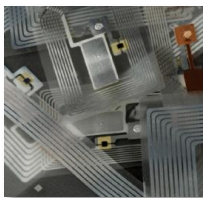






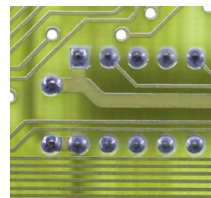
**VDC Research Group** (VDC) provides exceptionally detailed direct-contact primary market research and consulting services to many of the world's largest technology suppliers, innovative start-ups and leading investors. The firm is organized around six practices, each with its own focused area of coverage. Our clients rely on us for highly segmented research and analysis which is derived from our unwavering commitment to the idea that all markets are collections of smaller market segments and that winning companies must develop and execute strategies that are segment-specific.

Please visit our website at [www.vdcresearch.com](http://www.vdcresearch.com) to learn more, or call **508.653.9000**.



## AutoID & Transaction Automation

[MEET THE TEAM](#)



## Embedded Hardware & Systems

[MEET THE TEAM](#)



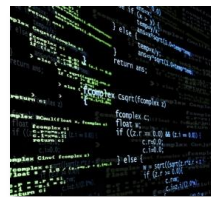
## Mobile & Wireless

[MEET THE TEAM](#)



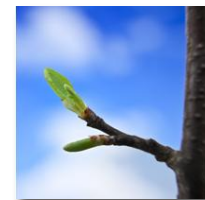
## Industrial Automation & Control

[MEET THE TEAM](#)



## Embedded Software & Tools

[MEET THE TEAM](#)



## Emerging Technologies

[ABOUT THE PRACTICE](#)



## Steve Balacco

*Director, Embedded Software & Tools*

Steve has more than nine years experience conducting market research studies and managing all of the market research programs for VDC's Embedded Software and Development Tools practice. His project-related experience is diverse and includes coverage of a number of embedded software technologies for syndicated research including embedded operating systems, software development tools, java, databases, and Linux, Windows Embedded, market statistics, and test automation tools. Steve holds a BSBA from Eastern Nazarene College.

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## Jared Weiner

*Analyst*

Jared supports all of the Embedded Software and Tools practice's major research programs and is a contributor on custom research and consulting engagements. His work includes coverage of embedded operating systems, software development tools, modeling and test tools, and more. He has additional research experience in education and financial services. Jared received an MBA from Babson College in 2007, and graduated from Bentley College in 2002 with a BS in Information Design and Corporate Communication.

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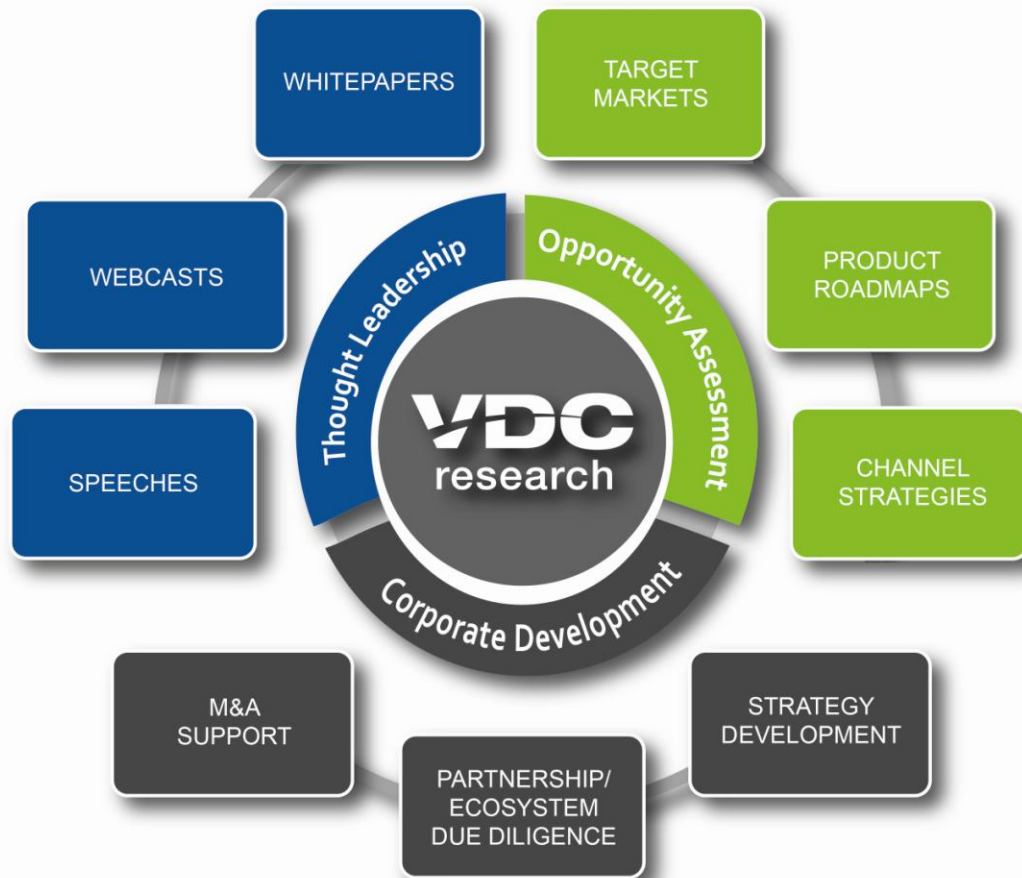


## Christopher Rommel

*Senior Analyst*

At VDC, Chris is responsible for market analyses and data collection on multiple projects and topics within VDC's Embedded Software Market Intelligence Program including developer trends and requirements, market sizes, and key technical requirements. Chris has authored numerous market research studies on Linux, multi-core components and tools, embedded/real-time and mobile application operating systems, software development tools, software and system modeling tools, and test automation tools. Chris is a graduate of Brown University.

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Our syndicated research is the basis for the many ways VDC can help you grow your business. We offer a wide variety of services designed to meet specific tactical and strategic decision support needs. All of our services are built on a foundation of highly skilled professionals applying robust methodologies to VDC's large and continuously refreshed datasets.

# Message To Our Research Participants

Thank you for your participation in VDC's 2011 Embedded Engineering Survey. We greatly appreciate you sharing your insights and requirements. We hope you find the following survey data of interest and look forward to hearing from you again in the course of our future market research.

## INCLUDED IN THIS REPORT ARE SURVEY DATA RELATING TO:

- Engineer demographics
- Project requirements and preferences

## FOR MORE INFORMATION:

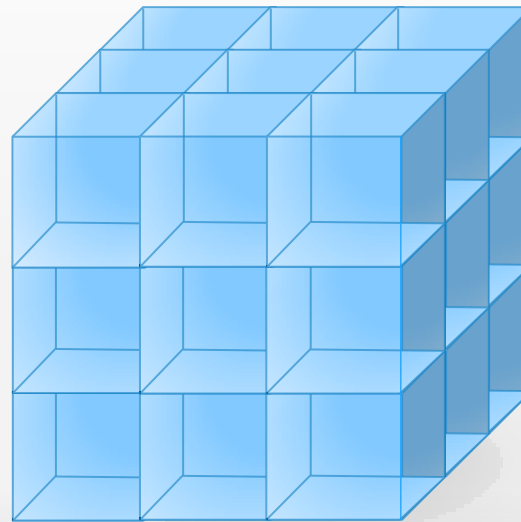
- For updates on the latest embedded news visit our Embedded Software and Tools blog [here](#).
- For more information on VDC's Embedded Software and Tools Practice click [here](#).
- Register to receive complimentary research and updates [here](#).

### Geographic Regions

- Americas
- EMEA
- Asia-Pacific

### Embedded Software & Tools Market Technologies

- Embedded/Real-Time Operating Systems
- Android & Linux in the Embedded Systems Market
- Mobile Operating Systems
- Virtualization for Mobile & Embedded Systems
- Multicore Components & Tools
- Safety & Security



### Industry Segments

- Automotive/Rail/Transportation
- Consumer Electronics
- Industrial Automation
- Medical Devices
- Military/Aerospace
- Mobile Phones
- Office/Business Automation
- Retail Automation
- Telecom/Datacom
- Others

## *Methodology*

Specifically, our research efforts are focused on the embedded engineer community to provide insight into current development projects - requirements, preferences and trends – to offer an understanding about the dynamics of the Embedded Software and Hardware market.

**THIS REPORT CONTAINS SELECT WEB-BASED SURVEY RESPONSES COLLECTED IN THE MARCH TO JULY 2011 TIMEFRAME FROM EMBEDDED SYSTEMS DEVELOPERS AND ENGINEERS.**

**TO DEVELOP THIS SURVEY HIGHLIGHTS REPORT, VDC EMPLOYED THE FOLLOWING RESEARCH METHODS:**

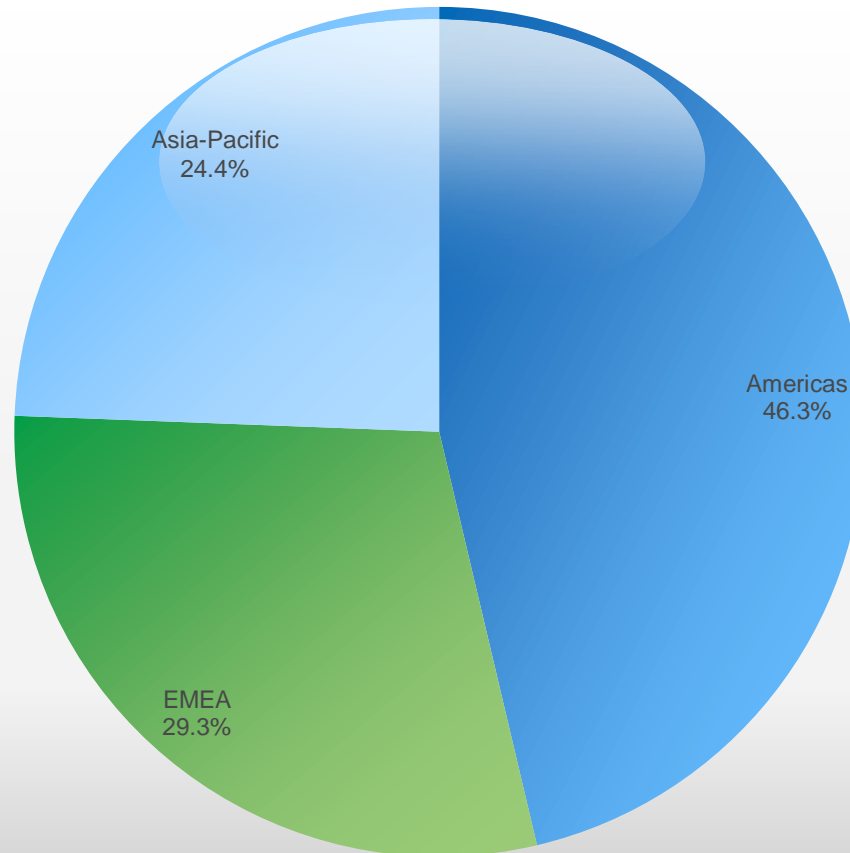
- **Web-Based Surveys** – An extensive survey was e-mailed to over 75,000 embedded systems engineers with the primary purpose of understanding the market's interest, opinions, and trends. Developers surveyed include subscribers to Ganssle Group, EmbeddedGurus.net, eg3.com, LinkedIn Embedded systems groups, Google and Yahoo discussion forums, and Research Now, as well as from VDC's embedded developer panel. The first 500 respondents to complete the survey were provided an incentive to receive a \$10 gift certificate to Amazon or have VDC donate \$10 to FIRST. In addition, all respondents were entered into a drawing for an iPad 2 grand prize. VDC received 870 total responses.
- **Data Analysis** – VDC used SPSS, an industry standard statistical software package, and Microsoft Excel for the statistical analysis used to produce our findings within this report. Other analyses were performed using proprietary VDC tools and techniques.

PAGE

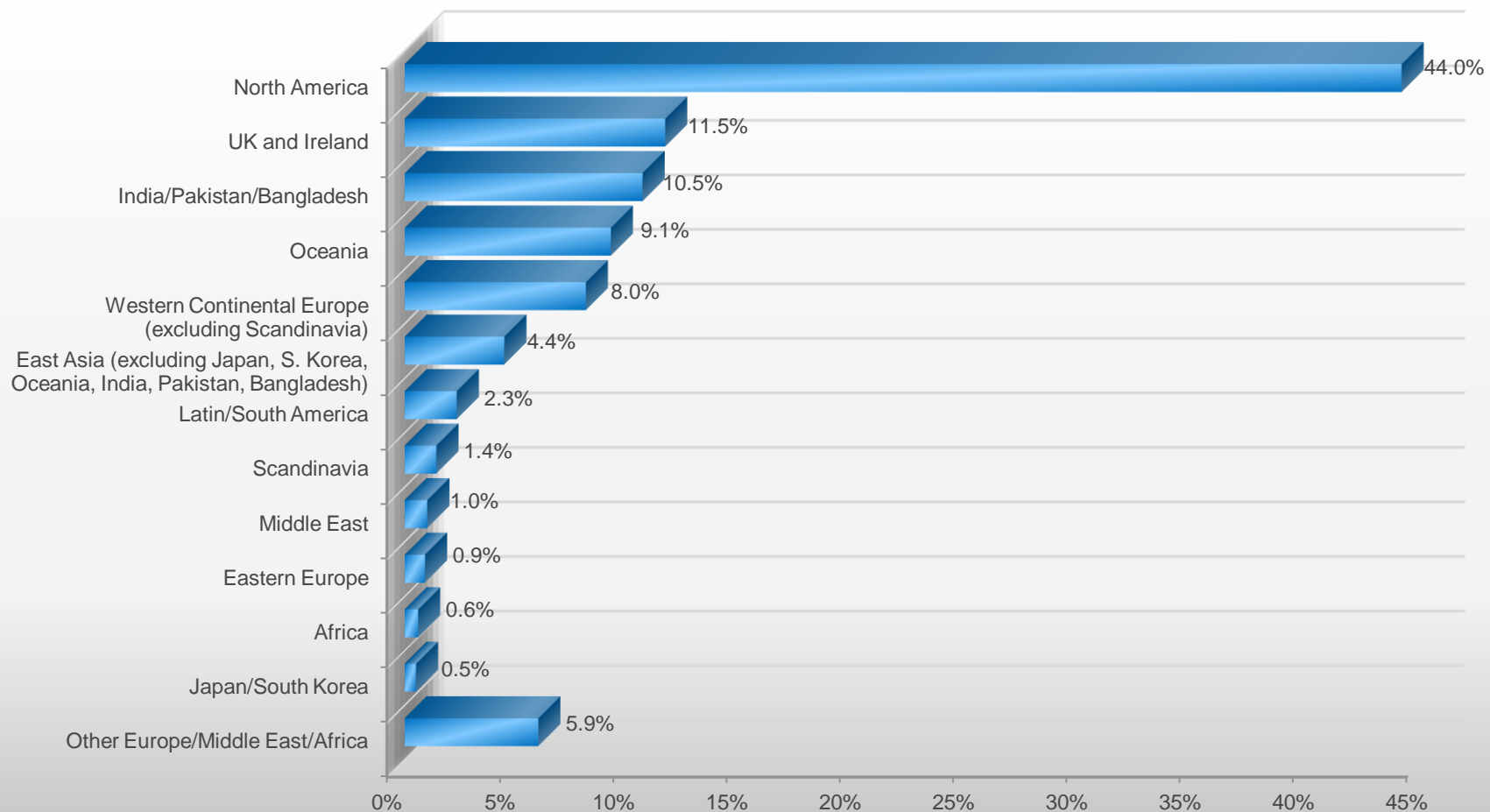
7

## 2011 Embedded Engineer Survey Research Highlights - Select Survey Data

Survey Respondents Segmented by Geographic Region  
(Percent of Respondents)

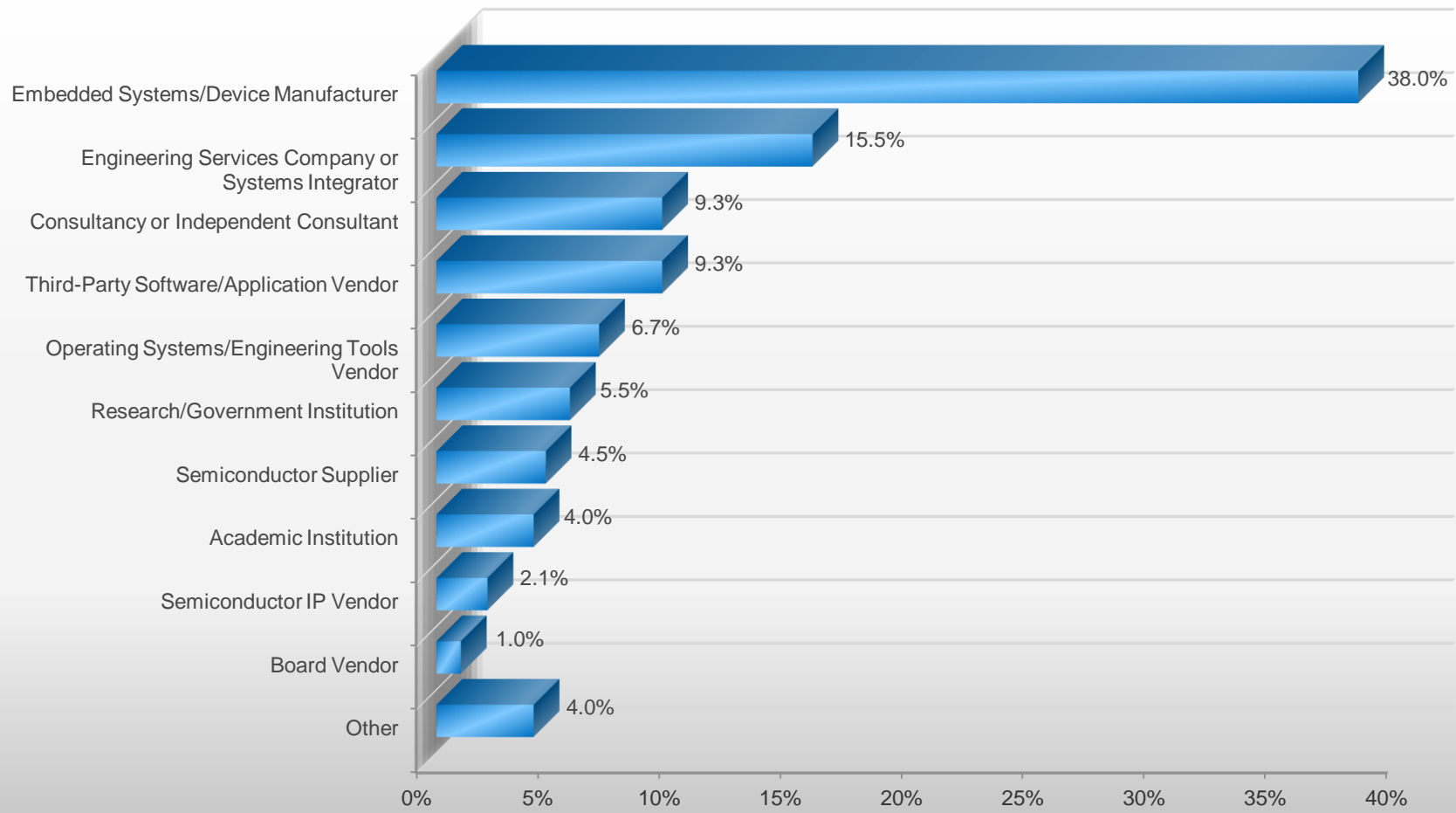


Survey Respondents Segmented by Geographic Sub-region  
(Percent of Respondents)



## Company type for which respondent works

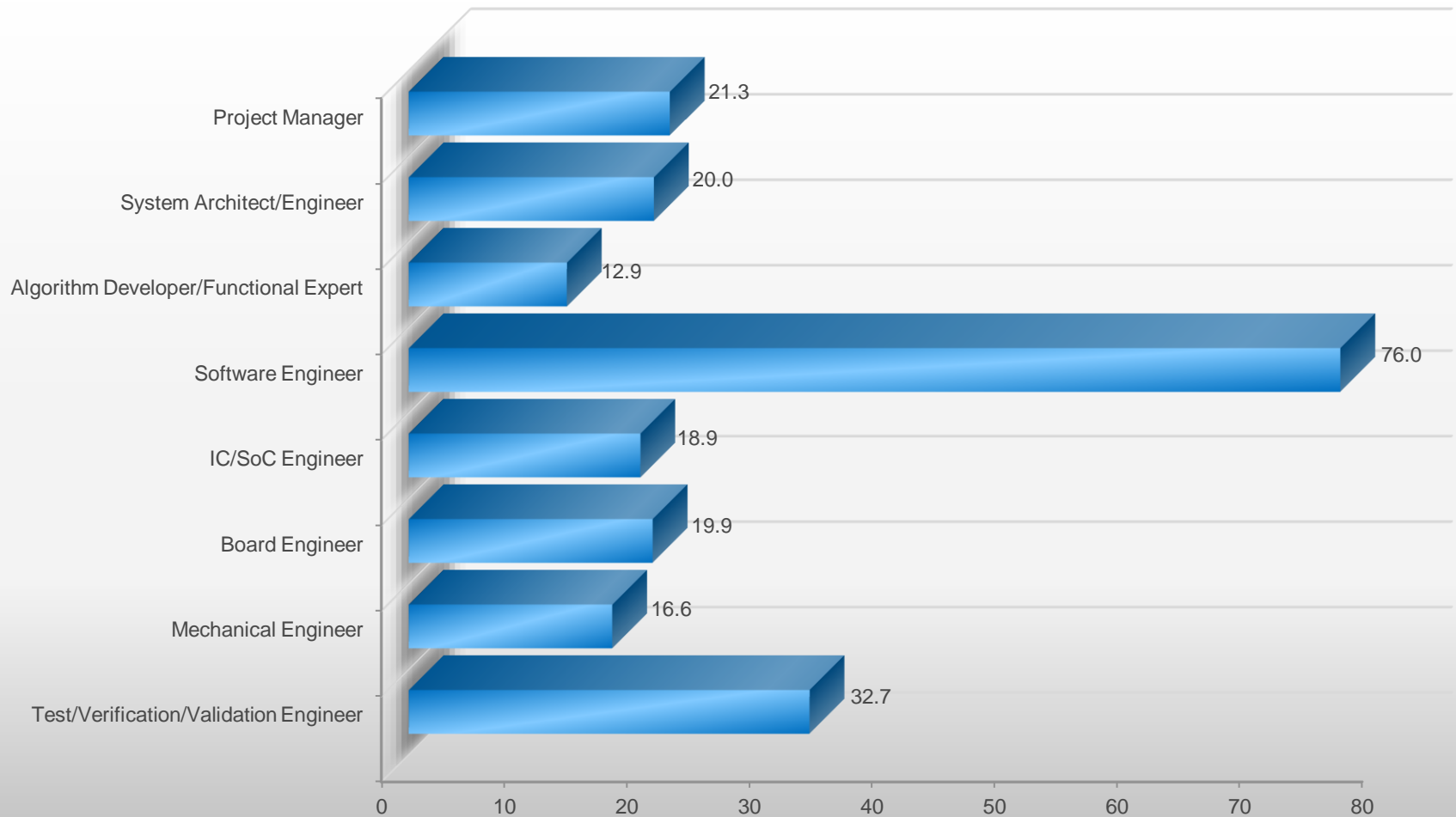
Types of Company/Organization for Which Respondents Work  
(Percent of Respondents)



### Number and Types of Embedded Systems Engineers at Respondents Companies

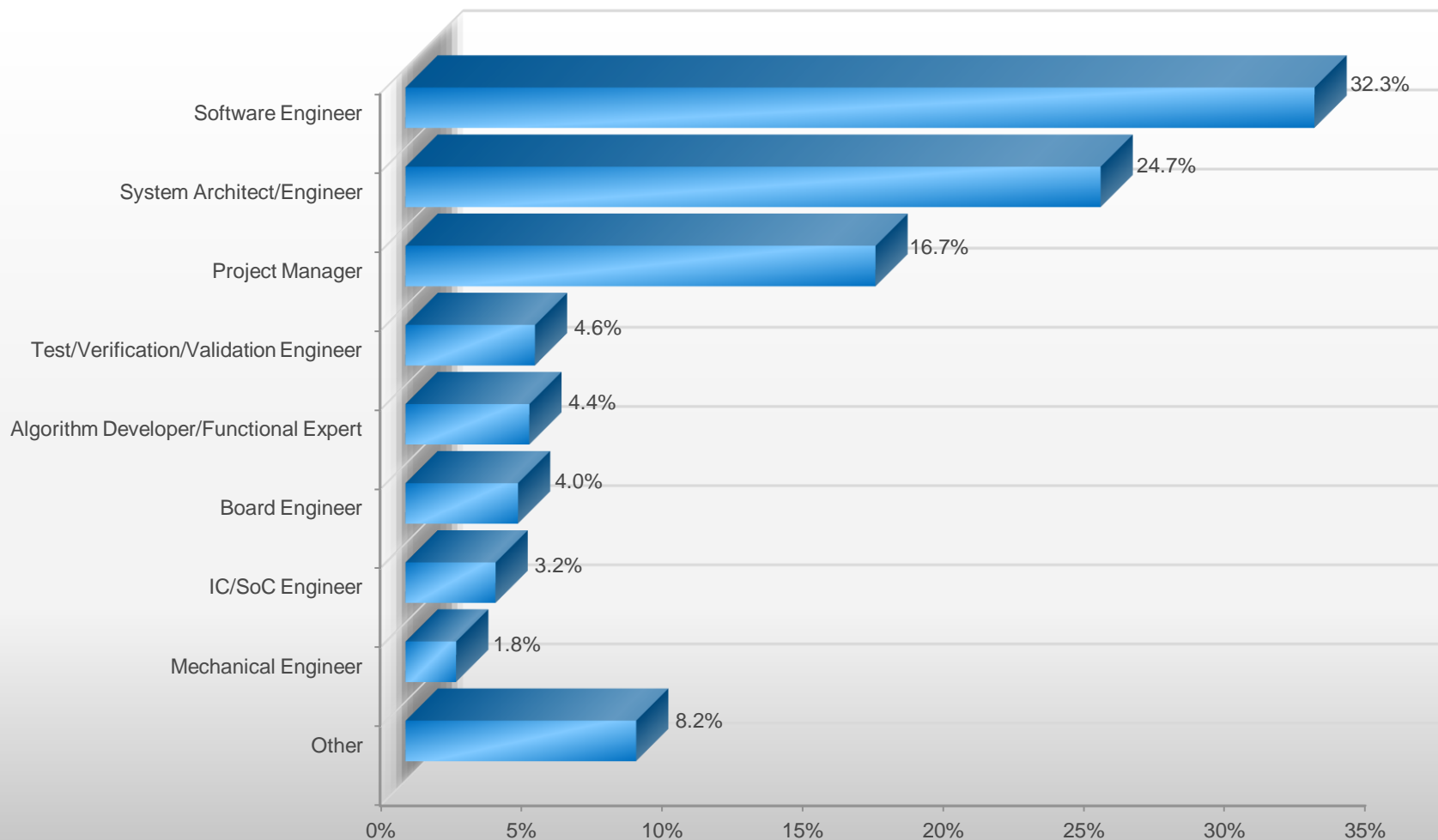
(Mean of Respondents)

Total = 218.3



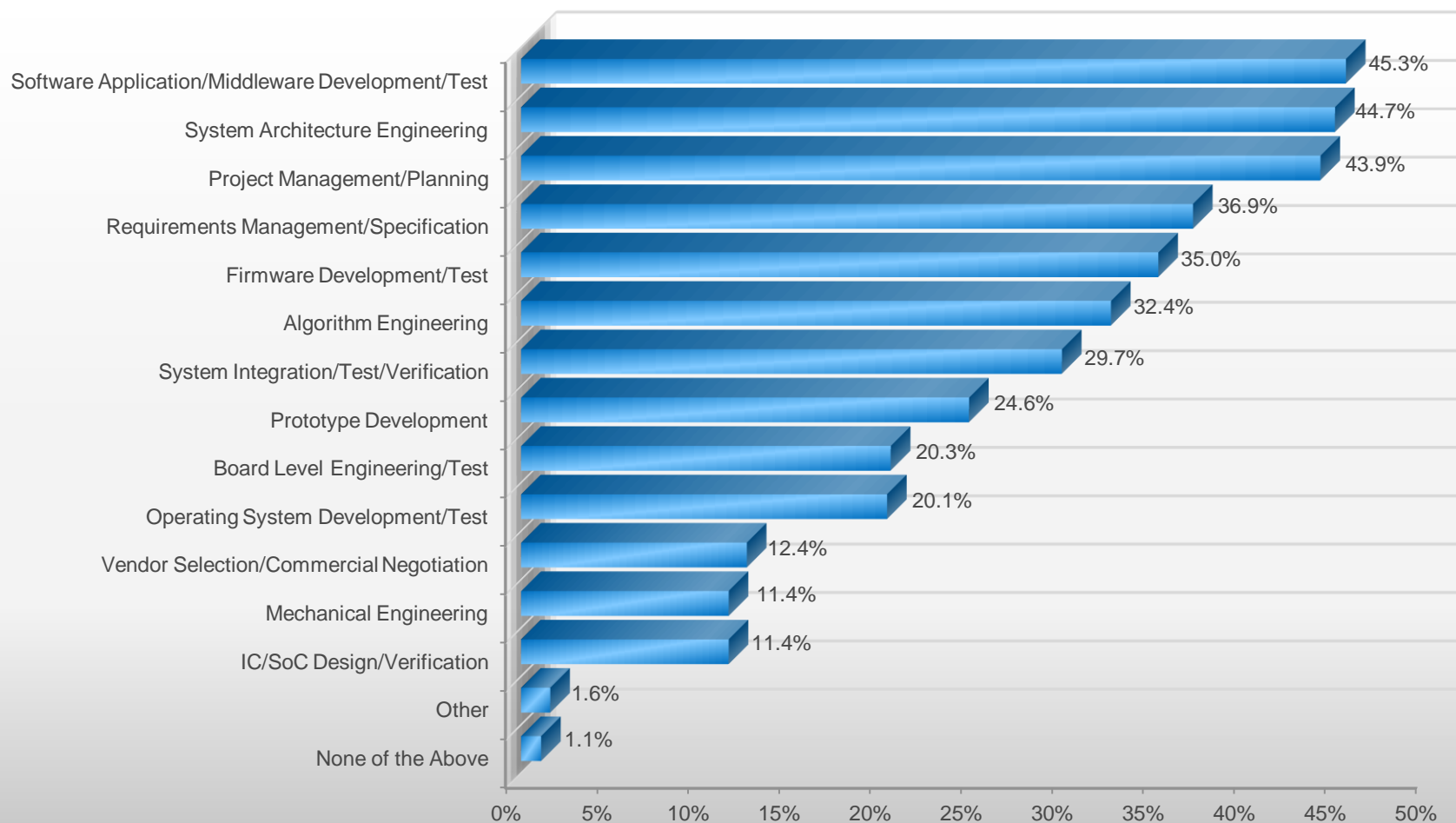
## Survey respondents primary role

Survey Respondents Segmented by Primary Role Within Company  
(Percent of Respondents)



## Survey respondents tasks involved in on the current project

**Project Tasks Respondents are Personally Involved in on Current Project**  
(Percent of Respondents)



Note: Percentages sum to over 100% due to multiple responses.

## Respondent company demographics

### Number of Different Embedded Engineering Projects Started by Respondents' Companies in 2010

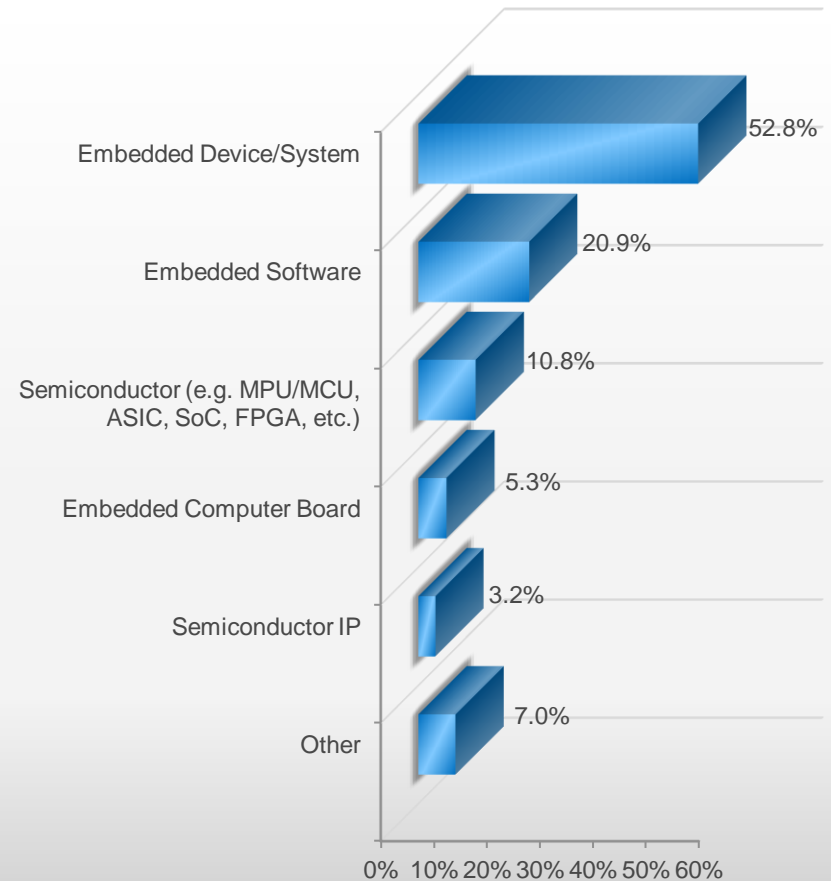
(Average of Respondents)

**Mean** = 9.3

**Median** = 4.0

### Type of Product Project Team Developing

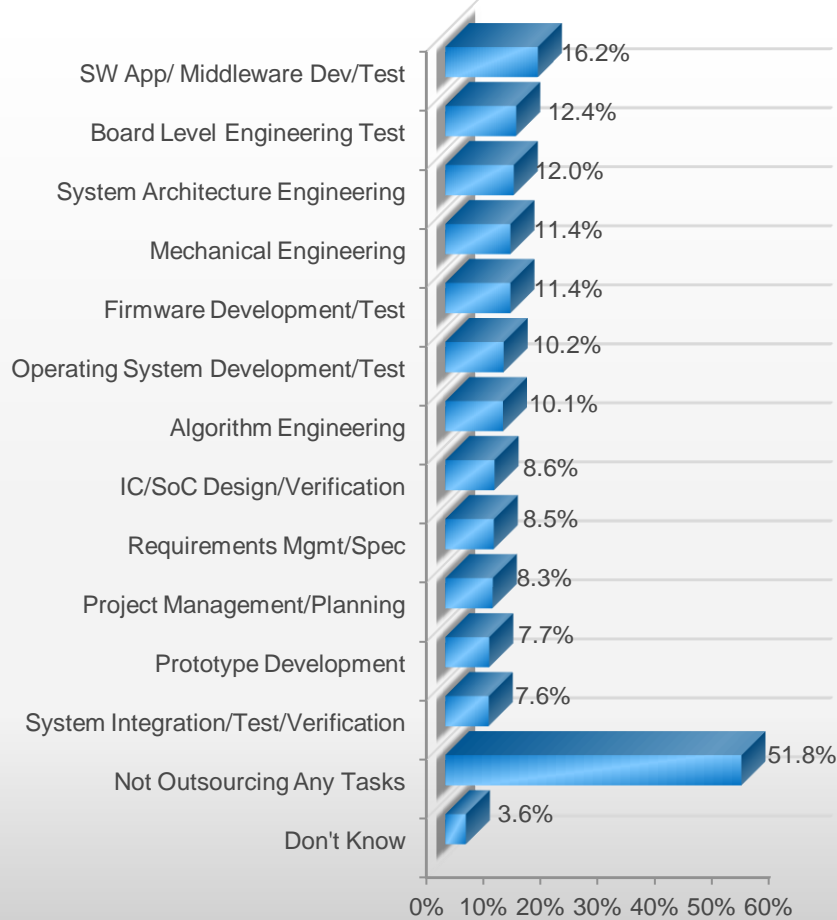
(Percent of Respondents)



## Outsourcing

### Engineering Tasks Outsourced to External Companies

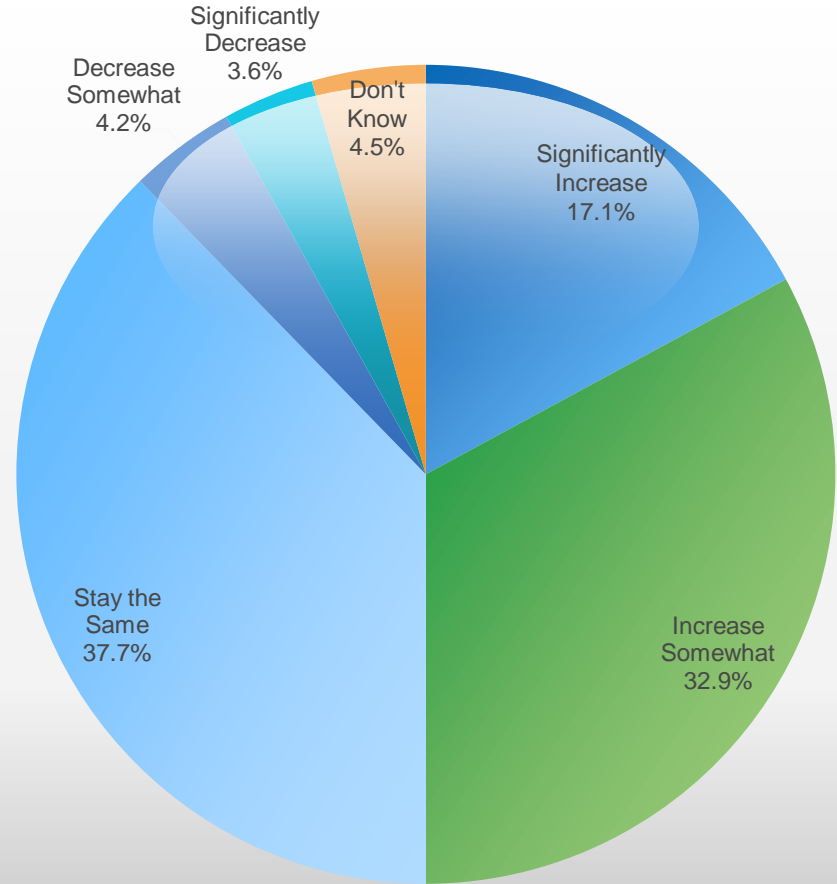
(Average of Respondents)



Note: Percentages sum to over 100% due to multiple responses.

### Expected Change in Amount of Outsourcing

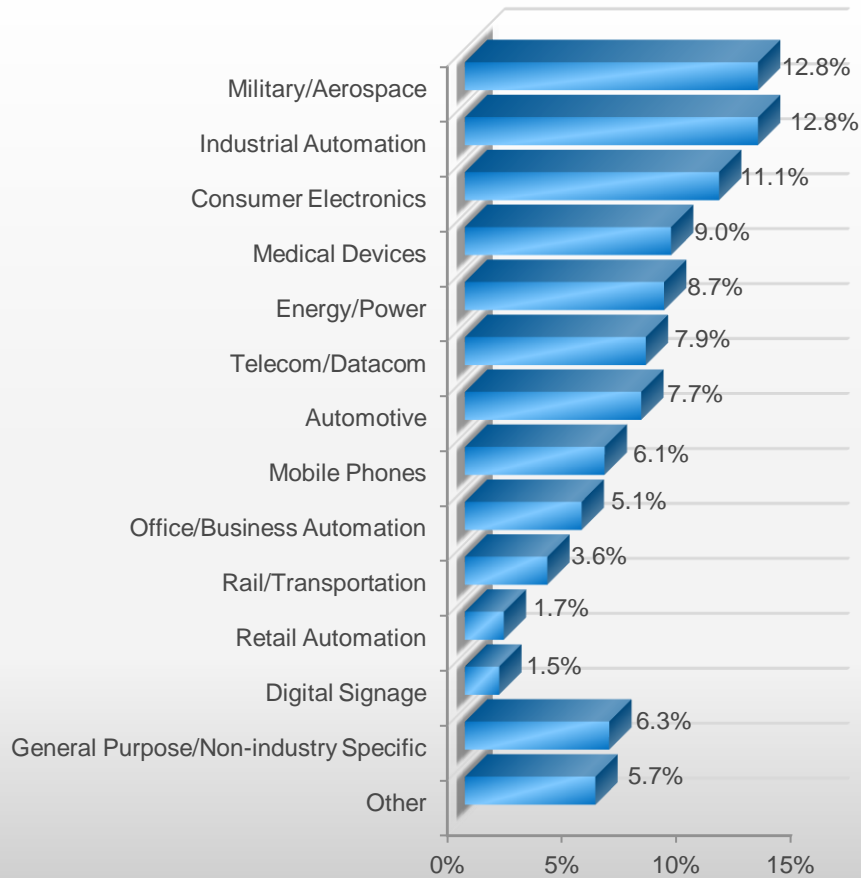
(Percent of Respondents)



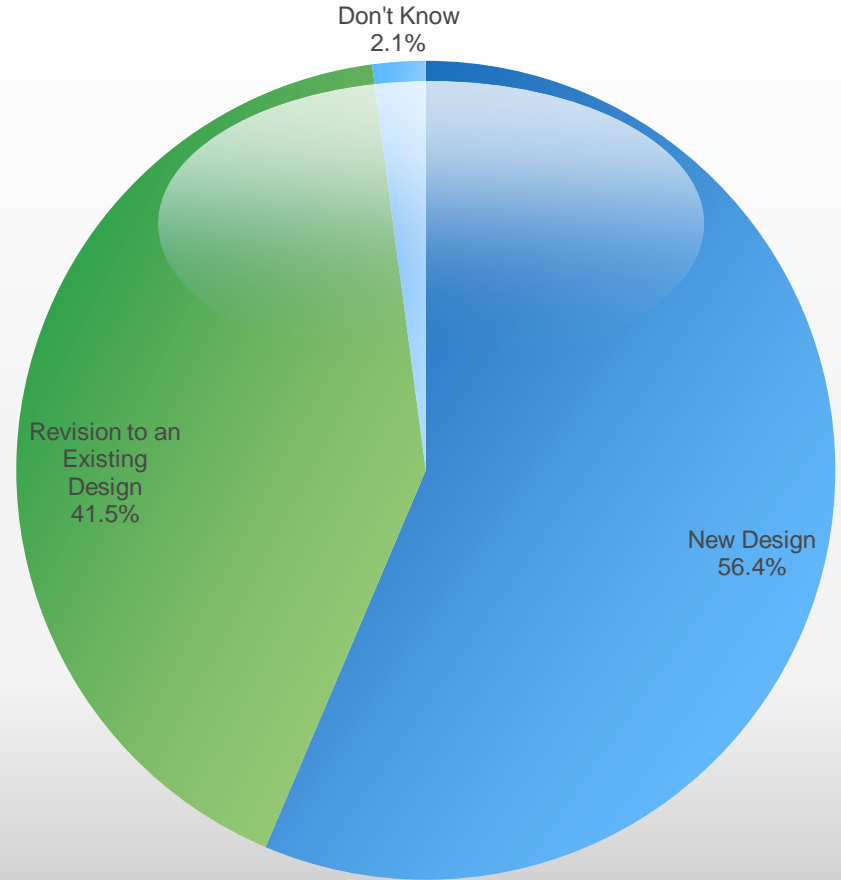
# Select Survey Data

Industry development project is targeted

Survey Respondents Segmented by the Target Industry/Application of their Current Project  
(Percent of Respondents)

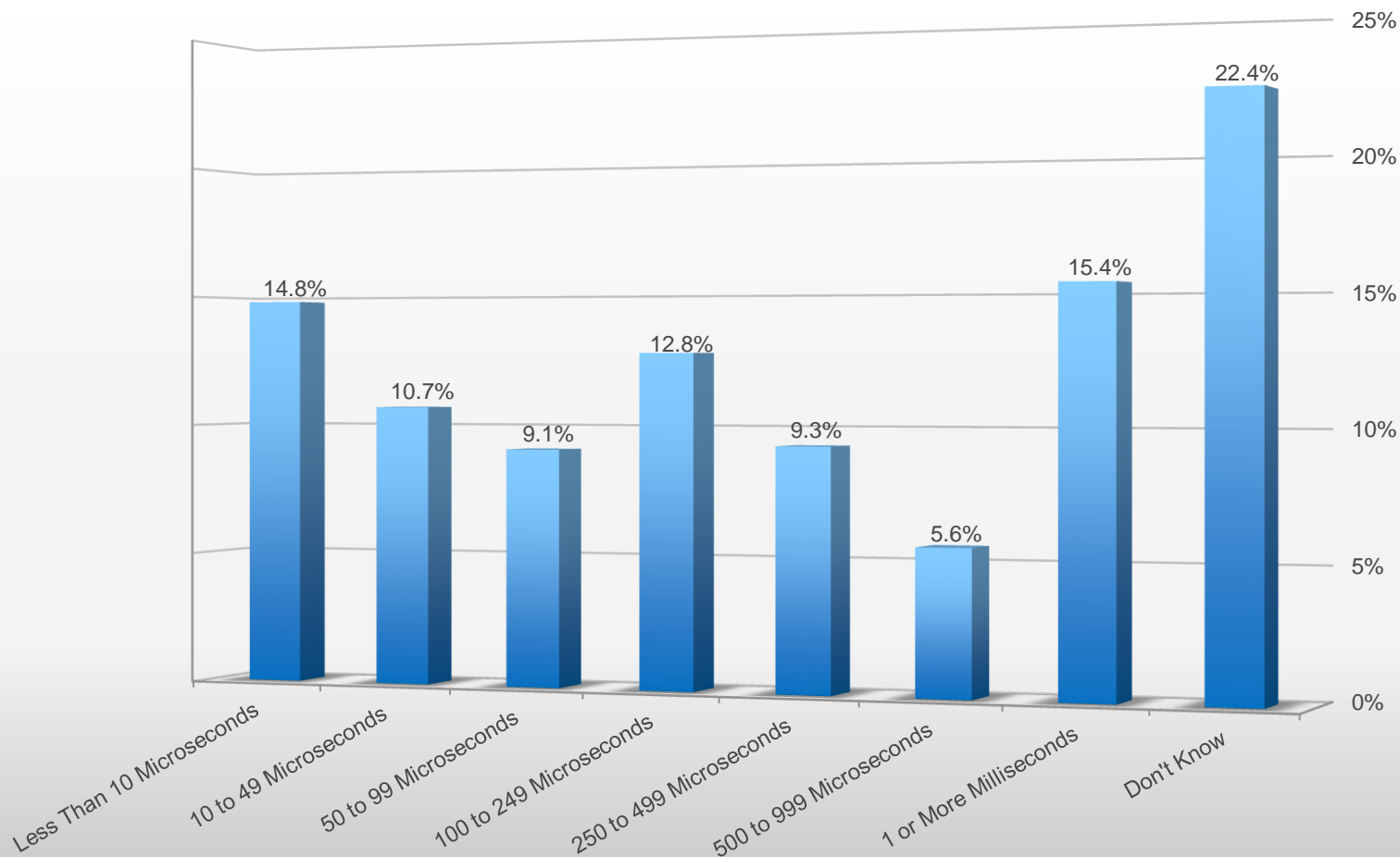


Product Design Type  
(Percent of Respondents)



## Current projects' real-time requirements

Respondents Current Project Application Interrupt Real-time Requirements  
(Percent of Respondents)

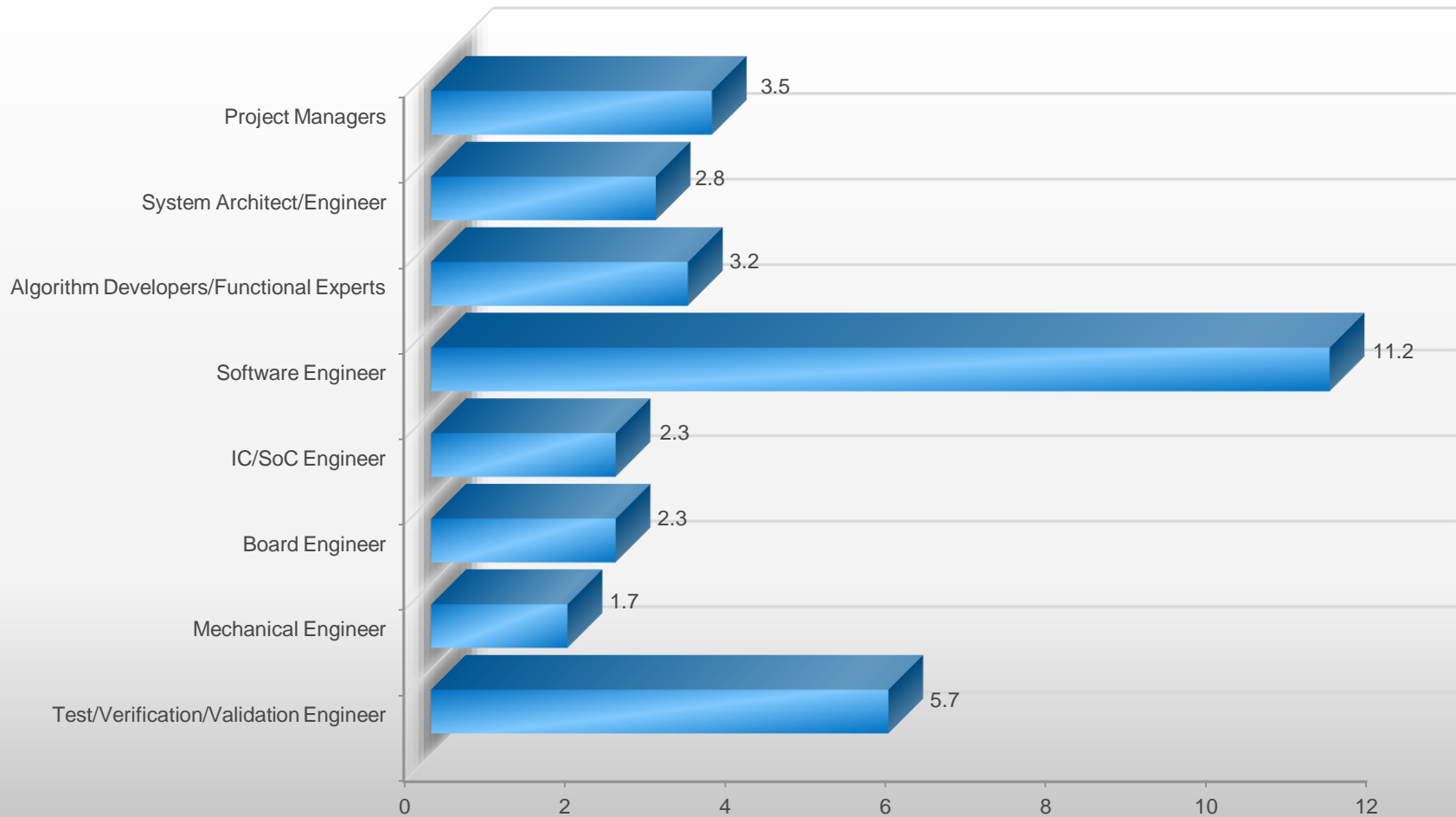


## Current development project team

### Number and Types of Full-time Engineers Working on Respondents' Current Project

(Mean of Respondents)

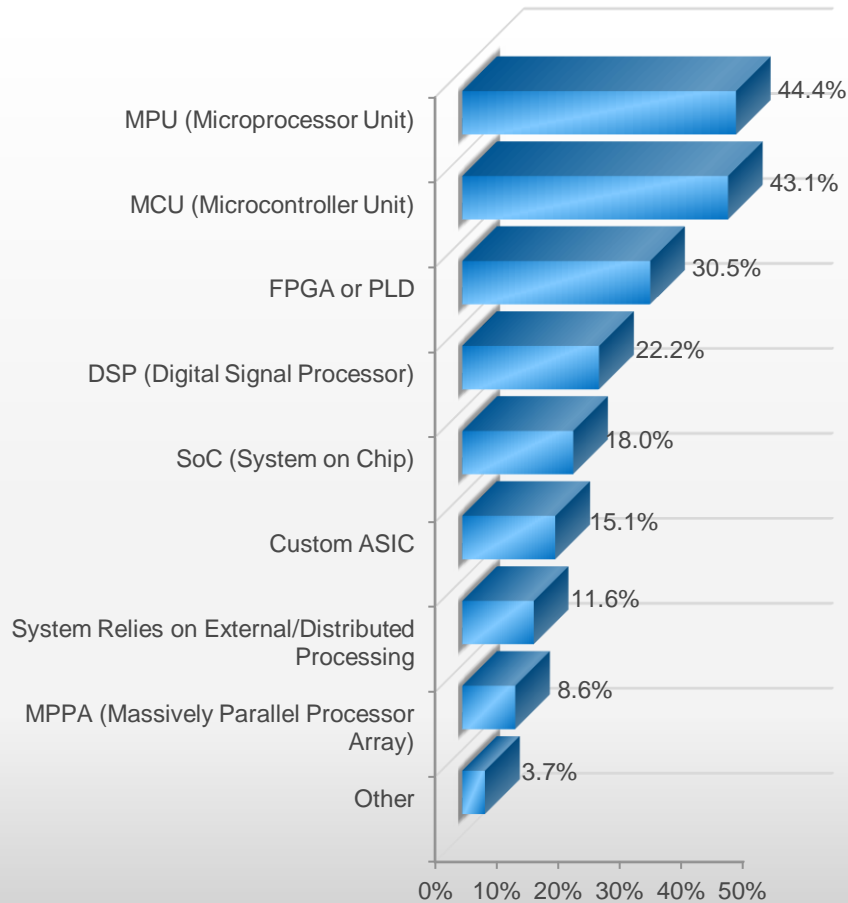
Total = 32.9



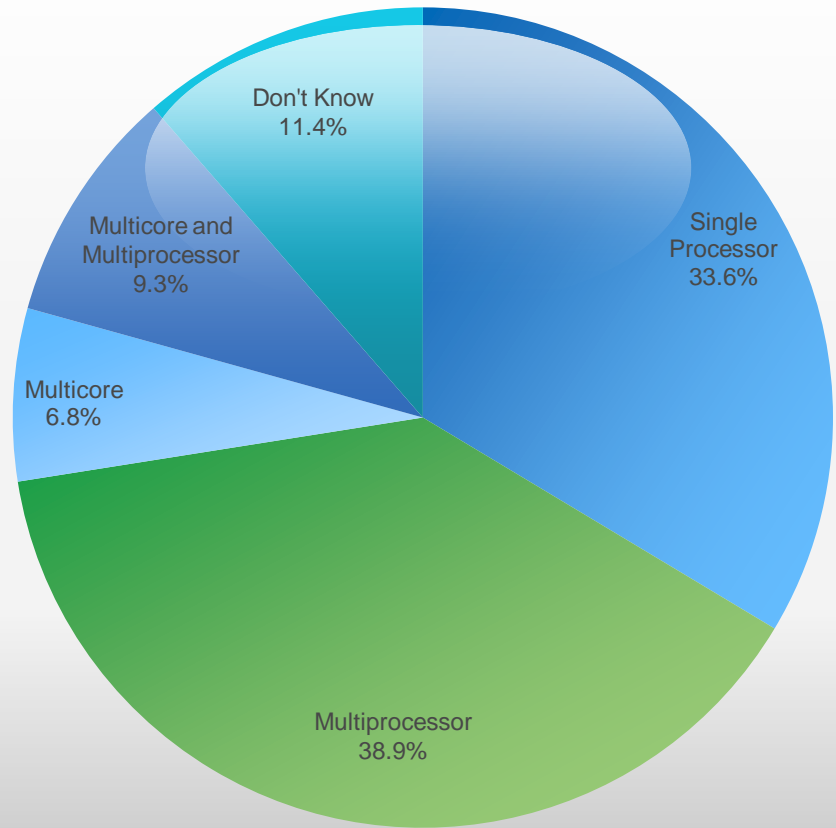
# Select Survey Data

## Current project processor architectures

**Processing Unit(s) Used on Current Design**  
(Percent of Respondents)



**Processing Architecture Used on the Current Project**  
(Percent of Respondents)

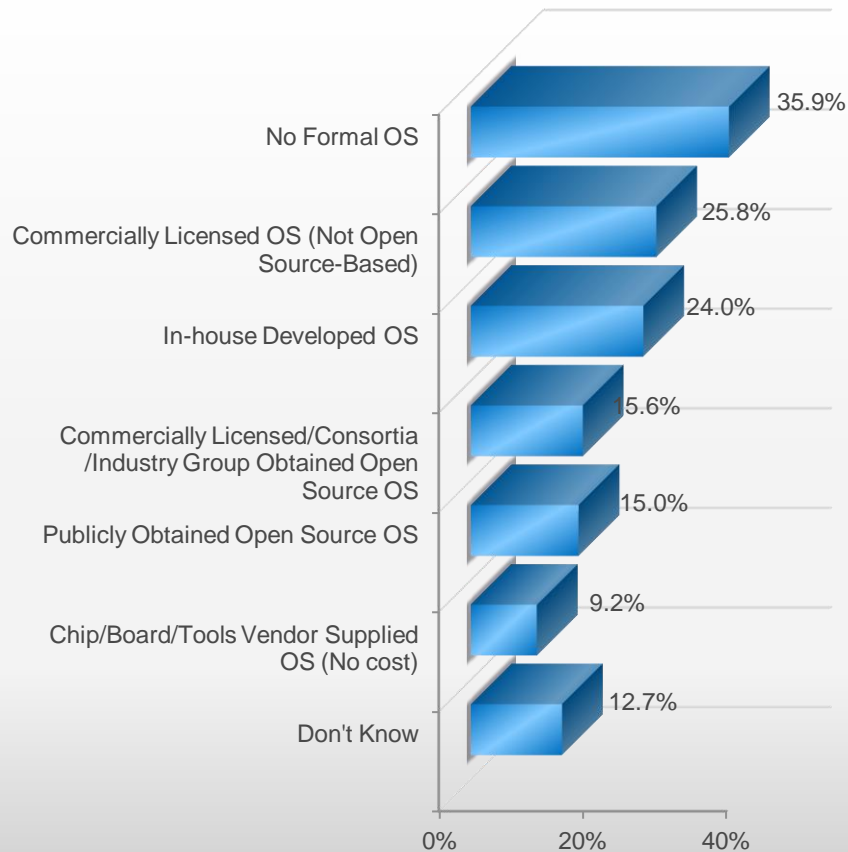


Note: Percentages sum to over 100% due to multiple responses.

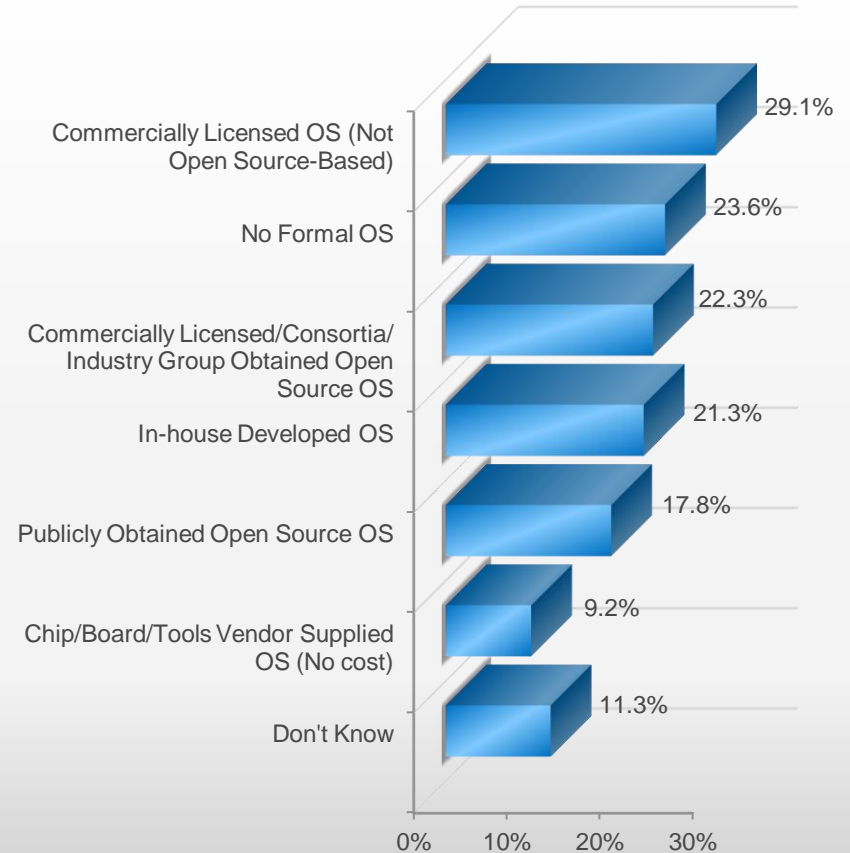
# Select Survey Data

## Operating systems

**Previous Project – Operating System(s) Used on the Target Embedded System**  
(Percent of Respondents)



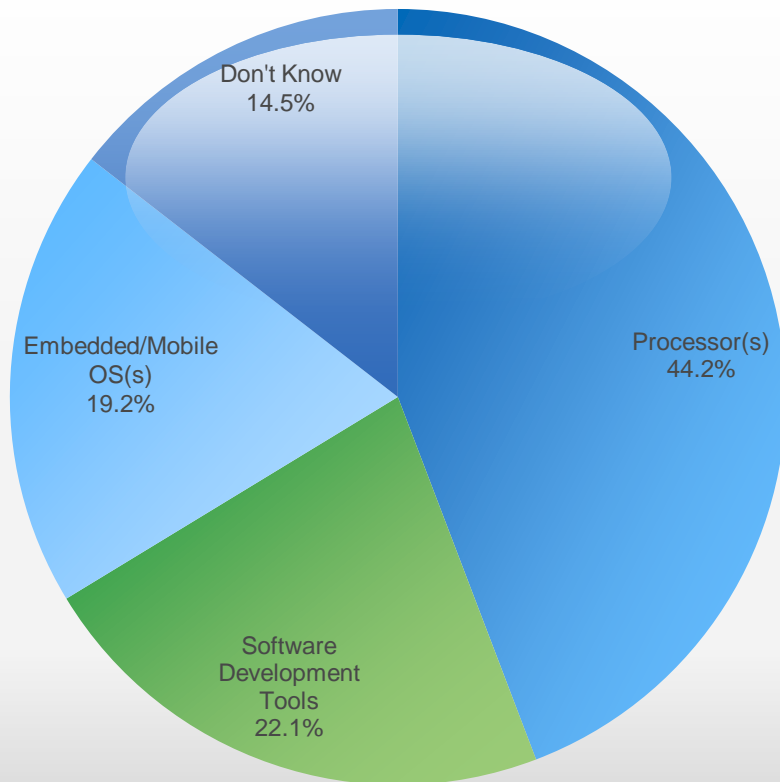
**Current Project – Operating System(s) Used on the Target Embedded System**  
(Percent of Respondents)



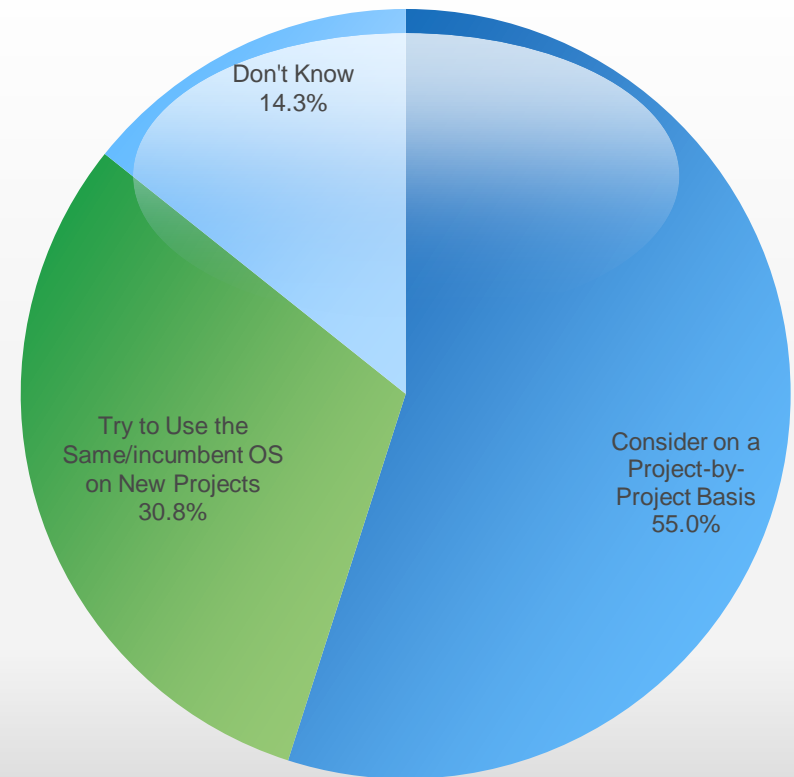
Note: Percentages sum to over 100% due to multiple responses.

## OS selection characteristics

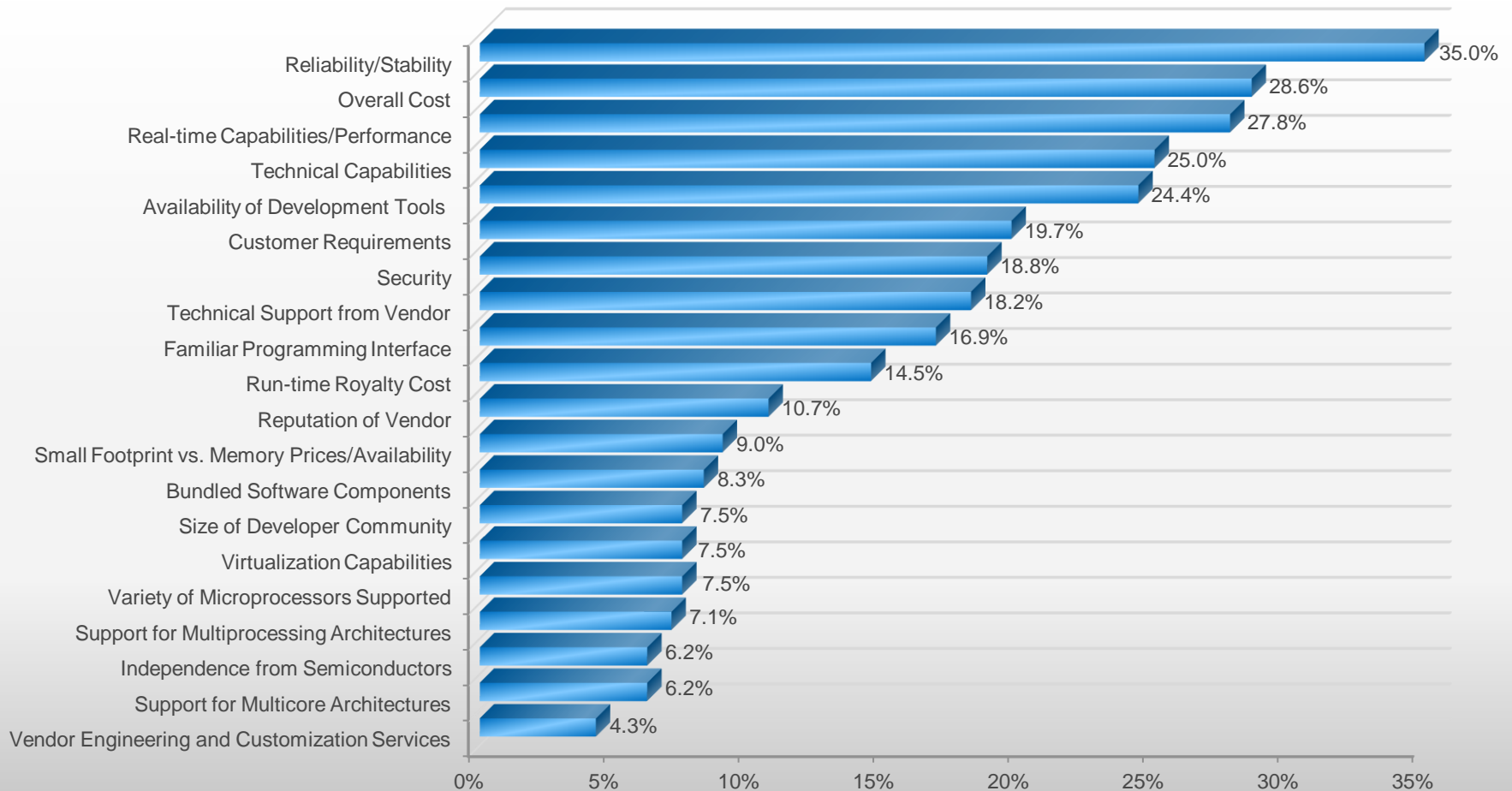
**Component that Respondent's Company Selected First for Current Project**  
(Percent of Respondents)



**Respondent's Company Approach to Selecting an Embedded/Mobile OS**  
(Percent of Respondents)

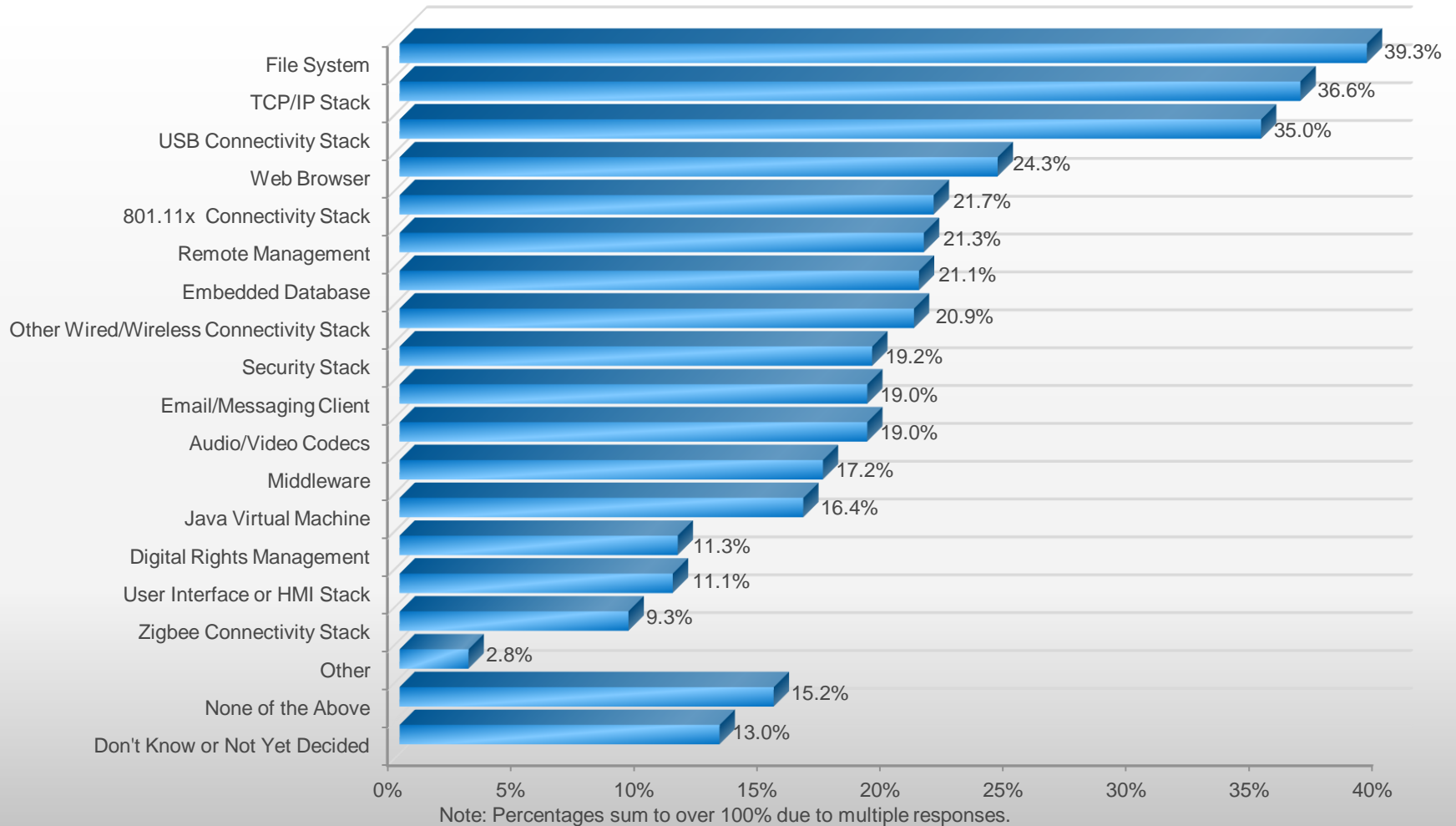


### Importance of Embedded Operating System Characteristics during OS Selection for Current Project (Percent of Respondents)



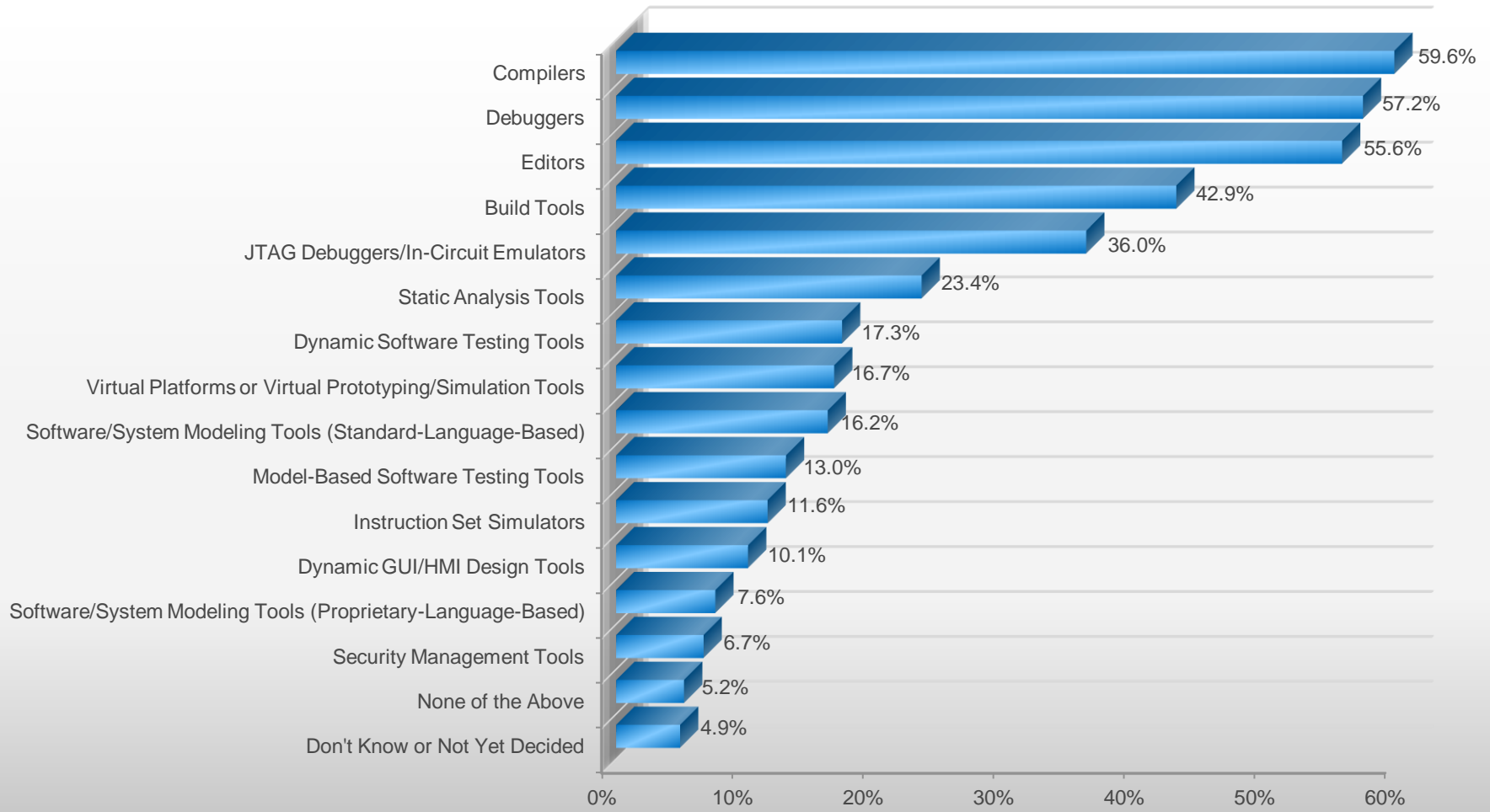
Note: Percentages sum to over 100% due to multiple responses. Respondents could select up to (3) criteria.

### Other Software Stack Components Required by Current Device/System (Percent of Respondents)



## Types of tool(s) used for current project

Types of Tool(s) Used for Current Project  
(Percent of Respondents)

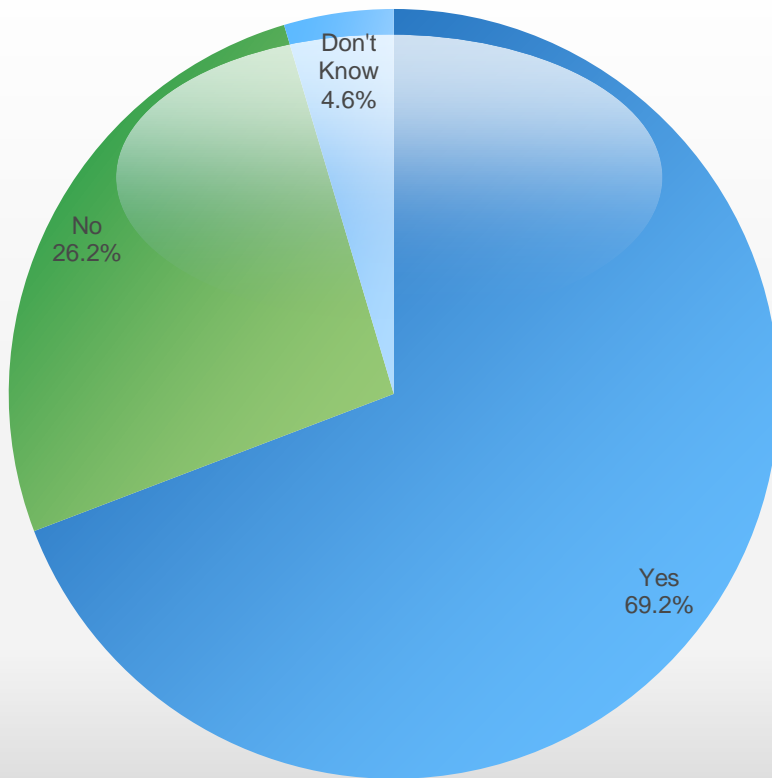


Note: Percentages sum to over 100% due to multiple responses.

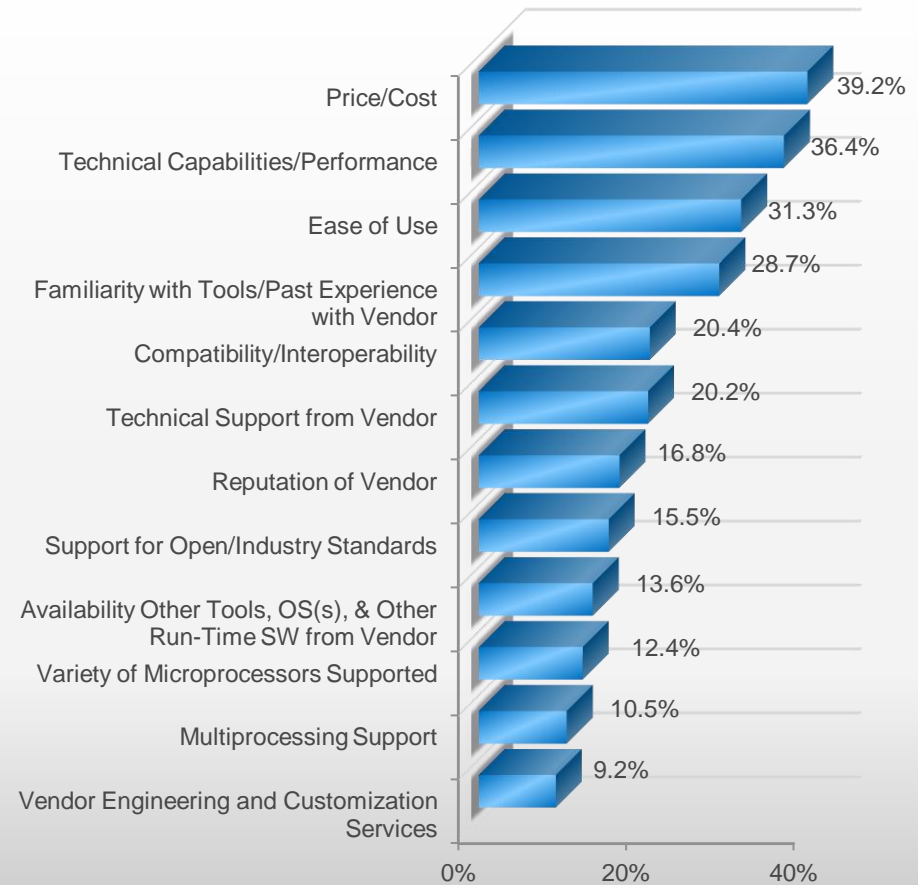
# Select Survey Data

Industry development project is targeted

**Respondents Use of an IDE for Current Project Development**  
(Percent of Respondents)



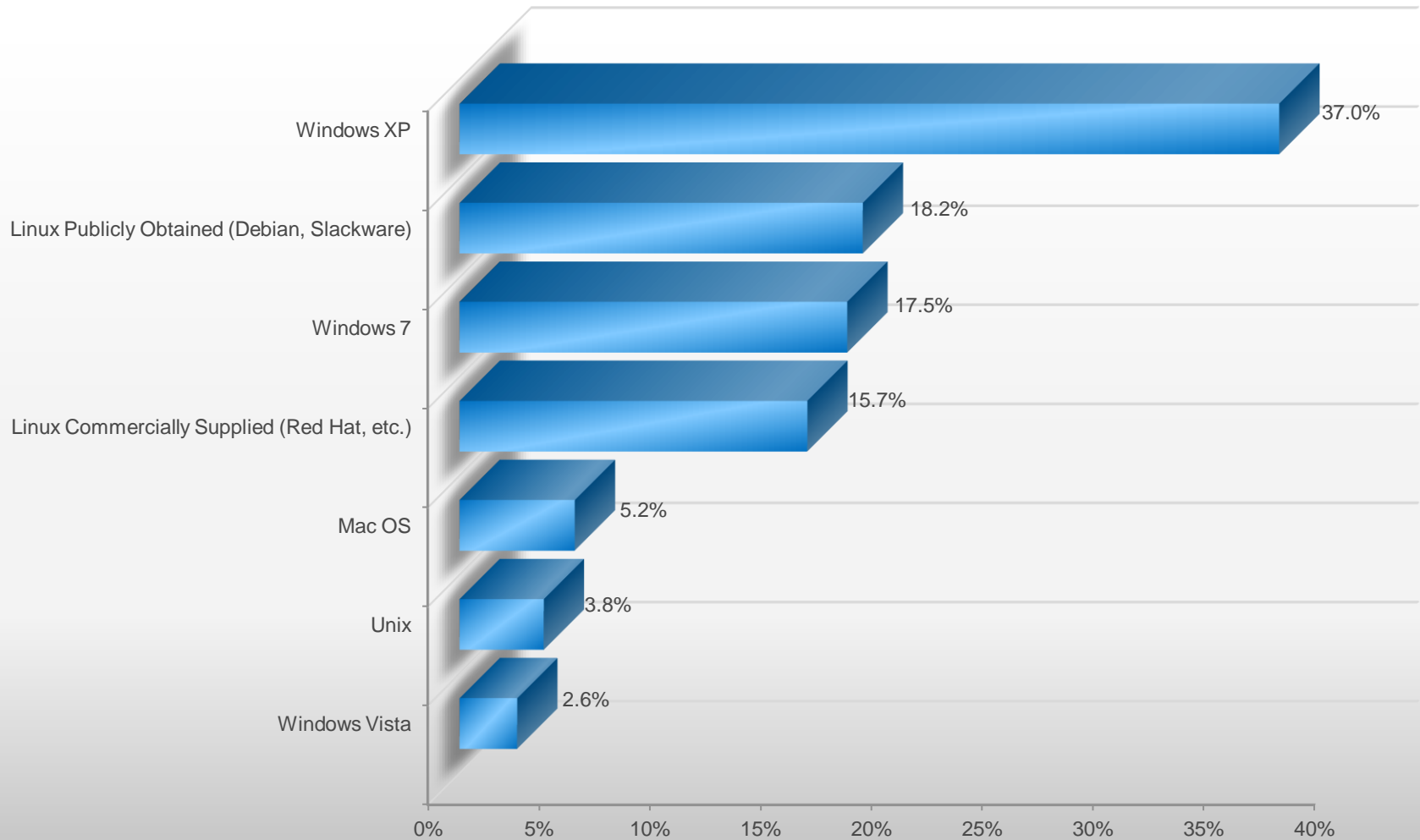
**Most Important Characteristics When Selecting Tools Used on Current Project**  
(Percent of Respondents)



Note: Percentages sum to over 100% due to multiple responses. Respondents could select up to (3) criteria.

## Primary host development environment

**Primary Host Development Environment Used for Current Development Projects**  
(Percent of Respondents)

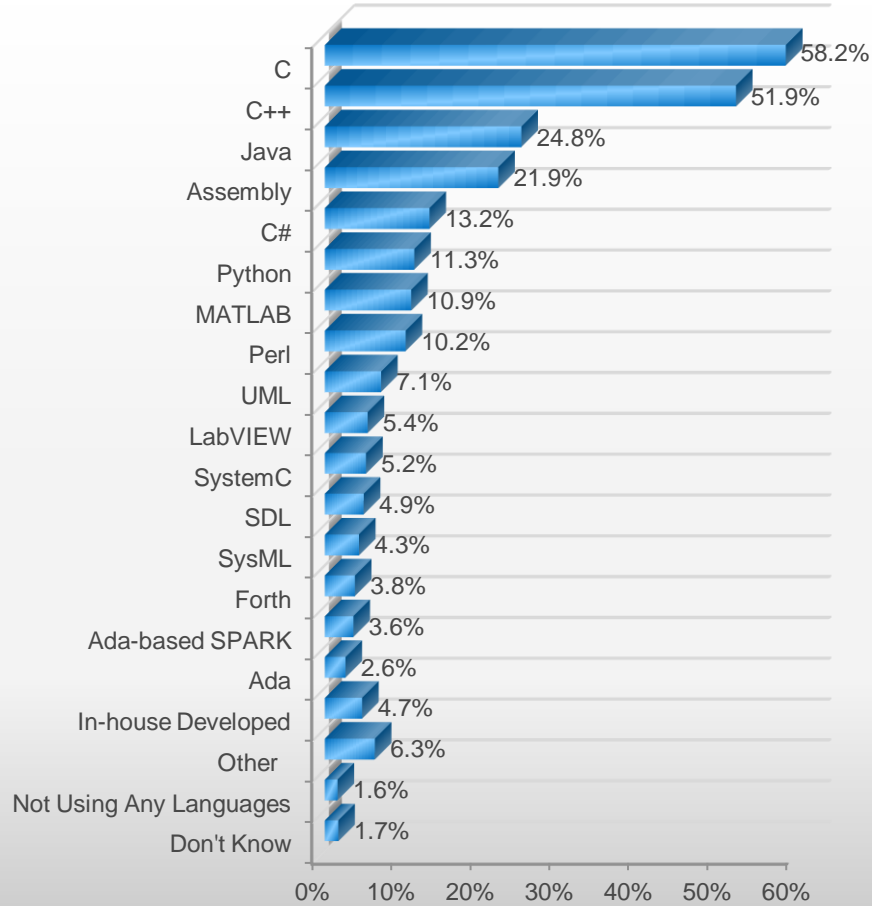


# Select Survey Data

## Current project languages and software design methodologies

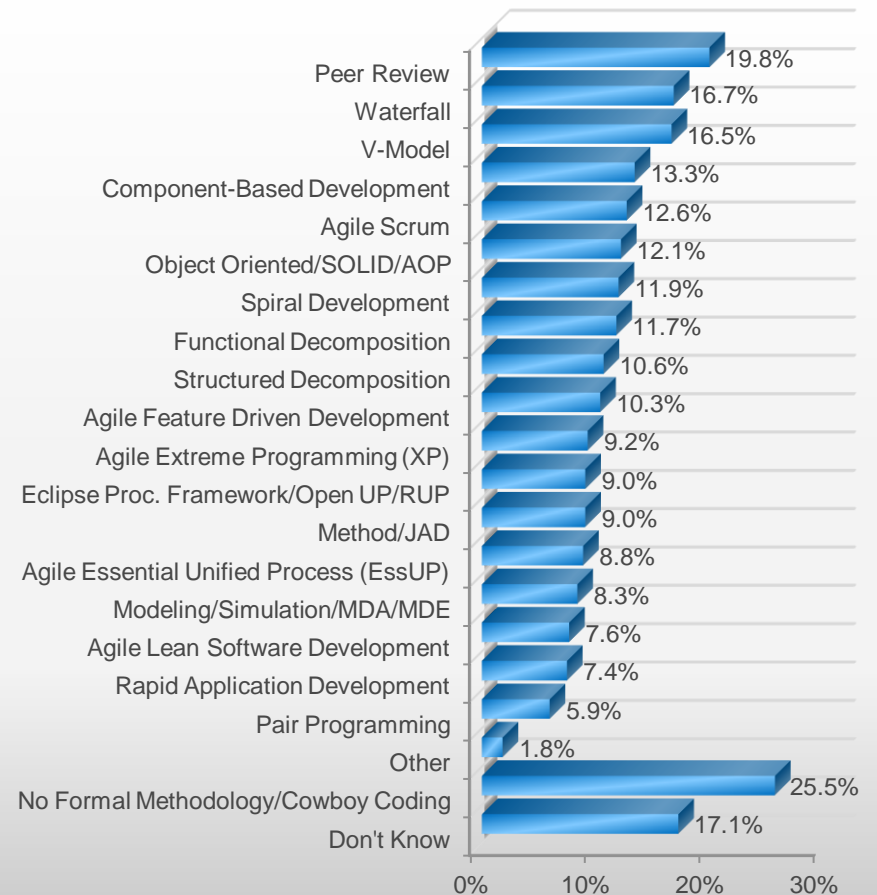
### Languages Used to Develop Software for Current Project

(Percent of Respondents)



### Software Design Methodologies being Used for Current Project

(Percent of Respondents)



Note: Percentages sum to over 100% due to multiple responses.

# Select Survey Data

## Current project schedule

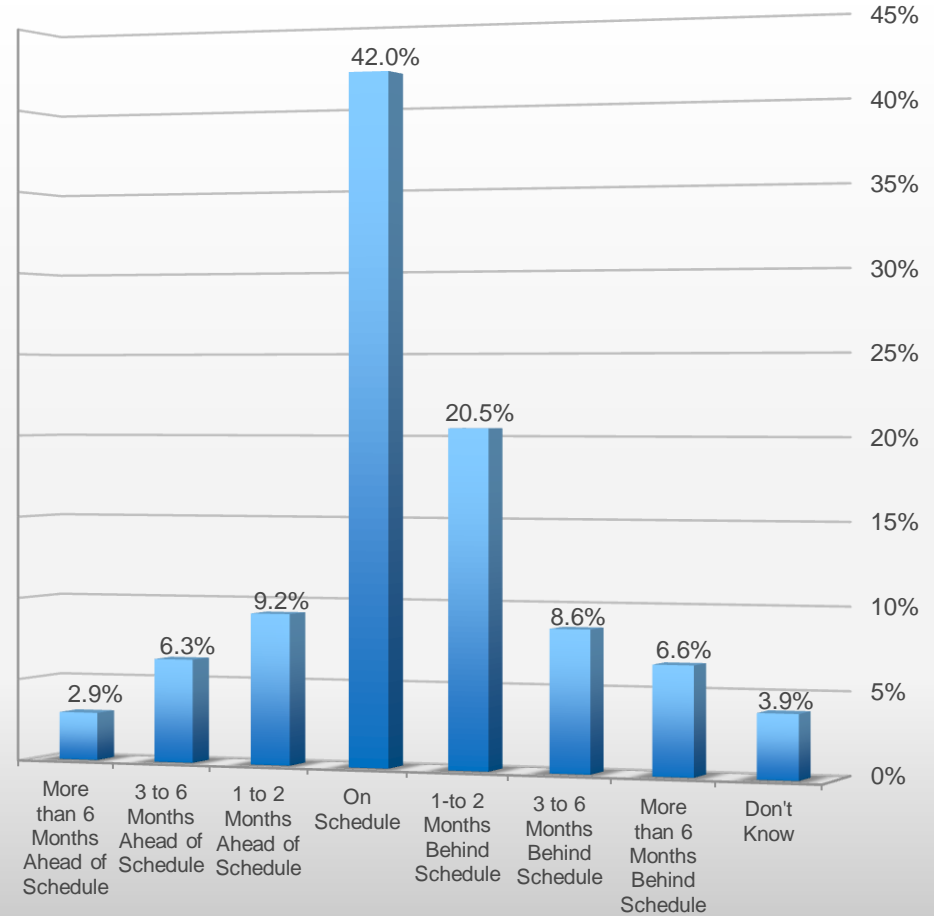
### Estimate of the Total Project Length in Calendar Months (Actual Time from Initial Specification to Shipment)

(Average of Respondents)

**Mean** = 15.7

**Median** = 12.0

### Adherence to Schedule for Current Project (or Best Estimate Upon Completion) (Percent of Respondents)



# Select Survey Data

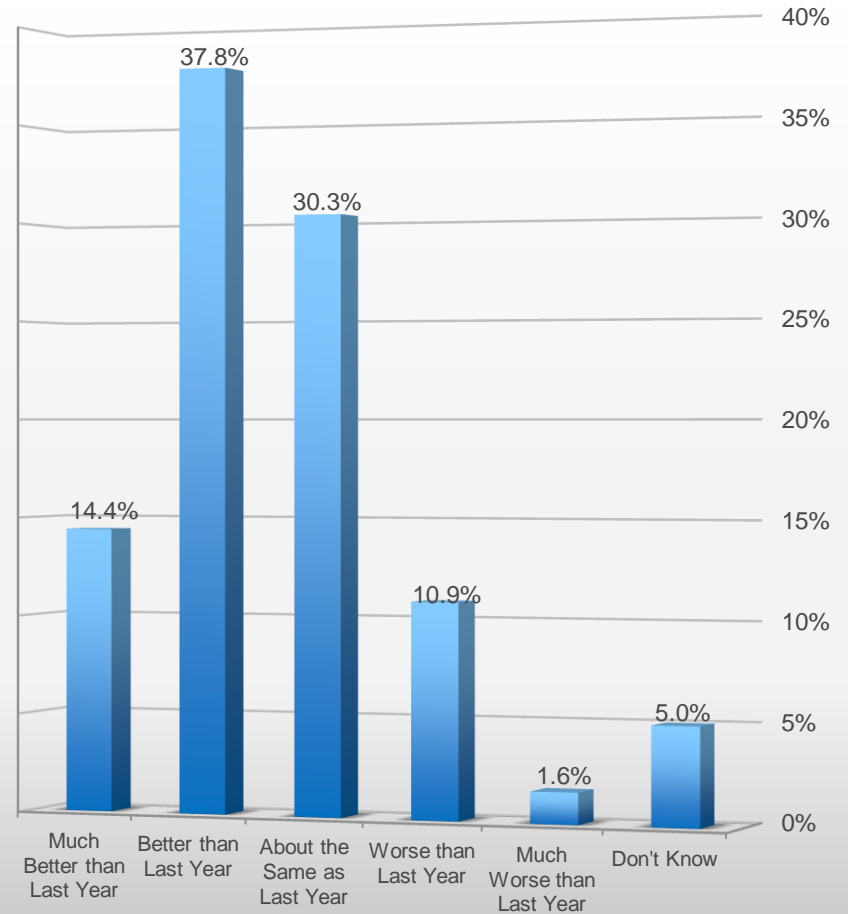
## Survey respondent demographics

### Respondent Annual Salary (Percent of Respondents)

**Mean** = \$74,679

**Median** = \$80,000

### Health of the Current Engineering Job Market in the Country of Respondent (Percent of Respondents)



**For further information about VDC's 2011 Embedded Software and Tools Market Intelligence Service, contact:**

Steve Balacco, *Director*, 508.653.9000 x124, [sbalacco@vdcresearch.com](mailto:sbalacco@vdcresearch.com)

Chris Rommel, *Senior Analyst*, 508.653.9000 x123, [crommel@vdcresearch.com](mailto:crommel@vdcresearch.com)

Jared Weiner, *Analyst*, 508.653.9000 x143, [jweiner@vdcresearch.com](mailto:jweiner@vdcresearch.com)

**For pricing/purchasing information, contact:**

Bob Perugini, *Senior Account Director*, 508.653.9000 x142, [rperugini@vdcresearch.com](mailto:rperugini@vdcresearch.com)

The entire contents of Source: *2011 EMBEDDED SOFTWARE AND TOOLS MARKET INTELLIGENCE SERVICE, Select Findings: Embedded Engineering Survey, Research Highlights for Survey Participants* are proprietary to VDC Research Group, Inc. (VDC), and may not be distributed in either original or reproduced form without prior written permission of VDC.

VDC has devoted its best efforts to obtain for and provide to its clients as accurate data as is possible. Nevertheless, we cannot be held responsible for incorrect information provided to us by vendors, users, or others that we interview. Nor can we be held responsible for forecasts of the future evolution of an industry, which, in retrospect, proves inaccurate. Our goal is to provide the best possible analysis of an industry, utilizing data obtained through a time-proven and rigorous research methodology, for our clients to employ in developing strategies to compete in an uncertain and ever-changing business environment.

## Trademark Acknowledgement

Many names of companies, associations, technologies, products and product types, etc. mentioned in this report comprise Trademarks, either registered or non-registered, owned by various entities. These are too numerous to mention individually. VDC acknowledges that ownership of these Trademarks exist and requests that readers acknowledge this as well.

List of Exhibits

2011 Embedded Software & Tools Market Intelligence Program  
Select Findings from the 2011 Embedded System Engineering Survey for Survey Participants

Click on exhibit number to proceed directly to the data

2011 Select Exhibits

<a href="#">Exhibit 1</a>	Survey Respondents Segmented by Geographic Region (Percent of Respondents)
<a href="#">Exhibit 2</a>	Survey Respondents Segmented by Geographic Sub-Region (Percent of Respondents)
<a href="#">Exhibit 3</a>	Types of Company/organization for which Respondents Work (Percent of Respondents)
<a href="#">Exhibit 4</a>	Number and Types of Embedded System Engineers at Respondents' Companies (Mean of Respondents)
<a href="#">Exhibit 5</a>	Survey Respondents Segmented by Primary Role within Company (Percent of Respondents)
<a href="#">Exhibit 6</a>	Project Tasks in which Respondents are Personally Involved on the Current Project (Percent of Respondents)
<a href="#">Exhibit 7</a>	Number of Different Embedded Engineering Projects Started by Respondents' Companies in 2010 (Average of Respondents)
<a href="#">Exhibit 8</a>	Survey Respondents' Product Design Type (Percent of Respondents)
<a href="#">Exhibit 9</a>	Type of Product Being Developed in Current Project (Percent of Respondents)
<a href="#">Exhibit 10</a>	Survey Respondents Segmented by the Target Industry/application of their Current Project (Percent of Respondents)
<a href="#">Exhibit 11</a>	Estimate of the Total Project Length in Calendar Months (Actual Time from Initial Specification to Shipment) (Average of Respondents)
<a href="#">Exhibit 12</a>	Estimate of the Number and Types of Full-time Engineers that are Working on Respondents' Current Projects (Mean of Respondents)
<a href="#">Exhibit 13</a>	Engineering Tasks Outsourced to External Companies (Percent of Respondents)
<a href="#">Exhibit 14</a>	Expected Change in the Amount of Outsourcing for a Typical Project at Respondents' Companies (Percent of Respondents)
<a href="#">Exhibit 15</a>	Processing Unit(s) Used on Current Designs (Percent of Respondents)
<a href="#">Exhibit 16</a>	Processing Architecture Used on the Current Project (Percent of Respondents)
<a href="#">Exhibit 17</a>	Operating System(s) Used on the Target Embedded System on the Previous Project (Percent of Respondents)
<a href="#">Exhibit 18</a>	Operating System(s) Used on the Target Embedded System on the Current Project (Percent of Respondents)
<a href="#">Exhibit 19</a>	Other Software Stack Components Required by Current Device/system (Percent of Respondents)
<a href="#">Exhibit 20</a>	Importance of Embedded Operating System Characteristics during OS Selection for Current Project (percent of Respondents)
<a href="#">Exhibit 21</a>	Respondents' Organization Policy towards the Use of Open Source Software (Percent of Respondents)
<a href="#">Exhibit 22</a>	Respondents' Familiarity with the Concept of Virtualization for Mobile/Embedded Systems (Percent of Respondents)
<a href="#">Exhibit 23</a>	Is Security Important for the Device/System under Development? (Percent of Respondents)
<a href="#">Exhibit 24</a>	Confidence in Meeting Security Requirement for Product Under Development (Percent of Respondents)
<a href="#">Exhibit 25</a>	Respondent's Company Approach to Selecting an Embedded/Mobile OS (Percent of Respondents)
<a href="#">Exhibit 26</a>	Components that Respondent's Company Selected First for Current Project (Percent of Respondents)
<a href="#">Exhibit 27</a>	Primary Host Development Environment Used for Current Development Projects (Percent of Respondents)
<a href="#">Exhibit 28</a>	Respondent's Current Project Application Interrupt Real-time Requirements (Percent of Respondents)
<a href="#">Exhibit 29</a>	Types of Tool(s) Used for Current Project (Percent of Respondents)
<a href="#">Exhibit 30</a>	Expected Change in Respondents' Tool Budgets (Percent of Respondents)
<a href="#">Exhibit 31</a>	Most Important Characteristics When Selecting Tools Used on Current Project (Percent of Respondents)
<a href="#">Exhibit 32</a>	Respondents Use of an IDE for Current Project Development (Percent of Respondents)
<a href="#">Exhibit 33</a>	Language(s) Used to Develop Software for Current Project (Percent of Respondents)
<a href="#">Exhibit 34</a>	Software Design Methodologies being Used for Current Project (Percent of Respondents)
<a href="#">Exhibit 35</a>	Adherence to Schedule for Current Project (or Best Estimate Upon Completion) (Percent of Respondents)
<a href="#">Exhibit 36</a>	Description of the Health of the Current Engineering Job Market in the Country of Respondent (Percent of Respondents)
<a href="#">Exhibit 37</a>	Annual Salary of Survey Respondents (Average of Respondents)

2011 Select Exhibits

All Survey Respondents  
Value

**Exhibit 1**

Survey Respondents Segmented by Geographic Region  
 (Percent of Respondents)

Americas	46.3%
EMEA	29.3%
Asia-Pacific	24.4%

**Exhibit 2**

Survey Respondents Segmented by Geographic Sub-Region  
 (Percent of Respondents)

North America	44.0%
India/Pakistan/Bangladesh	10.5%
Western Continental Europe (excluding Scandinavia)	8.0%
UK and Ireland	11.5%
Eastern Europe	0.9%
Latin/South America	2.3%
Africa	0.6%
Middle East	1.0%
Scandinavia	1.4%
Japan/South Korea	0.5%
Oceania	9.1%
East Asia (excluding Japan, S. Korea, Oceania, India, Pakistan, Bangladesh)	4.4%
Other Europe/Middle East/Africa	5.9%

**Exhibit 3**

Types of Company/organization for which Respondents Work  
 (Percent of Respondents)

Embedded systems/device manufacturer (e.g., Boeing, General Electric, Sony)	38.0%
Operating systems/engineering tools vendor (e.g., Microsoft, Wind River)	6.7%
Third-party software/application vendor	9.3%
Board vendor (e.g., Kontron)	1.0%
Semiconductor supplier (e.g., Intel, Texas Instruments)	4.5%
Semiconductor IP vendor (e.g., ARM, MIPS)	2.1%
Engineering services company or systems integrator (e.g., Wipro)	15.5%
Consultancy or independent consultant	9.3%
Research/government institution	5.5%
Academic institution	4.0%
Other	4.0%

2011 Select Exhibits

All Survey Respondents

Value

**Exhibit 4**

Number and Types of Embedded System Engineers at Respondents' Companies  
 (Mean of Respondents)

Project manager	21.3
System architect/engineer	20.0
Algorithm developer/functional expert	12.9
Software engineer	76.0
IC/SoC engineer	18.9
Board engineer	19.9
Mechanical engineer	16.6
Test/verification/validation engineer	32.7
<b>Total</b>	<b>218.3</b>

**Exhibit 5**

Survey Respondents Segmented by Primary Role within Company  
 (Percent of Respondents)

Project manager	16.7%
System architect/engineer	24.7%
Algorithm developer/functional expert	4.4%
Software engineer	32.3%
IC/SoC engineer	3.2%
Board engineer	4.0%
Mechanical engineer	1.8%
Test/verification/validation engineer	4.6%
Other	8.2%

**Exhibit 6**

Project Tasks in which Respondents are Personally Involved on the Current Project  
 (Percent of Respondents)

Project management/planning	43.9%
Requirements management/specification	36.9%
System architecture engineering	44.7%
Algorithm engineering	32.4%
Software application/middleware development/test	45.3%
Operating system development/test	20.1%
Firmware development/test	35.0%
IC/SoC design/verification	11.4%
Board level engineering/test	20.3%
Mechanical engineering	11.4%
Prototype development	24.6%
System integration/test/verification	29.7%
Vendor selection/commercial negotiation	12.4%
Other	1.6%
None of the above	1.1%
Don't know	0.1%

Note: Percentages sum to over 100% due to multiple responses.

2011 Select Exhibits

All Survey Respondents

Value

**Exhibit 7**

Number of Different Embedded Engineering Projects Started by Respondents' Companies in 2010  
*(Average of Respondents)*

Mean	9.3
Median	4.0

**Exhibit 8**

Survey Respondents' Product Design Type  
*(Percent of Respondents)*

New design	56.4%
Revision to an existing design	41.5%
Don't know	2.1%

**Exhibit 9**

Type of Product Being Developed in Current Project  
*(Percent of Respondents)*

Embedded device/system	52.8%
Semiconductor (e.g. MPU/MCU, ASIC, SoC, FPGA, etc.)	10.8%
Semiconductor IP	3.2%
Embedded computer board	5.3%
Embedded software	20.9%
Other	4.8%
Don't know	2.2%

**Exhibit 10**

Survey Respondents Segmented by the Target Industry/application of their Current Project  
*(Percent of Respondents)*

Automotive	7.7%
Consumer electronics	11.1%
Digital signage	1.5%
Energy/power	8.7%
Industrial automation	12.8%
Medical devices	9.0%
Military/aerospace	12.8%
Mobile phones	6.1%
Office/business automation	5.1%
Rail/transportation	3.6%
Retail automation	1.7%
Telecom/datacom	7.9%
General purpose or non-industry specific	6.3%
Other	5.7%

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**Exhibit 11**

Estimate of the Total Project Length in Calendar Months (Actual Time from Initial Specification to Shipment)  
*(Average of Respondents)*

Mean	15.7
Median	12.0

**Exhibit 12**

Estimate of the Number and Types of Full-time Engineers that are Working on Respondents' Current Projects  
*(Mean of Respondents)*

Project managers	3.5
System architect/engineer	2.8
Algorithm developers/functional experts	3.2
Software engineer	11.2
IC/SoC engineer	2.3
Board engineer	2.3
Mechanical engineer	1.7
Test/verification/validation engineer	5.7
<b>Total engineers</b>	<b>32.9</b>

**Exhibit 13**

Engineering Tasks Outsourced to External Companies  
*(Percent of Respondents)*

Not outsourcing any engineering tasks	51.8%
Project management/planning	8.3%
Requirements management/specification	8.5%
System architecture engineering	12.0%
Algorithm engineering	10.1%
Software application/middleware development/test	16.2%
Operating system development/test	10.2%
Firmware development/test	11.4%
IC/SoC design/verification	8.6%
Board level engineering test	12.4%
Mechanical engineering	11.4%
Prototype development	7.7%
System integration/test/verification	7.6%
Don't know	3.6%

*Note: Percentages sum to over 100% due to multiple responses.*

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**Exhibit 14**

Expected Change in the Amount of Outsourcing for a Typical Project at Respondents' Companies  
 (Percent of Respondents)

Significantly increase	17.1%
Increase somewhat	32.9%
Stay the same	37.7%
Decrease somewhat	4.2%
Significantly decrease	3.6%
Don't know	4.5%

**Exhibit 15**

Processing Unit(s) Used on Current Designs  
 (Percent of Respondents)

MPU (Microprocessor Unit)	44.4%
MCU (Microcontroller Unit)	43.1%
FPGA (Field Programmable Gate Array) or PLD (Programmable Logic Device)	30.5%
DSP (Digital Signal Processor)	22.2%
MPPA (Massively Parallel Processor Array)	8.6%
SoC (System on Chip)	18.0%
Custom ASIC (Application Specific Integrated Circuit)	15.1%
System relies on external/distributed processing	11.6%
Other	3.7%

Note: Percentages sum to over 100% due to multiple responses.

**Exhibit 16**

Processing Architecture Used on the Current Project  
 (Percent of Respondents)

Single processor	33.6%
Multiprocessor (more than one processor on separate silicon)	38.9%
Multicore (more than one processor core on the same silicon)	6.8%
Multicore and multiprocessor	9.3%
Don't know	11.4%

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**Exhibit 17**

Operating System(s) Used on the Target Embedded System on the Previous Project  
 (Percent of Respondents)

No formal operating system	35.9%
In-house developed operating system	24.0%
Commercially licensed operating system (not open source-based)	25.8%
Commercially licensed/consortia/industry group obtained open source OS (e.g., OHA Android, LiMo, etc.)	15.6%
Publicly obtained open source OS (i.e. Debian Linux, etc)	15.0%
Chip/board vendor supplied (or obtained from tools vendor at no cost) OS	9.2%
Don't know	12.7%

Note: Percentages sum to over 100% due to multiple responses.

**Exhibit 18**

Operating System(s) Used on the Target Embedded System on the Current Project  
 (Percent of Respondents)

No formal operating system	23.6%
In-house developed operating system	21.3%
Commercially licensed operating system (not open source-based)	29.1%
Commercially licensed/consortia/industry group obtained open source OS (e.g., OHA Android, LiMo, etc.)	22.3%
Publicly obtained open source OS (i.e. Debian Linux, etc)	17.8%
Chip/board vendor supplied (or obtained from tools vendor at no cost) OS	9.2%
Don't know	11.3%

Note: Percentages sum to over 100% due to multiple responses.

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**Exhibit 19**

Other Software Stack Components Required by Current Device/system  
 (Percent of Respondents)

Middleware	17.2%
Java virtual machine	16.4%
Audio/video codecs	19.0%
File system	39.3%
Embedded database	21.1%
Digital rights management	11.3%
User interface or HMI stack	11.1%
Remote management	21.3%
Security stack	19.2%
TCP/IP stack	36.6%
USB connectivity stack	35.0%
801.11x connectivity stack	21.7%
Zigbee connectivity stack	9.3%
Other wired/wireless connectivity stack	20.9%
Email/messaging client	19.0%
Web browser	24.3%
None of the above	15.2%
Other	2.8%
Don't know or not yet decided	13.0%

Note: Percentages sum to over 100% due to multiple responses.

**Exhibit 20**

Importance of Embedded Operating System Characteristics during OS Selection for Current Project  
 (Percent of Respondents)

Familiar programming interface	16.9%
Vendor engineering and customization services	4.3%
Variety of microprocessors supported	7.5%
Availability of development tools	24.4%
Security	18.8%
Technical capabilities	25.0%
Real-time capabilities/performance	27.8%
Reliability/stability	35.0%
Small footprint vs. memory prices/availability	9.0%
Support for multicore architectures	6.2%
Run-time royalty cost	14.5%
Overall cost	28.6%
Support for multiprocessing architectures	7.1%
Virtualization capabilities	7.5%
Size of developer community	7.5%
Bundled software components	8.3%
Independence from semiconductors	6.2%
Customer requirements	19.7%
Reputation of vendor	10.7%
Technical support from vendor	18.2%

Note: Percentages sum to over 100% due to multiple responses. Respondents could select up to three (3) criteria.

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**Exhibit 21**

Respondents' Organization Policy towards the Use of Open Source Software  
 (Percent of Respondents)

Does not allow the use of any open source software	10.9%
Makes use of open source software but does not permit participation in OSS communities	35.7%
Utilize OSS and actively contributes to the community	23.2%
Contributes significant development resources to the open source community	5.0%
The company's business model depends on OSS	5.0%
Don't know	20.2%

**Exhibit 22**

Respondents' Familiarity with the Concept of Virtualization for Mobile/Embedded Systems  
 (Percent of Respondents)

Extremely familiar	10.5%
Moderately familiar	29.7%
Only slightly familiar	30.5%
Not at all familiar	29.3%

**Exhibit 23**

Is Security Important for the Device/System under Development?  
 (Percent of Respondents)

Yes	69.9%
No	24.7%
Don't know	5.3%

**Exhibit 24**

Confidence in Meeting Security Requirement for Product Under Development  
 (Percent of Respondents)

Project has no specific security requirements	32.0%
Not confident	3.1%
Somewhat confident	17.4%
Confident	19.9%
More than confident	7.6%
Very confident	8.4%
Don't know	11.7%

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**Exhibit 25**

Respondent's Company Approach to Selecting an Embedded/Mobile OS  
 (Percent of Respondents)

Consider on a project-by-project basis	55.0%
Try to use the same/incumbent OS on new projects	30.8%
Don't know	14.3%

**Exhibit 26**

Components that Respondent's Company Selected First for Current Project  
 (Percent of Respondents)

Embedded/mobile OS(s)	19.2%
Software development tools	22.1%
Processor(s)	44.2%
Don't know	14.5%

**Exhibit 27**

Primary Host Development Environment Used for Current Development Projects  
 (Percent of Respondents)

Linux commercially supplied (Red Hat, etc.)	15.7%
Linux publicly obtained (Debian, Slackware)	18.2%
Mac OS	5.2%
Unix	3.8%
Windows XP	37.0%
Windows Vista	2.6%
Windows 7	17.5%

**Exhibit 28**

Respondent's Current Project Application Interrupt Real-time Requirements  
 (Percent of Respondents)

Less than 10 microseconds	14.8%
10 to 49 microseconds	10.7%
50 to 99 microseconds	9.1%
100 to 249 microseconds	12.8%
250 to 499 microseconds	9.3%
500 to 999 microseconds	5.6%
1 or more milliseconds	15.4%
Don't know	22.4%

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**Exhibit 29**

Types of Tool(s) Used for Current Project  
 (Percent of Respondents)

Compilers	59.6%
Debuggers	57.2%
Editors	55.6%
Build tools	42.9%
JTAG debuggers/In-circuit emulators	36.0%
Instruction set simulators	11.6%
Virtual platforms or virtual prototyping/simulation tools	16.7%
Static analysis tools	23.4%
Dynamic software testing tools	17.3%
Model-based software testing tools	13.0%
Software/system modeling tools (Standard-language-based)	16.2%
Software/system modeling tools (Proprietary-language-based)	7.6%
Dynamic GUI/HMI design tools	10.1%
Security management tools	6.7%
None of the above	5.2%
Don't know or not yet decided	4.9%

Note: Percentages sum to over 100% due to multiple responses.

**Exhibit 30**

Expected Change in Respondents' Tool Budgets  
 (Percent of Respondents)

Increase	32.5%
Remain about the same	49.0%
Decrease	7.2%
Don't know	11.3%

**Exhibit 31**

Most Important Characteristics When Selecting Tools Used on Current Project  
 (Percent of Respondents)

Familiarity with tools/past experience with vendor	28.7%
Variety of microprocessors supported	12.4%
Support for open/industry standards	15.5%
Technical capabilities/performance	36.4%
Technical support from vendor	20.2%
Multiprocessing support	10.5%
Price/cost	39.2%
Reputation of vendor	16.8%
Compatibility/interoperability	20.4%
Ease of use	31.3%
Vendor engineering and customization services	9.2%
Availability of other tools, OS(s), and other run-time software from	13.6%

Note: Percentages sum to over 100% due to multiple responses. Respondents could select up to three (3) criteria.

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**Exhibit 32**

Respondents Use of an IDE for Current Project Development  
 (Percent of Respondents)

Yes	69.2%
No	26.2%
Don't know	4.6%

**Exhibit 33**

Language(s) Used to Develop Software for Current Project  
 (Percent of Respondents)

Not using any languages to develop software	1.6%
Ada	2.6%
Ada-based SPARK	3.6%
Assembly	21.9%
C	58.2%
C++	51.9%
C#	13.2%
Forth	3.8%
Java	24.8%
LabVIEW	5.4%
MATLAB	10.9%
Perl	10.2%
Python	11.3%
SDL	4.9%
SystemC	5.2%
UML	7.1%
SysML	4.3%
In-house developed	4.7%
Other	6.3%
Don't know	1.7%

*Note: Percentages sum to over 100% due to multiple responses.*

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**Exhibit 34**

Software Design Methodologies being Used for Current Project  
 (Percent of Respondents)

No formal methodology/cowboy coding	25.5%
Method/JAD	9.0%
Agile Essential Unified Process (EssUP)	8.8%
Agile Extreme Programming (XP)	9.2%
Agile Feature driven development	10.3%
Agile Lean software development	7.6%
Agile Scrum	12.6%
Component-based development	13.3%
Eclipse Process Framework/Open UP/RUP	9.0%
Functional decomposition	11.7%
Modeling/simulation/MDA/MDE	8.3%
Object Oriented/SOLID/AOP	12.1%
Pair programming	5.9%
Peer review	19.8%
Rapid Application Development	7.4%
Spiral development	11.9%
Structured decomposition	10.6%
V-Model	16.5%
Waterfall	16.7%
Other	1.8%
Don't know	17.1%

Note: Percentages sum to over 100% due to multiple responses.

**Exhibit 35**

Adherence to Schedule for Current Project (or Best Estimate Upon Completion)  
 (Percent of Respondents)

More than 6 months ahead of schedule	2.9%
3 to 6 months ahead of schedule	6.3%
1 to 2 months ahead of schedule	9.2%
On schedule	42.0%
1-to 2 months behind schedule	20.5%
3 to 6 months behind schedule	8.6%
More than 6 months behind schedule	6.6%
Don't know	3.9%

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**Exhibit 36**

Description of the Health of the Current Engineering Job Market in the Country of Respondent  
*(Percent of Respondents)*

Much better than last year	14.4%
Better than last year	37.8%
About the same as last year	30.3%
Worse than last year	10.9%
Much worse than last year	1.6%
Don't know	5.0%

**Exhibit 37**

Annual Salary of Survey Respondents  
*(Average of Respondents)*

Mean	\$74,679
Median	\$80,000

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