2011
EMBEDDED MARKET STUDY

EE Times

Embedded Systems Design

Embedded.com
The Official Site of the Embedded Development Community
Purpose and Methodology

• **Purpose:** To profile the 2011 results of EE Times Group annual comprehensive survey of the embedded systems markets worldwide. Findings include break outs of the embedded developers’ tools and work environment, applications targeted, methods and processes used, operating systems used, brands and chips used and considering for adoption, issues being confronted and demographics. Many questions in this survey have been trended over five years. This special presentation report also highlights European vs. Non-European developments.

• **Methodology:** Web survey conducted from February 3, 2011 -- February 18, 2010

• **Returns:** 1,886 completed surveys 95% +/- 2.25% confidence overall

  • **Sample:** E-mail invitations were sent to the following subscribers to EE Times Group Embedded Brands...

    • *Embedded Systems Design (ESD)*
    • *EE Times*
    • *Embedded Newsletter Subscribers*
In which region of the world do you reside?

- **US: Total** - 61.9%
- **US: West Coast** - 23.0%
- **US: MidWest** - 12.3%
- **US: MidAtlant** - 7.3%
- **US: Northeast** - 5.4%
- **US: Southeast** - 5.3%
- **US: Southwest** - 5.0%
- **US: Central Mountain** - 3.5%
- **Europe** - 14.7%
- **Asia** - 12.9%
- **Canada** - 3.5%
- **Latin America** - 3.5%
- **Australia** - 1.3%
- **Africa** - 0.9%
- **Near East** - 1.1%

**Countries and Regions:**
- India
- Japan
- China
- Korea
- Indonesia
- Singapore
- Taiwan
- Hong Kong
- Southeast Asia
- Other Asian
How many employees does your company have at all locations?

- Under 100: 42.6%
- 100-499: 17.1%
- 500-999: 6.1%
- 1,000-4,999: 10.4%
- 5,000-9,999: 5.0%
- 10,000-19,999: 3.0%
- 20,000 or more: 12.9%
- Don't know: 2.8%

2011 (N = 1814)
Average = 3,819
My job function includes:

- Writing firmware/software for embedded systems: 62%
- Hardware/software integration: 60%
- Debugging firmware/software: 59%
- Architecture selection/specification: 54%
- Firmware/software design or analysis: 48%
- Project management: 45%
- Debugging hardware: 44%
- Firmware/software testing: 41%
- Prototype testing: 41%
- Device programming: 38%
- System design: 37%
- Designing hardware for embedded systems: 34%
- Hardware/software co-design: 24%
- Board layout/design: 21%
- Hardware/software co-verification: 18%
- SoC (system-on-chip) design: 9%
- Connected device design: 8%
- Other (please specify): 4%

2011 (N = 1819)
For what types of applications are your embedded projects developed?

- Automotive: 17% (2011), 18% (2010), 16% (2009), 15% (2008)
- Aerospace: 15% (2011), 12% (2010), 16% (2009), 15% (2008)
- Electronic instruments: 15% (2011), 15% (2010), 16% (2009), 16% (2008)
- Video & imaging: 12% (2011), 12% (2010), 8% (2009), 8% (2008)
- Security: 10% (2011), 8% (2010), 7% (2009), 8% (2008)
- Power generation and utilities: 8% (2011), 9% (2010), 7% (2009), 6% (2008)
- Government & municipal: 6% (2011), 5% (2010), 6% (2009), 5% (2008)
- Audio: 6% (2011), 6% (2010), 8% (2009), 6% (2008)
CURRENT EMBEDDED DESIGN ENVIRONMENT
My current embedded project is:

- **New to the world; a new project from scratch**
  - 2011 (N = 1,883): 43%
  - 2010 (N = 1,559): 43%
  - 2009 (N = 1,550): 42%
  - 2008 (N = 1,079): 46%
  - 2007 (N = 998): 39%

- **An upgrade or improvement to an earlier or existing project**
  - 2011 (N = 1,883): 57%
  - 2010 (N = 1,559): 57%
  - 2009 (N = 1,550): 58%
  - 2008 (N = 1,079): 54%
  - 2007 (N = 998): 61%
What does the upgrade or improvement include?

- New or different software features:
  - 2011 (N = 1065): 76%
  - 2010 (N = 886): 77%
  - 2009 (N = 895): 78%
  - 2008 (N = 582): 78%
  - 2007 (N = 663): 81%

- New or different processor:
  - 2011 (N = 1065): 57%
  - 2010 (N = 886): 56%
  - 2009 (N = 895): 54%
  - 2008 (N = 582): 55%
  - 2007 (N = 663): 56%

- New or different system logic:
  - 2011 (N = 1065): 40%
  - 2010 (N = 886): 37%
  - 2009 (N = 895): 39%
  - 2008 (N = 582): 41%
  - 2007 (N = 663): 41%

- New or different analog components:
  - 2011 (N = 1065): 30%
  - 2010 (N = 886): 32%
  - 2009 (N = 895): 33%
  - 2008 (N = 582): 36%
  - 2007 (N = 663): 32%

- New or different operating system:
  - 2011 (N = 1065): 28%
  - 2010 (N = 886): 29%
  - 2009 (N = 895): 27%
  - 2008 (N = 582): 28%
  - 2007 (N = 663): 28%

- Mandatory changes because of discontinued hardware or software:
  - 2011 (N = 1065): 22%
  - 2010 (N = 886): 22%
  - 2009 (N = 895): 26%
  - 2008 (N = 582): 22%
  - 2007 (N = 663): 28%

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

- **Real-time capability**
  - 2011: 72%
  - 2010: 73%
  - 2009: 75%
  - 2008: 74%
  - 2007: 77%

- **Networking capability**
  - 2011: 58%
  - 2010: 59%
  - 2009: 59%
  - 2008: 61%
  - 2007: 57%

- **Project rugged/environmentally resistant**
  - 2011: 42%
  - 2010: 42%
  - 2009: 44%
  - 2008: 47%
  - 2007: 43%

- **Wireless capability**
  - 2011: 38%
  - 2010: 38%
  - 2009: 33%
  - 2008: 32%
  - 2007: 34%

- **Battery-powered**
  - 2011: 37%
  - 2010: 38%
  - 2009: 35%
  - 2008: 33%
  - 2007: 34%
If wireless, what wireless interfaces does your current embedded project include?

- Wi-Fi: 53% (2011), 51% (2010), 32% (2009)
- Zigbee: 12% (2011), 21% (2010), 23% (2009)
- 900 MHz: 13% (2011), 22% (2010), 16% (2009)
- Unlicensed 2.4-GHz band: 11% (2011), 13% (2010)
- 433 MHz: 7% (2011), 6% (2010)
- Proprietary: 7% (2011), 7% (2010)
- Infrared: 7% (2011), 8% (2010)
- AM or FM radio: 7% (2011), 10% (2010)
- WiMax: 8% (2011), 9% (2010)
- Custom: 8% (2011), 6% (2010)
- Ultra wideband (UWB): 4% (2011), 5% (2010)
- Military bands: 3% (2011), 4% (2010)
How many people are on your embedded project team?

<table>
<thead>
<tr>
<th>Team 2011</th>
<th>13.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Software Engineer =</td>
<td>5.9</td>
</tr>
<tr>
<td>- Hardware Engineer =</td>
<td>4.2</td>
</tr>
<tr>
<td>- Firmware Engineer =</td>
<td>3.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team 2010</th>
<th>18.9*</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Software Engineer =</td>
<td>9.4</td>
</tr>
<tr>
<td>- Hardware Engineer =</td>
<td>5.3</td>
</tr>
<tr>
<td>- Firmware Engineer =</td>
<td>4.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team 2009</th>
<th>13.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Software Engineer =</td>
<td>6.6</td>
</tr>
<tr>
<td>- Hardware Engineer =</td>
<td>4.3</td>
</tr>
<tr>
<td>- Firmware Engineer =</td>
<td>2.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team 2008</th>
<th>15.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team 2007</td>
<td>13.6</td>
</tr>
</tbody>
</table>

*In 2010, a number of teams had very large teams of engineers that affected the mean.
What is your development team’s ratio of total resources (including time/dollars/manpower) spent on software vs. hardware for your embedded projects?

- **Total resources devoted to software**
  - 2011: 62.0%
  - 2010: 61.3%
  - 2009: 62.4%
  - 2008: 63.8%

- **Total resources devoted to hardware**
  - 2011: 38.0%
  - 2010: 38.7%
  - 2009: 37.6%
  - 2008: 36.2%

2011 (N = 1,878)
2010 (N = 1,542)
2009 (N = 1,536)
2008 (N = 1,041)
How long did the last project you completed take to finish?

- **6 months or less**
  - 2011: 33%
  - 2010: 30%
  - 2009: 33%
  - 2008: 35%
  - 2007: 34%

- **7 – 12 months**
  - 2011: 36%
  - 2010: 32%
  - 2009: 35%
  - 2008: 33%
  - 2007: 32%

- **13 – 18 months**
  - 2011: 15%
  - 2010: 15%
  - 2009: 17%
  - 2008: 17%
  - 2007: 16%

- **19 – 24 months**
  - 2011: 9%
  - 2010: 9%
  - 2009: 10%
  - 2008: 10%

- **25 months or more**
  - 2011: 7%
  - 2010: 7%
  - 2009: 8%
  - 2008: 9%

*2011 (N = 1,822) Avg: 12 mos
2010 (N = 1,494) Avg: 12 mos
2009 (N = 1,514) Avg: 13 mos
2008 (N = 1,060) Avg: 13 mos
2007 (N = 974) Avg: 13 mos*
Was that project completed . . .

For 2011, 43% of all projects finished on or ahead of schedule and 57% of all projects finished late or cancelled, which represents no change from 2010 and 2009.
My current embedded project is programmed mostly in:

- **C**: 62% (2011), 60% (2010), 63% (2009), 60% (2008), 62% (2007)
- **C++**: 22% (2011), 20% (2010), 25% (2009), 22% (2008), 25% (2007)
- **Assembly language**: 5% (2011), 6% (2010), 7% (2009), 5% (2008), 7% (2007)
- **UML, MatLab, or like**: 2% (2011), 3% (2010), 2% (2009), 2% (2008), 2% (2007)
- **.NET**: 1% (2011), 2% (2010), 1% (2009), 1% (2008), 1% (2007)
- **LabView**: 1% (2011), 1% (2010), 1% (2009), 1% (2008), 1% (2007)
- **BASIC**: 1% (2011), 1% (2010), 1% (2009), 1% (2008), 1% (2007)
- **XML**: 1% (2011), 1% (2010), 1% (2009), 1% (2008), 1% (2007)
- **Other**: 3% (2011), 3% (2010), 3% (2009), 3% (2008), 4% (2007)
My next embedded project will likely be programmed mostly in:

- **C**: 58% (2011), 57% (2010), 59% (2009), 58% (2008), 57% (2007)
- **C++**: 23% (2011), 27% (2010), 29% (2009), 27% (2008), 29% (2007)
- **Assembly language**: 3% (2011), 5% (2010), 3% (2009), 4% (2008), 2% (2007)
- **Java**: 3% (2011), 2% (2010), 2% (2009), 2% (2008), 2% (2007)
- **UML, MatLab, or like**: 3% (2011), 2% (2010), 3% (2009), 3% (2008), 2% (2007)
- **.NET**: 2% (2011), 4% (2010), 2% (2009), 4% (2008), 4% (2007)
- **LabView**: 1% (2011), 1% (2010), 2% (2009), 2% (2008), 2% (2007)
- **BASIC**: 1% (2011), 1% (2010), 1% (2009), 1% (2008), 1% (2007)
- **XML**: 1% (2011), 1% (2010), 1% (2009), 1% (2008), 1% (2007)
- **Other**: 3% (2011), 5% (2010), 3% (2009), 3% (2008), 3% (2007)
Does your current project reuse code from a previous embedded project?

<table>
<thead>
<tr>
<th></th>
<th>2011 (N = 1,862)</th>
<th>2010 (N = 1,540)</th>
<th>2009 (N = 1,534)</th>
<th>2008 (N = 1,068)</th>
<th>2007 (N = 1,012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, all new software, no code reuse</td>
<td>13</td>
<td>14</td>
<td>11</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Yes, reused code developed in-house</td>
<td>80</td>
<td>78</td>
<td>84</td>
<td>78</td>
<td>73</td>
</tr>
<tr>
<td>Yes, reused open-source, shareware code</td>
<td>25</td>
<td>24</td>
<td>21</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Yes, reused purchased code</td>
<td>17</td>
<td>17</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

EMBEDDED DESIGN PROCESS
What percentage of your design time is spent on each of the following stages?

- Developing overall system specs
  - 2011: 15%
  - 2010: 14%
  - 2009: 15%
  - 2008: 15%

- Conceptual design stage
  - 2011: 12%
  - 2010: 12%
  - 2009: 11%
  - 2008: 12%

- Detailed design stage
  - 2011: 22%
  - 2010: 23%
  - 2009: 22%
  - 2008: 22%

- Simulation stage
  - 2011: 8%
  - 2010: 8%
  - 2009: 8%
  - 2008: 8%

- Testing and debugging
  - 2011: 24%
  - 2010: 24%
  - 2009: 24%
  - 2008: 25%

- Prototyping
  - 2011: 12%
  - 2010: 12%
  - 2009: 12%
  - 2008: 12%

- Sending to production
  - 2011: 6%
  - 2010: 6%
  - 2009: 6%
  - 2008: 6%

- Documentation/coding/mtgs
  - 2011: 2%
  - 2010: 1%
  - 2009: 1%
  - 2008: 1%
If you could improve one thing about your embedded design activities, what would it be?

- **Debugging tools**
  - 2011: 29%
  - 2010: 28%
  - 2009: 30%
  - 2008: 32%

- **Schedule**
  - 2011: 14%
  - 2010: 15%
  - 2009: 18%

- **Engineering team**
  - 2011: 8%
  - 2010: 9%
  - 2009: 9%

- **Programming tools**
  - 2011: 7%
  - 2010: 8%
  - 2009: 8%

- **Microprocessor**
  - 2011: 12%
  - 2010: 11%
  - 2009: 10%

- **Interfaces**
  - 2011: 10%
  - 2010: 9%
  - 2009: 8%

- **Other hardware**
  - 2011: 7%
  - 2010: 8%
  - 2009: 6%

- **Operating system**
  - 2011: 5%
  - 2010: 4%
  - 2009: 5%

- **IDE**
  - 2011: 5%
  - 2010: 5%
  - 2009: 6%

- **Other (Mgt, budget, legacy, etc)**
  - 2011: 5%
  - 2010: 6%
  - 2009: 6%

*Note: “Engineering team” was added in 2009. Engineering team improvements could be made by adding more engineers, hiring higher quality personnel, improving coordination, improving communication, better leadership, better training, etc.*
In general, what sources of information do you consult to research your embedded design decisions?
(Only top 14 are displayed.)

- Websites of vendors or manufacturers: 86% in 2011, 83% in 2010, 85% in 2009
- Technical whitepapers: 61% in 2011, 43% in 2010, 39% in 2009
- Colleagues: 59% in 2011, 59% in 2010, 60% in 2009
- Websites of Industry publication*: 57% in 2011, 54% in 2010, 56% in 2009
- Print publications*: 49% in 2011, 39% in 2010, 39% in 2009
- Webinars/net seminars: 49% in 2011, 28% in 2010, 28% in 2009
- Industry newsletters: 31% in 2011, 24% in 2010, 28% in 2009
- Conferences and trade shows: 28% in 2011, 24% in 2010, 24% in 2009
- Distributor websites: 25% in 2011, 24% in 2010, 22% in 2009
- Catalogs and brochures: 22% in 2011, 24% in 2010, 23% in 2009
- Blogs: 18% in 2011, 17% in 2010, 14% in 2009
- Virtual conferences**: 9% in 2011, 4% in 2010, 4% in 2009
- Podcasts: 4% in 2011, 4% in 2010, 4% in 2009
- Linked-in: 4% in 2011, 4% in 2010, 4% in 2009

*Note: In 2011, 67.9% said they consult "Industry publication websites" or "Print publications" or both

**Not asked in prior years

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Thinking about the next year, what areas will be your greatest technology challenges? (Managers only)

- Integrating new technology or tools: 24% (2011), 25% (2010), 26% (2009)
- Building "on-time" devlpmt process: 16% (2011), 15% (2010), 22% (2009)
- Building higher quality devlpmt process: 14% (2011), 25% (2010), 19% (2009)
- Size, mix, type of the devlpmt team: 12% (2011), 16% (2010), 12% (2009)
- Improving the debugging process: 11% (2011), 12% (2010), 14% (2009)
- Processors: 15% (2011), 17% (2010), 13% (2009)
- Software tools: 15% (2011), 17% (2010), 15% (2009)
- Programmable logic: 25% (2011), 11% (2010), 22% (2009)
- RTOS: 15% (2011), 17% (2010), 13% (2009)
- Building enterprise devlpmt process: 11% (2011), 8% (2010), 13% (2009)
- Hardware tools: 2% (2011), 7% (2010), 7% (2009)
- Integrating external IPs into designs: 2% (2011), 4% (2010), 3% (2009)
- Changing enterprise approach to devlpmt: 6% (2011), 4% (2010), 6% (2009)
- Developing quality training program: 7% (2011), 4% (2010), 7% (2009)
- Buses/interconnects: 4% (2011), 4% (2010), 5% (2009)
- IDE*: 1% (2011), 3% (2010), 5% (2009)

(N=310) 2011, (N=270) 2010, (N=244) 2009
Which of the following are your favorite/most important software/hardware tools? (Top 18 shown only)

<table>
<thead>
<tr>
<th>Tool</th>
<th>2011 (%)</th>
<th>2010 (%)</th>
<th>2009 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler/Assembler</td>
<td>54%</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>Debugger</td>
<td>53%</td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td>Oscilloscope</td>
<td>36%</td>
<td>37%</td>
<td></td>
</tr>
<tr>
<td>IDE</td>
<td>37%</td>
<td>32%</td>
<td>33%</td>
</tr>
<tr>
<td>JTAG/BDM</td>
<td>23%</td>
<td>23%</td>
<td>29%</td>
</tr>
<tr>
<td>Logic analyzer</td>
<td>17%</td>
<td>18%</td>
<td>22%</td>
</tr>
<tr>
<td>ICE</td>
<td>17%</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Linux tools</td>
<td>11%</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Configuration management tools</td>
<td>9%</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>Codevelopment tools</td>
<td>8%</td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td>Software libraries</td>
<td>8%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Automatic code generation</td>
<td>9%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Simulation modeling tools</td>
<td>7%</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Source code analysis/timing analysis tools</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>Graphical Design tools</td>
<td>6%</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Software testing tools</td>
<td>5%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Device driver tool</td>
<td>3%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Trace</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>
### 2011 Embedded Market Study

Which of the following conferences have you attended in the last two years, and which do you plan to attend in the next year?

<table>
<thead>
<tr>
<th>Conferences</th>
<th>2011 Have Attended</th>
<th>2011 Plan to attend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded Systems Conference (Silicon Valley)</td>
<td>29%</td>
<td>34%</td>
</tr>
<tr>
<td>ARM Tech Con</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>Freescale Tech Forum</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Real Time Computer Show (RTECC)</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Embedded Systems Conference (Boston)</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Intel Developer Forum</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>DesignCon</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>CeBIT</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Microchip MASTERs Conference</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Embedded World (Nuremberg)</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>DAC</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Embedded Systems Conference (India)</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Electronica/Productronica</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Embedded Linux Expo and Conference (ELEC)</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Embedded Systems Show (UK)</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Convergence: Transportation Electronics</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>IIC(China)</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Eclipse World</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Embedded Systems Technology (Japan)</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total attending/planning to attend</strong></td>
<td><strong>871</strong></td>
<td><strong>968</strong></td>
</tr>
</tbody>
</table>

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Looking ahead over the next 2-5 years, select the areas below that you think will see the most dramatic changes?

- Chip technology
- Speed to markets
- The design/development process
- Global markets
- Outsourcing (domestic & overseas)
- Size and type of development teams
- Chip applications (vertical markets)
- Embedded systems research and theory
- Career training/education
- Professionalism and standards
- Other changes
What are the most effective ways that you systematically or formally maintain, educate, and advance your professional skills?

- Technical white papers by vendors: 47%
- Webinars provided by vendors: 40%
- Webinars by publications, media orgs: 39%
- Conferences provided by vendors: 30%
- Prof’s devpmt courses by private co.: 29%
- Spec. skills training courses by CD/online: 27%
- University professional dev. courses: 25%
- On-site seminars given by vendors: 25%
- Conference seminars by prof’snl assocns: 22%
- Webinars by prof’snl assocns: 22%
- Conference seminars by publctns, media orgs: 21%
- Books: 15%
- Other: 12%
- Don’t have formal method of career training: 8%

Average Number of Days Per Year Spent on Career Training
- 2011 = 11.2 days per year
- 2010 = 11.7 days per year
- 2009 = 10.0 days per year
OPERATING SYSTEMS
Does your current embedded project use an operating system, RTOS, kernel, software executive, or scheduler of any kind?

Almost no changes in usage of RTOS, kernels, execs, schedulers over past 5 years

Yes

<table>
<thead>
<tr>
<th>Year</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>2008</td>
<td>71%</td>
<td>29%</td>
</tr>
<tr>
<td>2007</td>
<td>70%</td>
<td>30%</td>
</tr>
</tbody>
</table>

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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
  - 2011: 82%
  - 2010: 81%
  - 2009: 80%
  - 2008: 81%
  - 2007: 78%

- OS / RTOS uses too much memory
  - 2011: 14%
  - 2010: 12%
  - 2009: 13%
  - 2008: 14%

- OS / RTOS requires too much processor power
  - 2011: 11%
  - 2010: 9%
  - 2009: 11%
  - 2008: 9%

- OS / RTOS is too expensive
  - 2011: 9%
  - 2010: 11%
  - 2009: 10%
  - 2008: 10%

- OS / RTOS is too complicated to use
  - 2011: 6%
  - 2010: 8%
  - 2009: 7%
My **current** embedded project uses:

- **Commercial OS**: 41% (2011), 38% (2010), 47% (2009), 49% (2008), 47% (2007)
- **Open-source OS without commercial support**: 29% (2011), 27% (2010), 27% (2009), 26% (2008), 27% (2007)
- **Internally developed or in-house OS**: 23% (2011), 26% (2010), 21% (2009), 21% (2008), 15% (2007)
- **Commercial distribution of an open-source OS**: 15% (2011), 14% (2010), 14% (2009), 11% (2008), 10% (2007)

My **next** embedded project will likely use:

- **Open-source OS without commercial support**: 37% (2011), 31% (2010), 27% (2009), 31% (2008), 27% (2007)
- **Commercial OS**: 30% (2011), 31% (2010), 34% (2009), 37% (2008), 37% (2007)
- **Internally developed or in-house OS**: 19% (2011), 23% (2010), 23% (2009), 26% (2008), 15% (2007)
- **Commercial distribution of an open-source OS**: 15% (2011), 16% (2010), 16% (2009), 15% (2008), 16% (2007)

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Which factors most influenced your decision to use a commercial operating system?

- Real-time capability
- Technical support
- Processor or hardware compatibility
- Good software tools
- Overall cost
- Documentation
- Royalty-free
- Networking capability
- Code size/memory usage
- Supplier's reputation
- Customer's desire

Base = Those who currently use a “Commercial” or “Commercial distribution of open source” OS
What are your reasons for **not** using a commercial operating system?

<table>
<thead>
<tr>
<th>Reason</th>
<th>2011 (N = 1065)</th>
<th>2010 (N = 851)</th>
<th>2009 (N = 862)</th>
<th>2008 (N = 491)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current solution works fine</td>
<td>55%</td>
<td>48%</td>
<td>44%</td>
<td>32%</td>
</tr>
<tr>
<td>Commercial alternatives too expensive</td>
<td>51%</td>
<td>50%</td>
<td>49%</td>
<td>48%</td>
</tr>
<tr>
<td>Avoid reliance on commercial supplier</td>
<td>59%</td>
<td>51%</td>
<td>50%</td>
<td>49%</td>
</tr>
<tr>
<td>No need for multitasking</td>
<td>16%</td>
<td>18%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Too much trouble to learn commercial alternative</td>
<td>16%</td>
<td>16%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>Incompatible with existing SW apps or drivers</td>
<td>15%</td>
<td>15%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>Commercial alternatives use too much memory</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Commercial alternatives lack an features I need</td>
<td>15%</td>
<td>16%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Other</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
</tr>
</tbody>
</table>
Who were the greatest influences on the choice of operating system?

- Software engineering staff: 36% (2011), 35% (2010), 33% (2009), 35% (2008)
- Group decision within engineering: 32% (2011), 33% (2010), 34% (2009), 33% (2008)
- Software engineering manager: 34% (2011), 34% (2010), 33% (2009), 33% (2008)
- Same OS as previous project: 26% (2011), 26% (2010), 30% (2009), 32% (2008)
- Corporate management: 32% (2011), 32% (2010), 33% (2009), 34% (2008)
- Hardware engineering staff: 12% (2011), 15% (2010), 15% (2009), 13% (2008)
- Hardware engineering manager: 10% (2011), 14% (2010), 15% (2009), 13% (2008)
- Systems engineering manager: 10% (2011), 14% (2010), 15% (2009), 13% (2008)
- Outside infl./customer/standards: 12% (2011), 14% (2010), 14% (2009), 13% (2008)
- Systems engineering staff: 6% (2011), 7% (2010), 13% (2009), 14% (2008)
- Marketing manager or department: 4% (2011), 6% (2010), 6% (2009), 7% (2008)
- Purchasing manager or department: 3% (2011), 3% (2010), 6% (2009), 7% (2008)

Base: Those who use operating systems.
Did you use the same operating system, RTOS, or kernel as in your previous project?

Base: Those who use operating systems

<table>
<thead>
<tr>
<th>Year</th>
<th>Yes, used same OS, RTOS or kernel</th>
<th>No, didn't use same OS, RTOS or kernel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>2010</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>2009</td>
<td>63%</td>
<td>37%</td>
</tr>
<tr>
<td>2008</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>2007</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Base: Those who use operating systems

2011 (N = 1,840) 2010 (N = 1,492) 2009 (N = 1,501) 2008 (N = 759) 2007 (N = 664)
Why did you use the same operating system?

- Happy with current one, no reason to switch
- Wanted to maintain software compatibility
- Wanted to make use of expertise/familiarity
- Wanted to maintain the same tools or software
- Switching OS too expensive / time-consuming
- Not my choice/operating system chosen for me
- Happy with supplier
- No other suitable alternatives available

Base = Those who are using the same operating system as in previous project.

2011 (N = 1054)
2010 (N = 949)
2009 (N = 943)
2008 (N = 487)
Why did you switch operating systems?

- Hardware or processor changed
- New operating system had better features
- Not my choice/operating system chosen for me
- New operating system had better growth path
- New operating system had better SW/dev tools
- New operating system is cheaper
- Unhappy with previous operating system supplier
- Previous operating system no longer available
- Previous operating system too slow

Base = Those who did not use the same operating system as in previous project

2011 (N = 745)
2010 (N = 505)
2009 (N = 530)
2008 (N = 261)
In 2011, what are the most important factors in choosing an operating system.

- Real-time performance: 50%
- Software-development tools available: 43%
- No royalties: 39%
- Purchase price: 34%
- Small memory footprint: 31%
- Simplicity / ease of use: 30%
- The processors it supports: 27%
- Middleware, drivers, existing code available: 18%
- Open-source availability: 17%
- Rich selection of services and features: 14%
- Compatibility w/ other software, systems: 12%
- My familiarity with the operating system: 11%
- Availability of tech support: 11%
- Freedom to customize or modify: 10%
- The supplier’s reputation: 6%
- The other hardware it supports: 6%
- Popularity: 4%
- Commercial support: 4%
- The supplier’s other products: 1%
- Other: 3%

Base: Currently using an operating system (N = 1840)
Please select ALL of the operating systems you are currently using.

<table>
<thead>
<tr>
<th>Operating System</th>
<th>2011 (%)</th>
<th>2010 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreeRTOS</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Microsoft (XP Embedded)</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Microsoft (Windows CE)</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Wind River (VxWorks)</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Debian (Linux)</td>
<td></td>
<td>13%</td>
</tr>
<tr>
<td>Micrium (uCOS)</td>
<td></td>
<td>13%</td>
</tr>
<tr>
<td>Texas Instruments (DSP/BIOS)</td>
<td></td>
<td>17%</td>
</tr>
<tr>
<td>Inhouse/custom</td>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>Keil (RTX)</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>Red Hat (IX Linux)</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Mentor Graphics (Nucleus)</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Green Hills (Integrity)</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>QNX (QNX)</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>Express Logic (ThreadX)</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>eCos</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>MontaVista (MV Linux)</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>QNX (Neutrino)</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Wind River (Platform neLinux)</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>OSEK (Metrowerks OSEK turbo)</td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Analog Devices (VDK)</td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>CMX (RTX/EmbOS)</td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Wind River (pSOS)</td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Symbian (EPoC)</td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>LynuxWorks (LynxOS)</td>
<td></td>
<td>2%</td>
</tr>
</tbody>
</table>

Operating Systems not shown were at 1% or under

Base: Currently using an operating system

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Please select ALL of the operating systems you are considering using in the next 12 months.

Operating Systems not shown were at 1% or under.

Base: Those who are considering an operating system in any project in the next 12 months.
Are you considering using embedded Linux?

- Yes (Net)
  - 2011 (N = 1,857): 56%
  - 2010 (N = 1,524): 57%
  - 2009 (N = 1,526): 51%
  - 2008 (N = 1,065): 48%

- Yes, using it now
  - 2011 (N = 1,857): 27%
  - 2010 (N = 1,524): 28%
  - 2009 (N = 1,526): 25%
  - 2008 (N = 1,065): 23%

- Yes, likely to use it in next 6 months (soon)
  - 2011 (N = 1,857): 7%
  - 2010 (N = 1,524): 7%
  - 2009 (N = 1,526): 6%
  - 2008 (N = 1,065): 5%

- Yes, likely to use in next 12 months
  - 2011 (N = 1,857): 21%
  - 2010 (N = 1,524): 22%
  - 2009 (N = 1,526): 21%
  - 2008 (N = 1,065): 20%

- No, not interested in using it
  - 2011 (N = 1,857): 44%
  - 2010 (N = 1,524): 43%
  - 2009 (N = 1,526): 49%
  - 2008 (N = 1,065): 52%
Why are you interested in embedded Linux?

- Adaptability/extensibility: 53% (2011), 58% (2010), 57% (2009), 57% (2008)
- Built-in drivers/network protocols: 40% (2011), 41% (2010), 38% (2009), 38% (2008)
- Performance: 39% (2011), 37% (2010), 37% (2009), 37% (2008)
- Control of features/migration: 34% (2011), 37% (2010), 37% (2009), 41% (2008)
- Avoid commercial alternatives: 33% (2011), 31% (2010), 30% (2009), 18% (2008)
- Memory requirements: 18% (2011), 19% (2010), 22% (2009), 18% (2008)

Base = Those who use or are considering using Linux

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**Why are you not interested in embedded Linux?**

<table>
<thead>
<tr>
<th>Reason</th>
<th>2011 (N = 802)</th>
<th>2010 (N = 639)</th>
<th>2009 (N = 747)</th>
<th>2008 (N = 544)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incompatible w/ existing software, apps,</td>
<td>41%</td>
<td>38%</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>drivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory usage</td>
<td></td>
<td>26%</td>
<td>20%</td>
<td>21%</td>
</tr>
<tr>
<td>Performance or real-time capability</td>
<td></td>
<td>21%</td>
<td>22%</td>
<td>20%</td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td>20%</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>Development tools</td>
<td></td>
<td>14%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Legal ambiguity</td>
<td></td>
<td>12%</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>Cost</td>
<td>5%</td>
<td>7%</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>Other*</td>
<td>26%</td>
<td>29%</td>
<td>28%</td>
<td>28%</td>
</tr>
</tbody>
</table>

*Other responses 2011:*
- No need = 13%
- Requirements of app, too big/complex = 4%
- Unfamiliarity = 3%
MICROPROCESSORS
Who were the greatest influences on the choice of the processor for your current project?

- HW engineering staff
- Group decision in engineering
- HW engineering mgr.
- SW engineering staff
- SW engineering mgr.
- Same processor as prev. project
- Corporate mgmt.
- Systems engineering staff
- Systems engineering mgr.
- Outside infl./customer/standards
- Purchasing mgr. or dept.
- Marketing mgr. or dept.
- Other

Survey data:

- 2011 (N = 1,855)
- 2010 (N = 1,510)
- 2009 (N = 1,531)
- 2008 (N = 1,060)
My current embedded project contains:

- **A single microprocessor/microcontroller**: 53%
- **2 processors/microcontrollers**: 27%
- **3 – 5 processors/microcontrollers**: 15%
- **6 – 10 processors/microcontrollers**: 3% (2011), 5% (2010), 3% (2009), 5% (2008)
- **>10 processors/microcontrollers**: 3% (2011), 5% (2010), 4% (2009), 6% (2008)

Note: In 2011, the average number of microcontrollers per project was **2.3**, in 2010 it was **2.6**.
Does your multiple-processor embedded project contain . . .

- Multiple different processor chips: 64% (2011), 60% (2010), 67% (2009), 61% (2008)
- Multiple identical processor chips: 21% (2011), 25% (2010), 23% (2009), 30% (2008)
- Single chip with multiple identical processor cores: 8% (2011), 8% (2010), 7% (2009), 6% (2008)

Base: Those who use multiple microprocessor/microcontrollers for current project

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My current embedded project's main processor is a:

- **8-bit processor**: 13%, 14%, 16% (2011, 2010, 2009)
- **16-bit processor**: 16%, 16%, 17% (2011, 2010, 2009)
- **32-bit processor**: 61%, 60%, 58% (2011, 2010, 2009)
- **64-bit processor**: 6%, 7%, 7% (2011, 2010, 2009)
- **Don't know**: 2%, 2%, 1% (2011, 2010, 2009)
My current embedded project's main processor clock rate is:

- Under 10 MHz: 8%
- 10 – 99 MHz (Net): 39%
- 10 - 24 MHz: 12%
- 25 - 49 MHz: 10%
- 50 - 99 MHz: 14%
- 100 – 249 MHz: 15%
- 250 – 499 MHz: 15%
- 500 – 749 MHz: 16%
- 750 MHz – 999 GHz: 14%
- 1 GHz or more: 12%

Note: In 2011, the average processor clock rate was 291 MHz.
In 2010, it was 314 MHz.

In 2009, 10-99 MHz was broken into three categories for greater granularity.
Did you use the same processor as in your previous embedded project?

Yes, used the same processor as in previous embedded project:
- 2011 (N = 1,859) - 44%
- 2010 (N = 1,516) - 48%
- 2009 (N = 1,533) - 48%
- 2008 (N = 1,060) - 42%
- 2007 (N = 944)

No, did not use the same processor as in previous project:
- 2011 (N = 1,859) - 56%
- 2010 (N = 1,516) - 52%
- 2009 (N = 1,533) - 52%
- 2008 (N = 1,060) - 52%
- 2007 (N = 944)
Why did you use the same processor?

- Happy with current processor/supplier: 59%
- To maintain software compatibility: 59%
- To maintain the same tools or software: 53%
- To make use of expertise/familiarity: 51%
- Switching is too expensive/time-consuming: 48%
- Not my choice/processor chosen for me: 47%
- No other suitable processors available: 46%

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: 48% (2011), 31% (2010), 28% (2009), 20% (2008), 17% (2007)
- Previous processor too slow: 26% (2011), 26% (2010), 26% (2009), 23% (2008), 24% (2007)
- New processor had better future growth path: 24% (2011), 24% (2010), 23% (2009), 26% (2008), 26% (2007)
- New processor had better SW/dev tools: 23% (2011), 20% (2010), 17% (2009), 17% (2008), 18% (2007)
- Not my choice/processor chosen for me: 18% (2011), 14% (2010), 15% (2009), 15% (2008), 14% (2007)
- Previous processor no longer available: 16% (2011), 15% (2010), 17% (2009), 16% (2008), 16% (2007)
- Previous processor too expensive: 12% (2011), 15% (2010), 15% (2009), 10% (2008), 9% (2007)
- Previous processor didn’t meet thermal/power req.: 7% (2011), 8% (2010), 8% (2009), 8% (2008), 8% (2007)
- Unhappy with previous processor's supplier: 3% (2011), 2% (2010), 4% (2009), 5% (2008), 8% (2007)

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

Choose a processor from a different family, architecture, or instruction set

<table>
<thead>
<tr>
<th>Year</th>
<th>Base</th>
<th>2011 (N = 1003)</th>
<th>2010 (N = 761)</th>
<th>2009 (N = 768)</th>
<th>2008 (N = 534)</th>
<th>2007 (N = 517)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>55%</td>
<td>52%</td>
<td>57%</td>
<td>54%</td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>45%</td>
<td>48%</td>
<td>43%</td>
<td>46%</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>43%</td>
<td>46%</td>
<td>41%</td>
<td>44%</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>41%</td>
<td>44%</td>
<td>41%</td>
<td>44%</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>40%</td>
<td>41%</td>
<td>41%</td>
<td>44%</td>
<td>47%</td>
<td></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: 43%, 45%, 48%
- The ecosystem surrounding the chip (software, tools, support, etc.): 36%, 34%, 46%, 43%, 41%
- The chip’s supplier/vendor: 57%, 59%, 11%, 13%, 10%

Data from 2007 to 2011:
- 2007: N = 928
- 2008: N = 1,056
- 2009: N = 1,530
- 2010: N = 1,501
- 2011: N = 1,859
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
  - 2011 (N = 1,843): 71%
  - 2010 (N = 1,497): 70%
- The chip's performance
  - 2011 (N = 1,843): 50%
  - 2010 (N = 1,497): 53%
- The chip's cost
  - 2011 (N = 1,843): 38%
  - 2010 (N = 1,497): 44%
- The operating systems it supports
  - 2011 (N = 1,843): 49%
  - 2010 (N = 1,497): 41%
- The on-chip I/O or peripherals
  - 2011 (N = 1,843): 35%
  - 2010 (N = 1,497): 34%
- Available middleware, drivers, existing code
  - 2011 (N = 1,843): 33%
  - 2010 (N = 1,497): 34%
- HW development tools available
  - 2011 (N = 1,843): 38%
  - 2010 (N = 1,497): 41%
- The chip's power consumption
  - 2011 (N = 1,843): 28%
  - 2010 (N = 1,497): 32%
- Familiarity w/ architecture/chip family
  - 2011 (N = 1,843): 15%
  - 2010 (N = 1,497): 14%
- Chip family's future growth path
  - 2011 (N = 1,843): 12%
  - 2010 (N = 1,497): 14%
- The supplier's reputation
  - 2011 (N = 1,843): 14%
  - 2010 (N = 1,497): 13%
- The processor's debug support
  - 2011 (N = 1,843): 8%
  - 2010 (N = 1,497): 8%
Please select the processor vendors you are familiar with.

<table>
<thead>
<tr>
<th>Processor Vendor</th>
<th>2011 (N=1,744)</th>
<th>2010 (N=1,416)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM (any vendor)</td>
<td>56%</td>
<td>52%</td>
</tr>
<tr>
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Please select the processor vendors you are currently using.

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Please select the processor vendors you are considering using on your next project.

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</table>
Which of the following 32-bit chip families would you consider for your next embedded project?

- ARM Cortex/ARM9/ARM11: 47%
- TI OMAP (ARM): 38%
- STMicro STM32 (ARM): 24%
- Intel Atom, Pentium, Celeron, Core iX: 21%
- Microchip PIC 32-bit (MIPS): 19%
- Atmel AT91xx (ARM): 19%
- NXP ARM: 18%
- Atmel (AVR32): 17%
- Freescale Kinetis (Cortex-M4): 16%
- Freescale 68K, ColdFire: 15%
- Altera Nios II (soft core): 14%
- Xilinx MicroBlaze (soft-core): 13%
- Luminary Micro Stellaris (ARM): 12%
- NXP LPC: 11%
- Freescale PowerPC 7xx, 8xx: 10%
- Freescale PowerPC 55xx: 10%
- Freescale PowerQUICC: 9%
- Xilinx Virtex-5 (with PowerPC 405): 8%
- Freescale PowerPC 5xx, 6xx: 8%
- Cypress PSOC 5 (ARM): 7%
- Freescale DragonBall MX (ARM): 6%
- AMD Fusion, Athlon, Opteron, Geode: 6%
- Renesas SuperH, H8SX, M32C, M32R: 5%
- Marvell: 5%
- Xilinx Virtex-4 (with PowerPC 405): 4%
- IBM PowerPC 4xx, 7xx: 3%
- Actel ProASIC 3 (ARM): 3%
- NXP: 3%
- Intel Itanium: 3%
Which of the following 16-bit chip families would you consider for your next embedded project?

- Microchip PIC24 / dsPIC 2011: 42% / 2010: 40%
- TI MSP430 2011: 42% / 2010: 38%
- Freescale HC16 2011: 21% / 2010: 22%
- Freescale HC12 2011: 17% / 2010: 16%
- STMicro ST9, ST10 2011: 16% / 2010: 16%
- Intel 8086, '186, '286 2011: 15% / 2010: 16%
- Renesas H8/300H, H8S, H8S/2000, M16C 2011: 12% / 2010: 8%
- AMD 186, '188 2011: 11% / 2010: 8%
- Zilog Z180, Z380 2011: 5% / 2010: 6%
- Maxim 2011: 5% / 2010: 4%
- Infineon 'C161, 'C167 2011: 5% / 2010: 5%
- Other 2011: 6% / 2010: 6%
Which of the following 8-bit chip families would you consider for your next embedded project?

- Atmel AVR: 36% (2011), 39% (2010)
- Freescale HC05, HC08, HC11: 23% (2011), 22% (2010)
- STMicro ST6, ST7, ST8: 14% (2011), 16% (2010)
- Cypress PSoC: 11% (2011), 13% (2010)
- Atmel 80xx: 10% (2011), 12% (2010)
- Renesas*: 9% (2011), 8% (2010)
- NXP/Philips P80x, P87x, P89x: 8% (2011), 5% (2010)
- SiLabs 80xx: 7% (2011), 4% (2010)
- Maxim 80xx: 5% (2011), 4% (2010)
- Infineon C500: 3% (2011), 3% (2010)
- NEC K0: 2% (2011), 3% (2010)
- Other: 6% (2011), 6% (2010)

*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?

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<td>TI 'C5000</td>
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<tr>
<td>Freescale 563xx, 566xx, 568xx, 96xxx</td>
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<td>TI 'C3x, 'C8x</td>
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<td>Freescale StarCore 71xx, 81xx</td>
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<td>Other</td>
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</table>
FPGAs, MEMORY, LCDs
Does your current embedded project contain FPGAs/programmable logic?

- Yes: 38% (2011), 42% (2010), 45% (2009)

(N = number of respondents)
If yes, which of the following vendors does your current embedded projects use for FPGAs?

- **Xilinx**: 62% (2011), 65% (2010), 69% (2009)
- **Altera**: 42% (2011), 42% (2010), 41% (2009)
- **Actel**: 11% (2011), 9% (2010), 11% (2009)
- **Lattice**: 8% (2011), 9% (2010), 12% (2009)
- **Atmel**: 6% (2011), 7% (2010), 6% (2009)
- **Mentor Graphics**: 5% (2011), 5% (2010), 5% (2009)
- **Cypress**: 5% (2011), 5% (2010), 5% (2009)
- **Synopsys/Synplicity**: 3% (2011), 3% (2010), 3% (2009)
- **Cadence**: 2% (2011), 2% (2010), 2% (2009)
- **Quicklogic**: 2% (2011), 2% (2010), 2% (2009)
- **Other**: 3% (2011), 2% (2010), 2% (2009)
Will your **next** embedded project likely contain FPGAs/programmable logic?

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<td>2008</td>
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<tr>
<td>2007</td>
<td>58%</td>
<td>43%</td>
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</table>

*Note: 2011 (N = 1,846) 2010 (N = 1,517) 2009 (N = 1,519) 2008 (N = 1,072) 2007 (N = 927)*
For 2011 only -- which of the following vendors does your current embedded projects use for FPGAs, and which will you consider in your next embedded project?

- **2011 Currently use (N = 690)**
  - Xilinx: 62%
  - Altera: 42%
  - Actel: 11%
  - Lattice: 8%
  - Atmel: 6%
  - Mentor Graphics: 5%
  - Cypress: 3%
  - Synopsys/Synplicity: 3%
  - Cadence: 2%
  - Quicklogic: 1%
  - Other: 3%

- **2011 Will consider (N = 759)**
  - Xilinx: 73%
  - Altera: 58%
  - Actel: 19%
  - Lattice: 15%
  - Atmel: 12%
  - Mentor Graphics: 9%
  - Cypress: 9%
  - Synopsys/Synplicity: 4%
  - Cadence: 3%
  - Quicklogic: 2%
  - Other: 4%
HARDWARE IPs, MEMORY, ESL DESIGN TOOLS & LCDs
Does your current embedded project reuse hardware or hardware IP from a previous project?

- No, all new hardware, no hardware or IP reuse: 27.5% (2011), 27.3% (2010)
- Yes, reused some hardware or IP that was developed in-house: 62.5% (2011), 62.1% (2010)
- Yes, reused some commercial (purchased) hardware or IP: 7.1% (2011), 7.3% (2010)
- Yes, reused some public domain hardware IP: 3.0% (2011), 3.3% (2010)
What type of flash memory will your next embedded project use?

- NAND: 40% (2011), 39% (2010)
- NOR: 8% (2011), 8% (2010)
- Neither: 21% (2011), 21% (2010)
When looking for flash memory, which of the following criteria is most important?

- Technical specs: 34% (2011), 34% (2010)
- Vendor's reputation: 3% (2011), 4% (2010)
- Other: 3% (2011), 3% (2010)
How do you stay up to date on the latest memory technologies?

- Industry websites/publications: 62% (61%)
- Directly from the vendors: 48% (50%)
- Distributors: 27% (26%)
- Webinars: 20% (21%)
- Other: 3% (2%)
How much of a concern is IP security in your next FPGA or custom logic design?

- Critical concern: 10%
- Important concern: 19%
- Average concern: 22%
- Minor concern: 15%
- Not at all a concern: 34%

2011 (N = 1765)
Do you or your organization currently use electronic system-level (ESL) design tools?

  - **2011 (N = 1,754)**
  - **2010 (N = 1,437)**
  - **2009 (N = 1,462)**
  - **2008 (N = 983)**
  - **2007 (N = 863)**

- **Yes, we currently use it**: 10% in 2011, 14% in 2010, 12% in 2009, 10% in 2008, 12% in 2007.

- **Yes, we are planning to use it in the next 6 months**: 3% in 2011, 4% in 2010, 3% in 2009, 3% in 2008, 3% in 2007.

- **Yes, we are planning to use it some time in the future**: 10% in 2011, 8% in 2010, 8% in 2009, 9% in 2008, 9% in 2007.

- **No, we do not use nor plan to use**: 77% in 2011, 74% in 2010, 78% in 2009, 78% in 2008, 76% in 2007.
If you prefer specific brands of displays, which of the following brands do you prefer?

- Sharp: 43%
- NEC: 41%
- Optrex: 20%
- Mitsubishi: 13%
- Other: 20%

Note 1: This question was asked differently in 2010 and the answers are not able to be compared.
Note 2: Multiple response answers do not add to 100%
APPENDIX

SLIDES FOR REFERENCE

OR SPECIAL USE
Write in your 2 Favorite Websites

- EETimes sites: 401
- embedded.com: 266
- digikey.com: 86
- google.com: 72
- linkedin.com: 65
- Ti.com: 62
- ieeexplore.ieee.org: 54
- ednmag.com: 45
- Microchipdirect.com: 39
- wikipedia.org: 37
- freescale.com: 34
- Msdn.com: 33
- xilinx.com: 22
- Mouser.com: 21
- stackoverflow.com: 20
- electronicdesign.com: 17
- analog.com: 16
- slashdot.org: 16
- drdobbs.com: 12
- arm.linux.org.ukdeveloper: 12
- altera.com: 12
- codeproject.com: 11
- circuitcellar.com: 11
Favorite Hardware Tools

- Digital oscilloscope/Oscilloscope
- Logic analyzer (no brand specified)
- DMM Multimeter
- JTAG all
- ICE
- Debugger
- Tektronix scope
- Soldering Iron
- Xilinx
- Altium
- DVM
- OrCAD
- Agilent (combo)
- Microchip ICD/MP Lab
- Mentor Graphics (Mentor)
- Bench Power Supply
- Device Programmer
- Altera Quartus II
- Lauderbach debugger
- BDM
- Spectrum analyzer
- USB Analyzer
-Cadence
- Emulator
- Signal analyzer