: 12% (2013), 11% (2012), 14% (2011)
- **Security**: 14% (2013), 10% (2012), 8% (2011)
- **Power generation and utilities**: 10% (2013), 8% (2012), 8% (2011)
- **Video & imaging**: 9% (2013), 8% (2012), 6% (2011)
- **Transportation**: 10% (2013), 9% (2012), 7% (2011)
- **Audio**: 7% (2013), 6% (2012), 6% (2011)
- **Government & municipal**: 6% (2013), 6% (2012), 7% (2011)
- **M2M**: 6% (2013), 6% (2012), 6% (2011)
- **Other**: 10% (2013), 8% (2012), 6% (2011)
CURRENT EMBEDDED DESIGN ENVIRONMENT
My current embedded project is:

- **New to the world; a new project from scratch**
  - 2013 (N = 2091): 44%
  - 2012 (N = 1,704): 44%
  - 2011 (N = 1,883): 43%
  - 2010 (N = 1,559): 43%
  - 2009 (N = 1,550): 42%

- **An upgrade or improvement to an earlier or existing project**
  - 2013 (N = 2091): 56%
  - 2012 (N = 1,704): 56%
  - 2011 (N = 1,883): 57%
  - 2010 (N = 1,559): 57%
  - 2009 (N = 1,550): 58%
What does the upgrade or improvement include?

- New or different software features: 55% (2013, N = 1,159), 58% (2012, N = 941)
- New or different processor: 40% (2013, N = 1,159), 44% (2012, N = 941)
- New or different system logic: 22% (2013, N = 1,159), 21% (2012, N = 941)
- New or different analog components: 15% (2013, N = 1,159), 14% (2012, N = 941)
- New or different operating system: 12% (2013, N = 1,159), 13% (2012, N = 941)
- Mandatory changes because of discontinued hardware or software: 21% (2013, N = 1,159), 22% (2012, N = 941)

Base = Those whose current project is an upgrade/improvement
Which of the following capabilities are included in your current embedded project?

- Real-time capability
- Networking capability
- Analog signal processing (added 2013)
- Project rugged / environment resistant
- Wireless capability
- Battery-powered
- Other

![Bar chart showing the percentage of projects that include each capability from 2009 to 2013.](chart.png)

Legend:
- 2013 (N = 2,090)
- 2012 (N = 1,704)
- 2011 (N = 1,886)
- 2010 (N = 1,559)
- 2009 (N = 1,550)
If wireless, what wireless interfaces does your current embedded project include?

- Wi-Fi: 54% (2013), 53% (2012), 55% (2011)
- Bluetooth Classic: 24% (2013), 22% (2012), 17% (2011)
- Cellular: 24% (2013), 24% (2012), 20% (2011)
- Zigbee: 23% (2013), 24% (2012), 24% (2011)
- Bluetooth LE/Smart: 23% (2013), 17% (2012), 15% (2011)
- Unlicensed 2.4-GHz band: 11% (2013), 10% (2012), 9% (2011)
- NFC: 8% (2013), 8% (2012), 9% (2011)
- 900 MHZ: 12% (2013), 10% (2012), 8% (2011)
- Proprietary: 11% (2013), 8% (2012), 7% (2011)
- Wi-Fi Direct: 7% (2013), 7% (2012), 7% (2011)
- AM or FM radio: 7% (2013), 5% (2012), 4% (2011)
- Infrared: 7% (2013), 5% (2012), 6% (2011)
- 315/433 MHZ: 7% (2013), 7% (2012), 5% (2011)
- Custom: 7% (2013), 5% (2012), 3% (2011)
- ANT: 3% (2013), 4% (2012), 3% (2011)

Only answers 3% or above are shown.
How many people are on your embedded project team?

<table>
<thead>
<tr>
<th>Team 2013</th>
<th>2013 (N = 2,041)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Software Engineer</td>
<td>4.0</td>
</tr>
<tr>
<td>- Hardware Engineer</td>
<td>2.9</td>
</tr>
<tr>
<td>- Firmware Engineer</td>
<td>2.7</td>
</tr>
<tr>
<td>- QA/Test Engineer</td>
<td>2.0</td>
</tr>
<tr>
<td>- Systems/Integrator</td>
<td>1.5</td>
</tr>
<tr>
<td>- Other Engineer</td>
<td>1.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team 2012</th>
<th>2012 (N = 1,625)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Software Engineer</td>
<td>4.9</td>
</tr>
<tr>
<td>- Hardware Engineer</td>
<td>3.7</td>
</tr>
<tr>
<td>- Firmware Engineer</td>
<td>3.1</td>
</tr>
<tr>
<td>- QA/Test Engineer</td>
<td>2.4</td>
</tr>
<tr>
<td>- Systems Engineer</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: Data excludes outliers 1000+
What is your development team’s ratio of total resources (including time/dollars/manpower) spent on software vs. hardware for your embedded projects?

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Total Resources Devoted to Software (%)</th>
<th>Average Total Resources Devoted to Hardware (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>60.6%</td>
<td>39.4%</td>
</tr>
<tr>
<td>2012</td>
<td>61.9%</td>
<td>38.1%</td>
</tr>
<tr>
<td>2011</td>
<td>62.0%</td>
<td>38.0%</td>
</tr>
<tr>
<td>2010</td>
<td>61.3%</td>
<td>38.7%</td>
</tr>
<tr>
<td>2009</td>
<td>62.4%</td>
<td>37.6%</td>
</tr>
</tbody>
</table>

2013 (N = 2,075)
2012 (N = 1,675)
2011 (N = 1,878)
2010 (N = 1,542)
2009 (N = 1,536)
How long did the last project you completed take to finish?

- **6 months or less**: 35% in 2013, 33% in 2012, 33% in 2011, 36% in 2010, 35% in 2009
- **7 – 12 months**: 35% in 2013, 35% in 2012, 35% in 2011, 35% in 2010, 35% in 2009
- **13 – 18 months**: 30% in 2013, 33% in 2012, 33% in 2011, 33% in 2010, 35% in 2009
- **19 – 24 months**: 9% in 2013, 9% in 2012, 9% in 2011, 9% in 2010, 9% in 2009
- **25 months or more**: 6% in 2013, 8% in 2012, 7% in 2011, 7% in 2010, 8% in 2009

**Average Times:**
- 2013 (N = 1,985) Avg: 12.4 mos
- 2012 (N = 1,634) Avg: 12.5 mos
- 2011 (N = 1,822) Avg: 12.2 mos
- 2010 (N = 1,494) Avg: 12.2 mos
- 2009 (N = 1,514) Avg: 13.2 mos
In 2013, 43% of all projects finished “ahead of” or “on” schedule, and 57% finished late or cancelled -- almost the same as the previous 3 years.

- Ahead of schedule
- On schedule
- Late by 1 – 2 months
- Late by 3 – 6 months
- Late by 6 – 12 months
- Late by 13 – 18 months
- Late by more than 18 months
- Canceled

2013 (N = 2,055)
2012 (N = 1,658)
2011 (N = 1,859)
2010 (N = 1,525)
My current embedded project is programmed mostly in:

- C: 60% (2013), 65% (2012), 62% (2011), 60% (2010)

Note: C#, Python and Ada were added in 2013. Ada was under 1%.
My **next** embedded project will likely be programmed mostly in:

- **C**: 55% (2013), 60% (2012), 58% (2011), 56% (2010)
- **C++**: 22% (2013), 24% (2012), 25% (2011), 23% (2010)
- **Java**: 4% (2013), 4% (2012), 4% (2011), 4% (2010)
- **Assembly language**: 3% (2013), 4% (2012), 4% (2011), 4% (2010)
- **C#**: 3% (2013), 4% (2012), 4% (2011), 4% (2010)
- **UML or other modeling...**: 4% (2013), 4% (2012), 4% (2011), 4% (2010)
- **Other**: 4% (2013), 4% (2012), 4% (2011), 4% (2010)

**Note:** C#, Python and Ada were added in 2013. Ada was under 1%. 
Does your current project reuse code from a previous embedded project?

A very slight change in usage of RTOS, kernels, execs, schedulers over past 5 years

In 2013, 86% reused code.
In 2012, 85% reused code.
In 2011, 87% reused code.
In 2010, 86% reused code.
In 2009, 89% reused code.
EMBEDDED DESIGN PROCESS
What percentage of your design time is spent on each of the following stages?

- Developing overall system specs: 2013 - 15%, 2012 - 11%, 2011 - 10%
- Conceptual design stage: 2013 - 15%, 2012 - 12%, 2011 - 6%
- Detailed design stage: 2013 - 30%, 2012 - 22%, 2011 - 12%
- Simulation stage: 2013 - 7%, 2012 - 8%, 2011 - 6%
- Testing and debugging: 2013 - 21%, 2012 - 23%, 2011 - 24%
- Prototyping: 2013 - 12%, 2012 - 10%, 2011 - 6%
- Sending to production: 2013 - 6%, 2012 - 6%, 2011 - 2%
- Documentation/coding/mtgs: 2013 - 1%, 2012 - 2%, 2011 - 2%
If you could improve one thing about your embedded design activities, what would it be?

- **Debugging tools**
- **Schedule**
- **Engineering team skill level**
- **Programming tools**
- **Microprocessor**
- **Interfaces**
- **IDE**
- **Other hardware**
- **Operating system**
- **The Compiler**

Percentage distribution for each category over the years 2010 to 2013:

- **2013 (N = 2,056)**
- **2012 (N = 1,667)**
- **2011 (N = 1,868)**
- **2010 (N = 1,541)**

The chart shows the percentage of respondents who would improve each aspect of their design activities. The values range from 3% to 29%, with the highest percentage for Debugging tools in 2013.
In general, what sources of information do you consult to research your embedded design decisions?

**Top 17 Sources**

- Websites of vendors or manufacturers
- Search engine
- Colleagues
- Technical whitepapers
- Websites of Industry publication
- Technical communities (like...)
- Print publications
- Webinars/net seminars
- Distributor websites
- Conferences and trade shows
- Industry newsletters
- In-person seminars
- Catalogs and brochures
- Blogs
- Video (YouTube, etc.)
- Social networks/Linked-in/Twitter
- Virtual conferences

2013 (N = 2,074)

2012 (N = 1,674)

2011 (N = 1,878)
Thinking about the next year, what areas will be your greatest technology challenges?

Managers Only

- Integrating new technology or tools: 28%
- Managing code size/complexity: 23.4%
- Software tools: 15.5%
- Processors: 15%
- Improving the debugging process: 14%
- Dealing with low power: 13%
- Programmable logic: 12%
- OS/RTOS: 12%
- Security concerns: 11%
- Integrating external IPs into designs: 11%
- Connecting to the cloud: 8%
- Hardware tools: 6%
- SoC's/ASSP's: 6%
- Buses/interconnects: 5%
- Memories and standard cells: 4%
- IDE*: 3.9%
- Other: 3.9%

2013 (N = 723)
2012 (N = 377)
2011 (N = 310)
Which of the following are your favorite/most important software/hardware tools? (Top 18 shown)
Which of the following conferences did you attend in the past 2 years, and which do you plan to next year?

<table>
<thead>
<tr>
<th>Conferences</th>
<th>2013 Have Attended</th>
<th>2013 Plan to Attend</th>
<th>Plus 4% or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training/seminars of distributors</td>
<td>40.3%</td>
<td>35.5%</td>
<td></td>
</tr>
<tr>
<td>DESIGN WEST/Embedded Systems Conference (Silicon Valley)</td>
<td>16.7%</td>
<td>21.6%</td>
<td>+5%</td>
</tr>
<tr>
<td>ARM TechCon</td>
<td>16.6%</td>
<td>19.9%</td>
<td></td>
</tr>
<tr>
<td>Freescale Technology Forum</td>
<td>11.0%</td>
<td>14.1%</td>
<td>+4%</td>
</tr>
<tr>
<td>DesignCon</td>
<td>10.8%</td>
<td>12.8%</td>
<td></td>
</tr>
<tr>
<td>DESIGN EAST/Embedded Systems Conference (Boston)</td>
<td>10.4%</td>
<td>11.9%</td>
<td>+4%</td>
</tr>
<tr>
<td>CES (Las Vegas)</td>
<td>9.9%</td>
<td>14.2%</td>
<td>+4%</td>
</tr>
<tr>
<td>Embedded World (Nuremberg)</td>
<td>8.9%</td>
<td>13.1%</td>
<td>+4%</td>
</tr>
<tr>
<td>Electronica</td>
<td>8.5%</td>
<td>9.9%</td>
<td></td>
</tr>
<tr>
<td>Real Time Computer Show (RTECC)</td>
<td>8.3%</td>
<td>9.9%</td>
<td></td>
</tr>
<tr>
<td>Microchip MASTERS Conference</td>
<td>7.8%</td>
<td>10.9%</td>
<td></td>
</tr>
<tr>
<td>Intel Developer Forum</td>
<td>7.0%</td>
<td>10.2%</td>
<td></td>
</tr>
<tr>
<td>CeBIT</td>
<td>6.4%</td>
<td>7.3%</td>
<td></td>
</tr>
<tr>
<td>Embedded Systems Conference (India)</td>
<td>6.4%</td>
<td>9.6%</td>
<td></td>
</tr>
<tr>
<td>DAC</td>
<td>4.7%</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Embedded Linux Conference (ELC)</td>
<td>4.0%</td>
<td>12.5%</td>
<td>+8%</td>
</tr>
<tr>
<td>Convergence: Transportation Electronics</td>
<td>2.1%</td>
<td>3.9%</td>
<td></td>
</tr>
<tr>
<td>Embedded Systems Conference (Brazil)</td>
<td>2.1%</td>
<td>3.9%</td>
<td></td>
</tr>
<tr>
<td>Android Builders Summit</td>
<td>1.6%</td>
<td>9.1%</td>
<td>+8%</td>
</tr>
<tr>
<td>Embedded Systems Technology (Japan)</td>
<td>1.4%</td>
<td>4.3%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Attending / Planning to Attend</strong></td>
<td><strong>1,045</strong></td>
<td><strong>1,146</strong></td>
<td></td>
</tr>
</tbody>
</table>
What are the most effective ways that you systematically or formally maintain, educate, and advance your professional skills?

<table>
<thead>
<tr>
<th>Training Method</th>
<th>2013 (%)</th>
<th>2012 (%)</th>
<th>2011 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training courses offered online</td>
<td>43.5</td>
<td>42.4</td>
<td>36.6</td>
</tr>
<tr>
<td>Technical white papers by vendors</td>
<td>42</td>
<td>42</td>
<td>37</td>
</tr>
<tr>
<td>Webinars provided by vendors</td>
<td>37</td>
<td>34</td>
<td>31</td>
</tr>
<tr>
<td>Webinars by publications, media orgs</td>
<td>34</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>Books</td>
<td>31</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Professional devlpmnt courses by private co.</td>
<td>29</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>Conferences provided by vendors</td>
<td>22</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>University professional dev. courses</td>
<td>18</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>On-site seminars given by vendors</td>
<td>18</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Webinars by profsnl assocns</td>
<td>18</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Conference seminars by publctns, media orgs</td>
<td>15</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Conference seminars by profsnl assocns</td>
<td>12</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Certification training</td>
<td>15</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>

Average Number of Days Per Year Spent on Training

- 2013 = 9.0 days per year
- 2012 = 11.7 days per year
- 2011 = 11.2 days per year
- 2010 = 11.7 days per year

Other Relevant Schooling and Reading

- 2013 Average number of years out of school: 19.7
- 2013 Hours per week reading technical pubs: 4.8
- 2013 Books per year read in full or substantially: 3.9
OPERATING SYSTEMS
2013 Embedded Market Study

Does your current embedded project use an **operating system, RTOS, kernel, software executive, or scheduler** of any kind?

Only slight changes in usage of RTOS, kernels, execs, schedulers over past 5 years

---

![Bar chart showing usage of operating systems, RTOS, kernels, software executives, and schedulers from 2009 to 2013.](chart.png)

<table>
<thead>
<tr>
<th>Year</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>2012</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>2011</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>2010</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>2009</td>
<td>72%</td>
<td>28%</td>
</tr>
</tbody>
</table>

---

Copyright © 2013 by UBM. All rights reserved.
If current embedded project does **not** use an operating system, RTOS, kernel, software executive, or scheduler of any kind, **why not?**

- **Current project doesn’t need it**
  - 2013: 81% (N = 669)
  - 2012: 82% (N = 541)
  - 2011: 81% (N = 561)
  - 2010: 80% (N = 458)
  - 2009: 81% (N = 434)

- **OS / RTOS uses too much memory**
  - 2013: 12% (N = 669)
  - 2012: 11% (N = 541)
  - 2011: 11% (N = 561)
  - 2010: 9% (N = 458)
  - 2009: 8% (N = 434)

- **OS / RTOS requires too much processor power**
  - 2013: 4% (N = 669)
  - 2012: 4% (N = 541)
  - 2011: 11% (N = 561)
  - 2010: 9% (N = 458)
  - 2009: 7% (N = 434)

- **OS / RTOS is too complicated to use**
  - 2013: 4% (N = 669)
  - 2012: 4% (N = 541)
  - 2011: 6% (N = 561)
  - 2010: 8% (N = 458)
  - 2009: 7% (N = 434)

- **OS / RTOS is too expensive**
  - 2013: 9% (N = 669)
  - 2012: 4% (N = 541)
  - 2011: 9% (N = 561)
  - 2010: 9% (N = 458)
  - 2009: 10% (N = 434)
My current embedded project uses:

- Commercial OS/RTOS: 35%, 40%, 38%, 41%, 47%
- Open-source OS/RTOS, without commercial support: 34%, 31%, 29%, 34%, 27%
- Internally developed or in-house OS/RTOS: 19%, 20%, 23%, 32%, 26%
- Commercial distribution of an open-source OS/RTOS: 13%, 9%, 15%, 14%, 14%

My next embedded project will likely use:

- Commercial OS/RTOS: 29%, 31%, 30%, 31%, 34%
- Open-source OS/RTOS without commercial support: 37%, 37%, 37%, 37%, 31%
- Internally developed or in-house OS/RTOS: 20%, 19%, 19%, 23%, 26%
- Commercial distribution of open-source OS/RTOS: 14%, 13%, 15%, 16%, 13%

2013 Embedded Market Study

Copyright © 2013 by UBM. All rights reserved.
2013 Embedded Market Study

Which factors most influenced your decision to use a commercial operating system? (Top 12 choices.)

- Real-time capability: 44%
- Good software tools: 35%
- Processor or hardware compatibility: 35%
- Ease of future maintenance: 32%
- Support for processor & drivers: 28%
- Technical support: 26%
- Code size/memory usage: 26%
- Documentation: 26%
- Royalty-free: 24%
- Networking capability: 21%
- Supplier's reputation: 21%
- Overall cost: 20%
- Customer's desire: 15%
- Scheduling efficiency: 15%

2013 (N = 479) Base = Those who currently use a “Commercial” OS/RTOS
What are your reasons for not using a commercial operating system?

- Current solution works fine: 61%
- Commercial alternatives too expensive: 36%
- Avoid reliance on commercial supplier: 28%
- No need for multitasking: 20%
- Incompatible with existing SW apps or drivers: 15%
- Commercial alternatives use too much memory: 12%
- Too much trouble to learn commercial alternative: 11%
- Commercial alternatives lack features I need: 7%
- Other: 8%

2013 (N = 1503)
Base = Those who do not currently use a “Commercial” OS/RTOS
Who were the greatest influences on the choice of operating system?

- Software engineering staff: 32% (2013) vs. 34% (2012)
- Software engineering manager: 30% (2013) vs. 30% (2012)
- Group decision within engineering: 30% (2013) vs. 29% (2012)
- Corporate management: 17% (2013) vs. 17% (2012)
- Same OS as previous project: 15% (2013) vs. 16% (2012)
- Hardware engineering manager: 15% (2013) vs. 14% (2012)
- Hardware engineering staff: 14% (2013) vs. 13% (2012)
- Systems engineering manager: 13% (2013) vs. 12% (2012)
- Outside influence/...: 12% (2013) vs. 12% (2012)
- Systems engineering staff: 11% (2013) vs. 11% (2012)
- Marketing manager or department: 6% (2013) vs. 7% (2012)
- Purchasing manager or department: 5% (2013) vs. 4% (2012)

Base: Those who use operating systems

2013 (N = 1,989)
2012 (N = 1,596)
Did you use the same operating system, RTOS, or kernel as in your previous project?

Yes, used same OS, RTOS or kernel: 62% in 2013, 57% in 2012, 58% in 2011, 64% in 2010, and 63% in 2009.

No, didn't use same OS, RTOS or kernel: 38% in 2013, 43% in 2012, 42% in 2011, 36% in 2010, and 37% in 2009.
Why did you use the same operating system?

- **Happy with current one, no reason to switch**: 63% in 2013 (57% in 2012)
- **Wanted to maintain software compatibility**: 40% in 2013 (41% in 2012)
- **Wanted to make use of expertise/familiarity**: 36% in 2013 (36% in 2012)
- **Wanted to maintain the same tools or software**: 33% in 2013 (34% in 2012)
- **Wanted to keep same Operating System**: 23% in 2013 (24% in 2012)
- **Switching OS too expensive / time-consuming**: 23% in 2013 (26% in 2012)
- **Happy with supplier**: 10% in 2013 (9% in 2012)
- **Not my choice/operating system chosen for me**: 9% in 2013 (6% in 2012)
- **No other suitable alternatives available**: 6% in 2013 (6% in 2012)
- **Other**: 3% in 2013 (3% in 2012)

**Base**: Those who are using the same operating system as in previous project

**Copyright © 2013 by UBM. All rights reserved.**
Why did you switch operating systems?

- Hardware or processor changed: 33% (2013), 37% (2012)
- New OS had better features: 22% (2013), 20% (2012)
- Not my choice/OS chosen for me: 20% (2013), 21% (2012)
- New OS had better SW/dev tools: 13% (2013), 13% (2012)
- New OS is cheaper: 11% (2013), 13% (2012)
- New OS had better growth path: 12% (2013), 14% (2012)
- New OS had OTS modules (apps, tools): 10% (2013), 10% (2012)
- Previous OS too slow: 9% (2013), 6% (2012)
- Previous OS no longer available: 7% (2013), 4% (2012)
- Unhappy with previous OS supplier: 6% (2013), 5% (2012)
- Other: 17% (2013), 18% (2012)

Base = Those who did not use the same operating system as in previous project.
What are the most important factors in choosing an operating system.

- Availability of full source code: 42% (2013), 41% (2012)
- Availability of tech support: 34% (2013), 30% (2012)
- No royalties: 30% (2013), 31% (2012)
- Compatibility w/ other software, systems: 27% (2013), 28% (2012)
- Freedom to customize or modify: 26% (2013), 27% (2012)
- My familiarity with the operating system: 20% (2013), 22% (2012)
- The processors it supports: 16% (2013), 17% (2012)
- Purchase price: 15% (2013), 17% (2012)
- Simplicity / ease of use: 14% (2013), 17% (2012)
- Software-development tools available: 13% (2013), 16% (2012)
- Small memory footprint: 12% (2013), 15% (2012)
- Commercial support: 10% (2013), 11% (2012)
- The other software, middleware, drivers, etc.: 9% (2013), 10% (2012)
- Successful prior use for similar applications: 9% (2013), 10% (2012)
- Popularity: 7% (2013), 10% (2012)
- The other hardware it supports: 6% (2013), 6% (2012)
Please select ALL of the operating systems you are currently using.

Base: Currently using an operating system

Only Operating Systems that had 2% or more are shown.
Please select ALL of the operating systems you are considering using in the next 12 months.

- Android: 28% (2013), 34% (2012)
- FreeRTOS: 21% (2013), 23% (2012)
- Inhouse/custom: 19% (2013), 13% (2012)
- Ubuntu: 17% (2013), 13% (2012)
- Micrium (uC/OS-II, III) Net: 10% (2013), 16% (2012)
- Microsoft (Win 7 Embedded/Standard): 9% (2013), 10% (2012)
- Debian (Linux): 8% (2013), 10% (2012)
- TI (DSP/BIOS): 8% (2013), 8% (2012)
- Texas Instruments RTOS: 8% (2013), 8% (2012)
- Wind River (VxWorks): 7% (2013), 10% (2012)
- Freescale MQX: 7% (2013), 10% (2012)
- Microsoft (Win 7 Compact): 6% (2013), 7% (2012)
- Keil (RTX): 5% (2013), 6% (2012)
- Red Hat (IX Linux): 5% (2013), 6% (2012)
- Wind River (Platform neLinux): 5% (2013), 5% (2012)
- Green Hills (INTEGRITY): 4% (2013), 6% (2012)
- Angstrom (Linux): 4% (2013), 4% (2012)
- QNX (QNX): 4% (2013), 4% (2012)
- Express Logic (ThreadX): 3% (2013), 4% (2012)
- Analog Devices (VDK): 3% (2013), 4% (2012)
- eCos: 3% (2013), 4% (2012)
- LynuxWorks (LynxOS): 3% (2013), 3% (2012)

Only Operating Systems over 3% are shown.
Are you considering using embedded Linux?

- **Yes (Net)**
  - 2013: 54%
  - 2012: 56%
  - 2011: 56%
  - 2010: 57%

- **Yes, using it now**
  - 2013: 27%
  - 2012: 27%
  - 2011: 27%
  - 2010: 28%

- **Yes, likely to use it in next 6 months (soon)**
  - 2013: 6%
  - 2012: 7%
  - 2011: 7%
  - 2010: 7%

- **Yes, likely to use in next 12 months**
  - 2013: 20%
  - 2012: 22%
  - 2011: 21%
  - 2010: 22%

- **No, not interested in using it**
  - 2013: 47%
  - 2012: 44%
  - 2011: 44%
  - 2010: 43%
Why are you interested in embedded Linux?

- **Low cost**
  - 2013: 66%
  - 2012: 52%
  - 2011: 40%
  - 2010: 38%

- **Adaptability/extensibility**
  - 2013: 52%
  - 2012: 54%
  - 2011: 58%

- **Built-in drivers/network...**
  - 2013: 40%
  - 2012: 44%
  - 2011: 43%

- **Performance**
  - 2013: 38%
  - 2012: 37%
  - 2011: 39%

- **Control of features/...**
  - 2013: 32%
  - 2012: 33%
  - 2011: 36%

- **Avoid commercial...**
  - 2013: 29%
  - 2012: 30%
  - 2011: 33%

- **Memory requirements**
  - 2013: 16%
  - 2012: 18%
  - 2011: 18%

- **Career development**
  - 2013: 14%
  - 2012: 17%

Base = Those who use or are considering using Linux
Why are you not interested in embedded Linux?

- No need for it: 72%
- Incompatible with existing software, apps, drivers: 18%
- Performance or real-time capability: 15%
- Memory usage: 12%
- Development tools: 9%
- Support: 8%
- Legal ambiguity: 6%
- Reliability issues: 5%
- Cost (after deployment): 4%
- Security issues: 4%
- Other*: 8%

Base = Those who are not considering using Linux.
Are you currently using embedded virtualization/hypervisors or will you likely use this in the next 12 months?

- Yes (Net): 17.8%
- Yes, using it now: 4.6%
- Yes, will likely use in next 6 months: 3.6%
- Yes, will likely use in next 12 months: 9.6%
- No, not using it and not planning to: 82.2%
Why are you interested in embedded virtualization/hypervisors?

- Separation of multiple applications: 48%
- Support for multiple guest OSes (Android, VxWorks, Linux): 37%
- Support for hard real-time application(s)/guest OS: 35%
- Processor consolidation: 26%
- Support legacy & new apps on same system: 23%
- Want to load balance across multicore system: 17%
- Other: 4%

2013 (N = 364)

Base = Those who use or are considering using Linux
MICROPROCESSORS
Who were the greatest influences on the choice of the processor for your current project?

- HW engineering staff: 33% (2013), 33% (2012)
- Group decision in engineering: 29% (2013), 30% (2012)
- HW engineering mgr.: 28% (2013), 29% (2012)
- SW engineering staff: 23% (2013), 26% (2012)
- SW engineering mgr.: 19% (2013), 21% (2012)
- Systems engineering mgr.: 16% (2013), 21% (2012)
- Corporate mgmt.: 15% (2013), 16% (2012)
- Systems engineering staff: 11% (2013), 13% (2012)
- Outside influence/ customer/standards: 10% (2013), 11% (2012)
- Same processor as in previous project: 9% (2013), 11% (2012)
- Purchasing mgr. or dept.: 6% (2013), 6% (2012)
- Marketing mgr. or dept.: 5% (2013), 6% (2012)
- Other: 4% (2013), 4% (2012)
My current embedded project contains:

- 3 – 5 processors/microcontrollers: 16% in 2013, 16% in 2012, 15% in 2011, 17% in 2010.
- 6 – 10 processors/microcontrollers: 4% in 2013, 3% in 2012, 5% in 2011, 3% in 2010.
- >10 processors/microcontrollers: 4% in 2013, 4% in 2012, 3% in 2011, 5% in 2010.

The average number of microcontrollers per project was:
- 2.4 in 2013
- 2.3 in 2012
- 2.3 in 2011
- 2.6 in 2010
Does your embedded project contain . . .

<table>
<thead>
<tr>
<th>Type</th>
<th>2013 (N = 979)</th>
<th>2012 (N = 773)</th>
<th>2011 (N = 874)</th>
<th>2010 (N = 759)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple different processor chips (Net)*</td>
<td>58%</td>
<td>60%</td>
<td>64%</td>
<td>62%</td>
</tr>
<tr>
<td>Multiple different processor chips from different vendors*</td>
<td>22%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple different processor chips from same vendor*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple identical processor chips</td>
<td>18%</td>
<td>21%</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>Single chip with multiple identical processor cores</td>
<td>9%</td>
<td>8%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Single chip with multiple different processor cores</td>
<td>6%</td>
<td>5%</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>FPGA with hard/soft processor cores</td>
<td>9%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In 2013, multiple different processor chips were broken out into “same vendor” vs “different vendor” groups.

Freescale and TI are substantially more likely to be included when different vendors are used.

Microchip is more likely to be the selection when the same vendor is used, followed by Atmel, TI and Freescale in that order.

Base: Those who use multiple microprocessor/microcontrollers for current project
My current embedded project's main processor is a:
My current embedded project's main processor clock rate is:

- Under 10 MHz: 7% (2013), 6% (2012)
- 10 – 99 MHz (Net): 38% (2013), 39% (2012)
- 10 - 24 MHz: 13% (2013), 14% (2012)
- 25 - 49 MHz: 13% (2013), 15% (2012)
- 50 - 99 MHz: 16% (2013), 15% (2012)
- 100 – 249 MHz: 16% (2013), 16% (2012)
- 250 – 499 MHz: 10% (2013), 11% (2012)
- 500 – 749 MHz: 7% (2013), 8% (2012)
- 750 – 999 MHz: 5% (2013), 5% (2012)
- 1 GHz: 13% (2013), 11% (2012)
- 2GHz+: 4% (2013), 3% (2012)

The average processor clock rate was:
- 485 MHz in 2013
- 425 MHz in 2012
Did you use the same processor as in your previous embedded project?

<table>
<thead>
<tr>
<th>Year</th>
<th>Yes, used the same processor as in previous embedded project</th>
<th>No, did not use the same processor as in previous project</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>2012</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>2011</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>2010</td>
<td>48%</td>
<td>52%</td>
</tr>
<tr>
<td>2009</td>
<td>48%</td>
<td>52%</td>
</tr>
</tbody>
</table>
Why did you use the same processor?

- Happy with current processor/supplier: 62% (2013), 59% (2012)
- To maintain software compatibility: 50% (2013), 57% (2012)
- To maintain the same tools or software: 49% (2013), 47% (2012)
- To make use of expertise/familiarity: 43% (2013), 41% (2012)
- To use same operating system: 29% (2013), 28% (2012)
- Switching is too expensive/time-consuming: 23% (2013), 27% (2012)
- Not my choice/processor chosen for me: 9% (2013), 8% (2012)
- No other suitable processors available: 4% (2013), 3% (2012)
- Other: 2% (2013), 3% (2012)

Base = Those who are currently using the same processor as in previous project.
What were your reasons for switching processors?

- New processor had better features: 46% (2013), 46% (2012)
- Previous processor too slow: 31% (2013), 31% (2012)
- New processor had better future growth: 24% (2013), 27% (2012)
- Not my choice/processor chosen for me: 15% (2013), 15% (2012)
- New processor had better SW/dev tools: 14% (2013), 18% (2012)
- Previous processor no longer available: 13% (2013), 13% (2012)
- Needed a lower power processor: 12% (2013)
- Previous processor too expensive: 10% (2013), 9% (2012)
- To change operating system: 8% (2013), 9% (2012)
- Unhappy with previous processor's supplier: 3% (2013), 2% (2012)
- Other: 9% (2013), 11% (2012)

Base = Those who did not use the same processor as in previous project
Did you . . .

<table>
<thead>
<tr>
<th>Year</th>
<th>Choose a processor from a different family, architecture, or instruction set</th>
<th>Choose a different processor from the same family, architecture, or instruction set</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>2012</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>2011</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>2010</td>
<td>52%</td>
<td>48%</td>
</tr>
<tr>
<td>2009</td>
<td>57%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Base = Those who did not use the same processor as in previous project
What’s most important when choosing a microprocessor?

- **The chip itself**: 42% in 2013, 45% in 2012, 43% in 2011, 46% in 2010, 43% in 2009
- **The ecosystem surrounding the chip (software, tools, support, etc.)**: 48% in 2013, 45% in 2012, 45% in 2011, 43% in 2010, 41% in 2009
- **The chip’s supplier/vendor**: 61% in 2013, 9% in 2012, 13% in 2011, 11% in 2010, 10% in 2009
If you selected "ecosystem," please write in ONE vendor that has the best ecosystem for your needs. (Unaided)
What are the most important factors in choosing a processor?

- Software development tools available
- The chip's performance
- The chip's cost
- Available middleware, drivers, existing code
- HW development tools available
- The operating systems it supports
- The on-chip I/O or peripherals
- The chip's power consumption
- The supplier's reputation
- Familiarity w/ architecture/chip family
- Chip family's future growth path
- The processor's debug support
- Programmable logic on chip

2013 (N = 2,033)
2012 (N = 1,648)
2011 (N = 1,843)
Please select the processor vendors you are familiar with.

- Texas Instruments
- Atmel
- Freescale
- Microchip
- Intel
- STMicroelectronics
- Altera
- AMD
- Xilinx
- Analog Devices
- NXP
- Renesas/NEC
- Cypress Semiconductor
- Zilog
- Maxim
- Infineon
- Broadcom
- Silicon Labs
- NVIDIA
- IBM
- Qualcomm
- Samsung
- Marvell
- Digi/Rabbit
- Cirrus Logic
- Lattice Semiconductor
- Fujitsu
- Applied Micro
- Toshiba
- Microsemi
- Energy Micro
- VIA
- PMC-Sierra
- Stretch
- Other
Please select the processor vendors you are currently using.

- Texas Instruments: 29% (2013), 29% (2012)
- Freescale: 26% (2013), 25% (2012)
- Intel: 17% (2013), 22% (2012)
- Xilinx: 14% (2013), 18% (2012)
- STMicroelectronics: 12% (2013), 13% (2012)
- Altera: 9% (2013), 11% (2012)
- NXP: 10% (2013), 11% (2012)
- Analog Devices: 8% (2013), 7% (2012)
- Renesas/NEC: 8% (2013), 9% (2012)
- AMD: 5% (2013), 6% (2012)
- Cypress Semiconductor: 4% (2013), 5% (2012)
- Maxim: 4% (2013), 3% (2012)
- Marvell: 4% (2013), 4% (2012)
- Silicon Labs: 4% (2013), 4% (2012)
- Broadcom: 4% (2013), 3% (2012)
- Infineon: 3% (2013), 3% (2012)
- Qualcomm: 3% (2013), 2% (2012)
- NVIDIA: 3% (2013), 2% (2012)
- Samsung: 2% (2013), 2% (2012)
- Digi/Rabbit: 2% (2013), 2% (2012)
- Lattice Semiconductor: 2% (2013), 2% (2012)
- IBM: 2% (2013), 2% (2012)
- Microsemi: 2% (2013), 2% (2012)
- Cirrus Logic: 1% (2013), 3% (2012)
- Zilog: 1% (2013), 2% (2012)
- Fujitsu: 1% (2013), 1% (2012)
- Applied Micro: 1% (2013), 1% (2012)
- Toshiba: 1% (2013), 1% (2012)
- VIA: 1% (2013), 1% (2012)
- PMC-Sierra: 1% (2013), 1% (2012)
- Stretch: 1% (2013), 1% (2012)
- Other: 2% (2013), 2% (2012)
Please select the processor vendors you are considering using on your next project (Top 20).

<table>
<thead>
<tr>
<th>Vendor</th>
<th>2013 (N = 1609)</th>
<th>2012 (N = 1327)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas Instruments</td>
<td>41%</td>
<td>39%</td>
</tr>
<tr>
<td>Freescale</td>
<td>34%</td>
<td>31%</td>
</tr>
<tr>
<td>Microchip</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Atmel</td>
<td>24%</td>
<td>23%</td>
</tr>
<tr>
<td>STMicroelectronics</td>
<td>22%</td>
<td>23%</td>
</tr>
<tr>
<td>Xilinx</td>
<td>19%</td>
<td>16%</td>
</tr>
<tr>
<td>Intel</td>
<td>18%</td>
<td>20%</td>
</tr>
<tr>
<td>NXP</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td>Altera</td>
<td>15%</td>
<td>13%</td>
</tr>
<tr>
<td>Renesas / NEC</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Analog Devices</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Cypress</td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>AMD</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>Silicon Labs</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Qualcomm</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>NVIDIA</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Samsung</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Energy Micro</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Broadcom</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Marvell</td>
<td></td>
<td>4%</td>
</tr>
</tbody>
</table>
(Continued) Please select the processor vendors you are considering using on your next project.
Which of the following 32-bit chip families would you consider for your next embedded project?

<table>
<thead>
<tr>
<th>Chip Family</th>
<th>2013 (%)</th>
<th>2012 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microchip PIC 32-bit (MIPS)</td>
<td>23%</td>
<td>21%</td>
</tr>
<tr>
<td>STMicroelectronics STM32 (ARM)</td>
<td>22%</td>
<td>24%</td>
</tr>
<tr>
<td>TI Stellaris (ARM)</td>
<td>21%</td>
<td>21%</td>
</tr>
<tr>
<td>TI OMAP (ARM)</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>NXP ARM</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Intel Atom, Pentium, Celeron, Core IX</td>
<td>16%</td>
<td>15%</td>
</tr>
<tr>
<td>Atmel (AVR32)</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Atmel SAMxx (ARM)</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Freescale i.MX (ARM)</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>FreescaleKinetis (ARM/Cortex-M4/M0)</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>TI Sitara (ARM)</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>Xilinx Zynq (with dual ARM Cortex-A9)</td>
<td>11%</td>
<td>13%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chip Family</th>
<th>2013 (%)</th>
<th>2012 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altera Nios II (soft core)</td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Arduino</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Atmel AT91xx</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Xilinx MicroBlaze (soft-core)</td>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>TI C2000 MCUs</td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Altera SoC-FPGA (ARM)</td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Renesas SuperH, H8SX, M32C, M32R</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Freescale 68K, ColdFire</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Cypress PSOC 5 (ARM)</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Freescale PowerPC 7xx, 8xx</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>TI Hercules (ARM)</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Freescale PowerPC 55xx</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Freescale PowerQUICC</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>Xilinx Virtex-5 (with PowerPC 405)</td>
<td></td>
<td>6%</td>
</tr>
</tbody>
</table>
(Continued) Which of the following 32-bit chip families would you consider for your next embedded project?

<table>
<thead>
<tr>
<th>Chip Family</th>
<th>2013 (%): N = 1887</th>
<th>2012 (%): N = 1548</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualcomm (any)</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>AMD Fusion, Athlon, Opteron, Geode</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Freescale PowerPC 5xx, 6xx</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>NVIDIA Tegra</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Energy Micro EFM32</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Intel Itanium</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Freescale Vybrid (ARM)</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Broadcom (any)</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Marvell</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Xilinx Virtex-4 (with PowerPC 405)</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>SiLABS Precision32 (ARM)</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>IBM PowerPC 4xx, 7xx</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Microsemi SmartFusion2 SoC FPGA (Cortex-M3)</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Infineon XMC4000 (ARM)</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Microsemi SmartFusion SoC FPGA (Cortex-M3)</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Microsemi FPGA (Cortex-M1, soft)</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>AMD Alchemy (MIPS)</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Infineon Tricore</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>NEC V850</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Fujitsu FM3 (ARM)</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Cirrus Logic EP73xx, EP93xx (ARM)</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>AMCC PowerPC 4xx</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>SPARC (any)</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Fujitsu FR series</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>IDT 32xxx</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>6%</td>
</tr>
</tbody>
</table>
Which of the following 16-bit chip families would you consider for your next embedded project?

- TI MSP430: 43% (2013) vs 43% (2012)
- Freescale HC16: 20% (2013) vs 19% (2012)
- STMicroelectronics ST9, ST10: 16% (2013) vs 17% (2012)
- Freescale HC12: 14% (2013) vs 14% (2012)
- AMD 186, '188: 9% (2013) vs 9% (2012)
- Infineon XE166, XC2000, XC166, C166: 5% (2013) vs 4% (2012)
- Zilog Z180, Z380: 4% (2013) vs 4% (2012)
- Maxim: 4% (2013) vs 4% (2012)
- Other: 6% (2013) vs 9% (2012)
Which of the following 8-bit chip families would you consider for your next embedded project?

- Microchip PIC: 43%
- Atmel AVR: 35%
- Freescale HC05, HC08, HC11: 18%
- Arduino: 17%
- TI TMS370, 7000: 15%
- STMicroelectronics ST6, ST7, ST8: 14%
- Intel 80xx, '251: 11%
- Xilinx PicoBlaze: 10%
- Renesas H8, R8: 11%
- Cypress PSoC: 10%
- NXP/Philips P80x, P87x, P89x: 9%
- Altera soft core: 9%
- Atmel 80xx: 7%
- SiLabs 80xx: 7%
- Zilog Z8, Z80, Z180, eZ80: 6%
- Digi / Rabbit 2000, 3000: 4%
- Maxim 80xx: 3%
- Parallax: 3%
- Infineon XC800, C500: 3%
- Toshiba: 2%
- NEC K0: 1%
- Other: 5%

2013 (N = 1,544)
2012 (N = 1,293)

*Renesas H8/300, 3800, 7200, 7600, R8C/Tiny, 38000, 7200, 7600, 740
Which of the following **DSP** chip families would you consider for your next embedded project?

- TI 'C6000
- Microchip dsPIC
- TI DaVinci
- TI 'C5000
- Analog Devices Blackfin
- NXP Cortex M4 LPC4000
- Freescale 563xx, 566xx, 568xx, 96xxx
- Analog Devices SHARC
- Analog Devices ADSP-21xx
- Analog Devices TigerSHARC
- Freescale StarCore 71xx, 81xx
- LatticeECP3
- Other

2013 (N = 1,333)

- TI 'C6000: 29%
- Microchip dsPIC: 27%
- TI DaVinci: 24%
- TI 'C5000: 22%
- Analog Devices Blackfin: 21%
- NXP Cortex M4 LPC4000: 18%
- Freescale 563xx, 566xx, 568xx, 96xxx: 17%
- Analog Devices SHARC: 15%
- Analog Devices ADSP-21xx: 11%
- Analog Devices TigerSHARC: 11%
- Freescale StarCore 71xx, 81xx: 9%
- LatticeECP3: 5%
- Other: 8%

2012 (N = 1,054)

- TI 'C6000: 29%
- Microchip dsPIC: 27%
- TI DaVinci: 25%
- TI 'C5000: 22%
- Analog Devices Blackfin: 23%
- NXP Cortex M4 LPC4000: 16%
- Freescale 563xx, 566xx, 568xx, 96xxx: 16%
- Analog Devices SHARC: 12%
- Analog Devices ADSP-21xx: 10%
- Analog Devices TigerSHARC: 11%
- Freescale StarCore 71xx, 81xx: 9%
- LatticeECP3: 3%
- Other: 9%
FPGA’s and Programmable Logic
Does your current embedded project contain FPGAs/programmable logic?

![Bar chart showing percentage of respondents who have embedded projects with FPGAs/programmable logic across different years (2009-2013).]
If project doesn’t contain any FPGAs, will the trend towards FPGAs with built in multicore processors change your mind?

Yes: 36% 37%
No: 64% 63%
Which of the following vendors does your current embedded projects use for FPGAs?

- Xilinx
- Altera
- Lattice
- Atmel
- Mentor Graphics
- Microsemi
- Cypress
- Cadence
- Synopsys/Synplicity

Tabula and Achronix were both less than one percent.
Will your next embedded project likely contain FPGAs/programmable logic?

- Yes: 2013 (N = 2,022) 41%, 2012 (N = 1,642) 43%, 2011 (N = 1,846) 45%, 2010 (N = 1,517) 50%, 2009 (N = 1,519) 51%
- No: 2013 (N = 2,022) 59%, 2012 (N = 1,642) 57%, 2011 (N = 1,846) 58%, 2010 (N = 1,517) 55%, 2009 (N = 1,519) 51%
Why won’t your next project include customizable chips?

- Don't need this functionality: 60% (2013), 63% (2012)
- They're too expensive: 29% (2013), 31% (2012)
- They consume too much power: 16% (2013), 16% (2012)
- They're too difficult to program (in HDL): 13% (2013), 14% (2012)
- We don't understand this functionality: 11% (2013)
- They're not fast enough for our purposes: 4% (2013), 4% (2012)
- They're not big enough for our purposes: 3% (2013), 2% (2012)
- They're not reliable enough: 2% (2013), 4% (2012)
- Don't know: 9% (2013), 10% (2012)

Base = Those who will not be using customizable chips
If yes, which of the following **vendors** will you **consider** in your **next** embedded project for FPGAs?

<table>
<thead>
<tr>
<th>Vendor</th>
<th>2013 (N = 801)</th>
<th>2012 Will consider (N = 675)</th>
<th>2011 Will consider (N = 759)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xilinx</td>
<td>74%</td>
<td>75%</td>
<td>73%</td>
</tr>
<tr>
<td>Altera</td>
<td></td>
<td>58%</td>
<td>58%</td>
</tr>
<tr>
<td>Lattice</td>
<td></td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>Atmel</td>
<td></td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Microsemi</td>
<td></td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>Cypress</td>
<td></td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Mentor Graphics</td>
<td></td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Synopsys/Synplicity</td>
<td></td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Cadence</td>
<td></td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Achronix</td>
<td></td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Tabula</td>
<td></td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>3%</td>
<td>4%</td>
</tr>
</tbody>
</table>
For 2013 only -- which of the following vendors does your current embedded projects use for FPGAs, and which will you consider in your next embedded project?

- Xilinx: 64% Currently use, 74% Will Consider
- Altera: 42% Currently use, 58% Will Consider
- Lattice: 10% Currently use, 17% Will Consider
- Atmel: 6% Currently use, 15% Will Consider
- Mentor Graphics: 6% Currently use, 7% Will Consider
- Microsemi: 4% Currently use, 9% Will Consider
- Cypress: 4% Currently use, 9% Will Consider
- Cadence: 3% Currently use, 4% Will Consider
- Synopsys/Synplicity: 3% Currently use, 5% Will Consider
- Other: 2% Currently use, 3% Will Consider
HARDWARE IPs, SYSTEM LEVEL DESIGN, & USE OF GUIs
Does your current embedded project reuse hardware or hardware IP from a previous project?

- No, all new hardware, no hardware or IP reuse: 30% (2013), 29% (2012), 27% (2011), 27% (2010)
- Yes, reused some hardware or IP that was developed in-house: 62% (2013), 61% (2012), 62% (2011), 62% (2010)
- Yes, reused some commercial (purchased) hardware or IP: 6% (2013), 7% (2012), 7% (2011), 7% (2010)
Which of the following design techniques will become *more important* to your designs in the future?

- Simulation: 63% (2013), 63% (2012)
- Modeling in a high level language: 36% (2013), 39% (2012)
- Virtual prototyping: 32% (2013), 33% (2012)
- Graphical system design: 31% (2013), 32% (2012)
What system level design tools do you or your organization currently use?

- MATLAB
- LabVIEW
- Simulink
- System C or other "hardware C"...
- UML
- Cadence Virtual System Platform
- Synopsys Virtualizer
- HAPS FPGA-based prototypes
- Mentor Vista
- Other

2013 (N = 1509)
2012 (N = 1200)
Who were the three greatest influencers on the choice of the **system-level tools** for your current project?

- Software engineering staff: 33%
- Software engineering manager: 27%
- Hardware engineering staff: 25%
- Systems engineering staff: 23%
- Hardware engineering manager: 20%
- Systems engineering manager: 19%
- Hardware architects: 19%
- Corporate management: 18%
- Outside influence, customer, standards: 10%
- Purchasing manager: 6%
- Marketing manager: 3%
- Other: 4%

2013 (N = 1,771)
Which of the following *project management* software packages do you currently use?

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Currently Use</th>
<th>Previously Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Excel</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>Microsoft Project</td>
<td>49%</td>
<td>44%</td>
</tr>
<tr>
<td>Visio</td>
<td>28%</td>
<td>26%</td>
</tr>
<tr>
<td>Open Source tools</td>
<td>23%</td>
<td>25%</td>
</tr>
<tr>
<td>IBM Telelogic DOORS</td>
<td>9%</td>
<td>11%</td>
</tr>
<tr>
<td>Simulink</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>TeamCenter</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Other software package</td>
<td>1%</td>
<td>8%</td>
</tr>
</tbody>
</table>
Which of the following Version Control software systems do you currently use?

- Subversion: 41%
- Git: 21%
- CVS: 20%
- Clearcase: 14%
- Perforce: 9%
- Other*: 20%

2013 (N = 1,660)

*Other mentions:
- Mercurial: 38
- Serena PVCS: 23
- Microsoft Source Safe: 21
- MKS: 18
- Team Foundation Server (TFS): 16
- Tortoise: 16
- Visual SourceSafe: 12
Does your current design use a graphical user interface?

Yes
- Color: 42%
- Touch: 34%
- Hi-res: 11%
- 3D: 2%
- Haptic: 1%
- Other: 10%
- 2013 (N = 804)

No
- Touch: 40%
- Color: 36%
- Hi-res: 10%
- Haptic: 2%
- 3D: 1%
- Other: 11%
- 2012 (N = 645)

2013 (N = 1993) vs. 2012 (N = 1613)
Thank you | See you at DESIGN West!

David Blaza, VP of UBM Tech, Electronics
david.blaza@ubm.com • 415-947-6929

Alex Wolfe, Brand Director, EE Times, Embedded, & EBN
alex.wolfe@ubm.com • 516-562-7386